



Sterling Building Consultants LLC



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Fire Engineering Design Report  
Cairnfield Rest Home  
56-60 Jack Street  
Whangarei

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## Appendix A

Fire Safety Drawings

## **1.0 Preliminary**

### **1.1 Purpose of Report**

The report outlines the fire safety precautions to the design team and the local Building Consent Authority demonstrating how the building complies with the New Zealand Building Code to the extent required by the New Zealand Building Act 2004.

### **1.2 New Zealand Fire Service – DRU**

This proposal does involve building work of a kind specified in the Gazette by the Chief Executive of the Department of Building and Housing, as the building is not undergoing a minor alteration to the existing specified systems. Therefore, a copy of this report shall be sent by the BCA to the NZFS Design Review Unit.

### **1.3 Format of this Report**

Following this preliminary section, this report has two other main sections.

'Scope of Works' describes the installation of, extension to, or alteration to; active, passive and egress systems that are considered necessary to achieve Building Code compliance. This section along with appended drawings or other information is of primary interest to the design team, client.

'Fire Safety Assessment' describes how Building Code compliance is achieved and is of primary interest to a peer review and or the local BCA.

### **1.4 Distribution**

The requirements of this report affects many aspects of the building design. We recommend that this report be distributed to all relevant parties for their review and implementation as appropriate. The distribution list should be typically include, but not limited to the following parties;

- Building Owner
- Project Manager
- Architect / Designer
- HVAC Engineer
- Building Contractor and relevant subcontractors

## **1.5 Description of the Building**

The existing building is a single level 2195m<sup>2</sup> rest home care facility which is defined under the Building Regulations 1992 as Unrestrained Community Care. The proposed works consists of a 712m<sup>2</sup> addition, which includes 23 bedrooms, sluice room, medical storage room, lounge/dining room area, accessible toilet, nurses station, and managers office.

The building currently has a Type 7 Automatic fire sprinkler system with smoke detection and alarm system.

Fire Safety Reports were completed by Fire Risk Consultants Ltd dated 16/04/1999 for building alterations, and further alterations by Sinclair Knight Merz September 2004, and SKM in May of 2007.

## **Design Philosophy**

The design philosophy is to consider the proposal against the provisions of the NZBC Acceptable Solutions C/AS3 which is contained within the Ministry of Business, Innovation & Employment. This design follows the Acceptable Solution with no Alternative Solutions proposed.

## **1.6 Scope of Works**

### **1.6.1 Building Act 2004 and Building Regulations 1992**

All new building work must comply fully with the Building Act and Building Regulations 1992. The existing building is connected to the new addition which therefore triggers assessment of Section 112 of The Building Act 2004. The Act says:

### **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.

(2) Despite subsection (1), a territorial authority may, by written notice to the owner of a building, allow the alteration of an existing building, or part of an existing building, without the building complying with provisions of the building code specified by the territorial authority if the territorial authority is satisfied that;

(a) If the building were required to comply with the relevant provisions of the building code, the alteration would not take place and;

(b) The alteration will result in improvements to attributes of the building that relate to—

(i) Means of escape from fire; or

(ii) Access and facilities for persons with disabilities; and

(c) The improvements referred to in paragraph;

(b) Outweigh any detriment that is likely to arise as a result of the building not complying with the relevant provisions of the building code.

The Fire Design Report is limited to the fire safety related measures associated with means of escape from fire, protection of other property, fire rating performance. It does not consider access and facilities for people with disabilities.

Means of Escape from Fire is defined by section 7 of the Building Act 2004 as follows:

Means of escape from fire, in relation to a building that has a floor area, -

(a) means continuous unobstructed routes of travel from any part of the floor area of that building to a place of safety; and

(b) includes all active and passive protection features required to warn people of fire and to assist in protecting people from effects of fire in the course of their escape from the fire

### **1.6.2 Fire Service Act 1975 & Fire Safety and Evacuation of Buildings Regulations 2006**

It is outside the scope of this report to consider the fire safety requirements of the Fire Service Act 1975 and the Fire Safety Evacuation of Buildings Regulations 2006. These should not be additional to the Building Code requirements. Every effort is made to ensure that the appropriate fire safety precautions are in place to facilitate the evacuation procedure or scheme.

### **1.6.3 Hazardous Substances and New Organisms Act 1996**

It is outside of the scope of this report to consider fire safety requirements, which may be additional to the Building Code requirements, of the Hazardous Substances and New Organisms (HSNO) Act 1996 and its companion standard.

### **1.6.4 Local Government Act and Fire Fighting Water Supplies**

It is a non-mandatory requirement of the Local Government Act that, where the Territorial Authority supplies a reticulated water supply within an Urban Fire District, they are obliged to make the water available to the NZFS use at the minimum flows and pressures set out from time to time by the NZFS via their code of practice. This is not a Building Act requirement and therefore outside of the scope of this report. We note the current code of practice is SNZ PAS 4509:2003 New Zealand Fire Service Fire Fighting Water Supplies Code of Practice.

## 1.7 Duty of Care

The emphases of the fire safety provisions of the New Zealand Building Code, as those of health and safety and protection of other property. These emphases do not include for amenity or protection of one's own property.

## 1.8 Drawings and Specifications

This report has been developed from the working drawings issued by SBC which are titled Alterations New Alterations to Cairnfield House dated August 2016. The fire report was also based on previous fire safety reports approved by Whangarei District Council.

## 2.0 Scope of Works

The proposed works is to construct a 712 m<sup>2</sup> addition designed in accordance with NZS3604:2011 which consists of, timber piles supporting a timber subfloor, light timber framing, with walls clad with weatherboards, timber roof trusses and light weight roof. The addition is connected via two access ways extending out from the existing building.

Provided that the fire protection features described in this report are implemented in full, we consider that the proposed alterations, will meet the requirements of the New Zealand Building Code 1992 in full. With respects to the existing section of the building, we also consider the building will continue to meet these requirements to at least the same extent as before the alterations and as far as nearly reasonably practicable in accordance with Section 112 of The Building Act 2004 based on the proposed upgrade of fire safety way finding signage, emergency lighting and door hardware.

## 2.1 General

The proposed design is in accordance with C/AS3 for Sleeping (non-institutional) which has a Primary Risk group of SI.

The proposed overall occupant load equates to **130**. This has been determined from the risk group, the number of people in each space, bed numbers and confirmation from Cairnfield management. The beds are typically single beds. Please refer to the floor layout drawings which indicates the location and number of beds. The lounge, kitchen and dining area has not been counted, as the occupant numbers have been counted elsewhere.

### **Makeup of the Total Occupant Load**

Existing residence occupant load equates to **68**

Existing staff occupant load **24**

New 712 m<sup>2</sup> addition will accommodate residence **20**

Additional staff support for the new 712m<sup>2</sup> addition **6**

Total visitors to Cairnfield House after the addition **12**.

**Total Occupant Load after the alteration is complete equates to a worse case of **130** at any given time.**

## 2.2 Firecells, Fire Safety Systems and Fire Resistance Ratings

The floor area of each of the Firecells, and common areas do not exceed 500m<sup>2</sup>.

The fire safety systems for firecells required for this risk group is defined as follows;

- a) Type 7 alarm system throughout the building in compliance with NZS4541 and NZS4512. Water supplies for the sprinkler system shall be a single supply which may be a public reticulated main as there are not more than 100 people receiving hospital care or detention and;
- b) Type 9 smoke control in any air handling system, and;
- c) Type 18 building fire hydrant, which is not required in the fire service hose run distance from the service vehicle access point is less than 75m.

The fire safety systems shall be interconnected throughout the building to alert all occupants of that floor in the event of fire. A staged evacuation will be required.

The fire resistance rating that apply for this risk group are as follows:

Life rating = **60 minutes**. This applies to fire ratings requirements, means of escape and control of internal fire and smoke spread.

Property rating = **60 minutes**. This applies to fire rating requirements, control of external fire spread.

## 2.3 Means of Escape from Fire

The minimum number of escape routes for the floor level shall be no less than 3, which can serve an occupant load of up to 150. More than 3 exits are provided.

Height and width of escape routes have a clear height of no less than 2100mm across the full width. All door opening width which gives access to escape routes also have clear height of no less than 1955mm for the required opening.

Single means of escape are also provided within the new addition and existing section of the building which meets the requirements of section 3.13 of C/AS3, in regards to the occupant load being no greater than 50 and within the permitted D.E.O.P length of 20m. It is noted that each sleeping wing has their own common area with associated services which ensures each space does not exceed more than 50 OCC at any point of time.

The width of all available escape routes have the total combined width of all escape routes having 8mm/person for horizontal travel and 10mm/person for vertical travel. Horizontal travel  $8 \times 130 = 1040\text{mm}$ . Vertical travel  $10 \times 130 = 1300\text{mm}$ .

All existing stairs and ramps serving the escape routes have existing handrails installed in accordance with D1/AS1.

The permitted lengths of escape are 30m for D.E.O.P and T.O.P 75m. All escape routes from level 1 to the final exits are within these permitted lengths.



All doors located along the egress routes shall open in the direction of travel for areas where the occupant load exceeds 50.

Locking devices shall be clearly visible, located where such a device would be normally expected and, in the event of a fire, designed to be easily operated without a key or other security device and allow the door to open in the normal manner.

All escape routes, fire doors and smoke control doors shall have signs complying with NZBC F8/AS1.

## **2.4 Control of Internal Fire and Smoke Spread**

Each of the firecells are fire separated from each other by the life rating of 60min.

All fire stops shall have an FRR of 60min and shall be maintained around all penetrations and in gaps between or within building elements. The material selected for use as fire stops, shall have been tested for the type of size of the gap or penetration, and for the type of material and construction used in the fire separation.

Each of the vertical fire separations shall terminate as close as possible to the underside of the external roof cladding and primary elements providing roof support, with any gaps fully fire stopped.

The sleeping areas are subdivided into suites. The suites are a separate firecell and contain no more than 12 beds / occupants. The fire separations shall have a FRR of 60min (60/60/60). Each of the doors that provide a fire separation shall have self-closers installed and achieve a FRR of -/60/60Sm. All sleeping areas are fire separated from other supporting activities, and have direct access into a horizontal safe path which leads to a place of safety.

Existing concrete floor between each of the floors provides greater than 60min FRR, as well as 60min FRR to the underside of the egress stairs.

All duct works that passes through a fire separation shall not reduce the fire resistance of the construction through which the duct passes. All duct work shall have fire dampers and shall comply with AS/NZS1668.1 and shall have a fire integrity and insulation rating no less than 60min.

As the basement is not sprinkler protected nor provided with effective cross flow ventilation, a smoke control system is required, if the building was built new. However, as there are no works in the basement area, we do not consider it reasonably practicable to install such system at this time. Further to this, the height of the basement is 2.2m and is not considered that a smoke control system would be effective in keeping the smoke layer above the level of escaping if it were installed.

Surface finishes requirements shall be in accordance with the below table:





<i>Exitways All occupied spaces in importance level 4 buildings</i>	<i>Wall materials in sleeping spaces (not in household units)</i>	<i>Ceiling materials in sleeping spaces (not in household units)</i>	<i>All other occupied spaces including household units: wall and ceilings</i>	<i>Ducts for HVAC systems: internal surfaces</i>	<i>Ducts for HVAC systems: external surfaces  Acoustic treatment and pipe insulation within air handling plenum</i>	
Maximum permitted Group Number						
1S	2S	2S	3	1S	3	Un-sprinklered
2	3	2	3	2	3	Sprinklered

## 2.5 Control of External Fire Spread

C/AS7 tables 5.2 and 5.3. have been assessed.

Level one has an external fire wall located on the boundary which is constructed of concrete block and is expected to provide greater than 60min FRR. The proposed works do not include any works to these existing firewall. The other walls either face Hobson Street or the access R.O.W which are greater than 7.5 meters, which allows them to be 100% unprotected.

External fire spread between different levels of the same building needs to be considered. Unprotected areas in external walls shall be protected against vertical fire spread between the firecells containing sleeping risk groups. 1500mm vertical separation is provided between the upper and lower firecells to front in full, and side elevations in part. In addition there is a canopy / apron on the lower level which provides a separation to the upper level. It is considered the construction to provide a FRR of 60mins with "promatech" soffit linings which was installed under a previous building consent. The work involved providing additional fire ratings to these areas is not considered reasonably practicable to do any further upgrades. Therefor we consider that the escape route distance complies as near as is reasonably practicable with the requirements of the building code.

## 2.6 Firefighting

Existing access is provided on site which appears to be suitable for a laden weight of up to 25 tonnes, with an axle load of 8 tonnes. It is also a concrete area suitable for all weathers, clear access way of greater than 4.0m to 20m of the entrance way.

An existing fire alarm panel is located in a position approved under a previous consent.

## 2.7 Report Basis

Sterling Building Consultants Ltd have considered the Building Act 2004, and are satisfied on reasonable grounds, that providing the actions noted in the fire analysis are implemented in strict accordance with this design, then the new building will



comply with NZBC C/AS2 and C/AS7 (basement) which is treated as complying with NZBC Protection From Fire clauses C1-C6.

The owner may adopt additional fire safety precautions to that required by NZBC Protection from Fire clauses C1-C6, but any additional precautions are beyond the scope of this fire analysis. Protection from tenants or owner's loss of content and property, and consideration of business continuity and community importance, are not addressed in this fire analysis.

### **Inspections and Construction Monitoring**

All inspections in relation to compliance will be undertaken by the Building Consent Authority, with compliance contingent upon the Building Consent Authority confirming that the requirements of the this report are properly completed.

### **Ongoing Compliance**

Sterling Building Consultants Ltd places full reliance on the performance of the proprietary systems to achieve the performance required by the NZ Building Code and accepts no liability for faulty workmanship or product failure.

### **Substitution of Materials and Fittings**

Components forming part of systems specified in this fire safety analysis must not be substituted for alternatives unless all necessary test reports and certificates that demonstrate compliance with the NZ Building Code are issued to the Building Consent Authority, and the Building Consent Authority has given written approval of the alternatives. Sterling Building Consultants Ltd takes no responsibility for substitution of alternatives without Sterling Building Consultants Ltd first giving their prior written approval before the alternative is installed.

### **Use of the Report**

This report has been prepared solely for the benefit of the Owner, the Designer, the Contractor, the Building Consent Authority, and the Territorial Authority with respect to the purpose and engagement of this analysis. Any other person or party who relies upon any matter contained in this report does so entirely at their own risk.



The Building Consent Authority, Territorial Authority, Building Control Officers, consultants and contractors, whose work is affected by this report, are expected to have read this report, understood the implications and have incorporated the relevant fire safety requirements into their consent documents, field/file notes, and building work.

If there is any doubt to the interpretation or application of the requirements of this report, the consultant shall be contacted immediately, and the issue clarified, prior to construction continuing.

Document prepared and approved by:

Geoff Cockery

Dip Bs, BOINZ LBP 129060

STERLING BUILDING CONSULTANTS LTD

## **A FIRE ALARM SPECIFICATION**

### **E1 GENERAL**

#### **E1.1 SCOPE**

An existing automatic fire sprinkler system and manual call points (Type 6) to be amended throughout the tenancy to suit the new layout in accordance with NZS 4541:2013 (if required)

### **E2 WORKMANSHIP**

#### **E2.1 FIRE ALARM SYSTEMS**

Work on the fire alarm system is required to be carried out in a thorough and workmanlike manner in accordance with sound trade practice approved and commissioned by competent and qualified personnel holding the minimum of NZQA approved National Certificate in Fire Detection and Alarm Systems Level 4 (or approved equivalent) in accordance with manufacturer's specifications, and NZBC G9.

The Fire Alarm Contractor is required to supply all necessary as-built documentation as required to determine compliance of the systems and for ongoing maintenance



to be achieved. The construction of all built-up equipment shall be carried out with high inherent reliability as the major objective.

## **E3 COMPONENTS**

### **E3.1 FIRE ALARM COMPONENTS**

The fire alarm system shall comprise only NZS 4541:2013 equipment and components listed on the Fire Protection Association register. NZS4541:2013 does not permit substitution of components from one manufacturer's fire alarm system to those of another manufacturer.

### **E3.7 FIRE ALARM MANUAL CALL POINTS**

Existing manual call point provided. This may need to be repositioned to suit the new layout. Fire alarm manual call points are required within 5 m of main exit doors. Additional call points are required to ensure travel distance to the nearest call point does not exceed 30 m.

Call points may be located under direct control of staff where normal positions would cause repetitive false alarms.

Each call point shall be clearly visible, accessible and identifiable, located at a height of 1.2 m to 1.5m and have a clear space of at least 0.6 m in all directions. Instructions for activation of the fire alarm and the phone number to dial in an emergency are required to be provided on each call point, or adjacent to each call point, in accordance with NZS 4512:2010 Appendix E and NZBC F8/AS1.

### **E3.10 AUDIBLE ALERTING DEVICES**

Existing Audible alerting devices are provided and shall produce the standardized evacuation signal complying with NZS4512:2010 Appendix F.

The sound pressure level of audible alerting signals shall be between 65 and 100 dBA, and be a minimum of 10 dBA above the noisiest background sound pressure level averaged over 1 minute.

All spaces able to be occupied shall pass the test with all doors closed.

Location of alerting devices shall be specifically designed to suit the sound levels achieved in each space in the building. Final commissioning shall determine if adequate alerting devices have been installed. Install additional alerting devices to achieve the performance requirements of NZS 4512:2010.

## **E4 COMMISSIONING**

### **E4.1 FIRE ALARM SYSTEM COMMISSIONING**

An 'accredited inspection body' is not required to confirm, with a Certificate of Completion as the proposed works are considered to be minor.

## **E5 ONGOING INSPECTIONS, TESTING AND MAINTENANCE**

### **E5.1 FIRE ALARM SYSTEM ONGOING COMPLIANCE**

The ongoing compliance of the system is maintained as part of the Building Warrant of Fitness regime. NZS4512:2010 requires a testing contract to be established with a competent and qualified contractor to ensure the control and alarm equipment is regularly tested in accordance with NZS 4512:2010 – Part 6, and any deficiencies rectified in a timely manner.

## **B EMERGENCY LIGHTING SPECIFICATION**

### **F1.1 FITTINGS AND SPACING**

Emergency lighting shall be Famco 9993 recessed fittings, spaced as indicated on appended drawing FA1.

Note that spacing of fittings is based on the fitting specified above. Substituting the fitting for a different make / model will require the spacing of fittings to be reassessed.

### **F1.2 ILLUMINANCE**

Emergency Lighting is required to provide direct illuminance of no less than 1 Lux above stairs and ramps, and 0.2 Lux on level escape routes where travel distance on escape routes exceeds 20 m to the nearest exit.

This shall be confirmed on site using the appropriate methods of measurement provided below, and verified by either the BCA, or by the installer by issuing a construction producer statement (PS3), or by obtaining an independent construction review producer statement (PS4).

### **F1.3 METHOD OF MEASUREMENT**

Illuminance must be measured in accordance with AS/NZS 1680 Interior Lighting Part 1. Measurements must be made;

- a) At floor level further than 500 mm of vertical surfaces,
- b) Once lamps are switched on and allowed to stabilise and
- c) Without interference of daylight or from light spill from adjacent rooms.

### **F1.4 LIGHT OUTPUT AND DURATION**

In the Café and Retail Areas, the emergency lighting is required to provide 10 % of design illuminance in 0.5 seconds, 80 % of design illuminance in 30 seconds, and maintain 100% after 30 seconds for no less than 30 minutes.

In staff only areas emergency lighting is required to provide 10% of design illuminance in 20 seconds, 80% in 60 seconds, and maintain 100% after 60 seconds for no less than 30 minutes.

### **F1.5 INSTALLATION, MAINTENANCE AND EQUIPMENT**

The Emergency Lighting must be installed in accordance with AS 2293.1:2005 and AS2293.3:2005 Emergency Evacuation Lighting For Buildings as amended by NZBC F6/AS1 Appendix B, and NZBC G9/AS1 Electricity.



Emergency lighting shall be setup on a separate circuit for ease of testing. The test facility is required to be capable of being manually reset, but is also required to be provided with a system that automatically reverts mains power back to the emergency lighting at the conclusion of the 40 minute discharge test if mains power supply to the emergency lighting is not manually switched back on.

The function of the test facility is required to be clearly identified eg "Emergency Lighting Test Switch".

#### **F1.6 BATTERY INSPECTION, MAINTENANCE AND REPORTING**

Inspection, maintenance and reporting of self-contained batteries shall be in accordance with AS/NZS 2293 Emergency Evacuation Lighting for Buildings Part 2.

#### **F1.7 COMMISSIONING**

Emergency lighting is required to provide the required illuminance for a duration of no less than 40 minutes at time of commissioning and any change of batteries.

The Declaration Of Compliance found in Appendix B of AS2293 Part 3 should be completed and issued to the owner to indicate the system is operating correctly when the work was commissioned.





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## C SIGNAGE SPECIFICATION

### G4 EXIT SIGNS

#### G4.1 INTERNALLY ILLUMINATED FITTINGS – MAINTAINED (POWERED)

Unless otherwise instructed, Exit Signs shall be recessed ceiling mounted Famco LED F9917L Mirage Blade units (comes with or without directional arrows – refer drawing FA1).



#### G4.2 EXIT SIGN PLACEMENT

- ✓ This requirement will be satisfied. As a minimum, 'Fire Exit' signs are required to be positioned on a vertical surface within 600mm doors to identify exit doors and the escape route. The location of exit signs on the appended drawings are indicative and assumes visibility of exit signs will not be obstructed by other signage / banners, merchandise / stock, and shelving / racking. Additional signage is required if these signs are obscured from view for any reason.

The Electrician is required to ensure exit signs contain the correct words and colours, are of the appropriate size for the viewing distance, are visible and are securely fixed.

#### G4.3 WORDING

- ✓ This requirement will be satisfied. The exit signs will display the word 'EXIT', or words 'EMERGENCY EXIT'. The type method of communicating 'exit' is required to be the same throughout the building but may be either the use of;
- Pictograms,
  - English text with or without a Pictogram,
  - Maori text plus either English text or a Pictograms or both, or
  - any other language including Braille, plus one of the above.

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#### **G4.4 HEIGHT AND COLOUR OF LETTERING AND PICTOGRAMS**

- ✓ This requirement is satisfied. Signs are required to have white text on safety green background. Low level signs on exit doors shall have 100mm high lettering which is suitable for a viewing distance of 24m. Lettering will be Arial font or similar having complying proportions as indicated in NZBC F8/AS1 Table 1.

#### G4.5 SIGN ILLUMINATION

Fire Exit signs are required to be continuously powered (maintained) as Emergency Lighting is required in the building. Signs are only permitted to be non-maintained illuminated type if they are interfaced into the fire alarm so that the signs also illuminate upon the fire alarm system detecting smoke.

- Exit signs shall be internally illuminated to the minimum of 8cd/m within 25 mm of the sign except may be as low as 2cd/m signs within dimmed lighting conditions.
- The light source that illuminates the fitting shall be on battery backup power supply that will automatically activate in the event of mains power supply failure and remain illuminated for a minimum duration of 30 minutes.
- The light source shall comply with NZBC G9 and NZBC F6, AS 2293:2005 Parts 1 and 3, and AS/NZS 2293:1995 Part 2.

#### G4.6 COMMISSIONING OF ILLUMINATED SIGNS

Illumination of exit signs is required to provide the required illuminance for a duration of no less than 40 minutes at time of commissioning and any change of batteries.

The Declaration Of Compliance found in Appendix B of AS2293 Part 3 should be completed and issued to the owner to indicate the system is operating correctly when the work was commissioned.

### G5 FIRE RELATED SAFETY FEATURES

#### G5.1 FIRE ALARM CALL POINTS

This requirement will be satisfied. The method of operation and appropriate emergency telephone number is required to be inscribed on the face of the call point, or be written on a 85 mm x 85 mm sign placed adjacent to the call point. The sign is required to have a safety red background.



The Fire Alarm Contractor is required to ensure signs are provided at manual call points to indicate the emergency phone number and the method to activate the fire alarm.



## D SURFACE FINISH TEST RESULTS

### H1.1 COMMON SURFACE FINISHES NOT REQUIRING TEST RESULTS

The table below provides the Group Number rating of some common interior surface finishes. The table is based on the information provided in NZBC C/VM2 Table A1.

Use of the table is an alternative to providing specific fire test results from coating manufacturers.

TABLE 17 COMMON INTERIOR SURFACE FINISHES

COATING THICKNESS	SUBSTRATE THICKNESS	ACHIEVED GROUP NUMBER (NZBC VM/2 Table A1)
Water or Solvent based paint coating $\leq 0.4\text{mm}$ . Polymeric film $\leq 0.4\text{mm}$ .	Concrete $\geq 15\text{ mm}$	1S
	Sheet Metal $\geq 0.4\text{ mm}$ Fibre Cement $\geq 6\text{ mm}$ Glass Plasterboard	2S
Water or Solvent based paint coating $\leq 0.4\text{mm}$ .	$\geq 9.5\text{mm}$ thick and $\geq 400\text{ kg/m}^3$ density and $< 5\%$ organic material.  Wood $\geq 9\text{mm}$ thick and $\geq 600\text{ kg/m}^3$	3
Water or Solvent based paint, stain or varnish coating $\leq 0.4\text{mm}$ and $\leq 100\text{g/m}^2$ .	density for particle board and $\geq 400\text{ kg/m}^3$ density for all other wood.	

# Resene Paint Systems- Fire Ratings

**Resene**

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The listed Resene paint systems over the listed substrate have been fire tested using a cone calorimeter in accordance with ISO 5660 to determine Group Classification in accordance with New Zealand Building Code (NZBC) Verification Method CNM2 Appendix A; National Construction Code (NCC) Volume One Specification C1.10 and A2.4 of the Building Code of Australia

Substrate	Undercoat (1 coat unless otherwise stated)	Topcoat (2 coats unless otherwise stated)	Indicated Group No.	Test Report
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10)	Resene SpaceCote Low Sheen (SR 15)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced	Resene Broadwall Waterborne Wallboard Sealer (SR 10)	Resene SpaceCote Flat (SR 15 sqm/l)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10)	Resene Zylone Sheen (SR 15 sqm/l)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10)	Resene Ceiling Paint (SR 12)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Sureseal (SR 15 sqm/L)	Resene SpaceCote Flat (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	7-593235-CO
10mm Paperfaced Plasterboard	Resene Sureseal (SR 15 sqm/L)	Resene Lustacryl (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	7-593262-CO
13mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 11)	Resene ClinicalCote Satin (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 11)	Resene ClinicalCote Low Sheen (SR 15)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall 3 in 1 (SR 2.5 sqm/l)	Resene ClinicalCote Satin (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall 3 in 1 (SR 2.5 sqm/l)	Resene ClinicalCote Low Sheen (SR 15 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall Surface Prep	Resene ClinicalCote Satin (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall Surface Prep	Resene ClinicalCote Low Sheen (SR 15 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall 3 in 1 (2 coats) (SR 7 sqm/l)	-	1-S (NZBC) 1 (NZBC)	FAR3981
13mm Paperfaced Plasterboard	Resene Broadwall 3 in 1 (SR 7 sqm/L)	Resene Zylone Sheen VOC Free (SR 16 sqm/l)	1-S (NZBC) 1 (NZBC)	FAR3981
13mm Paperfaced Plasterboard	Resene Broadwall 3 in 1 (SR 7 sqm/L)	Resene SpaceCote Low Sheen (SR 16 sqm/L)	1-S (NZBC) 1 (NZBC)	FAR3981
13mm Paperfaced Plasterboard	Resene Waterborne Smooth Surface Sealer (SR 12 sqm/L)	Resene SpaceCote Low Sheen (SR 16)	1-S (NZBC) 1 (NZBC)	FAR3981
13mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10)	Resene Ceiling Paint (SR 12 sqm/L)	1-S (NZBC) 1 (NZBC)	FAR3981
6mm Fibre Cement Board	Resene QUICK Dry (SR 12 sqm/L)	Resene Uracryl802 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139'
6mm Fibre Cement Board	Resene Quick Dry (SR 12 sqm/L)	Resene Uracryl803 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139•
6mm Fibre Cement Board	Resene Sureseal (SR 12 sqm/l)	Resene Uracryl802 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139'

6mm Fibre Cement Board	Resene Sureseal (SR 12 sqm/L)	Resene Uracryl 803 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139*
8mm MDF	Resene Quick Dry (SR 12 sqm/L)	Resene Fireguard (SR 3.5 sqm/L)	3 (NZBC) 3 (NCC)	FH5137
8mm MDF	Resene Quick Dry (SR 12 sqm/L)	Resene Fireguard (SR 3.5 sqm/L), Resene SpaceCote Low Sheen (SR 14 sqm/L)	3 (NZBC) 3 (NCC)	FH5137
18mm MDF	Resene Quick Dry (SR 12 sqm/L)	Resene Fireguard (SR 3.5 sqm/L)	3 (NZBC) 3 (NCC)	FH5137
18mm MDF	Resene Quick Dry (SR 12 sqm/L)	Resene Fireguard (SR 3.5 sqm/L), Resene SpaceCote Low Sheen (SR 14 sqm/L)	3 (NZBC) 3 (NCC)	FH5137
9mm thick 'A' grade plywood	Resene Aquaclear Semi-Gloss	Resene Aquaclear Semi-Gloss (3 coats SR 12 sqm/L)	3 (NZBC)	FAR3981
≥ 26mm Metrapanel	Pre-primed	Resene Fireguard (SR 1 sqm/L), Resene SpaceCote Low Sheen (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5334

# The Laminex Group Products

## Fire Test Classifications

Cone Calorimeter test in accordance with ISO5660 and New Zealand Building Code Verification Method C/VM2 Appendix A.

The tests were carried out and data recorded according to the test procedure described in ISO 5660: (2002), Reaction-to-fire tests - Heat release, smoke production and mass loss - Part 1: Heat release rate, and Part 2: Smoke production rate.

Product	Group Classification	Fire Test Report
Formica / Laminex HPL on Lakepine MDF	3	FH 5188
Laminex Aquapanel	3	FH 5028
Seratone Escape	3	FH 5027
Melteca	3	FH 5026
Tempered Hardboard	3	7-590426-CV
Lakepine MDF	3	7-590424-CV
Superfine Particleboard	3	7-590428-CV
Standard Hardboard	3	7-590420-CV
Triboard	3	FH 5119
Strandboard	3	FH 5119
Strandfloor	3	FH 5119
Laminam	1	FH 5190

THE laminex GROUP



## FIRE RATINGS

16<sup>TH</sup> OCTOBER 2013

CAP 508 PIGMENTED FIRE RATED SYSTEM AS TESTED TO ISO 5660, 2002 AND NZBC VERIFICATION METHOD C/VM2						
SYSTEM	COATS	APPLICATION RATE	TEST REFERENCE	TEST DATE	TESTED SUBSTRATE	GROUP NUMBER
CAP197	1	10m <sup>2</sup> /L	1314/15/16A	August 2013	9.5mm douglas fir plywood	1S
CAP508	1	2.8m <sup>2</sup> /L				

CAP 800 CLEAR FIRE RATED SYSTEM AS TESTED TO ISO 5660, 2002 AND NZBC VERIFICATION METHOD C/VM2						
PRODUCT	COATS	APPLICATION RATE	TEST REFERENCE	TEST DATE	TESTED SUBSTRATE	GROUP NUMBER
CAP100	1	10m <sup>2</sup> /L	138/7/8/10A	August 2013	9.5mm douglas fir plywood	1S
CAP800	2	6m <sup>2</sup> /L				
CAP830	1	10m <sup>2</sup> /L				

ZOLATONE FLEX FIRE RATED SYSTEM AS TESTED TO ISO 5660, 2002 AND NZBC VERIFICATION METHOD C/VM2						
PRODUCT	COATS	APPLICATION RATE	TEST REFERENCE	TEST DATE	TESTED SUBSTRATE	GROUP NUMBER
BASE	1	10m <sup>2</sup> /L	1311/12/13A	August 2013	paper faced plasterboard	1S
TOP COAT	2	3m <sup>2</sup> /L				

EARLY FIRE HAZARD RATINGS				
ASSESSMENT STANDARD	ACCREDITED TEST LABORATORY	PRODUCT	SUBSTRATE	RESULT
AS1530.3, 1999	APL FNE9931	CAP800	9.5mm plywood	SFI 0 SDI 4
AS1530.3, 1999	APL FNE9932	CAP800	9.5mm varnished plywood	SFI 0 SDI 5
AS1530.3, 1999	APL FNE9933	CAP800	9.5mm stained / blonded plywood	SFI 0 SDI 4
AS1530.3, 1999	APL 06191	CAP508	12mm mdf	SFI 0 SDI 3
AS/NZS 3837, 2005	APL 0918/19/20	CAP508	12mm cedar	Group 1, Peak Heat Release Rate under 100 kW/m <sup>2</sup> Total Heat Released under 25 MJ/m <sup>2</sup> , at 15 minutes

FIRE RESISTANCE RATING				
ASSESSMENT STANDARD	ACCREDITED TEST LABORATORY	PRODUCT	SUBSTRATE	RESULT
AS1530.4, 2005	CSIRO Opinion FCO 2738/3738	CAP508	load bearing ceiling, std 10mm plasterboard	60/60/60
AS1530.4, 2005	CSIRO Opinion FCO 2724/3737	CAP508	load bearing ceiling, fibrous plaster	90/90/90
AS1530.4, 2005	CSIRO Opinion FCO 2727/3740	CAP508	load bearing ceiling, fibre cement	90/90/90
AS1530.4, 2005	CSIRO Opinion FCO 2726/3739	CAP508	floor/ceiling, lath and plaster	90/90/90
AS1530.4, 1997	BRANZ Test Report FR3768	CAP508	non load bearing wall, std 10mm plasterboard	- /45/45
AS1530.4, 2005	CSIRO Opinion FCO 2631/3589	CAP508	non load bearing wall, std 10mm plasterboard	- /60/60



# E HAZARDS

## K1 CONSTRUCTION AND DEMOLITION HAZARDS

This section addresses compliance with NZBC F5 Construction and Demolition Hazards relating to the fire safety systems covered within the scope of this analysis.

TABLE 20 MITIGATION OF CONSTRUCTION HAZARDS

HAZARD	MEASURES TO MITIGATE RISKS
Risk to public inside the building during construction.	Enclosure of works with solid partitioning / hoarding barriers in accordance with NZBC F5 to prevent access into the worksite. Ensure access doors are closed at all times and provided with adequate signage to warn that the work site is a construction site and that access is restricted to approved personnel only. Keep hoarding clear of evacuation lanes, smoke detectors and emergency lighting.
Risk to public outside the building during construction	Providing site fencing in accordance with NZBC F5 to prevent public access where specific hazards occur if there is a risk of public entering the construction site while contractors are not present.
Risk to public in the building if a Code Compliance Certificate has not been issued prior to occupation of the building.	The Contractor is required to obtain a Certificate of Public Use if members of the public occupy the building prior to issuing of the Code Compliance Certificate.
Temporary isolation of the fire alarm system.	Ensure the owner has given written authorization of the work using figure K1 in NZS 4541:2013. Ensure a sign is placed on the fire alarm panel similar to that in figure K2 of NZS 4541:2013. Ensure other users of the building are notified of the building work. Ensure all people present are trained to be familiar with the evacuation procedure. Ensure a 'fire watcher' is in attendance for the full duration of the isolation, and is trained in the location and use of fire fighting equipment.
Hot works.	Ensure a 'fire watcher' is in attendance for the full duration of the work, ensure the area of work is clear of combustible material, and ensure a suitable fire extinguisher is readily accessible by the 'fire watcher'.
Storage or work on flammable materials.	Only permitted if a suitable fire extinguisher is readily accessible, all people present are trained in the location and use of the equipment, and all people present are trained to be familiar with evacuation procedures.

## **M2 LEGISLATION RELATING TO THE COMPLIANCE SCHEDULE**

### **M2.1 OBTAINING A COMPLIANCE SCHEDULE**

As specified systems will be installed in the building, the owner has responsibility of obtaining the Compliance Schedule,<sup>15</sup> and the Building Consent Authority has the responsibility of issuing it with the Code Compliance Certificate.<sup>16</sup>

### **M2.2 AMENDMENTS TO THE COMPLIANCE SCHEDULE**

The owner must apply to the Territorial authority for an amendment to the building's Compliance Schedule;

- a) If the owner considers that performance standards need updating,
- b) If the Compliance Schedule no longer complies with the requirements of the Building Act 2004 of any regulations made under it, or
- c) If the Compliance Schedule contains information that is no longer required under the Building Act 2004 or any regulations made under it.<sup>17</sup>

### **M2.3 REGULAR INSPECTIONS AND MAINTENANCE**

The owner is required to ensure each Specified System stated in the Compliance Schedule be regularly inspected and maintained to ensure the Specified Systems performs, and continues to perform, to the Specified System's Performance Standards.<sup>18</sup>

### **M2.4 DISPLAY THE COMPLIANCE SCHEDULE STATEMENT**

For the first 12 months of the period of the Compliance Schedule, the owner is required to display, in an accessible location, a Compliance Schedule Statement issued by the Territorial Authority stating the specified systems covered by the Compliance Schedule and the place where the Compliance Schedule is kept.<sup>19</sup>

### **M2.5 SUPPLY AN ANNUAL BUILDING WARRANT OF FITNESS**

The owner of a building is required to supply an annual Building Warrant of Fitness to the Territorial Authority, on the anniversary of issuing the Compliance Schedule.<sup>20</sup>

The owner is required to display a copy of the Building Warrant of Fitness in an accessible location. The Building Warrant of Fitness must have attached to it all certificates, issued by a Independent Qualified Person that, when those certificates are considered together, certify that the inspection, maintenance and reporting procedures stated in the Compliance Schedule have been fully complied with during the previous 12 months.<sup>21</sup>

## **F OWNERS OBLIGATIONS**

### **N1.1 ONGOING BUILDING MANAGEMENT**

Once the proposed work is complete, and after the Building Consent Authority has issued a Code Compliance Certificate for the work, the owner becomes responsible for managing the following parameters in accordance with this report;

- a) The peak occupant load in the building,
- b) The use of spaces within the building,
- c) Ongoing compliance of the means of escape, and
- d) Maintenance of specified systems.

### **N1.2 BUILDING WARRANT OF FITNESS**

The owner of a building is required to supply an annual Building Warrant of Fitness to the Territorial Authority, on the anniversary of issuing the Compliance Schedule.<sup>23</sup>

The owner is required to display a copy of the Building Warrant of Fitness in an accessible location. The Building Warrant of Fitness must have attached to it all certificates, issued by an Independent Qualified Person that, when those certificates are considered together, certify that the inspection, maintenance and reporting procedures stated in the Compliance Schedule have been fully complied with during the previous 12 months.<sup>24</sup>

## **O1.2 INSPECTIONS AND CONSTRUCTION MONITORING**

All inspections in relation to compliance will be undertaken by the Building Consent Authority, with compliance contingent upon the Building Consent Authority confirming that the requirements of the this report are properly completed.

## **O1.3 ONGOING COMPLIANCE**

Sterling Building Consultants Ltd places full reliance on the performance of the proprietary systems to achieve the performance required by the NZ Building Code and accepts no liability for faulty workmanship or product failure.

## **O1.4 SUBSTITUTION OF MATERIALS AND FITTINGS**

A modification to this fire analysis is not permitted unless Sterling Building Consultants Ltd first gives their written approval.

Components forming part of systems specified in this fire safety analysis must not be substituted for alternatives unless all necessary test reports and certificates that demonstrate compliance with the NZ Building Code are issued to the Building Consent Authority, and the Building Consent Authority has given written approval of the alternatives. Sterling Building Consultants Ltd takes no responsibility for substitution of alternatives without Sterling Building Consultants Ltd first giving their prior written approval before the alternative is installed.