



Determination 2014/052

Regarding the authority's exercise of powers in issuing a notice to fix for a pellet burner installed in an existing brick chimney for a house at 431 Selbie Road, Lumsden

1. The matter to be determined

1.1 This is a determination under Part 3 Subpart 1 of the Building Act 2004¹ ("the Act") made under due authorisation by me, John Gardiner, Manager Determinations and Assurance, Ministry of Business, Innovation and Employment ("the Ministry"), for and on behalf of the Chief Executive of the Ministry.

1.2 The parties to the determination are:

- The applicant, Southland District Council ("the authority"), carrying out its duties as a territorial authority or building consent authority.
- the owners C and H Drummond ("the owners")

1.3 This determination arises from the installation of a wood pellet burner ("the pellet burner") into an existing brick chimney. The owners obtained a building consent for the installation (BLD/2014/49356/1). The authority is currently refusing to issue a code compliance certificate and issued a notice to fix to the owners which stated the required testing of the pellet burner had not been completed where the timber wood is in contact with the chimney.

1.4 The matter to be determined² is therefore whether the authority correctly exercised its powers of decision in issuing a notice to fix for the installation of a pellet burner.

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

1.6 Unless otherwise stated, all references to sections are to sections of the Act, and all references to clauses are to clauses of the Building Code (Schedule 1 of the Building Regulations 1992).

2. The building work

2.1 The building work consists of the installation of a pellet burner into an existing chimney in a historic brick house built around 1860. The chimney is an original feature of the house. The pellet burner is located in the lounge area on the ground floor of the building.

2.2 The chimney consists of two layers of brick masonry, and three layers to the sides of the enclosure. The 75mm stainless steel flue has been centrally located in the

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

² Under sections 177 (1)(b) and 177(2)(f)

- chimney cavity using eight rounded spider brackets with a spacing of 100mm either side of the flue pipe. The flue height is around 4.5m.
- 2.3 The manufacturer's installation instructions for the pellet burner (included in the applicant's building consent documents) specify that within the existing cavity there must be a minimum of 300mm clearance to combustibles above the fire, and a minimum 600mm gap between the top of the fire and the ceiling cavity. The cavity requires a minimum of 100cm² ventilation.
- 2.4 The installation instructions require a clearance from the exhaust spigot at the rear of the fire to any combustibles, and a 100mm gap between a single flue at the rear of the fire and timber wall framing to the in-built enclosure.
- 2.5 The installation instructions also include diagrams for installing the flue kit for the fire for 'replacement applications in masonry chimneys' and timber-framed enclosures. The flue kits for masonry chimneys show a bare 75mm flue with no outer casing. The flue kits to the timber-framed enclosures include a 100mm outer casing. A minimum of 25mm clearance is required between the 100mm outer casing and any combustible material.
- 2.6 The installation instructions cite safety testing of the pellet burner reference and test Reports 05/1185³ and 08/1892⁴ in relation to required clearances to combustibles for the pellet burner and the flue, but also note:
- Built-in fire clearances don't apply in a non-combustible cavity.
- 2.7 Report 05/1185 was for the testing flue kit, using a 75mm flue installed in a 100mm outer casing. The report said a minimum 25mm clearance was required between the 100mm outer casing and any combustible material.
- 2.8 Report 08/1892 was for the testing of the pellet burner in an in-built situation in an enclosure made of combustible materials. The pellet burner was again tested with a 75mm flue installed in a 100mm outer casing: the lower edge of the 100mm outer casing finished 20mm above the spigot at the rear of the fire. The report said a 100mm clearance was required between the rear of the flue spigot box and any combustible material.

3. Background

- 3.1 On 10 April 2014 the authority received the owners building consent application for the installation of the pellet burner. On the same day the authority requested further information regarding a house floor plan showing the location of the pellet burner and smoke alarms.
- 3.2 On 16 April 2014 the authority acknowledged receipt of the owner's building consent application.
- 3.3 On 7 May 2014 the authority issued a building consent for the installation of the pellet burner. The building consent documents state the pellet burner is to be installed in accordance with AS/NZS 2918⁵.
- 3.4 On 14 August 2014 the authority issued a notice to fix to the owners. The notice to fix quoted Clauses C2.2 and C2.3 in relation to prevention of fire occurring and stated:

³ Thermal testing of the Natures Flame Pellet Heater Flue Kit to AS/NZS 2918:2001, Applied Research Services Ltd, September 2005

⁴ Safety testing of the Ecoteck Sara Pellet Burning Heater (Built-in) to AS/NZS 2918:2001, Applied Research Services Ltd, November 2008

⁵ AS/NZS 2918:2001 Domestic solid fuel burning appliances - Installation

The pellet fire is installed in an untested situation in that the flue system of the freestanding appliance has been installed inside an existing masonry chimney. The timber structure around the existing chimney is in contact at the floor and the roof penetration levels. The pellet fire has not been tested to Appendix E of AS/NZ2918 to enable timber surrounding the chimney to be in contact.

The outstanding issue is the combustible material in contact with the chimney at first floor and roof levels. You contend that this combustible material will not be subject to overheating due to the low kilowatt output of the pellet fire meaning the flue up the chimney will be relatively cool in combination with the insulating effect of the brickwork.

3.5 On 5 June 2014 the authority emailed the owners and the pellet burner's installer seeking a copy of test Report 05/1185 (refer paragraph 2.7) as noted in the installation instructions, to confirm that timber and other combustible material can be in contact with the exterior of a masonry chimney that serves the pellet burner. The authority reiterated its concern that the timber and other combustible material were touching the existing chimney.

3.6 On the same day the pellet burner's installer sent the authority the requested test reports. The authority emailed the owner noting that none of the testing relates to a single 75mm diameter stainless steel flue up through an existing masonry chimney. The authority stated:

The testing here is for a "built in" unit enclosed in a timber frame setup with a 75mm stainless steel flue system with a 100mm galvanised flue liner around it. There doesn't seem to be any testing for a situation with timber or other combustible material in contact with the outside of the chimney with a single stainless steel flue up it.

3.7 On 25 June 2014 the manufacturer wrote to the authority noting the details of the installation of the pellet burner (refer paragraph 2.3).

3.8 On 26 June 2014 the authority emailed the manufacturer, noting the following:

- There is no testing that demonstrates the pellet burner has been tested with the flue going up a chimney where timber is in contact with the brickwork exterior.
- The owner is 'probably quite correct' that any timber in contact with the exterior of the chimney isn't going to be a problem. The authority also noted the flue is a relatively low output heating unit and the existing chimney has performed adequately in its pre-existing use as an open flue fire system for the last 100 years.
- 'The only option where a solid fuel heater unit hasn't been tested to AS/NZS 2918 Appendix E for a fireplace insert is to treat it as an un-tested unit under the Building Code. ... this requires a minimum 50[mm] clearance from anything combustible from a masonry fireplace and its chimney.'

3.9 The Ministry received an application for determination on 26 August 2014.

4. The submissions

4.1 The authority included the following documentation with its application:

- building consent application documentation for the pellet burner, plus the associated construction review statement
- photographic evidence of the pellet burner, the flue, and the brick chimney
- hand written inspection notes dated 21 July 2014 from an officer of the authority

- a floor plan of the ground and first floors showing the location of the pellet burner
- the installation instructions for the pellet burner
- email correspondence dated 5 June 2014 and 26 June 2014 between the authority, the owner, and the manufacturer

4.2 A draft determination was issued to the parties on 30 September 2014.

4.3 The authority provided a written submission on 1 October 2014 accepting the decision but requiring further clarification regarding the clearances to the flue. In summary the authority contended that:

- The test reports were for a 75mm flue installed in a 100mm flue liner (referred to herein as the outer casing⁶). Because the 75mm flue is shielded by the casing 'it does not necessarily follow that the 100mm gap from the [bare] flue to the brickwork is sufficient. The manufacturer's testing for the 100mm flue clearance is for a shielded flue whereas on site the flue up the chimney is unshielded.'
- The draft determination refers to an 'un-shielded flue clearance as being the reason for determining the installation meets the building when in fact the 100mm testing is for a shielded flue'.

4.4 The owner accepted the draft determination on 10 October 2014.

4.5 In response to a request from the Ministry, the authority provided copies of test Reports 05/1185 and 08/1892 on 17 October 2014.

5. Discussion

5.1 The notice to fix states the pellet burner does not comply with Clause C2 of the Building Code relating to the prevention of fire. Clause C2.2 states:

The maximum surface temperature of combustible building materials close to fixed appliances using controlled combustion and other fixed equipment when operating at their design level must not exceed 90°C

5.2 The manufacturer's installation instructions for the pellet burner installed in an enclosed cavity states that the bare flue must be no closer than 100mm to any exposed timber framing (refer paragraphs 2.4). The manufacturer's installation instructions also states that the required clearances 'don't apply in a non-combustible cavity' as is the case for the brick chimney.

5.3 According to the installation instructions, a 100mm air gap is sufficient to prevent combustion of the wood framing. In the as-built situation the 75mm flue is installed in a brick chimney. The flue is centrally located with a 100mm air gap between it and the brickwork: the brickwork itself is a minimum of 200mm thick. It must follow that in the as-built situation any wood in contact with the outer face of the brick chimney is unlikely to reach a temperature that would contravene Clause C2.2. I am therefore satisfied that the as-built flue is compliant.

5.4 The authority contends that the results of the test reports apply to 75mm flue installed in a 100mm casing, and that the 100mm clearance to timber stated by the manufacturer does not apply to a bare flue without a casing. I do not consider this is correct. The test for the fire itself (Report 08/1892) required a minimum 100mm

⁶ The term 'outer casing' is used by the test reports and in AS/NZS 2918:2001

- clearance between the rear of the flue spigot box and any combustible material. In the test 'the outer casing lower edge finished 20mm above the flue spigot box': the spigot box was not covered by the 100mm casing. Where the 100mm flue casing is in place the required separation to combustible material is 25mm (Report 05/1185).
- 5.5 The authority also contends that a solid fuel heater must be tested to AS/NZS 2918 Appendix E before it can be considered compliant. Appendix E is for an in-built solid fuel heater installed in a chimney made of 75mm thick precast concrete: the test would appear to have limited relevance to this situation. The tests undertaken would appear to be adequate, particularly as they apply to in-built enclosures made of combustible material.
- 5.6 An assessment of the requirements of the Building Code would usually be in reference to the AS/NZS 2918, being the compliance method cited in C/VM1⁷, or C/AS1 Part 7. The chimney brickwork to wood separation falls short of the requirements of C/AS1 which in this case calls for a separation of 50mm⁸. However, the reference to 50mm separation is applicable to an open fire, and is not applicable to this situation. This is because the chimney brickwork above an open fire is subject to more severe heat effects than would apply with the 75mm steel flue in this situation. Consequently I do not consider C/AS1 applies in this case.
- 5.7 The installation of the pellet burner as an alteration to the existing building required the authority to make a decision under section 112 of the Act when granting the building consent: meaning that if the building complied with the Building Code immediately before the alteration, it must continue to comply with those provisions; or if the building didn't comply before it must continue to comply at least to the same extent as it did then comply. As I have found that the installation of the flue fully satisfies the requirements of the Building Code it must also satisfy the provisions of section 112.
- 5.8 The authority has no concerns regarding the condition of the brickwork chimney, or the proper ventilation of the chimney cavity with the flue installed. The fireplace and chimney has supported the successful operation of open fires throughout the 100+ year life of the building. The pellet burner, with its controlled combustion, would be highly unlikely to place a greater demand on the performance of the chimney to provide the required separation from combustible building elements than it has successfully provided to date.

⁷ Verification method C/VM1 Solid fuel appliances

⁸ At paragraph 7.5.11 of C/AS1 Part 7: Prevention of fire occurring

6. The decision

- 6.1 In accordance with section 188 of the Building Act 2004, I hereby determine that the authority incorrectly exercised its powers of decision in issuing a notice to fix to the owners, and I reverse that decision.

Signed for and on behalf of the Chief Executive of the Ministry of Business, Innovation and Employment on 21 October 2014.

John Gardiner
Manager Determinations and Assurance

Appendix A: The legislation

A1.1 The relevant sections of the Act include:

Section 112 Alterations to existing buildings

- (1) A building consent authority must not grant a building consent for the alteration of an existing building, or part of an existing building, unless the building consent authority is satisfied that, after the alteration,—
- (a) the building will comply, as nearly as is reasonably practicable, with the provisions of the building code that relate to—
 - (i) means of escape from fire; and
 - (ii) access and facilities for persons with disabilities (if this is a requirement in terms of section 118); and
 - (b) the building will,—
 - (i) if it complied with the other provisions of the building code immediately before the building work began, continue to comply with those provisions; or
 - (ii) if it did not comply with the other provisions of the building code immediately before the building work began, continue to comply at least to the same extent as it did then comply.

A1.2 The relevant clauses of the Building Code include:

Clause C2 – Prevention of fire occurring

C2.1 Fixed appliances using controlled combustion and other fixed equipment must be designed, constructed, and installed in buildings in a way that reduces the likelihood of illness or injury due to fire occurring.

C2.2 The maximum surface temperature of combustible building materials close to fixed appliances using controlled combustion and other fixed equipment when operating at their design level must not exceed 90 °C

C2.3 Fixed appliances using controlled combustion and other fixed equipment must be designed, constructed and installed so that there is a low probability of explosive or hazardous conditions occurring within any spaces in or around the building that contains the appliances.

A1.3 The relevant paragraphs of the Acceptable Solution C/AS1 Part 7: Prevention of fire occurring include:

7.5.11 A ventilated space of no less than 50 mm shall be provided between the outer face of a *fireplace, chimney or flue* and any *combustible* material.

A1.3 The relevant paragraphs of the Verification Method C/VM1: Solid fuel appliances include:

Limiting heat transfer

1.1.1 Compliance with NZBC Performances C2.2 and C2.3 may be verified for solid fuel burning appliances by meeting the appropriate test requirements of AS/NZS 2918.