



## Determination 2009/19

### Determination regarding the code compliance of a house at 37 Cardale Street, Darfield due to concerns over the cladding and stud spacing



#### 1. The matters to be determined

- 1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004<sup>1</sup> (“the Act”) made under due authorisation by me, John Gardiner, Manager Determinations, Department of Building and Housing (“the Department”), for and on behalf of the Chief Executive of that Department. The applicants are the building owners Mr S J Mitchell and Mrs H S Mitchell (“the applicants”), and the other party is the Selwyn District Council carrying out its duties and functions as a territorial authority or a building consent authority (“the authority”).
- 1.2 This determination arises from the decision of the authority to refuse to issue a code compliance certificate for a two-year-old house because it was not satisfied that the building complies with certain clauses of the Building Code<sup>2</sup> (Schedule 1, Building Regulations 1992).
- 1.3 Based on the evidence, I take the view that the matters for determination are:

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<sup>1</sup> The Building Act 2004 and the Building Code are available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

<sup>2</sup> The Building Code is available from the Department’s website at [www.dbh.govt.nz](http://www.dbh.govt.nz).

### 1.3.1 **Matter 1: The code compliance of the cladding system with respect to the stud spacing**

Whether the stud spacing used on the house is sufficient to ensure that the cladding complies with the Building Code. The maximum centres for the studs are based on the wind exposure of the house; and the authority considers that this has not been built in accordance with the requirements of the consented Sto Therm specification.

### 1.3.2 **Matter 2: The missed base plaster (cladding) inspection**

Whether the base coat and fibre reinforcing mesh component (“base plaster”) of the Sto Therm cladding system has been installed to comply with the relevant clauses of the Building Code. The authority considered this has not been satisfactorily inspected because Inspection 6 “Render/Base coat and fibreglass reinforcing mesh” was not completed, as required in the building consent.

1.4 I note that the authority has raised no matters relating to other elements in the building, other than compliance with B2 “Durability”, which I address in paragraphs 4.4 to 4.5, and I have therefore limited this determination to the matter of the stud spacing and the matter of the missed inspection of the base plaster.

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

## 2. **The building**

2.1 The building work consists of a single-storey detached house, with an attached garage that is on a flat site. The site is in a medium wind zone for the purposes of NZS 3604<sup>3</sup>. The construction consists of a timber frame on a concrete slab, with EIFS<sup>4</sup> cladding. The house has metal tile roofing and aluminium joinery, with 600mm eaves, and a 28° roof pitch. The timber frame is H1.2 treated for exterior timber studs with studs at 600 maximum centres.

2.2 The cladding is a monolithic EFIS system, which in this case is a “Sto Therm” system. The cladding system is described specifically as a plaster system of reinforced meshed base plaster (“base plaster”), fibre reinforced finishing plaster (“finishing plaster”), and silicon resin/façade paint on 40mm H Grade polystyrene, with EPS cavity battens over building wrap on timber framed construction to NZS3604:1999.

## 3. **Background**

3.1 The authority issued a building consent (no 050976) on 17 October 2005. Construction of the house began in October 2005. The authority approved a change of cladding system on 24 January 2006 as an amendment to the building consent. The change was from an Insulclad system to a Sto Therm system.

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<sup>3</sup> New Zealand Standard NZS 3604:1999 Timber Framed Buildings

<sup>4</sup> External Insulation and Finish System

- 3.2 The authority carried out inspections of the building work from 21 October 2005 to 24 March 2006. Final inspections started on 7 April 2006. The inspections are summarised as follows:

Type	Date	Status	Pass/fail
Foundation	21/10/05	Work may proceed, minor items to be resolved	Pass
Slab and plumbing	26/10/05	Re-check required	Fail
	27/10/05	In accordance with consent	Pass
Pre-wrap	08/12/05	Work may not proceed	Fail
	13/12/05	Work may not proceed	Fail
	19/01/06	Work may proceed, minor items to be resolved	Pass
Drainage	09/12/05	In accordance with consent	Pass
Pre-cladding	31/01/06	Work may proceed <b>Cladding system changed, documentation approved as amendment</b>	Pass
Pre-line	14/02/06	Work may proceed, minor items to be resolved	Pass
Post-line	23/02/06	Work may proceed, minor items to be resolved	Pass
Wet area	24/03/06	Work may proceed, minor items to be resolved	Pass
Final	07/04/06	<b>13 items listed as incomplete/unsatisfactory</b>	Fail
	18/09/06	<b>5 items listed as incomplete/unsatisfactory</b>	Fail
	05/12/06	<b>2 items listed as incomplete/unsatisfactory</b>	Fail
	07/02/07	<b>1 item listed as incomplete/unsatisfactory</b>	Fail
	14/02/07	<b>1 item listed as incomplete/unsatisfactory</b> (see paragraph 3.3)	Fail

- 3.3 The plaster area behind the guttering and fascia failed the final inspections. From the inspection notes of the final inspections, and in particular the notes on 7 and 14 February 2007, the authority has stated that the sealant used to bridge the void between the guttering and plaster system was not acceptable as the first line of weather protection. The authority required that the guttering and fascia be removed so the plaster could be extended to cover the void, so the areas behind the fascia and guttering are protected from water ingress. In the inspection notes of 7 February 2007, the authority notes that the plaster system requires a schedule of maintenance, and finally that ‘two areas require fixing because of the possible entry of water – will require over-flashing or guttering and fascia to rectify.’
- 3.4 A printout of the authority’s inspection notes was provided with the submission. The notes from 12 September 2006 show that the authority received a warranty from the plastering company (“the applicator”) for the application of the plaster system, as it

states ‘...Warranty 5 years specific to the Sto Plaster System, dated 18/04/06 signed... Stoanz Limited.’

3.5 The inspection notes of 14 February 2007 state ‘Please note: Producer Statement will require up grading to new completion date when this work is fixed.’

3.6 The authority made a site visit on 15 September 2008 to discuss the code compliance certificate with the applicants. The inspection notes show a number of issues pertaining to the issue of the code compliance certificate. In the letter dated 13 October 2008, the authority wrote to inform the applicants that they were unable to issue a code compliance certificate for three reasons:

The [authority] is unable to issue a code compliance certificate for this building consent because the Council cannot be satisfied on reasonable grounds that the building work complies with the building consent. This decision is based on the following reasons:

1. The change from “Insulclad” to the “Sto Plaster System” required stud spacing at 400 mm centres as per the approved building consent amendment dated 24 January 2006. The studs are at 600mm centres.
2. The required inspection (No 6) to check the Base Coat and fibreglass reinforcing mesh prior to the Levelling Coat for the polystyrene/plaster cladding system was not carried out.

In addition to the above, our building inspector identified an issue with the gutters embedded into the plaster as noted on inspection notice dated 7 April 2006. As this issue took some time to resolve there is a concern that the durability of some elements may have been compromised during this time.

3.7 The Department received an application for a determination on 8 December 2008.

## **4. The submissions**

4.1 In a statement accompanying the application, the applicant outlined the background to the situation, noting information about the construction of the house and it’s exposure to wind, the inspections that were completed, and the stud spacings, and forwarded copies of:

- the consent drawings
- the specification
- the Sto Therm specification and details
- the inspection records
- the letter from the authority refusing the issue of the code compliance certificate.

4.2 The authority made a submission dated 12 December 2008, in which it explained that it continues to hold the opinion as expressed in a letter to the applicant dated 13 October 2008, and forwarded copies of the building consent and the inspection records.

- 4.3 In the 13 October 2008 letter, the authority raised the matters of the stud spacing and the missed base plaster inspection of the cladding system. The authority also explains that because some time passed while the issue of the guttering being embedded in the plaster was resolved (refer to paragraph 3.3 and 3.6), it has concerns that the durability of some elements may have been compromised during this time.
- 4.4 In response to the authority's concerns about the durability, while I note that the authority is essentially seeking a waiver of Clause B2, none of the durability periods described in the Building Code Clause B2.3.1, and which could reasonably be expected to commence after the building was effectively completed, have yet been reached and therefore expired. I have received no evidence to suggest that the authority did not accept that the building work complied with Clause B2 at the time the work was substantially completed. I have also received no evidence to suggest that normal maintenance, also required by Clause B2.3.1 and which might otherwise affect the durability of the building elements, has not been carried out.
- 4.5 Consequently I do not believe sufficient time has passed, since the substantial completion of the house in April 2006, to initiate the need for a modification of the commencement date of the durability periods as sought by the authority.

#### **The draft determination**

- 4.6 A draft determination was issued to the parties for comment on 9 February 2009.

#### **The authority's response**

- 4.7 The authority accepted the draft determination subject to comments submitted to the Department on 24 February 2009:
- The stud spacing appears to range from 400 centres to 600 centres on exterior walls.
  - The wind zone stated in the draft determination (a low to medium wind zone) was disputed. The nature of the site was described in detail, against the methodology contained in Table 5.1 of NZS 3604, to support its contention that the wind zone was high.

#### **The applicant's response**

- 4.8 The applicant accepted the draft and submitted information to the Department on 2 March 2009:
- Certification was provided from the applicator that the Sto Thermo system was installed in accordance with the specification, including an 'Applicator Warranty PS3' and a 'Material Warranty'.
  - A letter was provided from the applicator stating 'All work carried out by [the applicator] was done in accordance to relevant specifications, good trade practice and on instructions from Stoanz Wellington'. The letter described in detail the system that had been applied.
- 4.9 I have considered both submissions and amended the determination accordingly.

## Matter 1: The code compliance of the cladding system

### 5. Discussion

- 5.1 Based on the 13 October 2008 letter described in paragraph 4.3, the authority believes that the change from Insulclad to the Sto Therm System required stud spacing at 400mm centres.
- 5.2 Correspondence from the authority and the applicant shows some disagreement on the stud spacing that was used. The consented drawings refer to a maximum stud spacing of 600mm centres, while the authority refers to 600mm centres and the builder to 400mm centres. Based on submissions received by the Department, it appears that stud spacing ranges from 400mm centres to 600mm centres.
- 5.3 The Sto Therm Specification, submitted to the authority as an amendment to the building consent, and approved on 24 January 2006 states ‘Timber frame: shall be constructed to comply with NZS 3604 with maximum 600mm centres for Low and Medium Building Wind Zones and 400mm maximum centres for High and Very High Wind Zones.’

Therefore, the selection of the stud spacing for the timber frame for the Sto Therm system is dependent on the building wind zone according to NZS 3604.

- 5.4 The wind zone has been evaluated using Section 5 of NZS 3604; and specifically Table 5.2 ‘Procedure for determination of wind zones’. Evaluation using this procedure establishes the wind zone for the site as follows:

#### Procedure for determination of wind zones (based on NZS 3604 Table 5.2)

Step	Action	Reference (NZS3604)	Value
1	Determine wind region	Figure 5.1	R1
2	Determine if in a lee zone	Figure 5.1	Not a lee zone
3	Determine ground roughness	Clause 5.2.3	Rural, see 5.5
4	Determine site exposure	Clause 5.2.4	Sheltered, see 5.6
5	Determine topographic class	Clause 5.2.5	T1
6	Determine building wind zone	Table 5.1	Medium, see 5.7

- 5.5 The draft determination considered the ground roughness to be urban (step 3 in the table above). The authority contends the ground roughness is ‘open’. While it is urban terrain, in terms of there not being more than ten obstructions per hectare and it being within a residential subdivision, there is grazed pasture is less than 500 metres away. Further, the site is within 500 metres of the fringe of the boundary between roughness zones, and therefore could be considered in the lesser of the ‘open’ and ‘urban’ ground roughness zones. However, taking account of the nature of the site, being predominantly urban, I consider the appropriate roughness zone to be ‘rural’.

- 5.6 The authority contends the site is exposed (step 4 in the table above). I consider the site to be sheltered, because a sheltered situation requires at least two rows of similarly-sized permanent obstructions at the same ground level all round, which this site has. To be exposed, a site needs to be on a moderate or steep hill side, or adjacent to playing fields, beach fronts, or wind channels. I note that there are empty residential lots directly adjacent to the site on two sides. However, I consider the requirements for a sheltered site are still met, as these are not large open spaces, like playing fields or beach fronts, and there is immediate shelter provided from the larger open spaces that affected the assessment of ground roughness. The qualifying feature in this case is the presence of the immediate shelter.
- 5.7 Using NZS 3604 Table 5.1 ‘Determination of building wind zone’, and taking account of the authority’s submission, I consider the wind zone to be medium (medium wind speed of 37m/s). Accordingly, for this building, the Sto Therm Specification requires a timber frame that is constructed with maximum 600mm centres stud spacing. As the building is in a medium wind zone, I conclude that the studs are at appropriate centres for the cladding system, and therefore that the cladding system, with respect to the stud spacing, was installed to comply with Building Code.

## **Matter 2: The missed cladding inspection**

### **6. Discussion**

- 6.1 The authority has concerns that an inspection was not carried out, which would have checked the application of the base plaster prior to the finishing plaster for the polystyrene/plaster cladding system. I note the authority had not made a ‘reasonable grounds’ assessment, which could have been based on the documentation received, or for example, testing of the cladding system by an appropriately qualified person in order to establish the correctness of the plaster application and therefore the compliance with Clause E2 “External Moisture”. In my view the authority was capable of advising the applicant of what it required in order to be satisfied that compliance has been achieved.
- 6.2 I consider that it is an unhelpful practice by the authority to raise the matter of a missed inspection over 18 months after the substantial completion of the building work. I contend this because there are records of pre-cladding, cladding, and pre-line inspections that were carried out by the authority, records that a warranty was accepted by the authority for the application of the plaster system, and the significant time the authority spent resolving the outstanding issues with respect to the fascia/guttering, as stated in paragraph 3.3. All of these events ought to have served to make the authority aware that the inspection was outstanding.
- 6.3 I have assessed the building using the risk matrix in E2/AS1. The resulting risk level can be applied to a particular building when using E2/AS1 to provide a cladding solution. I find that the building has the following characteristics:
- is built in a medium wind zone with respect to NZS 3604
  - is a one storey building with a relatively simple envelope design and a single cladding type

- has fully protected roof to wall intersections and 600mm eaves
  - has no decks
- 6.4 When evaluated using the risk matrix in E2/AS1, the weathertightness features show that all elevations to this building demonstrate a low risk rating which would not require a 20mm drained cavity with the use of EIFS. However, I note that the cladding has been installed with a 20mm drained cavity, as a part of the cladding system. Therefore, I consider that a robust system cladding system has been installed on a low risk building, in excess of the requirement of E2/AS1.
- 6.5 The inspection records show that the authority accepted a warranty for the application of the plaster, as noted in paragraph 3.4. This would indicate that the authority accepted, at the time of building, that the plaster system was installed correctly and according to the Sto Therm Specification. However, as noted in paragraph 3.5, the inspection records show that the authority requested an updated Producer Statement for the rectification work with respect to the fascia/guttering.
- 6.6 The system is from an established and reputable company that has a current BRANZ appraisal and the application was carried out by a Stoanz approved applicator.
- 6.7 The application of the base plaster is the only issue that has been raised by the authority. The applicant has provided an Applicator Warranty and Producer Statement 3 (Construction) and a Material Warranty from the applicator which state that the system has been installed in accordance with the Sto Therm specifications, and I accept that this is the case.

## **7. The decision**

- 7.1 In accordance with section 188 of the Building Act 2004, I determine that:
- the cladding complies with the Building Code with respect to the stud spacing
  - the EIFS cladding system complies with Clause E2;
- and accordingly
- reverse the authority's decision to refuse to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 20 March 2009.

John Gardiner  
**Manager Determinations**