

Determination 2023/030

Date: 31 October 2023

The issue of a building consent, specifically in regard to three cladding details.

400 Aberdeen Road, Gisborne

Summary

This determination considers a building consent for the construction of a dwelling. The matter concerns the details for fixing infill panels that were proposed to be installed above and below windows, and above a garage door and entrance. The determination considers whether those details, as documented in the consent application, would comply with clause E2 External Moisture and B1 Structure, if the building work was constructed in accordance with the building consent.



The legislation discussed in this determination is contained in Appendix A. 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 (eg 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, Charlotte Gair, Manager Advisory, Determinations, Ministry of Business, Innovation and Employment (“the Ministry”), for and on behalf of the Chief Executive.¹
- 1.2. The parties to the determination are:
 - 1.2.1. J Powell, the owner of the property (“the owner”) who applied for this determination
 - 1.2.2. G Morley, the licensed building practitioner concerned with the relevant design work (“the designer”)
 - 1.2.3. Gisborne District Council (“the authority”), carrying out its duties as a territorial authority or building consent authority.
- 1.3. The matter to be determined² is the issue of building consent BC 19859, specifically in relation to the fixing of the proprietary panel cladding and the depth of the cavity. The details from the plans (see appendix A for detail drawings) that are the subject of this determination are as follows:
 - 1.3.1. Detail 1 – Brick veneer cladding with a proprietary panel cladding (“the panel cladding”) above window head.
 - 1.3.2. Detail 2 – Brick and panel cladding vertical junction detail.
 - 1.3.3. Detail 3 – Brick garage door head detail.
- 1.4. In making this decision, I must consider whether the building work would have complied with Building Code clauses E2 External moisture and B1 Structure, and if it was properly completed in accordance with the building consent approved by the authority on 4 September 2019.

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

² Under section 177(1)(b) and 177(2)(a) of the Act.

- 1.5. I have not considered any other aspects of the building work or any other clauses of the Building Code.

2. Background

General

- 2.1. The determination arose from the owner's concerns about compliance of the building work during construction. Issues related to the construction of the building were resolved, an amendment to the building consent was granted, and a code compliance certificate was issued for the completed building work. However, the owner remains concerned that details described in the original building consent would not have complied with the Building Code. The owner's concerns largely relate to the fixings of the proprietary panel cladding and depth and formation of the cavity behind the cladding.
- 2.2. The property is a flat section in a recently developed urban area in Gisborne. The 120m² house is a single-story timber framed building with an attached garage. It is reasonably simple in plan and form.
- 2.3. The external walls are clad in a mixture of brick veneer and a proprietary panel cladding ("the panel cladding"). It is the details for the panel cladding that were approved in the building consent granted on 4 September 2019 that are the subject of this determination.
- 2.4. The panel cladding was proposed for above and below windows, and above the garage and entrance.

The panel cladding

- 2.5. The panel cladding system consists of a 9mm thick vertical grooved ship-lapped edge panel made of a low-density fibre-cement. The panels are 1200mm wide and come in lengths of 2450, 2750 and 3000mm.
- 2.6. The product technical statement³ for the panel cladding states it is suitable for use in residential buildings within the scope of E2/AS1⁴, and can be installed directly to the framing (without a cavity) on buildings within or up to risk score 6. I note that in this case, the cladding was installed over a cavity as a matter of choice, so I have not addressed the risk score any further.

³ Dated April 2019.

⁴ The scope of E2/AS1 is limited to buildings within the scope of NZS 3604 and up to a maximum of three storeys in height.

- 2.7. Figures from the product technical statement are provided in Appendix A. The specification for the panel cladding system includes the following instructions:

Timber framing

A minimum 70 mm wide stud is required at panel edges for cavity construction. The framing must fully support all panel edges. The framing must be rigid and not rely on the cladding panel for stability.

Cavity construction

When studs are spaced at 600 mm centres maximum, the nogs/dwangs must be provided at 800 mm centres maximum.

A minimum 70mm wide stud is required at vertical panel joint when fixing with [proprietary] 60 x 3.15 mm nails.

When studs are spaced at 400 mm centres then the nogs/dwangs may be provided at 1200 mm centres.

Cavity battens

Buildings with a risk score of 7-20 ..., require [the panel cladding] to be installed on a cavity. The battens provide airspace between the frame and the panel and are considered a “packer” only in this specification.

The timber cavity battens must be minimum H3.1 treated in accordance with NZS 3640 ...

Cavity battens must comply with E2/AS1 and be minimum 18mm thick, be as wide as the width of studs, be provided at 300 mm c/c where studs are fixed at 600mm c/c, be fixed by the cladding fixings to the main framing over the building underlay. Therefore, until claddings are fixed the battens only need to be fixed to framing by 40 x 2.8 mm nails at 800 mm c/c.

Panel layout

All panel edges must be supported by the framing. The shiplap joint must be formed vertically. The framing centres must be checked before the panel installation.

- 2.8. The fastener size and layout for cavity construction over flexible underlay is 60x3.15mm nails fixed at 200mm centres to all framing, with a minimum stud width of 70mm required at vertical joints.
- 2.9. The designer provided a project specification to support the application for the building consent.
- 2.10. Notes on the drawings specified:
- 2.10.1. external wall studs at maximum 600mm centres, and nogs at 800mm centres or to suit specific requirements of the external cladding system.

2.10.2. panel cladding to be installed over a 20mm drained cavity above and below windows, and “installed to manufacturer’s specifications”⁵, and flashed and finished in accordance with E2/AS1.

3. Submissions

The owner

- 3.1. The owner’s concern is that the building consent was approved with details that the owner considers were not in accordance with the product technical statement for the panel cladding.
- 3.2. The owner noted:

Cavity depth

- 3.2.1. Written specification states the panels are to be installed over a 20mm cavity.
- 3.2.2. Manufacturer specifies cavity depth is 20mm.
- 3.2.3. In contrast, the approved drawings show cavity depth above windows and above the garage door at 65mm (batten depth 20mm + cavity packer 45mm), and below windows at 40mm (batten 20mm + packer 20mm).

Fixings

- 3.2.4. The manufacturer specifies cavity battens are to be fixed by the cladding fixings to the main framing over the building underlay, and the panels be fully supported by vertical battens over the framing (refer to Appendix A Figure 3). This would achieve a 31mm depth of the fixings into the framing timber.
- 3.2.5. The approved drawings show 45mm horizontal packers above windows and the garage door head, and 20mm cavity packers below windows – with unsupported vertical cavity battens spanning the face. The building wrap is shown in the main framing line then dressed out over the horizontal packer. The result would be fixings through the 45mm packers into the cavity rather than into framing timber, and fixings through the 20mm packers would only achieve a depth of 11mm in the wall framing.

⁵ I’ve taken this as referred to the product technical statement.

Fall to cavity packers

- 3.2.6. No fall was specified to the top of the horizontal cavity packers.
- 3.2.7. The manufacturer specifies a 5° minimum fall for spacers/packers.
- 3.2.8. E2/AS1 E2/AS1 figure 67. 5° min fall required for sloping spacers.

The authority

- 3.3. The authority submitted the following:
 - 3.3.1. The window head detail showed the framing packed out over the building wrap, an additional layer of wrap, a drained and vented cavity, and H3.1 scribes sealed back to the brick.
 - 3.3.2. The window head detail is comparable to one produced by the brick manufacturer for sheet materials above windows and with an optional cavity. Both this detail and those for the subject house have been packed out with a packer and a cavity batten to achieve a finish in line with the brick face.

The designer

- 3.4. The designer was identified as a party during the determination process and was provided with a copy of the application and submissions. The designer did not make any submissions.

4. Discussion

General

- 4.1. The matter to be determined is the issue of building consent BC 19859.
- 4.2. The dispute concerns three cladding details (see Appendix A for detail drawings). A building consent was issued with the three cladding details, but the applicant disputes that the details comply with the Building Code. The three details are:
 - 4.2.1. Detail 1 – Brick veneer with proprietary panel cladding above window head.
 - 4.2.2. Detail 2 – Brick and panel cladding vertical junction detail.
 - 4.2.3. Detail 3 – Brick garage door head detail.
- 4.3. The dispute turns on whether the building work proposed in the building consent complies with Building Code clauses E2 External moisture and B1 Structure

Methods of establishing Building Code compliance

4.4. With respect to building consents, the Act provides:

49 Grant of building consent

(1) A building consent authority must grant a building consent if it is satisfied on reasonable grounds that the provisions of the building code would be met if the building work were properly completed in accordance with the plans and specifications that accompanied the application.

- 4.5. Section 19 of the Act sets out various methods by which compliance with the Building Code can be established (eg acceptable solutions, verification methods etc). A building consent authority must accept compliance with these methods as establishing compliance with the Building Code.
- 4.6. For example, a building consent authority must accept Acceptable Solution E2/AS1 as establishing compliance with Building Code clause E2 External moisture. It is common for manufacturers of cladding systems to adopt or closely follow E2/AS1 details in their installation details.
- 4.7. A common misunderstanding within the building industry is that if a design is not “in accordance with” the detail in an acceptable solution or trade literature, then it does not comply with the Building Code. However, there are many situations where neither the acceptable solutions (or other “deemed to comply” documents listed in section 19), nor trade literature provide a suitable construction detail. In these situations, an “alternative solution” complying with the Building Code is required.
- 4.8. The information or evidence required to support an alternative solution proposal depends on the complexity of the design. It may include expert judgement, comparison to compliance documents, use of other documents (eg standards, technical trade literature, test results, determinations etc) and in-service history.
- 4.9. Section 17 requires that building work complies with the Building Code. The Building Code sets out the performance criteria for the assessment of building work. The performance criteria are the qualitative and quantitative criteria required to be satisfied in performing the functional requirements of a Building Code clause. If the performance criteria are satisfied, the functional criteria will also be satisfied.
- 4.10. Conversely, to establish non-compliance with the Building Code, a demonstration of non-compliance with one or more of the performance criteria is required.
- 4.11. In this case, I will consider whether the disputed details comply with the relevant code clauses by way of an alternative solution. My assessment involves comparison to Acceptable Solutions, use of in-service history and use of technical trade literature.

Compliance with clause E2 External moisture

4.12. The applicable performance of E2 is E2.3.2, which states “roofs and exterior walls must prevent the penetration of water that could cause undue dampness, damage to building elements or both”.

Cavity cladding construction

4.13. Cavity cladding construction, as included in E2/AS1, incorporates four basic principles of water management in buildings:

4.13.1. deflection: keeping water away from potential entry points.

4.13.2. drainage: providing means of removing water that does enter.

4.13.3. drying: allowing any remaining moisture to be removed by ventilation or diffusion.

4.13.4. durability: providing materials with appropriate durability.

4.14. The main purpose of a cavity is to provide drainage and drying mechanisms.

Details 1 & 3

4.15. In terms of compliance with E2, I consider that Details 1 & 3 can be assessed together. This is because the details are essentially the same from the head flashing, including the junction of the head flashing to the joinery, and above.

4.16. Figure 116(a) of E2/AS1⁶ is the “deemed to comply” head flashing detail for fibre cement sheet. In terms of comparison with the acceptable solution, Details 1 and 3 (with the exception of the 70x45 H1.2 packer), are essentially the same as the E2/AS1 detail. I note that they are not as well annotated or dimensioned as Figure 116(a), with text not being provided to describe the following on one or both of the details:

4.16.1. additional wall underlay from overlap above lapped over flashing.

4.16.2. cavity spacers set to fall where required for sheet fixing.

4.16.3. cavity closer positioned to give 15mm minimum drip edge to cladding.

4.16.4. 10mm minimum cover to joinery.

4.17. However, by scale and by consideration of what is drawn, it is my opinion that these items are all provided within the detail, except the provision of cavity spacers for

⁶ Figure 116: Windows and doors for fibre cement sheet and flush-finished fibre cement on cavity. Acceptable Solution E2/AS1, Amendment 10 effective 5 November 2020, page 157.

bottom edge fixing. I note that the product technical statement covering the proprietary panel cladding for cavity batten installation shows the bottom edge fixing in the order of 75mm above the bottom sheet edge. Therefore, the bottom fixing would be into the 70x45mm packer.

4.18. The only material difference between Details 1 and 3 and Figure 116(a) is the increased size of the cavity created by the 70x45mm packer, being 65mm rather than 20mm. However, I do not consider that the increased depth of the cavity has any adverse effect on compliance with clause E2.3.2. This is because:

4.18.1. If anything, it improves the level of compliance by providing a greater volume of air that is able to absorb water, thereby improving the drying of any free water that has penetrated into the cavity and reducing the requirement for drainage provision.

4.18.2. The means of managing any surface water located on the building wrap against the wall framing shown in Figure 116(a) is replicated in Details 1 and 3. Building wrap is shown lapping over the packer from above. If any free water did penetrate, was not dealt with by drying, and was located on the building wrap against the wall framing, it would be directed into the 20mm cavity between the packer and cladding. Then, it would be drained via the vent strip over the head flashing.

4.19. As described above, the variation of Details 1 and 3 from what is specified in E2/AS1 will not have any adverse effect on the details' ability to meet performance criteria E.2.3.2. Therefore, I am of the view that Details 1 & 3 comply by way of an alternative solution.

Detail 2

4.20. Detail 2 shows the vertical junction between the infill panel and the adjacent masonry veneer, with the infill butting into the veneer.

4.21. In terms of in-service history, I note that the provision of an infill panel above joinery and fitted between adjacent brick veneer cladding has been a common cladding detail for decades, and successfully used. On the face of it, such a detail would be compliant with E2.3.2.

4.22. In terms of the technical trade literature, E2/AS1 does not provide a detail for the junction of an infill panel butting into adjacent brick veneer. However, an example of one provided by the brick veneer industry is Detail GJ02 (see Figure 1). Detail GJ02 has three components to it:

4.22.1. a 50mm packer is shown to bring the rear of the cladding in line with the rear face of the brick veneer.

4.22.2. a scriber to close the junction between the cladding and brick veneer.

4.22.3. a back flashing to capture and control any water penetrating into the junction.

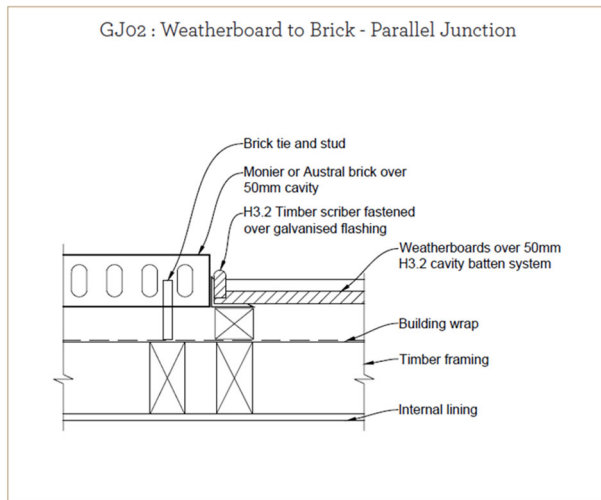


Figure 1: Detail DG02 from The Brickery Design Note A2.

4.23. Detail 2 has similar components, although the flashing is installed to a different configuration and the packer is fixed horizontally. Detail 2 also has additional components, that being the cavity battens on top of the packer and on the face of the building wrap to support the flashing.

4.24. I consider that Detail 2 reflects the intention of the industry detail and compliance with clause E2.3.2 can be expected. This is because:

4.24.1. The difference in the packer depth is immaterial, as its only purpose is to bring the cladding forward to enable a butt joint between the two claddings. The packer size will depend on the actual depth of the veneer cavity, as well as the desired line of the infill panel cladding.

4.24.2. The packer orientation is immaterial as it is a practical requirement to support the selected cladding.

4.24.3. The difference in cladding type is also immaterial, as it is the junction between two dissimilar claddings that is the location where water is more likely to penetrate the cladding.

4.24.4. The scriber is in the same location and serves the same purpose in both details, although a scriber can be expected to have a better fit to a flat sheet such as the proprietary panel cladding than to a variable surface such as that created by bevel back weatherboard. A better fit reduces the likelihood of water penetration.

- 4.24.5. A flashing is provided to the rear of the scribe/cladding junction in both details. As with the industry detail, the Detail 2 flashing will capture any water penetrating the junction.
- 4.24.6. The benefit of the flashing location and the provision of the cavity batten in Detail 2 is that these allow air to more easily circulate up to the rear face of the panel and the junction to assist with absorption and drying of moisture that has penetrated at this point. In turn, this reduces the requirement for drainage provision.
- 4.25. Therefore, I consider that Detail 2 complies with performance requirement E2.3.2 by way of an alternative solution.

Compliance with clause B1 Structure

- 4.26. The applicable performance criteria of B1 are B1.3.1 and B1.3.2. B1.3.1 states “Buildings, building elements and sitework shall have a low probability of rupturing, becoming unstable, losing equilibrium, or collapsing during construction or alteration and throughout their lives”. B1.3.2 states “Buildings, building elements and sitework shall have a low probability of causing loss of amenity through undue deformation, vibratory response, degradation, or other physical characteristics throughout their lives, or during construction or alteration when the building is in use”.
- 4.27. In order to determine whether Detail 1, Detail 2 & Detail 3 comply with these requirements the most important item I must consider is the proposed fixing of the 45mm and 20mm timber packers to the structural 90 x 45mm timber framing and the fixing of the cladding to these packers.
- 4.28. The applicant raised concerns in relation to the fixing of the cladding through the wall underlay into the framing, specifically the embedment of the nails into the framing and the lack of a vertical packer detail.
- 4.29. In my opinion, it is reasonable to consider the 45mm and 20mm packers as being part of the framing.
- 4.30. While the specific fixings for the packers to the structural timber frame have not been explicitly shown on the drawing, it is standard practice that these would be fixed using 90mm framing nails, in line with industry standards and common practice.
- 4.31. Considering the packers to be an integral part of the timber framing, means I can now turn my attention to the applicants concern about vertical support for the cavity battens.

- 4.32. I acknowledge that the details in question, particularly Detail 2, do not specifically show a vertical member over the framing to provide support.
- 4.33. The manufacturer's installation guide for the cladding states "The framing must fully support all panel edges".
- 4.34. Therefore, a vertical support member is required between the 90mm x 45mm wall framing and the vertical cavity batten.
- 4.35. Detail 2 lacks clarity on this requirement. However, it does not contradict the construction details as provided in the cladding manufacturer's installation guide, which indicate that vertical support is required.
- 4.36. The manufacturer's installation guide was freely available, and it is reasonable to expect that a builder would be aware of and would utilise that guide.
- 4.37. A building's design is communicated through a combination of drawings, specifications and supporting documents, such as product manufacturer's installations guides, etc. None of these documents in isolation are intended or expected to provide a complete set of instructions. They are a suite of documents which are used in combination by a builder.
- 4.38. Finally, the proposed assembly of the packers with cavity battens over does not prevent the cladding from being fixed in the manner that is specified by the cladding manufacturer, as noted in Table 2 of their installation guide.
- 4.39. Fixing of the cladding in accordance with the manufacturer's installation guide will achieve compliance with the relevant performance requirements of B1.
- 4.40. For these reasons, I am satisfied that the details in question are adequate to demonstrate that the design, when constructed, would achieve compliance with the performance requirements of B1.3.1 and B1.3.2.

5. Decision

- 5.1. In accordance with section 188 of the Building Act 2004, I determine that Details 1, 2, and 3 comply with clauses E2 External Moisture and B1 Structure by way of an alternative solution and that a building consent could be issued. I confirm the decision to issue the building consent.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 31 October 2023.

Reference 3245

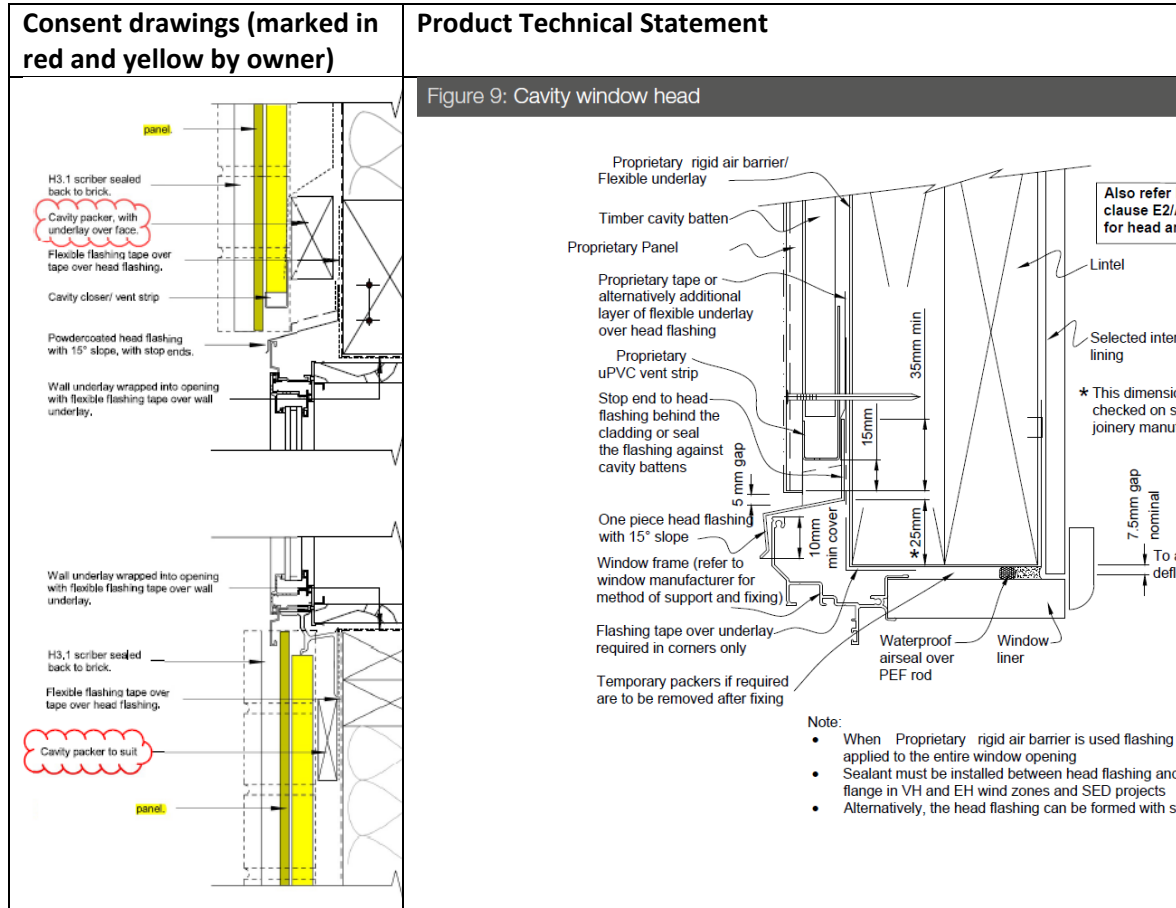
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Charlotte Gair

Manager Advisory, Determination

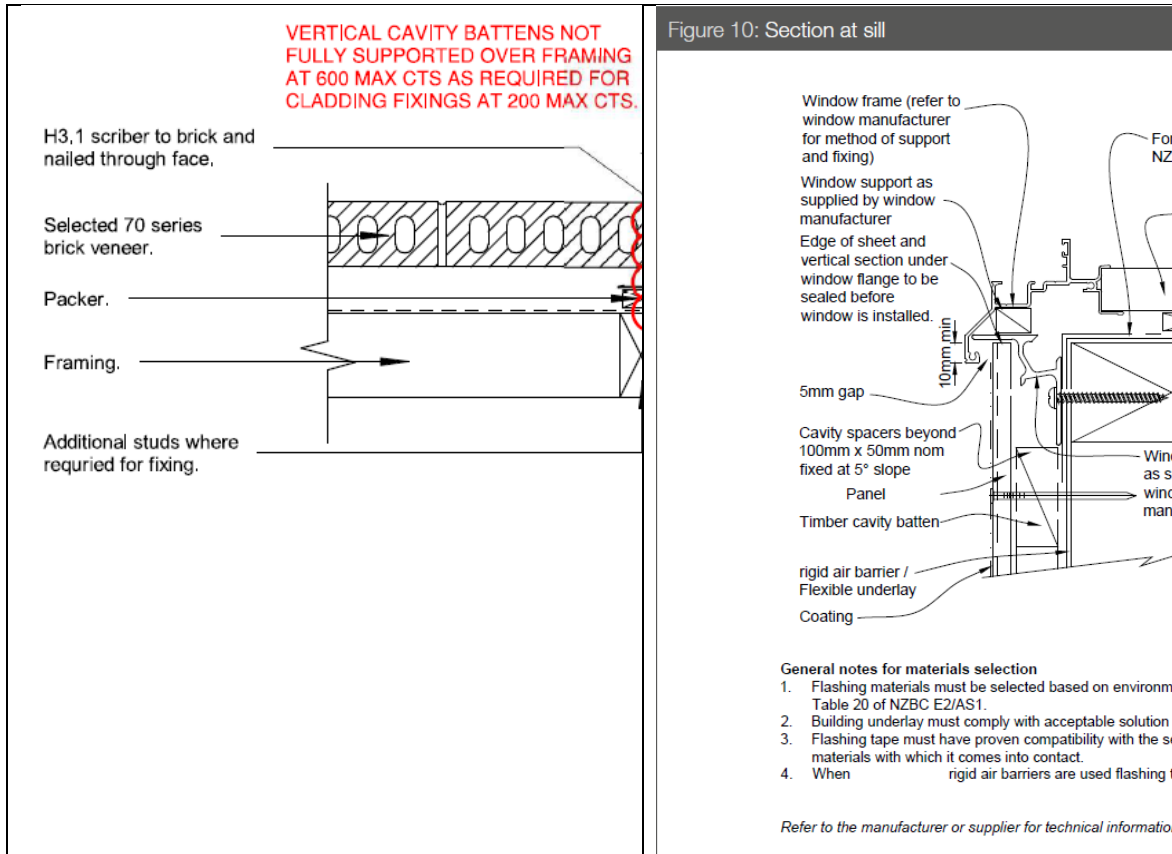
Appendix A: Panel cladding details

Detail 1 - Brick veneer with panel cladding above window



Detail 2: Brick and panel cladding vertical junction detail

Consent drawings (marked in red and yellow by owner)	Product Technical Statement



Detail 3: Brick garage door head detail

<p>Consent drawings (marked in red and yellow by owner)</p>	<p>Product Technical Statement</p>
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