



Determination 2013/075

Regarding the compliance of roof flashings and the issuing of a notice to fix for a 7-year-old educational complex at 136 Landlyst Road, Waihi



1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations 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

- the applicant, Hauraki District Council carrying out its duties and functions as a territorial authority or a building consent authority (“the authority”)
- the owner of the building, the Flying Phoenix Trust (“the building owner”).

1.3 I have also identified the following as persons with an interest in respect of this determination:

- The manufacturer of the butyl-rubber flashing membranes in question (“the flashings”), Ardex New Zealand Ltd (“Ardex”).
- The manufacturer and supplier of the terracotta tiling associated with the flashing membranes, Monier Roofing NZ (“Monier”).

Both Ardex and Monier are acting through the same agent (“the agent”)

1.4 This determination arises from the decision of the authority to issue a notice to fix in regard to three building consents for buildings that form part of an educational complex (“the complex”). The authority’s concerns relate to the compliance of the

¹ The Building Act, Building Code, Compliance documents, past determinations and guidance documents issued by the Ministry are all available at www.dbh.govt.nz or by contacting the Ministry on 0800 242 243.

flashings with Clauses E2 and B2 of the Building Code (Schedule 1 of the Building Regulations 1992)².

1.5 The matters to be determined³ are whether

- the authority correctly exercised its powers when it issued a second notice to fix in regard to building consents Nos BC27794, BC28029, and BC28578, and
- the flashings comply with Clauses B2—Durability and E2—External Moisture of the Building Code⁴ (First Schedule, Building Regulations 1992).

1.6 In making my decision, I have considered the submissions of the parties, the report of the expert commissioned by the Ministry to advise on this dispute (“the expert”), and the other evidence in this matter.

2. The building work

2.1 The three buildings that are subject to this determination form part of a large education complex situated on a rural site that is in a specific design wind zone and a medium exposure zone for the purposes of NZS 3604⁵. The relevant buildings and building consents are as follows:

Consent No. Issue date	Building description	Roof cladding
BC 28578 26 February 2007	Administration/Library Block: Two-storey central core and two single-storey wings to west and east	Terracotta tile
BC 27794 17 October 2007	Two storey Student dormitory blocks (D3 and D5)	Terracotta tile
BC 28029 17 October 2007	Three-storey Main hall	Profiled metal
	Two-storey Staff dormitory block (D1)	Terracotta tile

2.2 The administration/library block and student dormitory blocks consisted of concrete slab on grade and upper floor with precast exterior walls and internal gutter facades. Internal gutters are torch-on membrane lined and roofs pitched with terracotta tile cladding (with the exception of the stairwells clad with profiled metal roofing) and flashed with butyl rubber apron flashings and butyl rubber concealed gutters at barge details. The student dormitories also have dormer style facings fitted with precast concrete parapets.

2.3 The staff dormitory is connected to the south end of the main hall block and is a two-storey structure with a rear single storey annexe. The structure consists of concrete slab on grade with concrete upper floor and roof. The exterior walls and parapets are precast concrete and the roof slab is torch-on membrane lined. The annexe roof is pitched with terracotta tile cladding and flashed with butyl rubber membrane.

2.4 The expert observed the timber head plate in the ceiling area of the administration/library block marked '90 x 45 KD NZS 3603', and the drawing specified H3.1 treatment to this framing.

² In this determination, unless otherwise stated, references are to sections of the current Act and references to clauses are references to the Building Code

³ Under sections 177(1)(a), 177(1)(b) and 177(2)(f) of the Act

⁴ In this determination, unless otherwise stated, references are to sections of the Act and references to clauses are references to the Building Code

⁵ New Zealand Standard NZS 3604:2011 Timber Framed Buildings

2.5 The flashings

- 2.5.1 The flashings that are subject of this determination are proprietary butyl rubber apron flashings to the terracotta tile clad roofs.
- 2.5.2 The butyl rubber flashings adhered to the horizontal tile perimeters are continuous and extend part way down the top row of tiles. Pleated upstands are turned into a chase are protected by stainless steel overflashings.
- 2.5.3 The flashings adhered to the sloping tile perimeters are installed as individual pieces to each tile. Each flashing covers the visible edge of the tile and continues below the upper overlapping tile, with overlaps ranging from 85mm to 185mm. The membrane is extended out on the tile, though in some locations by only 80mm. The front edge of the tile is not covered by the flashing.
- 2.6 I have not seen copies of the building consents or records of inspections carried out during construction, nor advice on the dates of completion. (According to the agent, the flashings had been installed by April 2007.)

3. Background

- 3.1 In a letter to the building owner dated 25 January 2011 in respect of a code compliance certificate for building consent No. 28578, the authority stated that in regard to building consent No 28578, there were 'matters identified in the final inspection that still need addressing and re-inspection'. (I have not seen a copy of the final inspection record.)
- 3.2 Following a site visit on 8 March 2012, the authority emailed the building owner on 15 March 2012, noting that as regards the Staff Dormitory, lead flashings were required to be installed in conjunction with the terracotta roofing tiles. Butyl flashings, which had not been approved on the consented plans, had been installed in lieu. In addition, the apron flashings were required to be chased in as detailed on the consented plans.
- 3.3 On 2 October 2012, Monier wrote to the authority stating that it accepted the use of butyl-rubber as a weatherproofing solution for apron flashings and recommended that it could be used as an alternative solution for specific design requirements. If applied by an approved applicator, the product complied with the durability requirements, and was an Acceptable Solution under paragraph 8.2.4 of E2/AS1. Monier noted that at a 2007 site meeting the Monier personnel had discussed and approved the installation of the butyl-rubber alternative. Monier also asked the authority to list its concerns in writing.
- 3.4 The authority issued a site instruction notice (No 0034) on 22 November 2012, in regard to building consent No 28029. The items relating to the flashings on this notice were:
- 14. Roof membrane is bubbling in places. It appears that glue has let go.
 - 27. Manufactures (*sic*) warranties for butyl rubber membrane that has been installed as an alternative solution for apron flashings over the concrete ties (*sic*). Please note: I notice in some areas that this is now failed and the glue used on the tiles has let go.

Some photographs were also provided.

- 3.5 On 18 December 2012, the authority emailed the building owner, noting that the authority 'could not make an informed decision to approve the alternative solution'. The authority required verification that demonstrated compliance with Clauses B2 and E2 for 'the complete system covering all components and also their compatibility'.
- 3.6 On 21 January 2013, the agent emailed the building owners noting that the installed flashings differed from the lead/mechanical flashings that had been specified in the approved consent documents. There also appeared to be some bubbling of the membrane that was of concern to the authority. The agent then went on to outline a number of steps to resolve the issue as follows (in summary):
- Monier to provide as-built details and guarantee/warranty statement to be used for amendment to the consents.
 - Ardex to carry out an inspection and provide a statement to the authority on current performance and expected durability.
 - A modification of Clause B2.3.1 be sought to allow the durability periods to commence from the date of substantial completion.
- 3.7 According to the agent, representatives of both Monier and Ardex visited the site and inspected the flashings on 28 January 2013.
- 3.8 Monier wrote to the authority on 31 January 2013, in regard to the three building consents in question, and gave the view that the butyl flashing system installed was an appropriate alternative to that prescribed in Monier's technical manual. Monier's approval was on the grounds that
- butyl flashings were covered in E2/AS1, which provided standardised details against which the future likely performance could be assessed
 - based on site specific technical details and drawings Monier was satisfied that if the membrane was installed as per the technical details the flashings would comply with clauses E2.3.2 and B2.3.1
 - the flashings had been installed by a licenced applicator who had provided a Producer Statement. (I note here that the licenced applicator referred to by Monier was not the applicator for the subject flashings)
- 3.9 On 15 February 2013, Ardex wrote to the authority noting that it had undertaken an inspection of the flashings on 28 January 2013, and confirmed that they had been installed by a licenced applicator. Ardex was of the opinion that the installations on the Dormitory and Administration Blocks complied with Clause E2.3.2 and the balance of Clauses B2.3.2. With regard to the Staff Dormitory and the Main Hall, there were two areas that required re-bonding and once this was completed this block would also be code-compliant. Ardex also noted that the membrane used complied with E2/AS1, and while the buildings were not covered by this acceptable solution, the membrane's inclusion in E2/AS1 should give the authority a degree of assurance as to the veracity of the flashings. Ardex also supplied their 'Butynol flashing specification for masonry tiles'.
- 3.10 The authority emailed the agent on 25 February 2013, stating that the sloped flashings applied as individual pieces (beginning at the top front edge of each tile and continuing beneath the upper overlapping tile) did not comply with the Ardex

specifications which details one continuous piece of butynol flashing which is pleated at the front edge with pleats then covered by an over-flashing. It also noted that the authority had not received a detailed drawing of the flashings as installed, nor had specific examples or in-service history been supplied. The authority also had concerns about durability because of the way the products had been used.

- 3.11 The agent responded in an email also dated 25 February 2013, attaching revised drawings and photographs, and stating that the letters from both Ardex and Monier in respect of the flashings were sufficient for the authority to rely on as being reasonable grounds for compliance. The agent noted that butyl membranes were referred to in E2/AS1 and could be used for their inclusion in an acceptable solution. Also, the inspections undertaken by Ardex and Monier had not shown any failure of the materials used. As suggested by the authority, the agent had also examined a guidance document on establishing compliance that was published by the Ministry.
- 3.12 On 1 March 2013 there was an exchange of emails between the agent and the authority discussing the concerns raised by the authority.
- 3.13 On 3 March 2013, the agent wrote to the authority setting out the background to the dispute and stated that the authority was aware of the change of flashings at the time of construction but did not issue a site instruction. The agent considered that both Monier and Ardex had provided sufficient information for the authority to be satisfied on reasonable grounds that the flashings as installed were code-compliant. In addition, due to the age of the building consents, a modification to Clause B2 would be appropriate. The agent was also of the opinion that the notice to fix issued by the authority had been incorrectly issued as it had cited one of the remedies as “apply for a determination”.
- 3.14 The authority responded in a letter dated 4 March 2013, again noting that the flashings were not in accordance with the consented plans and stating that the authority was aware of the change on 8 March 2012, and a site notice was issued on 22 November 2012. The authority also stated that its officers had inspected the roofs and flashings and it also agreed to withdraw the original notice to fix and re-issue it with amended wording in respect of the remedies. The authority noted that:

The buildings are in a specific design wind zone so any design must consider the length of the laps and back cover under the tiles. No mention of these aspects has been made. Photographs supplied by [the agent] clearly show areas where the butynol has not adhered to the tiles and the concrete wall panels. Without removing the flashings however it is not possible to determine if this has been caused by adhesive failure or workmanship.

The in service history seems to be limited to this job. ... [The authority has] not been provided with an accurate drawing of this system. Ardex (the membrane suppliers) details were originally provided but they differ from what has been built ... a further detail from Ardex was supplied but this also differs from what has been constructed on site.

- 3.15 The authority issued a second notice to fix dated 13 March 2013, and under the particulars of contravention or non-compliance noted:

Building work consisting of roof flashings to the concrete tile roof has not been completed in accordance with the approved plans and specifications of building consent numbers 27794, 28029 and 28578.

The remedy for the contravention or non-compliance was:

Complete the building work and specifically the roof flashings in accordance with the approved plans and specifications.

- 3.16 On 13 March 2013, the authority emailed the agent stating that the drawing provided by the agent showing the front of the tile with butynol over it, was not verified in the photographs provided by the authority. In addition, there were gaps in some of the tiling that could allow the ingress of water.
- 3.17 The Ministry received an application for a determination on 8 April 2013.
- 3.18 The agent emailed Monier on 9 May 2013, seeking confirmation that Monier had completed the required work, which entailed re-bonding the membrane to two areas of the membrane on the Staff Dormitory and the Main Hall. In an email to the agent dated 13 May 013, Monier confirmed that “all the butynol remedials have been completed...”

4. The submissions

- 4.1 The authority did not make a formal submission in support of the application but attached copies of the
- plans and specifications
 - second notice to fix issued on 13 March 2013
 - Monier Producer Statement dated 9 November 2009
 - correspondence with the building owner and the agent
 - correspondence with Monier and Ardex.
- 4.2 The building owner did not make a formal submission in response.
- 4.3 The agent made a submission on behalf of Monier and Ardex dated 8 May 2013. The submission set out the background to the dispute and stated that it was believed the authority had carried out in excess of 60 inspections during the construction of the complex. The agent considered that it would be reasonable for the authority to have approached the changed flashing issue by means of a retrospective amendment to the building consent, along with the appropriate evidence of code-compliance.
- 4.4 The agent considered that by issuing a single notice to fix in respect of the three building consents, together with generalised comments as to non-compliance, the authority had adopted a “blanket approach” in respect of the matters at issue. Nor had the authority given due consideration to the documentation provided. It was accepted that the onus as to code-compliance lay with either the building owner or the building contractor. The agent considers the evidence of in-service performance since construction and the statements provided by both Monier and Ardex is sufficient in this regard, and noted that the authority had no ‘tangible evidence’ supporting its concerns.
- 4.5 The agent attached copies of :
- correspondence with the authority, the building owner, Monier, and Ardex
 - some photographs showing the flashings in question.

4.6 The first draft determination and submissions

4.6.1 A draft determination was issued to the parties for comment on 22 July 2013. Based on findings of the expert, the first draft noted that there were faults in the butyl rubber membrane as applied to the sloping apron junctions on the terracotta tile roofs. The draft concluded that the building envelope would not continue to meet the requirements of Clause E2 for the durability periods set out in Clause B2 and accordingly confirmed the authority's decision to issue the second notice to fix.

4.6.2 The agent responded to the draft determination by way of a submission dated 29 August 2013 that was received by email on 2 September 2013. The agent considered that the draft determination conclusions were incorrect and submitted (in summary):

- There was one area of moisture ingress that required repair (northeast corner of west wing of administration block; building consent BC28578), but there are no other defects and apart from the one identified defect the durability provisions will be met in respect of all three building consents.
- There was no evidence of moisture ingress to the other two consents (BC28029 and BC27794), and under B2/VM1 the in-service performance demonstrates that the butyl membrane/tile system is durable.
- The Ardex drawings were indicative and the expert has mistakenly arrived at the conclusion that the membrane must be continuous, and that a 150mm upstand is required.
 - Ardex details the butyl membrane extending 120mm under the tile above, however the tile overlaps are only ever 85-120mm; the ridge on the tile combined with the butyl membrane provides resistance to moisture penetration
 - Though less than the 150mm Ardex detail for the top row of tiles, the system is an alternative solution and should be considered in its entirety.
 - The Ardex detail is not clear as to the extent the membrane needs to be taken onto perimeter tiles, the drawings indicate approximately a third of the width of the tile.
 - In a diagram dated 21 February 2013, Ardex had noted multiple laps rather than a continuous membrane.
- Insufficient consideration has been given to tile features such as the upstand on the underside.

4.6.3 The agent appended to the submission a 'review of Monier tile/butyl membrane flashing system', which noted that (in summary):

- Monier had undertaken an investigation of sites where the system has been used previously and were confident in the performance of the system over time.
- Laps and extensions of the butyl flashings are dependent on the tile profile and cladding system used.
- The glazed surface of clay and concrete tiles readily accepts the contact adhesive.

- When the adhesive breaks down, at some time in excess of 15 years, the butyl membrane retains its shape on the horizontal plain.
- 4.6.4 The agent's submission also included a document titled 'Water management system of Monier tiles' that described the tile system in more detail noting that (in summary):
- the tiles have a number of anti-capillary voids and channels to limit the travel of moisture
 - the back edge of the tile also has an upstand or stop end
 - the standard lap will vary from 80mm to 120mm and is dependent on roof tile set-out
 - on the raking apron flashing the lap under the tile will be no more than the physical tile overlap
 - the dimension of the side lap is dependent on where the tile is finished against the junction and where the tile is cut; normally the cover of one trough is adequate to ensure performance
- 4.6.5 The authority accepted the draft subject to comment in a letter dated 5 August 2013. The authority noted, in response to the agent's submission, that it had considered the alternative solution and required 'a compliance path that could be followed to establish compliance as an alternative solution', and that it was the authority's view that evidence of an adequate compliance path was not provided.
- 4.6.6 On 5 August 2013 the agent requested relevant documentation from the authority; that information was provided to the agent enclosed with a letter dated 19 August 2013. (I note that a copy of this letter was received by the Ministry on 28 August 2013).
- 4.6.7 The owner accepted the draft without further comment in a response dated 12 August 2013 that was received on 26 August 2013.

4.7 The hearing, the second draft, and submissions

- 4.7.1 I held a hearing at the site on 17 October 2013 at the request of the agent acting on behalf of Monier and Ardex. I was accompanied by a Referee engaged by the Chief Executive under section 187(2) of the Act, together with two officers of the Ministry and the expert. The owner and two representatives of the authority were present, along with the agent and a representative of Monier and of Ardex.
- 4.7.2 All of those present at the hearing had the opportunity to speak, and the evidence presented enabled me to amplify or clarify various matters of fact and was of assistance to me in preparing this determination. The technical aspects of the hearing covered the use of butyl as a flashing system with the concrete tiles and the drawings provided to the authority.

- 4.7.3 The owner and the agent clarified some of the background to the construction timing in respect of the time of practical completion of the buildings.
- 4.7.4 The agent provided submission prior to the hearing that reiterated in summary many of the points raised in previous submissions. At the hearing the agent noted it was not disputed that the flashing was not in accordance with the building consent or with the Ardex details, and the drawings supplied to the authority in respect of the flashings were indicative only
- 4.7.5 The representative from Monier explained the built-in water management system on the tiles used on these buildings, noting the membrane-to-tile dimensions were dictated by the features of the tile and that the membrane is cut into the drainage track on the tile. Monier had also investigated the area of moisture ingress noted by the expert and concluded this was caused by a broken tile that has subsequently been replaced; a photograph was provided.
- 4.7.6 The representative from Ardex noted that the membranes were correctly bonded to the face and not over the ‘nose’ of the tile, and that the adhesive would perform regardless of any moisture, and that minimum overlaps of 50mm only were required.
- 4.7.7 The authority commented that the drawings did not reflect the building work, and made no comment other than stating that it would rely on expert advice or the outcome of the determination in forming a view on compliance.
- 4.7.8 In light of the information provided at the hearing, the expert reviewed some of the conclusions made in his report (refer paragraph 5.10).
- 4.7.9 A second draft determination was issued to the parties for comment on 21 October 2013. Taking into account the information put forward at the hearing and the expert’s revised conclusions, the second draft concluded that the butyl rubber membranes applied to the terracotta tile roofs comply with Clauses B2 and E2 of the Building Code and proposed that the authority’s decision to issue the second notice to fix be reversed.
- 4.7.10 The authority provided a submission to the second draft by email on 1 November 2013. The authority did not accept the decision, and submitted (in summary):
- The authority had endeavoured to consider the work as an alternative solution and had requested as-built details and a compliance path that could be followed; however Monier and Ardex failed to present as-built details to establish compliance so the authority could not assess the work as an alternative solution.
 - The authority was empowered by section 164(1)(a) of the Act to issue the notice to fix as the work was not in accordance with the building consent.
 - Given the above, the determination decision should reflect that the authority correctly exercised its powers in issuing the notice to fix but that the notice to fix should now be ‘withdrawn’.
 - An amendment to the consent cannot be made retrospectively; irrespective of whether the changes are major or minor, approval of those changes should have been sought from the authority before the work was undertaken and accordingly a certificate of acceptance should be sought for the identified changes from the consent drawings.

4.7.11 The agent responded to the authority's submission by email on 5 November 2013. The agent submitted (in summary):

- A compliance pathway was agreed with the authority and formalised by email on 21 January 2013.
- As built details and document had been provided to the authority; the authority refused to accept the documentation (refer paragraph 3.10).
- The authority was not reasonable in its actions leading up to the issue of the notice and the application for determination; it should have outlined what further information was required and advised what the problems were; the authority's decision rested purely on non-compliance with the building consent.
- The changes relate to a product substitution and accordingly an amendment to the consent is appropriate.

4.7.12 The building owner accepted the second draft with no further comment in a response received on 9 December 2013.

5. The expert's report

5.1 As described in paragraph 1.6, I engaged the services of an expert, who is a member of the New Zealand Institute of Building Surveyors, to assist me. The expert examined the complex on 6 June 2013 and produced a report completed on 17 June 2013. Copies of this report were forwarded to the parties on 24 June 2013.

5.2 The report described the buildings making up the complex in general terms and gave some of the background to the dispute. In the expert's opinion, the overall construction was of a reasonable quality, although construction debris had been left in some gutters and under roof tiles. Apart from lichen growing on some ridge tiles, the buildings generally appeared to be well presented and maintained.

5.3 The report compared the roofing details shown on the consented plans and specifications with those actually installed and also compared the compliance of the installed elements with the manufacturers' installation instructions. The expert described the elevations facing the road as facing north and I have maintained this convention. I have summarised the expert's general observations in the table below:

As consented	As installed	Compliance with manufacturer's instructions
Administration/Library		
Soft metal apron flashing dressed over roofing tiles at a sloping apron junction.	<i>North elevation</i> Continuous butyl rubber membrane flashing dressed into and adhered to terracotta roof tile pans at horizontal apron junctions. Stainless steel over-flashings protect the pleated upstands.	Detail complied with 06/12/12 Ardex Monier Tile Flashing Detail, with the exception of the flashing not extending as far down the top row of tiles as shown.
	<i>West and east elevations</i> Individual butyl rubber membrane flashings to sloping apron junctions with each flashing continuing below the upper overlapping tile, upstands,	Not in accordance; Ardex detail required continuous flashings and over flashings. The gap could allow moisture entry. Ardex specification also required the butynol to be taken 150mm

	and carried 80mm over tiles. The front ends of the tiles were not covered by flashing.	onto the tiles.
Stainless steel concealed gutter at parapet.	Concealed butyl rubber flashing	The flashing as installed appeared to be effective.
Student Dormitories		
Profiled metal roofing (Issue A – consent version) Concrete tiles with stainless steel concealed verge gutter flashings (Issue 1 – construction version) Butyl membrane apron flashings with a compressive strip under wall/tile junction (Issue 4 – as-built version).	As per Issue 4 (as-built version), but compressive strip not installed. Laps ranging from 80 to 105mm.	Similar comments to Administration/Library west and east elevations
Staff Dormitory		
Soft metal apron flashing dressed over concrete roofing tiles	Butyl-rubber membrane flashings. Laps ranging from 80 to 85mm.	Similar comments to Administration/Library west and east elevations

5.4 I summarise below the additional observations made by the expert in regard to the individual blocks:

Administration /Library Block

- No issues such as bubbling or loss of adherence were observed with the continuous membrane flashings to the north elevation flashings.
- Water staining was observed on the ceiling tiles in the northeast corner of the west wing and the roof underlay was torn, stained, and sagged adjacent to the apron junction. No under flashing was installed, and the butynol flashing above the damaged underlay was ineffective. Construction debris left on the roof has contributed to the damaged underlay and subsequent leaking.
- Water staining apparent on the ceiling tiles in the southeast corner of the west wing. Wet insulation in the ceiling space which could be related to adjacent extract ducting.
- Apron flashing to the south had roof underlay looped under the perimeter apron flashing junction. The butyl flashing similarly terminates at the upper edge of the terracotta tile.
- The butyl-rubber overlap to the flashing on the east side of the roof was 185mm and extended over the top end of the adjacent tile and this provided better protection against wind-driven rain. Construction debris was also left on the roof at this location.
- Parapet apron junctions on the north elevation flashed with a concealed butyl rubber flashing which appears to be effective. The roof underlay adjoining the parapet on the north elevation was torn and offcuts and debris were lying on it.

Student Dormitory Blocks

- No evidence of water entry into any of the interior habitable spaces that were accessed on the day, though numerous water stains observed on the particle

board flooring in the roof spaces of both Block D3 and D5 and buckets were placed to catch drips. The expert considered that the water ingress was due to faults in the tiled roofing rather than from the flashings.

- The sloping apron flashing is similar to the administration/library block, with gaps at the edge of tiles. A butyl-rubber offcut was found on the roof underlay in the single location that a tile was uplifted.

Staff Dormitory Block

- The sloping apron flashing is similar to the administration/library block, with gaps at the edge of tiles.
- No evidence of associated water entry was found in this block.

5.5 While the expert found one location in the complex where there was water ingress through a flashing, the moisture levels at this location were 'normal'.

5.6 The expert also observed that the timber head plate in the Administration/ Library Block was marked as being kiln dried; the specification required it to be H3.1 treated. While the expert did not find any indications of timber decay, he was of the opinion that some aspects of the flashing installation and observed underlay damage posed a future risk of moisture ingress.

5.7 In respect of the butyl apron flashings the expert concluded that

- leaving a gap next to perimeter tiles could allow water entry
- the minimal flashing overlap of 80mm in some areas and lack of turn-up at the top edge increases the risk of water blowing over the top of the tiles
- the risk is exacerbated by the compromised secondary protection of roof underlay being torn at batten junctions and elsewhere, and by construction debris on the underlay.

5.8 The expert also referred to the terracotta roof tiles that were installed in the various blocks and observed that none of the tiles lifted for inspection complied with the requirements of Clause 3.10 of NZS 4206:2002-- *Concrete Interlocking Roof Tiles*. This clause requires all perimeter tiles and every second tile to be secured and this had not occurred. The expert also noted that the current manual of the supplier of the installed tiles required tiles to be secured in accordance with AS 2050:2002 *Installation of roof tiles* and NZS 4206 (Section 5).

5.9 As well as the three blocks that relate to this determination, the expert commented on the flashings on Classroom Block C1. The authority has issued a code compliance certificate for this block. Accordingly, I have not included the expert's comments in this paragraph. Nor have I referred to the Main Hall roofing, which has a pitched metal profiled covering.

5.10 Review of conclusions

5.10.1 As a result of the information provided at the hearing the expert reviewed the conclusions formed in his report. I summarise the conclusions reached as follows:

- Given the statement made by Ardex as to the adhesive performance the expert considered the horizontal flashings would comply, although it doesn't accord with the Ardex instructions.

- If the membrane on the raking flashing comes out to the pan the expert considered it would comply, but again it doesn't accord with the Ardex instructions.
- The Ardex detail appeared to show a continuous membrane, but given the information provided at the hearing the expert agreed that the overlapping membrane could be adequate.
- The expert considered that an overlap of 85mm or more in the raking flashing under the tile above would be adequate but did not consider a length of 50mm would be adequate, particularly where there were wide gaps where the tiles finished short of the cladding.
- The broken tile would explain the moisture ingress that had been identified.

5.10.2 The expert reiterated his concern regarding the durability of the roof cladding given the debris, sagging and torn underlay.

6. Discussion

- 6.1 The building consent was issued under the Building Act 2004. Under section 94(1)(a) of the Act an authority must issue a code compliance certificate if it is satisfied, on reasonable grounds, that the building work complies with the building consent.
- 6.2 Changes to the roof flashings when compared to the consented plans were noted in the authority's correspondence to the building owner and to the agent, and also in the notice to fix issued on 13 March 2013. The expert has also noted a number of variations in the as-built construction when compared with the approved plans.
- 6.3 When considering the issue of a code compliance certificate for a building consent where the as-built construction differs from that consented, it is important to consider whether the completed building work complies with the Building Code.
- 6.4 The authority has submitted that it endeavoured to consider the building work as an alternative solution and requested sufficient information in order for it to form a view as to compliance. I note here that the drawings provided by Ardex were indicative only and did not adequately identify the design details in a way that was sufficiently clear to the authority (refer paragraph 3.14); however the authority also had statements from both Monier and Ardex setting out their opinion on the compliance of the building work.
- 6.5 Taking into account the issues highlighted in the expert's report, the clarification provided at the hearing as to the detailing of the flashing system and the subsequent review of the expert's conclusions, I consider that the butyl rubber membranes applied to the terracotta tile roofs will continue to meet the requirements of Clause E2 for the durability periods set out in Clause B2.
- 6.6 In conclusion, I am satisfied that the butyl rubber membranes applied to the junctions with the terracotta tile roofs comply with the Building Code and therefore that the notice to fix should be reversed.
- 6.7 The authority has submitted that an amendment to the consent is not the appropriate regulatory mechanism for the changes and that the owner should apply for a certificate of acceptance. The authority is correct in its submission that the building

consent cannot be amended retrospectively. However, a certificate of acceptance is not required for every possible variation from a building consent.

- 6.8 There will often be minor variations between the plans and specifications and the building work as completed. While minor variations should always be communicated to an authority prior to the building work being carried out so the authority can decide the proper process for dealing with those variations, sometimes the variations are not noticed until after the work has been completed. Where such variations are minor and the work complies with the Building Code an authority could choose to record those variations by way of adequately detailed as-built drawings. In this case, I consider the variations are not of such a significant degree that they would have warranted formal amendment to the consent; substitution of products is not uncommon and in this case the provision of adequately detailed as-built drawings will be sufficient.
- 6.9 While the procedure for considering minor variations is now addressed in the Building (Minor Variations) Regulations 2009, those regulations record the approach to dealing with variations that had developed up to that time, an approach that is record in guidance issued prior to the making of those regulations (see “Guide to building consent amendments”⁶).
- 6.10 Having reached the above conclusion I wish to comment on certain issues that have arisen during my consideration of the matters arising from this determination.
- 6.11 Based on the information provided to me, the authority appears to have raised issues in relation to the individual consents on an ad hoc basis that refers to only one or other of the buildings in question. To my mind there has been a lack of a cohesive approach to the three building consents that feature in this determination. The documents supplied by the authority to the determination also reference the torched-on membranes that are outside the ambit of this determination.
- 6.12 I note that some of the documentation provided by the authority and designated by the agent as supporting the agent’s arguments do not relate to the three building consents in question. In particular, I refer to the Monier Producer Statement dated 9 November 2009 that related to Classroom Blocks C1 and C2. These two blocks were subject to a separate building consent and the comments in the statement are not relevant to the consents at issue.
- 6.13 I strongly suggest that the authority record this determination and any modifications resulting from it, on the property file and also on any LIM issued concerning this property.

7. What happens next?

- 7.1 I note that the expert identified one tile with a broken nose, and I suggest the owner and/or Monier undertake to repair this tile.
- 7.2 Both the authority and the expert have identified changes from the consent drawings, and adequately detailed as-built drawings should be provided to the authority to be included with the building consent documentation. Where durability of the remaining building elements rely on rigorous inspection and maintenance any amendment to the building consent documentation should make reference to this.

⁶ Guide to building consent amendments. (Department of Building and Housing, September 2008), available at <http://www.dbh.govt.nz/UserFiles/File/Publications/Building/Guidance-information/pdf/guide-to-amendmnts-sept-08.pdf>

8. The Decision

- 8.1 In accordance with section 188 of the Building Act 2004 I hereby determine that the butyl rubber membranes applied to the terracotta tile roofs complies with Clauses B2 and E2 of the Building Code; accordingly I reverse the authority's decision to issue the notice to fix in regard to building consents BC27794, BC28029, and BC28578.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 9 December 2013.

John Gardiner
Manager Determinations and Assurance