



codewords

Good progress on initiatives to streamline the design and consent process

Recently Building and Construction Minister Shane Jones announced a number of decisions aimed at tackling housing affordability and reducing costs through streamlining the design and consent process.

The changes intended to streamline the consent process include:

- a Compliance Document for simple starter homes
- national multiple-use approvals for building work that is to be replicated on a large scale
- reducing the number of building projects that need a mandatory project information memorandum (PIM)

- simplifying the process for making amendments to building consents
- reducing the number of building projects that require a building consent, based on the level of risk involved.

SIMPLE STARTER HOMES

The Compliance Document for simple starter homes draws together in a single document all the technical and compliance information needed to build a standard, simple, low-cost home.

Minister Jones called the document a 'horizontal cut' across the entire Building Code. This is the first time such a document has been available in New Zealand. The average New Zealand home is currently 200 m²; twice the historical size for a starter home.

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Good progress on initiatives to streamline the design and consent process continued

For a house of 120 m², independent costing based on this new Compliance Document put a total build as part of a group development at within \$1,400 per m². Including allowances for double glazing, floor coverings and service connections of \$9,000, a simple starter home could cost \$177,000.

The trend towards larger homes and complex, one-off projects contributes to the rising cost of home ownership. It is expected that group builds based on the Compliance Document for simple starter homes will help get on top of this issue and encourage the construction of more affordable homes in volume.

The Minister has said that he 'hope[s] by facilitating the design and consent process for simple, modest homes we are able to send a signal to the market that will encourage construction of more affordable homes'.

In the future, the Compliance Document may be used as the prototype to develop Compliance Documents for whole buildings of different types. The Department of Building and Housing is currently consulting on this document which is available on our website at <http://www.dbh.govt.nz/consulting-index>

NATIONAL 'MULTIPLE-USE' APPROVALS

National multiple-use approvals will streamline the consent process for building work that uses the same design and that will be replicated nationwide. This means developers and project managers can devote more time to the build itself. This will also make it easier to do the paperwork for major developments, so the work can get under way sooner.

The authority to issue national approvals will sit with the Department of Building and Housing.

Minister Jones said this is 'a fast track approach which should enhance our ability to provide starter homes to first-home buyers at a quicker and more affordable rate'.

VOLUNTARY PIMS

Currently, all building projects require a project information memorandum (PIM) before work goes ahead. PIMs are applied for and provided before, or at the same time, as a building consent is issued, so that any possible issues are covered off at the very beginning of a project.

The Minister has pointed out that evidence suggests 'in order of less than 5%' of PIMs are applied for before a building consent application is made, which means the point of obtaining a PIM is often lost. In order to reduce costs, changes are under way to make getting a PIM voluntary.

PIMs would not disappear altogether. They would still be available (and often advisable) for owners and developers who wish to be absolutely sure they have 'dotted the Is' and 'crossed the Ts' before putting the foundations down.

AMENDMENTS TO BUILDING CONSENTS

Changes to consented building work commonly occur during construction. Some changes are minor, while others are major and are likely to affect compliance with the Building Code. There are currently a range of approaches to managing amendments to building consents which sometimes adds unnecessary costs and delays to the building process.

Changes to the Building Act are being considered to distinguish between minor and major changes to consented building work. This would mean that there would be a clear basis for streamlining the process for making amendments to building consents. For example, if a change to consented building work is minor, a building consent applicant would not have to go back through the full building consent application process, therefore reducing time and costs. The Minister has announced he will be introducing changes to the Building Act to give effect to the decisions relating to national multiple use approvals, voluntary PIMS and simplifying the process for managing amendments to building consents.

REDUCING THE NUMBER OF BUILDING PROJECTS THAT REQUIRE A BUILDING CONSENT

A number of proposed additions to the list of building work that will no longer require a building consent are being worked into Schedule 1 of the Building Act. These include:

- removal/alteration of an internal wall with certain limitations, including that it does not affect the structural stability of the building
- alterations of dwellings for purposes of access for people with disabilities, including doorway modifications and access ramps, but excluding wet area accessible showers
- certain internal shop or office fitouts where the work does not modify, or require modifications to, amongst other things, any specified system or means of escape from fire
- increasing from 30 m² to 100 m² the size limit of tents and marquees where they are for private use and to 50 m² where they are intended for public assembly and not in use for more than one month.

With these changes in place, building consent authorities can be more specific about the kinds of building work that will not require a building consent and can apply these criteria to similar types of work. Additions to Schedule 1 of the Building Act do not require legislative amendment and can be made through regulation. These changes are expected to occur later in 2008. Other work is also continuing which is looking at ways to simplify consenting processes and includes research into the use of smart technology such as online consenting. Another idea is to have regional consent processing units which will pool expertise and improve the collection and sharing of information on building products and product performance.

Further BCA registrations



Fifteen more territorial and regional authorities accredited and registered as building consent authorities (BCAs) were presented with their certificates of registration by the Department of Building and Housing's Chief Executive, Katrina Bach, at a function in Wellington this month.

As at 10 July, 48 territorial authorities and two regional authorities had been accredited and registered as BCAs. All territorial and regional authorities are required to be accredited and registered as BCAs by 31 March 2009 or to have made alternative arrangements for their statutory building control functions, such as transferring them to an accredited and registered BCA.

The photo shows, from left, Graham Wait (Rangitikei District Council), Leigh Sage (Kapiti Coast District Council), Sharon Robinson (South Waikato District Council), Trevor Burkett (Masterton District Council), Taylor Wong (Whakatane District Council), Stuart Grant (Kaikoura District Council), Dr Gavin Palmer (Otago Regional Council), Ian Petty (Gisborne District Council), Ms Bach, Malcolm Hart (Hastings District Council), Russell Bierre (Hauraki District Council), John Scott (Wellington City Council), Paul Davey (Selwyn District Council), Kim Kelly (Hutt City Council), David Ward (Horowhenua District Council), Phil Ruffell (Nelson City Council), Chris Jensen (Kawerau District Council).

Product certification scheme preparation enters final stages

With the passing of the Building Amendment Act earlier this year, the Department has been able to prepare for the final stages of the introduction of a voluntary building product certification scheme for New Zealand.

The scheme is due to be launched later this year.

Product certification is a way for product proprietors such as manufacturers and importers to demonstrate that their products, systems or methods meet Building Code requirements. This is done by an assessment of the product, systems or methods that will include product testing results, evaluation, site inspections, manufacturing quality control inspections and a review of the manufacturer's technical literature.

The next stage is drafting the regulations that cover the scheme and how it will run. Overall, it is expected that the scheme will provide an easily understood, robust and cost-effective way to demonstrate that a method, system or product meets the requirements of the New Zealand Building Code.

The use of a certified product, system or method will give confidence to building consent authorities, designers, builders and consumers that a product, system or method:

- conforms with the New Zealand Building Code
- is capable of performing its intended function
- will speed up building consent and inspection processes.

Once certified, a product, system or method must be accepted nationally. This means that the proprietor of a certified product, system or method will not have to seek approval from individual building consent authorities for its use, thus helping to streamline the building consent and inspection process.

If the certificate is granted for compliance with the New Zealand Building Code, details of the product certificate and certificate holder are then held on a public register by the Department of Building and Housing.

The scheme has been developed in close conjunction with the Australian Building Codes Board (ABCB) and will be harmonised with Australia under the brand name 'Codemark'.

However, before the scheme can be launched, there will need to be work done on accrediting product certification bodies. These will be the bodies that actually carry out assessment of products.

The product certification bodies will be administered in New Zealand by Joint Accreditation System of Australia and New Zealand, (JAS-ANZ). It will be up to JAS-ANZ to oversee the scheme and appoint the bodies who actually test and certify products. JAS-ANZ and the product certification bodies will be fully funded from fees paid by companies applying for product certification.

Charging the users of the scheme will mean those who are the primary beneficiaries of accreditation and certification bear the direct costs.

Building product certification is not the only way to provide the appropriate level of information to demonstrate Building Code compliance, but it is likely to be the most effective for new and innovative products or those with high consequences of failure.

Other methods of demonstrating Building Code compliance include appraisals from independent organisations such as BRANZ. Such methods, however, are fundamentally different from Product Certificates in that they must be considered and approved by the building consent authority as part of the normal building consent process.

Over the coming months, the Department will be working to ensure the regulations are completed as well as working with potential product certification bodies to assist them in making use of the scheme.

The Department will be releasing more information on the scheme as the final stages are completed.

Tougher insulation requirements

TOUGHER INSULATION REQUIREMENTS COME INTO EFFECT IN NORTH ISLAND DISTRICTS SOUTH OF FRANKLIN AND THAMES-COROMANDEL FROM 30 JUNE 2008

In October 2007, Clause H1 of the New Zealand Building Code was changed to require improved thermal performance in all new houses. These changes came into full effect in the South Island and the North Island Central Plateau in October 2007.

These changes came into full effect in the remainder of the North Island south of the Franklin and Thames-Coromandel Districts from 30 June 2008.

The changes come into full effect throughout New Zealand from 30 September 2008.

More information can be found in:

- H1 Compliance Document – www.dbh.govt.nz/compliance-docs-get-copies
- free information from the Department of Building and Housing – ph 0800 242 243.

Domestic ventilation systems

Do the many domestic ventilation systems regularly advertised on television meet the Building Code?

Domestic ventilation systems are mechanical ventilation systems with a fan that moves air around a house, flat or apartment. Typically, they draw air from the warmer roof space and force it into the living space below. Delivery of air into the living space creates a slight positive pressure and the air escapes from the building through the openings in or around windows and floors.

Claimed effects of these systems include healthier homes because of reduced internal moisture and less mould, fungi and dust mites.

BUILDING CODE COMPLIANCE

The Building Code (Clause G4) requires ventilation with outdoor air to maintain air purity. Compliance Documents contain several solutions for achieving this. The main solutions are natural ventilation comprising 5 percent of the floor area in opening devices or mechanical ventilation to achieve an air change in the occupied spaces (such as living areas) every three hours.

Because domestic ventilation systems draw air from the roof space, they are not directly drawing air from outside. Hence, they cannot be used to comply with the Building Code ventilation provisions.

However, Building Code compliance is not generally an issue because domestic ventilation systems are installed in addition to opening windows.

CONSIDERATIONS

Installing domestic ventilation systems needs special care. The roof space must be clean and dry, as any animal waste, pathogens, allergens, mould and fungi in the roof space may be ventilated into the living space of the house. It is important to check for leaks in the roof space, as these may contribute to fungal and bacterial growth.

NZBC Clause F6, Visibility in Escape Routes

The Department has been asked to clarify the linkage between NZBC Clause F6, Visibility in Escape Routes and the Fire Safety Acceptable Solution C/AS1. Confusion has occurred because C/AS1 has not yet been updated to account for the changes made to Code Clause F6. The soon-to-be-released amendment to C/AS1 will resolve the confusion. Please note that all italicised words are defined in the Building Code.

Clause F6, effective from 18 October 2007, was drafted and renamed from 'Lighting for Emergency' to 'Visibility in Escape Routes' to acknowledge that emergency situations in *buildings* may have a number of causes and 'visibility in escape routes' may be provided by systems other than illuminance (lighting), such as wayfinding systems.

Clause F6 requires that the *specified features* in the *escape routes* of all *buildings*, except those listed in the Limits on Application, (ie, detached dwellings, *household units* within multi-unit dwellings, outbuildings or ancillary buildings) be made *reasonably visible* when the main lighting fails.

Visibility systems do not have to be provided in the first 20 metres of an *escape route* in situations where the risk of impediment to movement due to the *specified features* not being visible is low. Examples include where people are familiar with the *escape route*, the *escape route* is level and people do not require assistance to escape.

While there has been a change in Clause F6's title, systems installed to satisfy the requirements of the clause remain *specified systems* under the Building (Specified Systems, Change of Use and Earthquake-prone Buildings) Regulations 2005. These systems require compliance schedules (SS 4).

Where a *building* is altered and the alteration involves changes to the means of escape then, under sections 112 and 115 of the Building Act, the requirements of Clause F6 must be considered along with other relevant Code clauses.

New loading Standard referenced

The Department has referenced the new loading Standard AS/NZS 1170 by including it in Verification Method B1/VM1 under the Building Code Clause B1 Compliance Document. This decision follows extensive public consultation.

The new Standard, which is in five parts, reflects the latest understanding of structural loads, including those imposed by earthquakes.

The Department has cited the Standard with amendments to make it suitable for use as a Verification Method. Several other changes have been made which differ from the proposals in the public consultation document in response to public feedback.

Highlights of AS/NZS 1170's citation in the amended B1/VM1 include the following.

- The design process must involve an experienced structural engineer, such as a Chartered Professional Engineer (CPEng).
- The loads on vehicle barriers in buildings have been increased by a factor of three or more.
- Snow loads for Canterbury, Otago and Southland are higher.

Estimated building costs

- Earthquake resistance requirements in low seismic hazard areas may be reduced where the project is large enough to justify a special study.
- A 0.5 kPa wall face load that applies when wall support is removed following a fire (that was in NZS 4203, but not in AS/NZS 1170.1) has been reinstated.
- The Design of Reinforced Concrete Masonry Structures Standard, NZS 4230: 2004, is cited in place of the 1990 edition.
- Rules for loads on balustrades have been clarified.

The Department has published a practice advisory for users of the Verification Method B1/VM1, explaining its most important features and the changes from the previous loading Standard cited (NZS 4203).

The practice advisory and the amended B1/VM1 can be found on the Department's website. It will take effect on 1 December 2008, following a six-month transitional period.

The Department provides estimated building costs to help territorial authorities estimate values when questioning a job value provided with a building consent application.

The table below shows the latest figures and various building types by region.

GUIDE TO THE TABLE

Costing information has been provided by Maltby and Partners Ltd, a firm of construction cost consultants.

Small house – 145 m²:

Single-storey house on a flat site including internal double garage, three bedrooms, open-plan kitchen, dining and lounge, bathroom, separate toilet, ensuite, and separate laundry.

Large house – 202 m²:

Single-storey house on a flat site including internal double garage, four bedrooms, open-plan kitchen and family room, open-plan dining and lounge, bathroom, separate toilet, ensuite, separate dressing room, separate laundry.

Light commercial – 414 m²:

Single-storey warehouse, with mezzanine on a flat site accommodating warehouse, office accommodation, reception and display area, staff lunchroom, kitchen, and toilet facilities.

Commercial – 896 m²:

Single-storey commercial building on a flat site with two units: one comprising retail area, two offices, kitchen, and toilet facilities; the other containing retail and toilet facilities.

Retirement home – 394 m²:

Single-storey building on a flat site, including 12 residential bedrooms with washbasins, separate sanitary facilities, dining and lounge, commercial kitchen and laundry, staff accommodation, and office.

For more information on estimated building costs go to the Department's website:

www.dbh.govt.nz/bofficials-estimated-building-costs

BUILDING COSTS PER METRE (\$/M²) INCLUDING GST AS AT JANUARY 2008

Region	SMALL HOUSE \$/m ²	LARGE HOUSE \$/m ²	INDUSTRIAL BUILDING \$/m ²	BULK RETAIL \$/m ²	RETIREMENT HOME \$/m ²
Auckland	1,768	1,493	1,267	1,305	2,027
Waikato/Bay of Plenty	1,695	1,443	1,210	1,252	1,964
Wellington	1,720	1,459	1,231	1,273	1,975
Remainder of North Island	1,737	1,481	1,234	1,267	2,011
Canterbury	1,736	1,471	1,237	1,287	2,000
Remainder of South Island	1,686	1,434	1,204	1,250	1,957

Timber treatment survey results

The Department is reviewing whether treated framing meets the needs and expectations of the building and construction sector.

In February 2008, we asked people working in the industry to comment on:

- timber identification and quality assurance
- choices for treated framing
- handling LOSP-treated timber
- boron treatments
- the weather exposure of treated framing.

The survey indicates there are clear industry preferences in critical areas of timber treatment, and confirms our own assessments that improvements are needed in the supply and use of treated framing timber. We are planning a review of NZS 3602 Timber and Wood Based Products for Use in Buildings. In the shorter term we are also commissioning a testing programme on the performance of H3.1 boron-treated framing. Also, ERMA and the Department of Labour are helping the Timber Preservation Council review their LOSP health and safety information sheets and the treatment industry's Best Practice Guide for flash-off. ERMA and the Department of Labour are also working with industry to reduce and eliminate the active preservative Tri-n-butyltin in LOSP treatments.

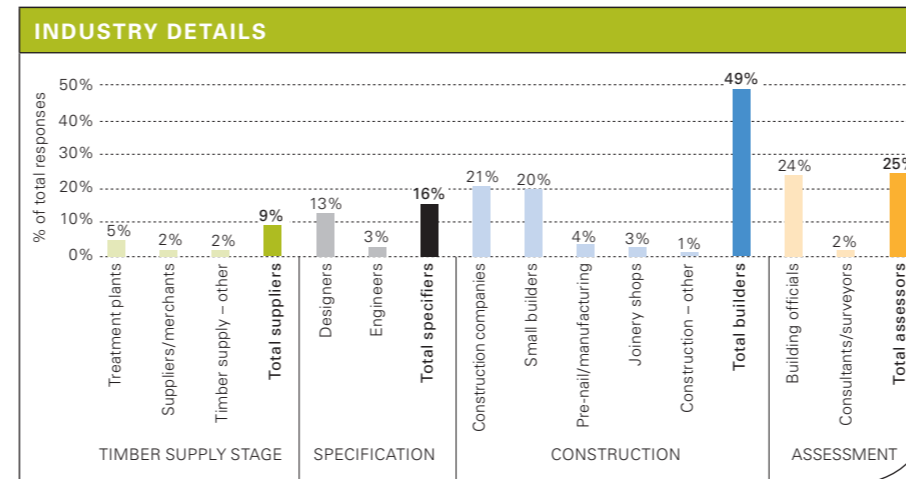
The full survey report is available for download from our website, www.dbh.govt.nz/technical-reports

The report explores the responses to all 14 questions, together with the many associated comments people made.

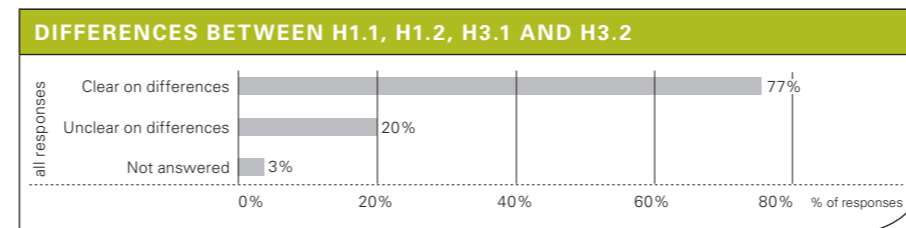
The graphs opposite summarise a selection of the survey questions.

Note: all graphs may not total 100% as some respondents indicated that some questions were not applicable to their work.

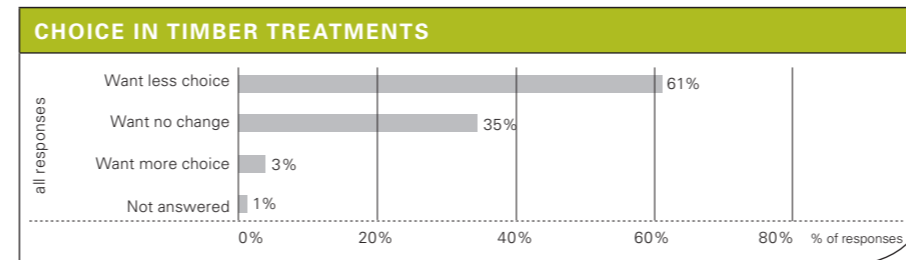
Question 1. What best describes your involvement in the construction industry?



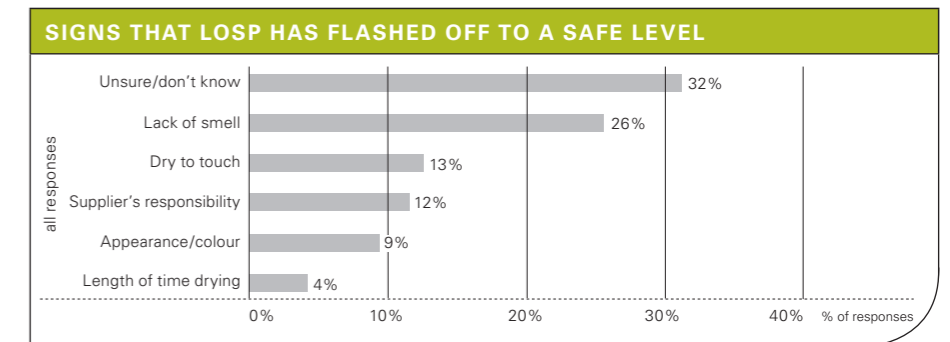
Question 2. Are the differences between H1.1, H1.2, H3.1 and H3.2 clear to you?



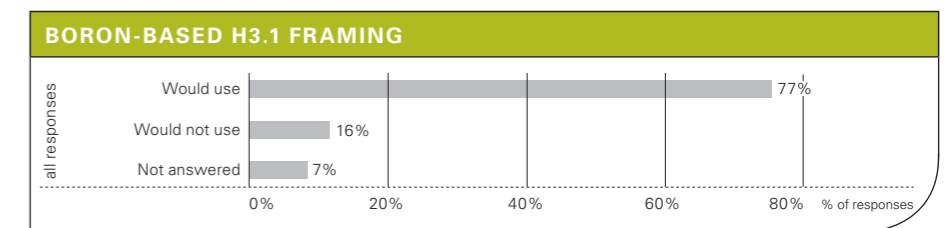
Question 3. Do you require more or less choice in timber treatments for framing?



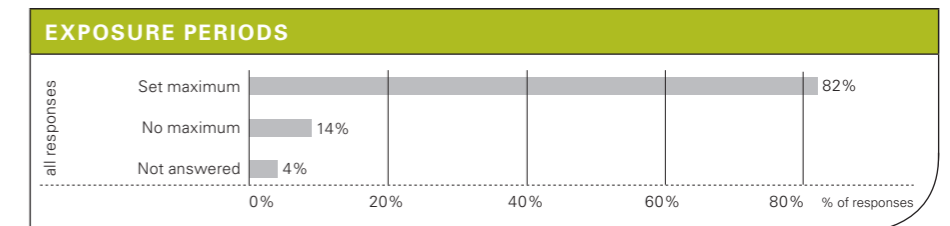
Question 4. How do you know that the LOSP treatment has flashed off to a safe level?



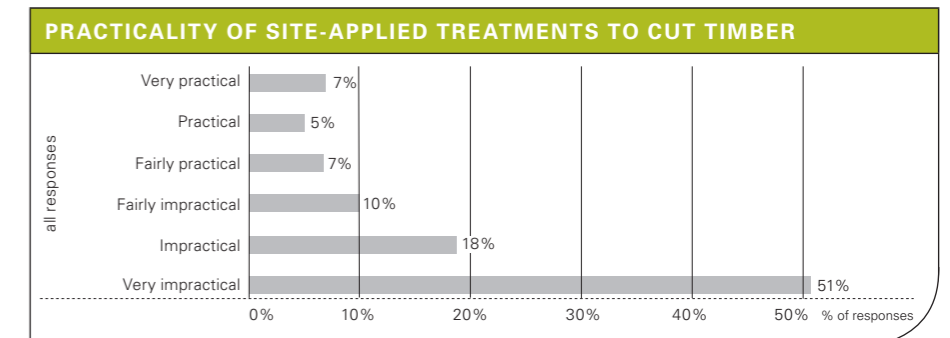
Question 6. If a boron-based treatment was available for the H3.1 treatment class for timber framing, would you use it?



Question 8. Should there be maximum recommended exposure periods for timber framing left open to the weather during off-site fabrication, delivery and the construction period?



Question 9. How practical is it to require builders to use site-applied treatments to cut or notched timber framing on the job?








WHERE TO GET COMPLIANCE DOCUMENTS

Victoria University Bookcentre is pleased to be associated with the Department of Building and Housing. We supply the Department's Compliance Documents in hard copy, CD-ROM or PDF (internet) format, as well as the Building Act and Building Regulations which include the Building Code. We can also source technical and general books on your behalf.

**Victoria University Bookcentre,
Gate 1, Student Union Building,
1 Kelburn Parade, PO Box 12337,
Wellington.**

 www.vicbooks.co.nz
 sam.stanley@vicbooks.co.nz
 Freephone 0800 370 370

Disconnecting wet-back water heaters

Explosions have occurred recently because wet-back water heaters were unintentionally reused after the wet-back had been disconnected.

The installation of a wet-back water heater requires a great deal of care and skill to ensure that the heated water can easily circulate, thus preventing a small volume of water from being heated, turning to steam, building up pressure, and exploding.

If a wet-back water heater is ever disconnected, it must never have the pipes to and from the wet-back sealed. Any water that is deliberately or accidentally left in the wet-back can cause an explosion if it is heated.

Ideally, all disconnected wet-back heaters should not have the pipe fitting installed in the pipe ends, sealing the wet-back.

If this is not practicable, a 6 mm hole must be drilled through each plug. This will help to ventilate and dry the inside of the wet-back and will prevent pressure build-up if the wet-back is accidentally heated.

The installation and disconnection of wet-backs should only be undertaken by a qualified and licensed plumber.

Standards New Zealand request feedback on NZS 4541

You are invited to submit suggestions for improvements to NZS 4541: 2007 Automatic Fire Sprinkler Systems. Please send them by 31 July 2008 to the General Manger Standards Development, at Standards New Zealand, email address: **Michelle.Wessing@standards.co.nz**

As the Standard was published in late 2007 and is starting to be used across the fire protection industry, Standards New Zealand, in conjunction with the four principal sponsors of this publication, would welcome user feedback. Suggestions could include the following.

1. Listing specific improvements and the technical basis for them. This is to ensure that the fire protection community has an opportunity to put forward ideas as the basis of a future amendment to this Standard.
2. Editorial inconsistencies – please advise specific example(s) including the clause, table or figure number. A number of minor typographical inaccuracies have been found. Standards New Zealand wishes to evaluate the need to publish a small errata to this Standard.

Determinations issued

DETERMINATION 2008/23:

The refusal to issue a code compliance certificate for the installation of an oil-fired appliance

The matter for determination

The application arose from the territorial authority's refusal to issue a code compliance certificate for the installation of an oil-fired water boiler ('the appliance') because it had not been provided with certain test certificates to show that the appliance complied with a particular Australian Standard. The building owner applied for the determination.

The building work and the submissions

The appliance provided heated water to heat a house through a radiant floor heating system.

The territorial authority said it would not accept the installation of any product that could not be proven to comply with Australian Standard AS 1691: 1985 Domestic Oil-fired Appliances – Installation.

The owner said AS 1691 was an installation standard, and not a design standard. The owner provided a copy of a certificate showing that the appliance was certified under British Standard EN267: 1999 Forced Draught Oil Burners. Definitions, Requirements, Testing, Marking. The owner had used the certification to obtain approval for the appliance from the appropriate authority, the Environmental Risk Management Authority (ERMA).

Discussion

In the absence of a specific submission on the matter, it appeared the territorial authority was principally concerned about whether the appliance itself had been tested to the appropriate Standard, and whether the testing met the requirements of the Acceptable Solution C/AS1.

Clause C1 of the Building Code is only concerned with the safe installation of such appliances. Paragraph 9.3.2 of C/AS1 modifies AS 1691 by removing the requirement that an installer is to ensure that the appliance itself complies with another Standard (AS 1960: SAA Domestic Oil-fired Appliances Safe Design Code).

The compliance of the appliance itself is the responsibility of ERMA, which has recognised that certification under EN267 is equivalent to certification under AS 1690. The appliance was therefore one approved by ERMA for its intended use in the owner's house.

The appliance manufacturer had provided the installation instructions to the installer that specified safe distances between the appliance and adjacent combustible materials. It was understood the appliance had been installed and the territorial authority had raised no specific objections about the installation.

Conclusion

The determination concluded that the decision by the territorial authority to refuse to issue a code compliance certificate because the appliance had not been tested to AS 1690 was incorrect. The appliance had been tested and certified using a recognised testing Standard and had been approved for use by the appropriate authority.

In the absence of any specific submission to the contrary, it was accepted that the appliance had been installed in accordance with the manufacturer's instructions.

The decision

It was determined that the territorial authority's decision to refuse to issue a code compliance certificate was reversed.

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DETERMINATION 2008/35:

The Code compliance of a house in which injected foam wall insulation has been installed

The matter for determination

The application arose from the territorial authority's decision to issue a notice to fix in respect of foam insulation that had been injected into the cavity behind the brick veneer of an existing single-storey house. The notice to fix required the foam to be removed and the cavity to be reinstated.

The matter to be determined was whether the foam, as installed in the cavity, complied with the Building Code. The owner applied for the determination.

The installation of the foam was not consented. The determination also considered faults that were found with the consented work done on the house. However, that aspect of the determination is not discussed here.



The building work

The building is an existing single-storey house, which was subject to some alterations and additions, including plastering the existing brick-veneer. The brickwork was plastered and then painted with an acrylic paint system. A close-boarded deck was constructed next to the house as part of the consented work (this was found to trap moisture near the junction of the concrete foundations and lower walls).

The territorial authority granted a building consent and a code compliance certificate for the additions and alterations. However, the consented work did not include the foam insulation, which was installed near the end of construction.

The foam was provided to increase the thermal performance of the house and was installed by the local franchisee of a company that operated nationwide.

The foam is a urea-formaldehyde foam and was injected, as a viscous liquid, into the existing brick cavity where it expanded and set. There was no building paper to the timber framing and the foam filled the depth of the timber framing in addition to the cavity, resulting in a foam layer that was approximately 150 mm thick. The house was considered to have some low risk weathertightness features and it was subject to extreme wet and windy weather conditions and high humidity levels.

The territorial authority issued a notice to fix that required the owner to remove the foam and reinstate the cavity behind the brickwork.



Assessment methodology

The determination considered the following aspects.

- The effect of installing the foam into the brick cavity.
- An internal study of New Zealand and overseas literature on the use and effectiveness of the foam.
- The arrangements between the local franchisee and the national company, quality assurance, installation techniques, and the size of the national operation. General aspects of the foam's ability to comply with the Building Code were also considered.
- A detailed inspection of the building was completed plus a second inspection after six months to see whether the moisture levels detected in the walls during the first inspection had changed over time.
- Whether the installation of the foam was considered building work and whether it was exempt from the need for a building consent.

The effects of installing the foam to the brick cavity

The original single-skin brick veneer formed a rain screen that prevented any moisture penetrating the brickwork from coming into contact with the timber framing. Any moisture that did penetrate the brickwork was stopped from going further by the drained and ventilated cavity. The brickwork was readily able to absorb and dissipate moisture.

The injection of the foam significantly modified the brick veneer cladding system because:

- there is no longer a drained and ventilated cavity between the brick and the timber frame
- the plaster and paint to the brick veneer means any moisture in the brickwork cannot now dissipate to the outside. Also, moisture cannot escape from the brickwork to the interior because the cavity has effectively been removed.

The internal study

The foam has been used with a high degree of success and there have been few failures reported. The few failures that had been reported were due to rain penetration from pre-existing defects in the existing cladding. In the United Kingdom, the foam was most commonly installed in the cavity between double skin brick walls. The outer skin of brick is often not exposed to the combinations of wind and rain that affect New Zealand buildings. The formaldehyde gas released as the foam cures is an irritant to some people, the extent of which differs from person to person. The use of the foam was banned in Canada in 1980 on account of reports of homeowners suffering ill effects from formaldehyde. However, no such ban appears to have been imposed in the United Kingdom or in Europe.

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The installer and general aspects of Code compliance

There are 12 active franchises operating throughout the country and each franchisee operates as an independent contractor. The national company organises conferences, training programmes, and ongoing off-site training on a compulsory basis. There is a standardised tendering and monitoring procedure, including job record sheets. Each franchise is monitored twice each year and is required to submit job records and samples of foam for testing. The company claimed to have carried out about 9,000 installations spanning a period of about 25 years up to the present.

The determination considered the foam to be durable. It was not susceptible to the agents that commonly cause degradation of other building materials nor was it exposed to UV light that can degrade some plastics.

Combinations of some factors affected the weathertightness risks to retrofitted external walls, particularly where there were defects in the walls exposed to wind-driven rain. The foam did generally improve the thermal resistance of the walls that contributed to achieve the requirements of both Building Code Clauses E3 and H1.

There was the risk of condensation forming within the wall cavity, but this could occur regardless of the type of insulation used.

The curing foam gives off formaldehyde gas. The company recommended increased rates of ventilation for the first four weeks following installation of the foam. The company provided test data from studies carried out in 1981 that showed gas levels 30 days after installation that were well within safe levels given in a Department of Labour publication.

The inspections

The determination noted that a cubic metre of foam contains approximately 40 litres of water that results from the production of the foam itself and that dissipates from the foam as it cures. The foam to the external walls is 150 mm thick, which means a large volume of water was present in the foam as it was installed. Foam samples were taken at four levels at one location, which showed much higher levels of moisture at the lower levels. Permeability tests indicated that water can easily percolate downwards through the foam.

People in the house experienced irritation when the samples were being taken and tests indicated that wet foam was still producing irritants.

Air tests for formaldehyde were also carried out in several rooms of the house and high readings were found in areas that were not well ventilated.

The dissipation of water from the foam was made difficult as the brickwork was now impervious to water. Impervious internal finishes had also been installed, and the close-boarded deck had limited ventilation at the junction of the concrete foundations and lower walls. It is believed the wet, and therefore uncured, foam was still giving off irritants but that this would diminish once the foam dried. High ventilation rates should be maintained until this was achieved. The moisture content of the timber framing was also tested and high readings were found at lower levels. A second inspection was completed six months after the first readings were taken to see whether the moisture content to the timber had changed over time. The moisture content had dropped near to an acceptable level, indicating that the foam was also drying. It was recommended that ventilation of the exterior junction of the foundations and the wall be improved, as the limiting effects of the close-boarded deck were still evident.

Was the installation of the foam 'building work', and was it exempt from the need for a building consent?

Section 7 of the Building Act says 'building work' means work 'for, or in connection with, the construction, alteration, demolition, or removal of a building; . . .'. It was concluded that the installation of the foam insulation was building work that altered the house and must therefore be building work as defined in section 7 of the Act.

Schedule 1 of the Act does not specifically mention foam insulation. However, paragraph (k) of Schedule 1 provides that a territorial or regional authority may allow building work to proceed without the need for a building consent subject to conditions concerning Code compliance or safety. Paragraph (k) should only be invoked after consideration of the nature and type of the building work concerned. In relation to this building, the view was taken that the installation of the foam should have been included as part of the consented work, and was therefore not exempt from the need for a building consent. While the foam cannot be subject to a code compliance certificate, because it was unconsented work, it was eligible to receive a certificate of acceptance if considered to be Code-compliant.

Conclusion

It was concluded that the house did comply with Building Code Clauses E3 Internal moisture and H1 Energy efficiency. However, because of a combination of the moisture injected with the foam, and inadequate ventilation, the house did not comply with Clauses B2 Durability, E2 External moisture and F2 Hazardous building materials.

There is evidence that the brick walls, with the right conditions, will eventually comply with Clauses B2 and E2. The modification of the close-boarded deck to allow better ventilation would assist this. The continuing presence of formaldehyde in the building was a concern, taking into account the time the foam has been in place.

However, it was acknowledged that with adequate ventilation and the passing of time, this would also comply.


While the determination concluded that the decision of the territorial authority to issue the notice to fix requiring the removal of the foam was incorrect, it was recommended that any new notice to fix should not be enforced until a full spring and summer season had passed. This would confirm whether or not the foam insulation and adjacent framing and linings had dried out to acceptable levels and the formaldehyde present had dissipated.

The use of the foam was not appropriate in all situations and the company needed to make its franchisees aware of the product's limitations. The injection of foam into particular walls would alter the performance of the wall with respect to other Building Code Clauses in addition to Clause H1. It was recommended that the company revise its procedures around the injection of the foam into brick cavities.

The decision

It was determined that the foam did not comply with Clauses B2, E2 and F2 of the Building Code. The decision of the territorial authority to issue the notice to fix requiring the removal of the foam from the cavity behind the brick veneer was reversed.

To read all the determinations in summary or in full, go to:

 www.dbh.govt.nz/determinations

Learning curve

BRANZ WINDOWS AND FLOORING SEMINAR

This seminar is targeted at architects and designers, and anybody making selection decisions for windows and flooring.

Case studies will be used to discuss the selection issues you will be faced with and attendees will come away with a better understanding of:

- Building Code clauses that impact on the selection of windows and flooring and the impact of recent regulatory changes (eg, H1 on glazing)
- the specific performance factors that influence selection such as durability, materials, appearance, thermal performance, environment, occupier comfort and maintenance requirements
- the factors that distinguish between two similar products (eg, the difference between the basic aluminium window and one that costs more)
- integrating higher performance windows into retrofit situations
- sustainability aspects of your choice.

The seminar will be presented by Trevor Pringle, ANZIA, BRANZ Principal Writer and Des Molloy, Building Consultant (BRANZ Builder's Mate "Old Geezer"). All seminar attendees will receive a certificate that can be included as part of a record of recent learning activities.

Location	Date
Dunedin: Otago Museum	21 July
Christchurch: Crowne Plaza	22 July
Auckland: Crowne Plaza	23 July
Hamilton: Seddon Park	24 July
Wellington: Westpac Stadium	25 July

All seminars run from 1.30 pm to 4.30 pm. Book online at

 www.branz.co.nz – go to 'seminars'.

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The Barrier Free New Zealand Trust encourages, facilitates, and promotes Universal Design principles to ensure a barrier free and accessible built environment for all people. The Trust has developed considerable technical expertise and established itself as a 'first port of call' for accessibility advice and information. We have registered an advisor network of accredited Barrier Free Advisors who are trained by our well-established education programme.

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The Barrier Free NZ Trust training is recognised by BOINZ, the New Zealand Registered Architects Boards (NZRAB), and the New Zealand Institute of Architects (NZIA) and seminar attendees will be eligible for Continuing Professional Development (CPD) points upon satisfactory completion of training modules.

2008 Training Pathways calendar

Location	Date
Train the Trainers Auckland	21 August 2008
Wellington	30–31 October 2008
Hamilton	9–10 September 2008
Christchurch	14–15 October 2008
Auckland	18–19 November 2008

For more information or to register, please go to


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