BUILDING PERFORMANCE

Determination 2025/027

The refusal to grant an amendment to a building consent to include external wall claddings terminating in channel drains

Block 18, 241 Park Estate Road, Karaka, Auckland

Summary

This determination relates to the authority's decision to refuse to grant an amendment to a building consent proposing to include parts of the wall claddings terminating within channel drains at the base of the external walls. The determination considers Building Code compliance pathways and whether the plans and specifications included sufficient evidence to establish compliance with Building Code clauses B2 *Durability* and E2 *External moisture*.

Figure 1: Block 18 north-east elevation.

In this determination, unless otherwise stated, references to "sections" are to sections of the Building Act 2004 ("the Act") and references to "clauses" are to clauses in Schedule 1 ("the Building Code") of the Building Regulations 1992.

The Act and the Building Code are available at www.legislation.govt.nz. Information about the legislation, as well as past determinations, compliance documents (e.g. Acceptable Solutions) and guidance issued by the Ministry, is available at www.building.govt.nz.

1. The matter to be determined

1.1. This is a determination made under due authorisation by me, Rebecca Mackie, for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment ("the Ministry").[1]

1.2. The parties to the determination are:

1.2.1. Vivid Living Ltd ("the owner"), the owner of the building, represented by its director S Evans, who applied for the determination.

1.2.2. T Clarke ("the licensed building practitioner" or "LBP"), who is a Registered Architect and a licensed building practitioner[2] concerned with the design work, also acting as agent for the owner.

1.2.3. Auckland Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.

1.3. This determination arises from the authority's refusal to grant an amendment to a building consent. The original building consent was for a new semi-detached housing block in retirement village complex. The amendment application proposed to include the bottom of external wall claddings terminating within channel drains at the base of the external walls in some locations around the building.

1.4. The matter to be determined, under sections 177(1)(b) and (2)(a), is the authority's decision to refuse to grant an amendment to building consent BCO 10374843.

1.5. In deciding this matter, the determination will consider the form and content of the refusal and the grounds of the refusal being whether the information supporting the amendment to building consent application for the proposed building work, being the bottom of external wall claddings systems that incorporate drained cavities terminating within the channel drains, establishes compliance with Building Code Clauses B2 *Durability* and E2 *External Moisture*.

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[1] The Building Act 2004, section 185(1)(a) provides the Chief Executive of the Ministry with the power to make determinations.

[2] Registered Architects under the Registered Architects Act 2005 are treated as if they were licensed in the building work licensing class Design 3 under the Building (Designation of Building Work Licensing Classes) Order 2010. Section 176(d) provides the Registered Architect, by way of being a licensed building practitioner, is a party to the determination.

1.6. This determination does not consider the compliance of any other building work beyond that matters described above, including work already approved in the original building consent.

2. The building work and background

2.1. The owner's property (Lot 801 DP 588435) is a large level site near Pahurehure Inlet, Karaka. The site is currently being developed as a retirement village complex, proposing the construction of 19 various housing 'blocks' across the site.

2.2. On 31 October 2023, the owner lodged separate building consent applications relating to several of the housing blocks. This included an application (BCO 10374843) for Block 18, a building comprising two household units that are semi-detached.[3] The proposed building work subject of this determination relates to Block 18 only.

2.3. The building consent for Block 18 proposed to construct level thresholds at openings to the units. The design for these incorporated channel drains between the concrete floor slab of the building and the external paved areas beyond the thresholds. The channel drains also extended beyond the thresholds to run along the base of the external envelope of the building in several locations.

2.4. The authority raised concerns about the proposed design of the channel drains and a meeting was held between the parties on 15 January 2024, with the authority later issuing a request for information letter.

2.5. In the meeting and subsequent letter, the authority noted concerns it had regarding the termination of the external wall cladding within the channel drain and the impact this would have on "the performance of the materials within the cavity and its ability to provide sufficient ventilation into the cavity". It also noted concerns about the length of the drains, which it noted exceeded the maximum length of 3.7m for threshold channel drains cited in Acceptable Solution E2/AS1 ("E2/AS1").[4] The parties also discussed whether "finished ground level" should be measured from the base of the channel drain or the ground level adjacent to the drain. The authority was concerned about the effect that these matters might have on the external wall cladding's ongoing compliance with clauses E2 and B2.

2.6. Following the meeting and request for information, the owner removed the channel drains from the scope of the building consent application. Subsequent to this revision, on 13 March 2024, the authority granted the building consent for Block 18.

2.7. On 15 March 2024, the owner lodged an application for an amendment to the building consent, to "add patios and threshold drains to provide level access". The

[3] Also denoted on the building consent plans as Lots 56 and 57.

[4] Acceptable Solution E2/AS1 (third edition, amendment 11, effective 5 November 2020).

design of the channel drains differed slightly from those originally proposed in the building consent and are described below.

2.8. The proposed locations and configurations of the external wall cladding systems and channel drains are as shown in Figure 2. In the remaining areas of the external cladding, the ground levels fall away from the building, and do not include channel drains at the base of the wall.

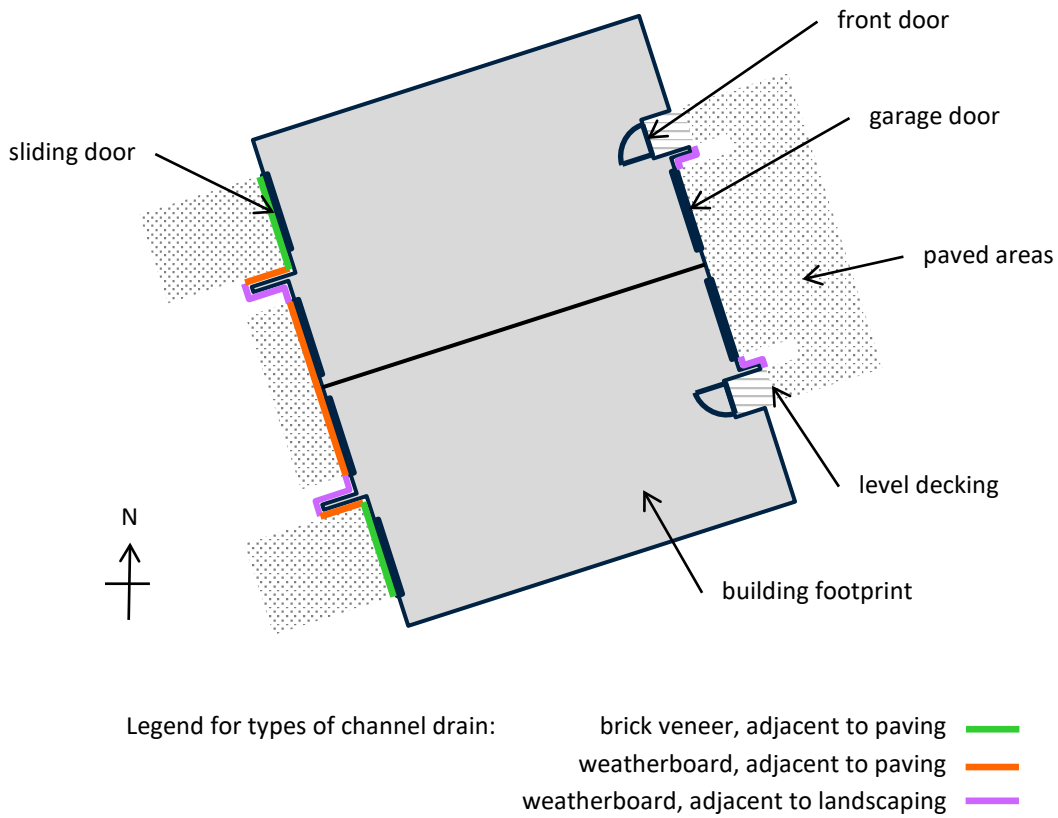

Figure 2. Block 18 site diagram showing locations of proposed channel drains.

2.9. The proposed details for the channel drains include areas where the external wall cladding terminates into and within a channel drain at the base of the wall. The details show proprietary vertical shiplap fibre cement weatherboard cladding system incorporating a cavity ("weatherboard cladding") and brick veneer cladding system incorporating a cavity used in these locations, with the design of the channel drains differing depending on the type of external wall cladding used. The channel drains fall to stormwater outlets at intervals along their length, with the maximum distance between outlets being 3.7 metres. The outlets connected to the stormwater network via a sump.

2.10. For the areas where weatherboard cladding system is to be used the proposed building work is as follows:

2.10.1. The channel drain is to be 250mm wide and 170mm deep; formed from concrete with a minimum 1:100 fall to the outlet drain; and finished with a proprietary flexible waterproof coating.

2.10.2. The channel drain is to be covered with timber decking boards, cut to fit and supported on stainless steel angle brackets, with a 12mm gap left between the outside of the cladding and the boards.

2.10.3. The weatherboard cladding is shown to extend into the channel drain, below the level of the decking by approximately 30mm, with the base of the cavity behind the weatherboard cladding terminating within the channel drain.

2.10.4. The maximum height of the weatherboard cladding is approximately 3.9 meters. The top of the weatherboard cladding is covered by eaves in some areas and is exposed in other areas.

2.10.5. Where the top of the weatherboard cladding is protected by eaves, the top of the cavity is not vented. Where the top of the weatherboard cladding is not protected by eaves, the top of the cavity includes a ventilation gap for airflow.

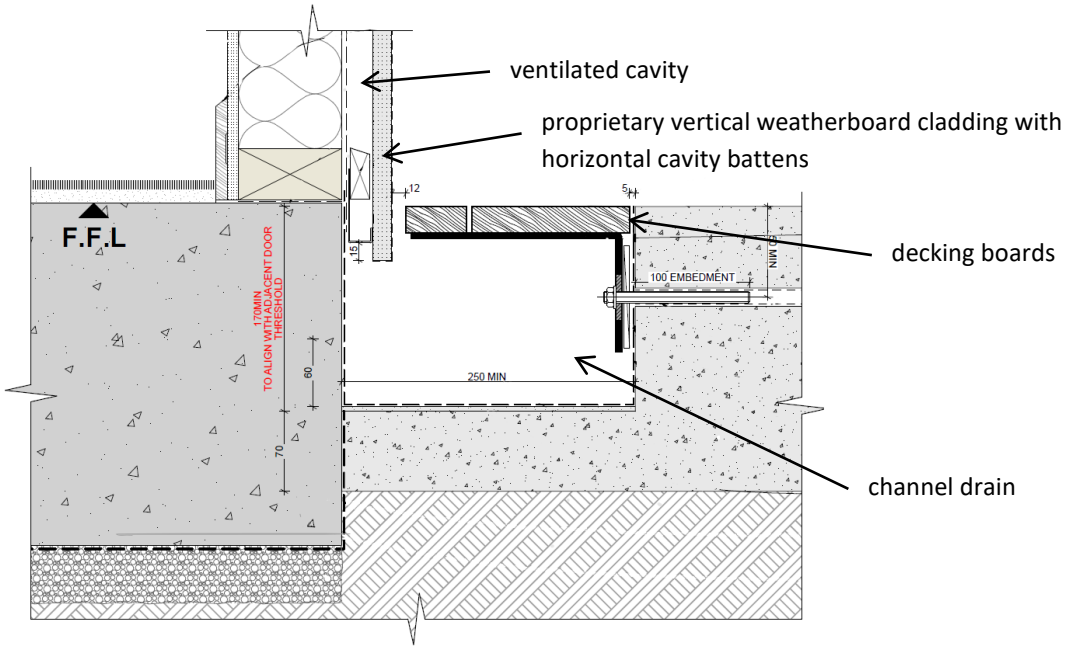

Figure 4. Detail for the proposed channel drain adjacent to weatherboard cladding

2.11. For the areas where brick veneer cladding system is to be used the proposed building work is as follows:

2.11.1. The channel drain is to be 200mm wide and 170mm deep; formed from concrete with a minimum 1:100 fall to the outlet drain; and finished with a proprietary flexible waterproof concrete coating.

2.11.2. The channel drain is to be covered with decking boards, cut to fit and supported on stainless steel angle brackets, with a 12mm gap left between the outside of the cladding and the boards.

2.11.3. The brick veneer cladding is shown to extend into the channel drain, below the level of the decking by 100mm, with the weep holes of the brick veneer cladding from the cavity also being located below the top of the channel drain and terminating within the channel drain. The maximum height of the brick veneer cladding is approximately 3.9 metres.

2.11.4. The base of the cavity behind the brick veneer cladding sits 70mm above the base of the channel drain. The top of the cavity is ventilated and covered by eaves approximately 1.5 metres deep.

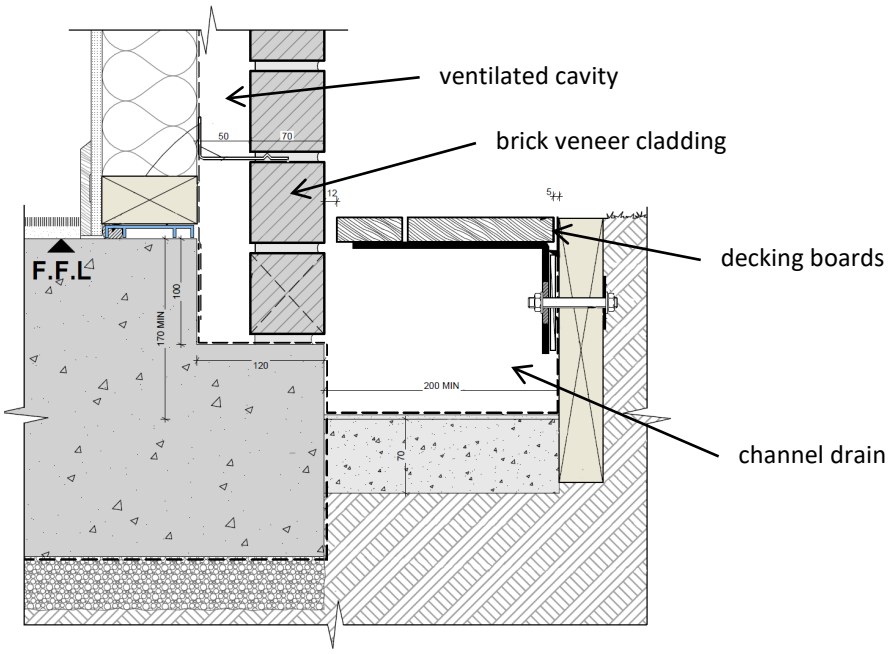

Figure 3. Detail for the proposed channel drain adjacent to brick veneer cladding.[5]

2.12. In support of the application for an amendment, the licensed building practitioner provided a report outlining how the proposed building work would achieve

[5] Note that while this detail shows a channel drain adjacent to brick veneer cladding and bordering a landscaped area, this combination does not occur in the proposed building work. Channel drains adjacent to brick veneer cladding only border paved areas (see Figure 2).

compliance with the Building Code as an alternative solution ("the compliance report").[6]

2.13. The compliance report stated that the design for the channel drains was based on the design detailed in paragraph 7.3.2.1 and Figure 17B of E2/AS1, but with three deviations, hence the report identifying it as an alternative solution. The three deviations from the acceptable solution outlined in the report are:

1. The length of the threshold drain is longer than the maximum 3.7m noted in E2/AS1 7.3.2.1a)iii).

2. Removable decking boards are proposed in lieu of grating noted in 7.3.2.1b)

3. The threshold drain is proposed in front of landscape areas rather than just paving noted in 7.3.2.1c)i)

2.14. The compliance report detailed how these deviations would be compensated for within the proposed design, noting that the relevant Building Code Clauses were E1 *Surface water*[7], E2 *External Moisture* and B2 *Durability*. The report made the following main points (in summary).

2.14.1. With respect to clause E1.3.3 and the channel drains:

- The adjacent paving and landscaping areas fall away from the channel drains, minimising the amount of water that enters them; most water will be from the cladding.

- The outlets within the drains are spaced at a maximum of 3.7 metres apart "limiting the effective length of each portion of drain to the maximum noted in E2/AS1 7.3.2.1a)".

- Gravity falls within the drain are 1:100, which is greater than the minimum fall noted in E2/AS1 7.3.2.1a).

- The drains are 170mm deep, which is greater than the 150mm cited in E2/AS1 7.3.2.1a)ii), allowing for overflow, without the 150mm minimum clearance to floor level being compromised.

2.14.2. With respect to clause E1.3.3 and the decking over the channel drains:

- The deck boards minimise the likelihood of debris entering the channel drains and can be removed for maintenance.

[6] An alternative solution is where compliance with the Building Code is established by means other than those outlined in section 19.

[7] Building Code Clause E1 in not in dispute and not included in this determination, however this information is provided in the context of the functioning of the channel drains.

- "The use of decking boards in lieu of grating and its relationship to cladding and joinery is equivalent to E2/AS1 Figure 17."

- "These design features specifically address the deviation from [E2/AS1] 7.3.2.1b)".

2.14.3. With respect to clauses E2.3.3 and E2.3.5:

- The amount of water entering the channel drains is minimised.

- The channel drains provide effective separation between the framing, external wall cladding and adjacent paved and landscaped areas, thereby "avoiding moisture and condensation contacting the framing or entering the cavity".

- The 1:100 falls within the channel drain are greater than noted in E2/AS1 7.3.2.1a).

- "The proposed threshold detail is consistent with … clause 7.3.2.1 E2/AS1 [and] Figure 17B. The detail is improved by way of a wider channel, greater falls to outlets and waterproof coating all of which contributes moving water quickly to stormwater outlets which mitigates risk of moisture and condensation contacting the framing or entering the cavity."

- The proposed channel drain detail is consistent with the manufacturer's literature for a similar weatherboard cladding product, providing "similar or improved performance characteristics".

- In areas where the channel drains are adjacent to landscaping, the channel drains provide a permanent separation between plant growth and the external wall cladding, ensuring the cavity and brick weepholes "remain unobstructed at all times". This is an improvement on standard construction details "where plant growth can enter cladding cavities … and obstruct brick weepholes if not maintained" and hence this detail specifically addresses the deviation from E2/AS1 7.3.2.1c)i).

2.14.4. With respect to clause E2.3.7, the design provides multiple drainage outlets and end overflows, safeguarding against failure of individual outlets or the stormwater system.

2.14.5. With respect to clause B2.3.1, the design features noted in relation to clause E1 and E2 ensure "that moisture and condensation are effectively managed … to the same extent or better than intended by E2/AS1 clause 7.3.2.1 ensuring the 50 year framing and 15 year cladding durability requirements are met" and ensuring the "performance requirements of B1 are maintained".

2.14.6. The licensed building practitioner stated, “threshold drains in front of the cladding are an acceptable solution”.

2.15. Discussions ensued between the licensed building practitioner and the authority.

2.16. On 31 March 2024, the authority refused to grant the amendment to the building consent, because it was not satisfied “the plans and specifications accompanying the building consent application do not satisfy Council on reasonable grounds that the completed building work would comply with the New Zealand Building Code” and specifically because “compliance has not been demonstrated with [Building Code] clause E2 & B2”.

3. Submissions

The owner (via the LBP as the agent)[8]

3.1. The owner made a submission in support of the application for determination, in which the owner noted that the provision of threshold drains was a “fundamental design feature” to eliminate tripping hazards and acknowledged that the proposed design for the channel drains is an alternative solution.

3.2. The owner compared the proposed design to figure 17B in E2/AS1 and noted that it differs from the requirements with regard to the length of the channel drains, the decking timber used instead of grating, and the adjacent landscaping instead of paved surfaces, as outlined in Figure 2.

3.3. In the owner’s view, the mitigations included in the proposed design, as set out in the licensed building practitioner’s compliance report (see paragraphs 2.12-2.14) are sufficient to address those differences and to demonstrate compliance with clauses E2 and B2.

3.4. Paragraph 7.3.2.1(b)(v) and Figure 17B of E2/AS1 indicate that channel drains can be used adjacent to external wall cladding, including situations where the external wall cladding terminates below the top of the channel drain.

3.5. Following receipt of the refusal letter, the owner sought clarification from the authority on specifically how compliance had not been demonstrated, but they had not been provided that clarification.

The licensed building practitioner

3.6. The licensed building practitioner did not make any specific submissions in their own capacity as a party to the determination.

[8] The owner’s submissions were made by the licensed building practitioner acting as the owner’s agent. I refer to these submissions as the owner’s submissions.

The authority

3.7. The authority made a submission in response to the application for a determination in which it confirmed that it did not dispute the compliance of the channel drains where they were used at door thresholds/openings, as this was an accepted design solution.

3.8. The authority stated that:

> Where the issue arises is in extending the channel drain well beyond the openings which will leave the bottom plate at the finished ground level and the cladding dressed into the channel drain ... This design detail of cladding in the channel drain does not meet E2/AS1 and we have not received evidence to accept it as an alternative solution.

3.9. The authority also disagreed that the finished ground levels should be taken as the bottom of the channel drains, as suggested by the owner.

3.10. With respect to both external wall claddings, the authority clarified that its concern with the external wall claddings terminating within the channel drain was that this would prevent "sufficient ventilation into the cavity" and that it would affect "the overall durability of the claddings".

3.11. With respect to the external wall framing, the authority clarified that its concern was that the structural timber framing, including elements such as the bottom plate, finished level with the top of the channel drain, which itself was finished at ground level, which "prevents sufficient ventilation to the framing".

3.12. With respect to clause E2, the authority noted that application for an amendment identified E2/AS1 as the Building Code compliance pathway but submitted that E2/AS1 does not allow for external wall cladding (either weatherboard or brick veneer) to terminate below the top of channel drains.

3.13. The licensed building practitioner provided the appraisal in support of the amendment application.

3.14. The authority referred to several industry publications[9] relating to drained and vented wall cavities, and to the weatherboard cladding manufacturer's product literature. It stated that the sides of the channel drains would obstruct airflow into the cavities and that moisture within the channel drains would create damp air, which would enter the cavities.

[9] For example: *External moisture – An introduction to weathertightness principles*, Department of Building and Housing, August 2006, *Construction cavities for wall claddings*, Department of Building and Housing, June 2006, Bassett, M.R. and Steven McNeil, *The theory of ventilation drying applied to New Zealand cavity walls*, 2005 Institute of Refrigeration, Heating & Air Conditioning Engineers (IRHACE) Conference, Nelson, New Zealand, 20-22 May 2005

3.15. With respect to the brick veneer cladding, the authority submitted that both E2/AS1 and other industry literature "make it clear that the bricks need to terminate above paving or garden surfaces", and the drainage slots in the brick veneer cladding must remain clear, so that moisture can drain out of the cavity behind the brick veneer and air can enter it to "provide drying". Bricks are less susceptible to moisture decay than weatherboard, but are more porous, so "sufficient drying to the rear of the brick (within the cavity) is imperative".

3.16. With respect to the weatherboard cladding, the authority submitted that both E2/AS1 and the manufacturer's literature required minimum cladding clearances, which "would not include terminating within a channel drain". In addition, there were no top vents shown in this area of the cladding, which would reduce the ventilation rates even further.[10]

3.17. For both types of cladding, the authority concluded that terminating the cladding within the channel drains was likely to provide insufficient ventilation and drainage of the cavity, and no evidence had been provided to demonstrate that this was not the case and that sufficient air movement would be maintained.

3.18. With respect to clause B2, the authority noted that the application for an amendment had cited several means of demonstrating compliance, but in its view only B2/AS1 and NZS3604 were relevant. The authority noted that in both documents, greater ground clearances to external wall bottom plates and cladding are shown than those in the proposed design.

3.19. The authority submitted that the level thresholds used in the proposed design mean the finished floor level of the building is not sufficiently high compared to the adjacent finished ground level. The structural timber being at ground level raises a risk of damage to the bottom plates and timber framing supporting the cladding through coming into contact with moisture. This will prevent both the structural timber and the cladding achieving their durability periods and hence compliance with clause B2.

3.20. The authority concluded that insufficient information and evidence had been provided for the proposed amendment to demonstrate compliance with the Building Code as an alternative solution.

4. Discussion

4.1. The matter to be determined is the authority's refusal to grant an amendment to a building consent, to include channel drains to be installed at the base of the external walls, with the bottom of cladding terminating within the channel drain. In

[10] I note that details regarding the top of the weatherboard cladding cavity are detailed in the original building consent, as described in paragraph **Error! Reference source not found.**. There were no changes to these details proposed as part of the application for an amendment to the building consent.

deciding this matter I will consider the refusal (the form and content) and the grounds for the refusal, being the information provided to the authority.

The relevant legislation

4.2. Sections 16 and 17 of the Act require all building work must comply with the Building Code performance criteria. Sections 18, 19, 22 and 23 describe the extent of Building Code compliance and pathways to establish compliance with the Building Code performance criteria.

4.3. Sections 44 and 45 set out when and how to apply for a building consent, including directions that an application for building consent must be accompanied by plans and specifications, and that an application for an amendment to a building consent is to be made as if it were an application for a building consent.

4.4. Section 48 sets out how applications for building consents (and amendments) are to be processed, and sections 49 and 51 provide for the granting and issuing of building consents (and amendments). Section 49 states:

> 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.

4.5. Where a building consent authority decides to refuse to grant an application for a building consent (or amendment), section 50 states that the authority:

> … must give the applicant written notice of—
>
> (a) the refusal; and
>
> (b) the reasons for the refusal.

The form and content of the authority's refusal

4.6. A number of previous determinations[11] have considered the requirements of section 50 and what is expected of an authority when providing reasons for refusal.

4.7. In essence, an authority, with consideration of the test set out in section 49 to grant a building consent (or amendment), must give an applicant sufficiently explicit, specific and clear reasons as to why the authority believes the provision of the Building Code would not be met if the building work was completed in accordance

[11] Determination 2024/041: *Regarding the authority's refusal to grant a building consent for building work to replace the existing fire alarm system in a cool store* (dated 13 August 2024), and Determination 2021/010: *Regarding the refusal of a building consent for alterations to an existing students' hall of residence* (dated 31 May 2021).

with the plans and specifications. It is then for the owner to consider what measures may be required to remedy the situation.

4.8. A generalised refusal that does not identify the specific building work in question, the non-compliant aspects of the design, and the specific provisions of the Building Code not being met is not sufficient for the authority to meet its obligations under section 50. A refusal should clearly identify the particular building work being refused and the specific Building Code performance criteria not met, so that the applicant can affect remedial measures in respect of the particular building work being refused.

4.9. In its letter of 31 March 2024, the authority's reasons for refusal were effectively because it could not be satisfied that the application met the test in section 49, and specifically that compliance had not been demonstrated with Building Code clauses E2 and B2. No further specific reasons were given, nor clearly identify the particular building work being refused.

4.10. In this case, the authority did not provide sufficiently explicit, specific or clear reasons for its refusal. Although the authority's written notice refers to clauses B2 and E2 the Building Code, it neither describes the particular building work in question or the particular aspects of the amendment application, nor states in what ways the specific Building Code performance criteria are not being met. I acknowledge the authority may have set out their concerns in 'request for information' correspondence, however, if the authority considered that information formed their reasons for refusal, that information should have been included in the refusal. If the authority also considered all of the proposed building work was being refused, that should have also been made clear in the refusal.

4.11. Accordingly, I conclude that the refusal letter did not meet the requirements of section 50.

Grounds for the refusing the amendment

4.12. To determine the matter, I must also consider the grounds for refusing to grant the amendment in relation to the proposed building work. This will require me to consider whether the authority was provided with sufficient information to establish whether the provisions of the Building Code performance criteria, in this case Building Code clauses E2 and B2, would be met if the building work was completed in accordance with the plans and specifications.

4.13. The dispute relates to channel drains at the base of external claddings with the bottom of the cladding terminating within those channel drains, which parties agree is an 'alternative solution'. The LBP has made comparisons between the proposed details and a detail in Acceptable Solution E2/AS1 along with the cladding

manufacturers details. The authority is concerned with the cladding terminating within the drain, the durability of materials within the cavity and sufficient ventilation to the cavity.

Compliance pathways

4.14. Compliance with the Building Code can be established via several pathways. Section 19 sets out specific pathways that a building consent authority must accept, such as Acceptable Solutions or Verification Methods, as establishing compliance with the Building Code to which that solution or method relates[12].

4.15. However, these are not the only[13] pathways for establishing compliance with the Building Code. There can be situations where Acceptable Solutions, Verification Methods, and other pathways in section 19 do not provide suitable construction details or methods. In these circumstances, an 'alternative solution' also known as 'specific design' for establishing compliance with the Building Code is required.

4.16. For an alternative solution proposal, evidence to establish how the proposed building work will comply with the relevant Building Code performance criteria should be provided to the authority. The type and extent of evidence to support the proposal will vary depending on the type and complexity of the building work, as well as consideration of site-specific factors. Evidence[14] could include in-service history, expert opinion, comparison with documents such as Acceptable Solutions or the use of other documents, such as determinations, standards, or technical literature, or a combination of these. Where comparison with an Acceptable Solution is used, changes or deviations from the Acceptable Solution will need to be explained, changes compensated for or otherwise justified, including why it is suitable to compare the alternative solution proposal with an Acceptable Solution, for example minor or discrete deviations. Where there is a significant deviation, it may not be appropriate to compare the alternative solution proposal with an Acceptable Solution.

4.17. It is important to note the assessment of whether Building Code compliance has been established is always specific to the site, the building and the building work in question.

[12] Also refer section 22.

[13] Section 23 states "A person may comply with an acceptable solution or a verification method in order to comply with the provisions of the building code to which that acceptable solution or verification method relates, but doing so is not the only means of complying with those provisions".

[14] https://www.building.govt.nz/building-code-compliance/how-the-building-code-works/different-ways-to-comply/alternative-solutions

Compliance with clause E2 External Moisture

4.18. The objective of Building Code clause E2 is to safeguard people from illness or injury that could result from external moisture entering a building.

4.19. I consider the relevant performance criteria in dispute are E2.3.3 and E2.3.5 as they relate to drained cavities and elements in close proximity to the ground. These performance criteria state:

> **E2.3.3** Walls, floors, and structural elements in contact with, or in close proximity to, the ground must not absorb or transmit moisture in quantities that could cause undue dampness, damage to *building elements*, or both.
>
> **E2.3.5** *Concealed spaces* and cavities in *buildings* must be constructed in a way that prevents external moisture being accumulated or transferred and causing condensation, fungal growth, or the degradation of *building elements*.

4.20. For the design details in dispute, the parties agree that the proposed design represents an alternative solution because it does not comply in full with the requirements of Acceptable Solution E2/AS1.

4.21. The licensed building practitioner's compliance report, outlining the alternative solution proposal, states the design for the channel drains was based on a detail in Acceptable Solution E2/AS1 paragraph 7.3.2.1 and Figure 17B, but with three deviations. These relate to the increased length of drain, the change in cover to the drain and the detail is proposed in front of landscaping, not just paved areas. The compliance report also suggests drains in front of cladding are within the scope of the Acceptable solution, pointing to Figure 17B which annotates the line of cladding in the background of the figure.

4.22. Acceptable Solution E2/AS1 is a document that covers the weathertightness of the building envelope by setting out the requirements for some common cladding systems, such as for example, horizontal weatherboards, sheet claddings and masonry veneer. In some cases, as part of the external wall cladding system, a 'drained cavity' is required. A drained cavity is defined as:

> **Drained cavity** A cavity space, immediately behind a wall *cladding*, that has vents at the base of the wall. Also known as a drained and vented cavity and referred to in this Acceptable Solution as a cavity or drained cavity.
> A *drained cavity* assists drying by allowing water which occasionally penetrates the wall *cladding system* to drain to the exterior of the building, and any remaining moisture to dry by evaporation.
> …

4.23. Section 9.1 of E2/AS1 sets out the requirements for wall claddings generally, including requirements for the way drained cavities are constructed, including controlling the clearance at the 'bottom of cladding'. These requirements are to ensure the functioning of the cavity as intended by E2/AS1 and as per the definition

of a drained cavity. For example, E2/AS1 has requirements for the construction of a drained cavity and includes non-mandatory commentary which explains the functioning and purpose of a drained cavity:

4.23.1. Paragraph 9.1.3 specifies minimum clearances between the bottom of the cladding to various ground conditions, with the commentary "This keeps the bottom edge of the cladding dry, and allows cleaning and painting of the bottom surfaces".

4.23.2. Paragraph 9.1.8.2 – describing the general requirements for cavities such as vertical cavity battens for drainage and restricting air movement between cavities and other confined spaces.

4.23.3. Paragraph 9.1.8.2 d) - drained cavities are required to be "drained and open to the exterior at the bottom of cavities".

4.23.4. Comment at Paragraph 9.1.8.2 "Solid horizontal cavity spacers risk obstruction of air flow in cavities and risk bridging moisture across the cavity".

4.23.5. Comment at paragraph 9.1.8.3 "It is important the openings in vermin-proofing are kept clear and unobstructed in order to maintain draining and venting of the cavity".

4.23.6. Comment at paragraph 9.1.9.4 "A drained cavity height is limited to manage the moisture handled by the cavity before it is directed to the outside".

4.23.7. Comment at paragraph 9.1.3.5 "Where claddings require drained cavities, care must be taken to ensure air from the subfloor space cannot enter the cavity. This is important, as moisture levels in subfloor air can be high".

4.24. With consideration of the above, E2/AS1 has specific requirements for the bottom of the cladding system incorporating a drained cavity. That is, specifying clearances between the bottom of the cladding to the ground and ensuring the cavity is drained and open at the bottom. Commentary suggests this is to ensure the drainage and ventilation of the cavity at the bottom[15] and preventing moist air from other confined spaces entering the cavity (or vice-versa the cavity directing moist air into other parts of the construction).

4.25. I acknowledge the compliance report has considered the design of the channel drains by comparing with the threshold details in E2/AS1 Figure 17B, and includes additional compensating features to improve the performance of the drain managing water out of the drains. However, the compliance report does not address the way in which the channel drains interfere with the proper functioning of a drained cavity as intended in E2/AS1 of the wall cladding systems. In this case,

[15] E2/AS1 paragraph 9.1.8.1 states "this Acceptable Solution is limited to systems where c) The drained cavity behind claddings, except masonry veneer, is not vented at the top".

the bottom of the drained cavity is no longer 'open to the exterior' as the bottom is encompassed by and terminates within the channel drains. The channel drain, despite surrounding areas sloping away, will manage water as a result of rain that hits the cladding that sheds down cladding into channel drain. When this rain dries, some of this moisture will evaporate into the cavity. The drained cavities where the bottom finishes in the channel drains will have reduced ventilation (and therefore less opportunity to dry out) compared to E2/AS1 and will manage some additional moisture evaporated from the channel drain.

4.26. In this case, the resulting impact or risks of extending the external wall cladding system, which incorporates a drained cavity, below the adjacent ground level and into the channel drain itself, relate to:

- The channel drains altering the functioning and performance of a drained cavity set out in E2/AS1, which is a more than a simple deviation from the Acceptable Solution
- Reduced ventilation of the drained cavity and the resulting reduced airflow within the cavity, this could result in longer drying time and/or increased moisture levels.
- Some moisture from the drains will evaporate into the cavity, as the channel drains will receive and manage rain that sheds from the cladding, resulting in the cavity likely managing increased amounts of moisture.
- Increased moisture in the cavity could impact the durability of the cladding, cavity battens or structural wall framing, or a combination of these.
- The bottom of the claddings will be subject to reduced ventilation and increased drying time for the cladding, which could impact the durability of the cladding.
- The bottom plate of the wall framing being level with and, in close proximity to, the ground level on the other side of the channel drain could be subject to increased moisture, which could impact the durability of the bottom plate.

4.27. Furthermore, consideration needs to be given to how these risks apply to each of the two cladding systems in this case. The brick veneer and weatherboard cladding systems have different construction elements and moisture management properties as set out in paragraphs 2.10 and 2.11. This extends to their respective material properties of the claddings, cavity construction, and differing airflow properties and moisture levels of the cavity. Also, consideration to any site specific

conditions, such as whether the details are sheltered/exposed, or prevailing weather[16].

4.28. Returning to the relevant performance criteria E2.3.3 and E2.3.5, these risks must be managed to avoid 'undue dampness or damage to building elements or both' from the absorption or transmission of moisture– like the reduced ventilation of and increased moisture in the cavity and the structural timber framing and cavity elements – that are close to the ground. Unmanaged, this moisture could accumulate within the cavity and cause condensation or mould growth in the cavity or degradation of building elements.

Proprietary fibre cement vertical weatherboard cladding system

4.29. One disputed detail involves the proposed use of a proprietary fibre cement vertical weatherboard cladding system, incorporating a cavity, the base of which terminates with a channel drain.

4.30. Evidence referenced by the owner to support the compliance of the vertical weatherboard cladding includes the licensed building practitioner's compliance report which compares the proposed detail to figure 17B of E2/AS1. The owner, in the amendment application,[17] has also referred to an 'appraisal' and associated technical literature for the cladding, which they submit supports its use as shown in the proposed design.

4.31. The manufacturer of the weatherboard cladding system has engaged an independent appraisal organisation to produce a technical assessment of the cladding system's performance ("the appraisal") which outlines an associated scope of use for the product.

4.32. Appraisals are technical opinions on a building product or system's fitness for purpose. They involve testing, assessment and verification of Building Code compliance, and are issued by an independent appraisal organisation (not the product or system's manufacturer or distributor). An appraisal will look at any specific installation systems or processes that apply to a product and will recognise any limitations on the product's intended scope of use.

4.33. It is important to note that appraisals do not have any legal standing (they are not, for example, listed in section 19) and do not have to be automatically accepted as evidence of compliance. They can, however, be considered as expert opinion and form part of the evidence establishing compliance.

4.34. In the current case, the appraisal notes that it must be read in conjunction with the manufacturer's technical literature, being specifications outlining further details

[16] I note E2/AS1, comment at paragraph 7.3.2 in relation to Figure 17B, suggests considering "shelter, prevailing winds and ground levels".
[17] As stated by the authority

regarding scope of use[18], components, accessories, and tools, as well as construction details and techniques. The appraisal states that, when installed within the scope of the appraisal and the technical literature, the weatherboard cladding will meet the performance criteria of E2.3.2. In a different part of the appraisal, in respect of performance criteria E2.3.5 the appraisal requires the cavity to be sealed from roof and subfloor spaces. In respect of E2.3.6 states the cladding system "allows excess moisture present at the completion of construction to be dissipated without permanent damage to building elements to meet… E2.3.6".

4.35. However, the referenced manufacturer's technical literature does not include any threshold details that incorporate channel drains. Further, the appraisal requires the bottom edge of the weatherboards must be kept clear of paved and unpaved surfaces in accordance with E2/AS1 Table 18, noting "Failure to adhere to the minimum ground clearances… will adversely affect the long term durability of [the cladding system]". In this regard, the proposed design for the weatherboard cladding system is outside the scope of the expert opinion outlined in the appraisal. I therefore find that the appraisal alone does not provide sufficient evidence that the proposed design will comply with the relevant Building Code performance criteria if constructed in accordance with the plans and specifications, because the proposed details differ from those in the scope of the appraisal.

4.36. The owner has also referenced previous technical literature from the manufacturer, showing one of the manufacturer's products which incorporates a channel drain. However, this detail is not included in the current literature referenced by the appraisal, and no further evidence has been provided as to why this detail might show compliance, or clarifying why it is no longer referenced by the manufacturer. I note that the detail is for a different cladding product, not the vertical weatherboard cladding that is proposed to be installed.

4.37. Another way of establishing compliance by way of an alternative solution is by comparing the requirements outlined in an acceptable solution with the proposed design, considering the underlying principles of the acceptable solution, areas where the proposed design does and does not align with that detail, and any features which address risks created in areas where it differs.

4.38. The owner has adopted this approach in the current case, comparing the proposed design detail with that outlined in paragraph 7.3.2.1 and Figure 17B of E2/AS1, and detailing how the design compensates for any deviations. This comparison is outlined in the licensed building practitioner's compliance report (see paragraph 2.14), which the owner refers to and relies on in their submission.

4.39. I note, however, that the figure referenced applies to channel drains used at level thresholds, being doorways and other entrances into buildings. I am of the view that this detail is not intended to show how external wall cladding should terminate into a channel drain; rather, the channel drain shown in that figure only extends the

[18] Which includes a scope limitation of E2/AS1 Paragraph 1.1

length of the doorway, which ordinarily does not have additional external wall cladding running below the sill. This is supported by paragraph 7.3.2.1(a), which notes that the channel extends "across the door opening". In addition, I consider that the line of external wall cladding beyond the threshold shown in Figure 17B achieves standard ground clearances, akin to those shown in figure 65 of E2/AS1, suggesting the level threshold is achieved by some form of ramp up to the threshold forming a level threshold, allowing other parts of the cladding to maintain ground clearances.

4.40. Therefore, in my view, the owner's comparison to paragraph 7.3.2.1 and Figure 17B of E2/AS1 and the appraisal does not support or establish the Building Code compliance of the proposed proprietary fibre cement vertical weatherboard cladding system with cavity, terminating within the channel drain.

4.41. As neither the compliance report nor the appraisal sufficiently addresses the impacts or risks associated with the proposed weatherboard cladding system terminating within a channel drain altering/impacting the intended functioning of the drained cavity set out in E2/AS1, I find that the plans and specifications do not demonstrate that the cladding system would achieve compliance with the performance requirements of E2.3.3, or E2.3.5 as an alternative solution.

4.42. In this case, the cavity terminating within the channel drain will reduce the ventilation within the cavity and therefore increase the moisture within the cavity causing an accumulation of moisture which could cause condensation, fungal growth, or the degradation of building elements.

4.43. Further, the parties dispute the proposed details as there is a disagreement in respect of the vertical distance, or lack of, between the bottom plate and the finished ground level. In my view the primary matter is the impact and risk that arise from these details is the reduced ventilation of the bottom of the cavity and the resulting accumulation of moisture within the cavity.

4.44. In respect of the proprietary fibre cement vertical weatherboard cladding system, the test under section 49 was not met and I conclude the authority had reason to refuse to grant the amendment to the building consent in this respect.

Brick veneer cladding system

4.45. The other disputed detail involves brick veneer cladding incorporating a cavity, the base of which terminates within a channel drain (see paragraph 2.11).

4.46. As noted in paragraph 4.27, the way in which cavity for brick veneer cladding system functions is different to that of other wall cladding systems with drained cavities in E2/AS1. Generally, in acknowledging the porous properties of brick and increased moisture expected within the cavity as a result, the cavity depth for brick veneer cladding systems in E2/AS1 is increased and venting is required at the base and top of the cavity to provide additional airflow to manage additional moisture.

Accordingly, any evidence provided to support the brick veneer cladding's compliance as an alternative solution should consider the specific features of cavities for brick veneer cladding systems.

4.47. I note the brick veneer cladding appears, at least on one side, to be sheltered under a large eave, which could reduce the amount of rain received, however there is no discussion in the proposal about whether this is a relevant or a relied upon feature.

4.48. The owner did not provide evidence specific to the brick veneer cladding system which addressed these differences from E2/AS1 or associated risks with altering the performance of the E2/AS1 drained cavity, such as the passage of moisture through the lower row of bricks and weep holes located within the channel drain. The plans and specifications therefore do not establish how compliance with the performance criteria of E2.3.3 and E2.3.5 would be achieved as an alternative solution.

4.49. In respect of the brick veneer cladding system, the test under section 49 was not met and I conclude the authority also had reason to refuse to grant the amendment to the building consent in this respect.

Compliance with clause B2 Durability

4.50. The other Building Code clause where compliance is in dispute is B2.

4.51. The relevant performance criteria is Clause B2.3.1, which requires that building elements must, with only normal maintenance, continue to satisfy the other performance criteria of the Building Code for specified periods of time (known as durability periods). Durability periods vary depending on the nature and function or importance of the building elements they relate to, including how easy they are to access, replace and maintain.

4.52. The weatherboard and brick veneer cladding systems proposed to incorporate multiple building elements, which clause B2 requires those elements to continue to meet their performance criteria of the other relevant Building Code clauses with only normal maintenance.

4.53. This includes elements such as the external wall cladding itself, its fixings, cavity battens, building wrap, and timber structural wall framing, which have durability periods ranging from 5 to 50 years.

4.54. In my view, the plans, specifications and the licensed building practitioner's compliance report does not include sufficient information or additional compensating features to demonstrate that these elements will continue to meet their performance criteria for the required length of time when subject to increased moisture within the drained cavity arising from reduced ventilation at the base of the cavity compared to E2/AS1. For instance, the bottom plate of the timber framed wall is vulnerable to decay within its 50-year durability period outlined in B2.3.1(a)(i). This is due to the bottom plate's proximity to the base of the channel

drain, being level with the adjacent paved and landscaped areas, as well as the cavity terminating within the channel drain meaning an elevated risk of damage from excess moisture and undue dampness due to a lack of ventilation. Further, excess moisture in the cavity risks undue dampness and damage to the cavity battens supporting the weatherboard cladding, meaning they may need replacing within the 15-year durability period specified for them by clause B2.

4.55. In respect of Clause B2.3.1, I conclude that the test under section 49 was not met, and the authority had reason to refuse to grant the amendment to the building consent in this respect.

Conclusion

4.56. I have found, at paragraphs 4.44, 4.49 and 4.55, the information provided with the amendment to building consent application did not establish compliance with the Building Code performance criteria E2.3.3, E2.3.5 or B2.3.1, if the building work were to be properly completed in accordance with the plans and specifications that accompanied the application. Accordingly, there was grounds for the authority to refuse to grant the application under section 49.

5. Decision

5.1. In accordance with section 188 of the Building Act 2004, I determine there were grounds to refuse to grant the amendment to the building consent based on the information provided to the authority, however the authority's refusal letter does not meet the requirements of section 50. For this reason, I reverse the authority's decision to refuse to issue the amendment to the building consent.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 6 June 2025.

Rebecca Mackie

Principal Advisor Determinations