Determination 2007/98

Determination regarding the reflectivity of a monolithic cladding on a house at 36 Rita Way, Omaha

1 The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004[1] ("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 applicant is the owner, Mr P McDermott, acting through his agent, Mr Q Powell, of Plaster Systems Ltd ("the applicant") and the other party is the Rodney District Council ("the territorial authority").

1.2 The matter for determination was the territorial authority's decision to refuse to issue a code compliance certificate for a house because it was not satisfied that it complied with clause B2 Durability of the Building Code[2] (First Schedule, Building Regulations 1992).

[1] The Building Act 2004 is available from the Department's website at www.dbh.govt.nz.
[2] The Building Code is available from the Department's website at www.dbh.govt.nz.

1.3 The question I have to answer is whether the cladding as installed to the walls of the building ("the cladding") complies with clause B2 (see sections 177 and 188 of the Act). By "the cladding as installed" I mean the components of the system (such as the backing materials, the flashings, the joints and the coatings) as well as the way the components have been installed and work together.

1.4 In making my decision, I have considered the submissions of the parties, and the other evidence in this matter.

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 two-storey detached house. The house has been constructed with a variety of cladding materials. This determination is concerned only with the external insulation and finish system (EIFS) cladding used on some of the walls on each storey.

2.2 The cladding is described as 60mm Thermaclad Batten Cavity System, supplied by Plaster Systems Ltd. The coloured final coating applied over the cladding is described in a fax supplied by the house's painter, dated 25 January 2006, as Resene Paints Ltd 'Quarter Gravel' with a reflectivity index of 26. I understand the "reflectivity" figure used here is the equivalent to the light reflectance value (LRV) used in elsewhere in correspondence relating to this matter.

2.3 Plaster Systems Ltd issued a Material Components Guarantee ("the guarantee") for the finished system on 12 October 2004.

3 Background

3.1 Based on the date of the guarantee it appears that the territorial authority issued a building consent (No ABA-40560) for the house at some date in 2004. I have not seen a copy of the building consent.

3.2 On 15 December 2005 the territorial authority wrote to the applicant, care of Sovereign Homes Ltd ("the builder"), regarding an inspection it had carried out on 13 December 2005. The letter said:

> An inspection of the building work . . . was carried out on 13-December-2005. The items listed below require attention:
>
> The light reflective value (LVR) of the paint on the cladding is 26 where as the BRANZ certification required a LRV of over 40, Plaster Systems have claimed they guarantee their product with any LRV over 25. This information is to be submitted to the Rodney District Council, Consents Department for consideration as an alternative solution.

3.3 On 4 January 2005 the territorial authority sent a fax to the builder enclosing a copy of a "Decision Record" dated 22 December 2005. The Decision Record said:

> Acceptable solution E2/AS1[3] requires that the finish colour for flush-finished fibre-cement sheet and EIFS shall have a reflectivity of 40% or more.
>
> This is a consent granted before this E2/AS1 came into effect.
>
> When the consent was issued the EIFS cladding was an alternative solution and the assessment as to meeting the requirements of the NZBC is to be judged against the performance criteria in the NZBC. These performance criteria at the time the consent was issued required the cladding to be watertight and meet the durability requirements.
>
> The assessment now is whether it meets these performance requirements. From our current knowledge for EIFS to remain watertight the finished colour needs to have a reflectivity of 40% or more.

3.4 On 1 February 2006, Plaster Systems Ltd responded to the territorial authority reiterating that its "warranty" accepted the use of colour with an LVR "of 25% and higher". A copy of the guarantee was enclosed with the letter.

3.5 On 7 February 2006, the builder wrote to the territorial authority, enclosing the letter from Plaster Systems Ltd and a copy of the guarantee. In its letter the builder argued that the question of the required reflectivity should be assessed against the "older legislation" that applied when the consent was granted.

3.6 On 23 February 2006 the territorial authority wrote to the builders saying:

> . . . the cladding is an alternative solution. At the time the consent was issued the colour was not considered. If it had been . . . it would have taken into account the BRANZ appraisal for this type of material which all recommend a high LRV.
>
> The legislation including the Building Code, did . . . not specify the LRV.
>
> Our decision is based on the NZBC code requirements at the time the consent was issued. While the perception of compliance may have altered over time it has not altered from what was previously recommended in appraisals, to what is now required in the acceptable solutions appraisal No. 453(2004) required LRV of 40%.
>
> It is all very well to rely on warrantees from Plaster Systems Ltd, however their guarantees potentially exclude consequential damage.
>
> It does concern us that Plaster Systems Ltd does not abide by the BRANZ appraisals for its product.

3.7 The territorial authority said that if the builder did not intend to repaint the house, the best course of action would be for the Council to issue a notice to fix requiring repainting to achieve the required LRV. It also pointed out that the matter could be taken to the Department for determination.

3.8 The applicant supplied an email to the Department on 6 June 2007. In the email the applicant outlined many similarities between the cladding as installed and the cladding described in BRANZ Appraisal Certificate No. 453(2004).

[3] An Acceptable Solution is a prescriptive design solution approved by the Department that provides one way, but not the only way, of complying with the Building Code. The Acceptable Solutions are available from The Department's Website at www.dbh.govt.nz.

3.9 The applicant supplied a copy of the current appraisal for Thermaclad Batten Cavity System (BRANZ Appraisal Certificate No.553 (2007)) to the Department on 21 June 2007. Although Appraisal No.553 (2007) was not current when the cladding was installed, it says:

> Paint colours must have a light reflectance value of 40% minimum regardless of gloss value.

3.10 The Department received the application for determination on the 4 April 2007.

3.11 The territorial authority issued a notice to fix on 17 May 2007 which required the applicant to:

> . . .repaint the exterior cladding with a paint colour having a light reflectance value of 40 or greater.

4 The submissions

4.1 Accompanying his application for determination the applicant supplied copies of the correspondence and other documents to which I have referred in paragraphs 3.2 to 3.11 inclusive.

4.2 The territorial authority provided copies of the consented plans to the Department on 4 July 2007.

4.3 The draft determination was sent to the parties for comment on 24 July 2007. The response from the applicant was received on 30 July 2007 and that of the territorial authority on 21 August 2007. Both parties accepted the draft without comment.

5. Evaluation for code compliance

5.1 In evaluating the design of a building and its construction, it is useful to make some comparisons with the relevant Acceptable Solution, in this case E2/AS1, which will assist in determining whether the features of this house are code compliant. However, in making this comparison, the following general observations are valid:

- Some Acceptable Solutions are written conservatively to cover the worst case, so that they may be modified in less extreme cases and the resulting alternative solution will still comply with the Building Code.
- Usually, when there is non-compliance with one provision of an Acceptable Solution, it will be necessary to add one or more other provisions to compensate for that in order to comply with the Building Code.

5.2 The approach in determining whether building work is weathertight and durable and is likely to remain so, is to apply the principles of weathertightness. This involves the examination of the design of the building, the surrounding environment, the design features that are intended to prevent the penetration of water, the cladding system, its installation, and the moisture tolerance of the external framing. The Department and its antecedent, the Building Industry Authority, have also described weathertightness

risk factors in previous determinations[4] (for example, Determination 2004/1) relating to cladding and these factors are also used in the evaluation process.

5.3 The consequences of a building demonstrating a high weathertightness risk is that building solutions that comply with the Building Code will need to be more robust. Conversely, where there is a low weathertightness risk, the solutions may be less robust. In any event, there is a need for both the design of the cladding system and its installation to be carefully carried out.

6 Discussion

6.1 In its letter to the territorial authority dated 7 February 2006 the builders referred to "older legislation" as distinct from the "new legislation". I note that clauses B2 and E2 are part of the Building Regulations 1992 that came into force on 1 June 1992. The builders may, in fact, be referring to the Acceptable Solution for E2 (E2/AS1), which did also exist at the time of construction, however, a significant amendment to E2/AS1 came into force on 1 July 2005.

6.2 Clause 2.4 'Cladding finish colours' of the Third Edition of E2/AS1 came into effect on 1 July 2005 and says:

> Finish colours for flush-finished fibre cement sheet and EIFS shall have a reflectivity of 40% or more when measured in accordance with ASTM C1549 or ASTM E903.

6.3 'BRANZ Appraisal Certificate No. 453 (2004) Insulclad Cavity System' was issued by the Building Research Association of New Zealand (BRANZ) on 25 March 2004. The appraisal has now been replaced by BRANZ Appraisal Certificate No. 453 (2005), which issued on 28 September 2005.

6.4 The appraisal is for the "Insulclad Cavity System" and makes no reference to "Thermaclad Batten Cavity System" being the system as installed on this house, and for which the guarantee has been issued.

6.5 An appraisal has no legal status as a Compliance Document under the Act. It is a technical opinion issued by an independent appropriately-qualified organisation that may be used by a territorial authority, and similar, to provide reasonable grounds that a particular product or system will comply with the building code.

6.6 While it may appear that the territorial authority has confused the status of Appraisal No 453 (2004) with Compliance Documents published by the Department under the Act, I believe the territorial authority was using the appraisal as a typical example of what such appraisals require with respect to light reflectance for EIFS systems.

6.7 In the absence of any other evidence, the territorial authority could be justified in declining the paint system, on the grounds that it did not meet the requirements of the current Acceptable Solution, E2/AS1.

6.8 However, in this instance I believe the following matters need to be taken into account:

[4] Copies of all determinations issued by the Department can be obtained from the Department's website.

- The cladding is installed over a drained and ventilated cavity, which, by its very nature, is designed to allow for some water to penetrate the cladding.
- The areas of cladding subject to thermal movement from the incidence of solar radiation have been considered. The South-facing wall has the largest areas of EIFS cladding but it will have limited exposure to the sun. The remaining walls will have a higher exposure to solar radiation but the areas of cladding to these walls, not broken up by joinery and the like, do not appear to be significant.
- Plaster Systems Ltd has provided a 15-year guarantee for the cladding system as installed when coated with a paint system with a reflectivity greater than 25%. The territorial authority has raised no other concerns as to the performance of the cladding system.
- Plaster Systems Ltd is an established manufacturer of EIFS cladding systems and has produced such systems for approximately 23 years.

6.9 It must be noted that Compliance Documents by their very nature, are conservative, as they are required to cover a wide range of situations yet provide a margin of safety. The LRV of 40% specified in E2/AS1 and in the appraisal should be considered with that in mind. Non-compliance with the Compliance Document does not necessarily mean non-compliance with the Building Code.

6.10 In response to the territorial authority's letter dated 23 February 2006, I note that the exclusion for consequential damage contained in the Plaster Systems Ltd guarantee refers to consequential damage occurring as a result of the use of untreated framing. The letter from Plaster Systems Ltd, dated 1 February 2006, unequivocally endorses the paint system used on the house, and makes no suggestion that the warranty is consequently qualified in any way.

6.11 I emphasise that each determination is conducted on a case-by-case basis. Accordingly, the fact that a particular cladding system, including its reflectivity, is compliant with the code in this particular case does not mean the same system will be compliant in other instances.

7 The decision

7.1 In accordance with section 188 of the Act, I hereby determine that the cladding system does comply with clause B2 of the Building Code, and accordingly instruct the territorial authority to issue a code compliance certificate.

Signed for and on behalf of the Chief Executive of the Department of Building and Housing on 28 August 2007.

John Gardiner
Manager Determinations