



VISHNU FIRE SAFETY

Fire Safety Design Report



Extension to Existing Church

**25 Mana Avenue
Titahi Bay**

Reference	Revision	Date	Comment
15166R01	-	11 th April 2016	-

INTRODUCTION

This assessment has been undertaken in order to review the proposed extension to the existing Church building located at 25 Mana Ave, Titahi Bay and report on the fire safety requirements of the NZ Building Act 2004 and New Zealand Building Code.

FIRE ENGINEERING DESIGN PHILOSOPHY

This assessment has been undertaken in accordance with Sections 17 and 112 of the New Zealand Building Act 2004 and has taken into consideration the requirements of the New Zealand Building Code (NZBC) clauses C/AS4 (Fire Safety, Risk Group CA), F6/AS1 (Visibility in Escape Routes), F7/AS1 (Warning Systems) and F8/AS1 (Signs).

NZ FIRE SERVICE DESIGN REVIEW UNIT

According to “Building Controls Update - No. 132: Gazette notice updated for fire design review” and “Gazette Notice 49”, designs for building consent must be submitted to the Fire Service Commission **when both criteria 1 and 2 below are met:**

Criteria 1 - Building type

Only the following types of buildings require designs be submitted to the Fire Service Commission (provided the design/building work also meets one of Criteria 2 below):

Buildings (or parts of buildings) used for:

- gathering together of 100 or more people (for any purpose)
- employment for 10 or more people
- accommodation for 6 or more people (other than in 3 or fewer household units)
- hazardous substances in quantities exceeding prescribed minimum amounts
- early childhood facilities
- nursing, medical, or geriatric care
- specialised care for persons with disabilities
- lawful detention of people (not home or community detention).

Excluding the following:

- Crown buildings that are specified by the Minister in the Gazette premises of diplomatic missions
- single household units
- buildings in which every fire-cell is a household unit separated vertically from the other fire-cells, and each fire-cell has independent and direct egress to a safe place outside the building
- an internal fit-out, unless the fit-out relates to a change of use
- outbuildings or ancillary buildings.

Criteria 2 - Designs/building work type

Consent applications need to be sent to the Fire Service Commission in any of the following circumstances:

- Designs for new buildings using alternative solutions (not using an Acceptable Solution or Verification Method) to comply with any of the following Building Code clauses:
 - C1-C6 Protection from Fire
 - D1 Access routes
 - F6 Visibility in escape routes
 - F8 Signs.
- When waivers or modifications to any of the above Building Code clauses are required.
- Alterations, change of use or subdivisions that have a more than minor effect on fire safety systems.

As the proposed work will only have a minor effect on the fire safety systems, **this application for Building Consent is not required to be sent to the NZ DRU.**

FIRE SAFETY AND EVACUATION OF BUILDINGS REGULATIONS 2006 AND HAZARDOUS SUBSTANCES AND NEW ORGANISMS ACT (HSNO)

This fire safety assessment does not take into consideration the requirements of the “Hazardous Substances and New Organisms Act” (HSNO) or the “Fire Safety and Evacuation of Buildings Regulations 2006”. It is important that the owners understand their requirements to comply with these legal documents.

A copy of the above Act and Regulation is available free of charge from <http://www.legislation.govt.nz>

BUILDING DESCRIPTION

The existing church building is single storey and of timber frame construction with a small limited area mezzanine.

PROJECT DESCRIPTION

The proposed work involves a small single storey extension to the existing building.

BASIS OF REPORT

This assessment has been based on the drawings forming Appendix 1 of this report and a site visit undertaken on the 14th of March 2016.

PART 1: GENERAL

Risk group

The primary risk group for the existing building is CA.

Design occupancy

The design occupancy for the building is as follows;

Design Occupancy			
Activity	Occupant Density (m²/ person)	Approx. Floor Area (m²)	Occupant Load
Stage / Chapel	1.1	150	137
Library / store	10	18	2
Hall	Used by persons counted elsewhere		0
Lounge (bible class)	2	48	24
Ancillary areas	Counted elsewhere		0
Building Total			161

PART 2: FIRECELLS, FIRE SAFETY SYSTEMS AND FIRE RESISTANCE RATINGS**Escape height**

The escape height is less than 4m due to the slightly sloping nature of the site.

Fire safety systems

When considering Part 2 of C/AS4, a Type 2 manual fire alarm system is required throughout the building and one is currently present.

A fire hydrant system is not required as the fire service hose run distance will be less than 75m to any point of the building.

PART 3: MEANS OF ESCAPE

Number of escape routes

The multiple escape routes from the building are indicated on the attached plan and are considered to satisfy the requirements of the Acceptable Solutions.

Escape route width

The minimum egress width required for the individual escape routes are listed in the table below;

Minimum escape route clear widths required			
Escape type	Non accessible escape routes and occupants less than 50 persons	Non accessible escape routes and occupants more than 50 persons	If accessible route in accordance with NZS 4121
Horizontal escape routes (corridors, within rooms, passageways etc)			
Non-fire rated ¹	700mm	850mm	1200mm
Vertical escape routes (stairs, ramps etc)			
Non-fire rated ¹	850mm	1000mm	1100mm
Doors (minimum clear width)			
Clear opening width for all other doors ²	600mm	600mm	760mm
Notes:			
1. The escape width may have minor projections such as handrails, signs, switches, fire alarm sounders. Handrails shall not project more than 100mm into the escape route width.			
2. Where the door is a double door, each leaf shall be no less than 500mm wide.			

The required combined egress width of 1127mm (161 persons x 7mm per person) is also satisfied even when the largest (double door exit) is discounted as the front and side single exit have a combined clear egress width of 1430mm.

Escape route length

The following are the allowable and actual worst case escape distance from the building.

Allowable Escape Distance		
	D.E.O.P	T.O.P
CA	20m	50m
Actual Escape Distance		
	D.E.O.P	T.O.P
Ground	23m	31.5m
Mezzanine	16.5m	Say N/A

The actual escape distances are within the allowable maxima.

Doors on escape route

Any new exit door locks shall;

- be clearly visible,
- located where such a device would be normally expected,
- designed to be easily operable from the inside in an emergency without the use of a key or other security device,
- allow the door to be opened in a normal manner

Signage

Illuminated exit signs shall be provided to satisfy the requirements of clause F8/AS1 as indicated on the attached plans.

Emergency lighting

Emergency lighting shall be provided in accordance with clause F6/AS1 as indicated on the attached plans.

PART 4: CONTROL OF INTERNAL FIRE AND SMOKE SPREAD**Mezzanine**

The existing mezzanine floor is approximately 20m² and the ground floor is approximately 420m², this gives a mezzanine coverage of 5% which satisfies the requirements of the Acceptable Solutions.

The underside of the mezzanine and its support structure is considered to satisfy the 30/30/30 FRR requirements as nearly as is reasonably practicable considering the cost to reline the entire underside and support structure as well as the interruption that would take place would well out way the benefits achieved. The mezzanine floor itself is small and intermittently used as a break out space and has existing plasterboard linings.

Interior surface finishes*Ceilings and walls*

Any new internal surface finishes on ceilings and walls of the new extension are required to satisfy the group number requirements of Table 4.1 of C/AS4 as summarised below.

Surface Finishes	
Location	Group Number
Public access areas	2S or less
All other occupied spaces	3 or less

Please refer to Appendix 2 for Resene paint test information which may be used to satisfy the above requirements.

The existing surface finishes comply with requirements at the time they were installed. They are gypsum plasterboard that is painted. Although it cannot be shown what Group Number the existing surface finishes achieve, there is no intention to carry out building work on these areas and painted GIB Board usually satisfies the above requirements. Therefore the existing surface finishes are considered to satisfy the requirements of the NZBC to at least the same extent as before the proposed works.

Suspended flexible fabrics

Any new suspended flexible fabrics (curtains etc) within the building shall have a flammability index of no greater than 12 when tested to AS 1530 Part 2. This information may be obtained from the fabric manufacturer.

Flooring

Any new flooring (such as carpets etc) within the building shall be non-combustible or satisfy the requirements summarised below;

Critical Radiant Flux Requirements for Flooring	
Area of Building	Minimum Critical Radiant Flux When Tested to ISO 9239-1
Throughout building	2.2kW/m ²

This information may be obtained from the manufacturer of the respective floor coverings.

PART 5: CONTROL OF EXTERNAL FIRE SPREAD

External walls

The proposed extension is to be located remote from the boundary on the eastern side and hence this wall can be 100% unprotected.

The northern external wall of the proposed extension will be minimum 3m away from the boundary and can therefore be 25% unprotected when considering Table 5.2, C/AS4. The proposed unprotected opening area on the northern wall is approximately 4.3m² and the wall itself is 18.9m² (3m x 6.3m) which gives a unprotected percentage of 23%. This satisfies the requirements of Table 5.2. The remainder of this wall is required to be fire rated from the inside to 120/120/120 FRR up to the underside of the roof cladding.

Largest unprotected area(s)

The proposed openings have a combined area of 4.3m² including the area in between them and therefore satisfies the requirements of Table 5.3, C/AS4.

Post fire stability

The northern wall of the new extension shall be designed by a Structural Engineer to satisfy the post-fire stability requirements of clause B1 – Structure of the NZBC.

PART 6: FIRE FIGHTING

Fire service vehicular access will be available within 18m of the building and this satisfies the requirements of Part 6, C/AS4.

FIRE SAFETY INSPECTIONS

Any fire safety inspections required as part of the Building Consent can be carried out by the Building Consents Authority. There are no specific inspections required to be carried out by the Fire Engineer.

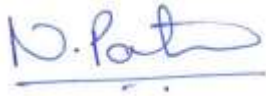
COMPLIANCE SCHEDULE

The proposed emergency lighting and illuminated exit signage shall be installed, maintained and inspected in accordance with AS/NZS 2293.3:1995 and clauses F6/AS1 and F8/AS1 of the NZBC.

SUMMARY

1. Any new exit door locks shall satisfy the requirements of the Acceptable Solutions as outlined in this report.
2. Illuminated exit signage shall be provided in accordance with clause F8/AS1 as indicated on the attached plan.
3. Emergency lighting shall be provided over the mezzanine stairs in accordance with clause F6/AS1.
4. All new interior surface finishes (paints etc) on ceilings and walls within the building shall comply with the requirements of this report.
5. Any new suspended flexible fabrics (curtains etc) within the building shall have a flammability index of no greater than 12 when tested to AS 1530 Part 2.
6. All new floor coverings within the building shall be non-combustible or satisfy the critical radiant heat flux requirements as outlined in this report.
7. The northern external wall of the new extension (except for the proposed windows) shall be fire rated from the inside to 120/120/120 FRR up to the underside of the roof cladding.
8. The northern external wall of the new extension shall be designed by the Structural Engineer to satisfy the post fire stability requirements of clause B1 – Structure of the NZBC.

Report Prepared by
Vishnu Fire Safety Limited

A handwritten signature in blue ink, appearing to read 'N. Patel', is written over a horizontal line.

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APPENDIX 1

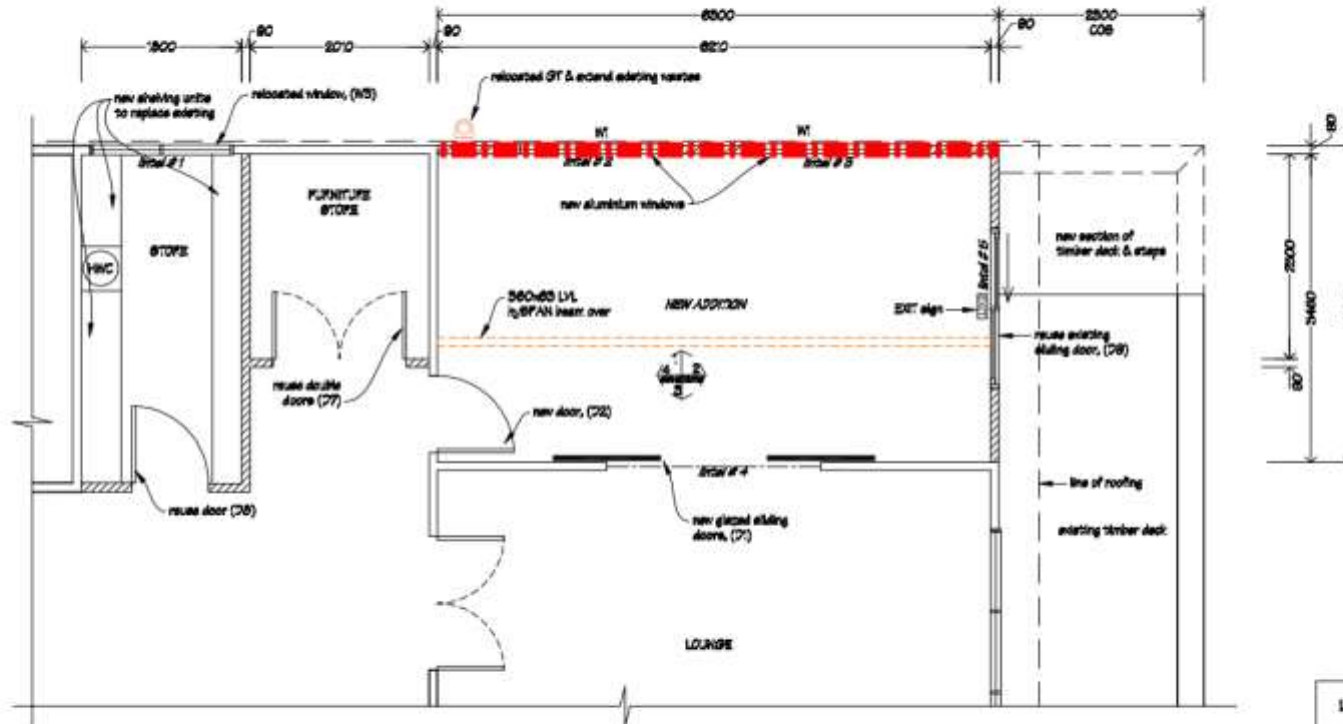
DRAWINGS





Fire rate wall (except the glazing) from inside to 120/120/120 FRR up to the underside of the roof cladding

KEY
New timber framed valie



LVL TIMBER LINTEL SCHEDULE		
Lintel Number	Span	LVL Lintel Size
1	1.8m	180x45 1/2 SPAN LVL
2	1.8m	180x45 1/2 SPAN LVL
3	1.8m	180x45 1/2 SPAN LVL
4	2.4m	210x45 1/2 SPAN LVL
5	1.8m	210x45 1/2 SPAN LVL



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Titahi Bay Gospel Chapel
25 Mana Avenue
Titahi Bay

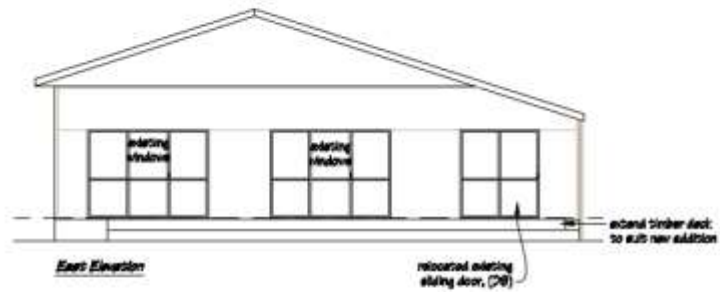
Project Addition
& Interior Alterations

Part Floor Plan

Drawn by Ian Rattray

Scale 1:50
Date 16/12/15
Original sheet size A3
Drawn 5.11
Sheet No 4 of 8

Pricing/Building Consent
Drawings
Do not scale from drawings.
Check all dimensions on site.



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Titahi Bay Gospel Chapel
25 Maria Avenue
Titahi Bay

Project
Addition &
Interior Alterations

25/09/2014
Proposed Exterior
Elevations

Drawings
Mr. John Thompson

Scale 1:200
Date 18/07/14
Original sheet size A3
Drawn S.T.
Sheet No 18 of 18

Pricing/Building Consent
Drawings
Do not make from drawings.
Check all dimensions on site.

APPENDIX 2

RESENE PAINT TEST INFORMATION

Resene Paint Systems - Fire Ratings



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 C/VM2 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 sqm/L)	Resene SpaceCote Low Sheen (SR 15 sqm/L)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10 sqm/L)	Resene SpaceCote Flat (SR 15 sqm/L)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10 sqm/L)	Resene Zylone Sheen (SR 15 sqm/L)	1-S (NZBC) 1 (NCC)	FH4967
10mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10 sqm/L)	Resene Ceiling Paint (SR 12 sqm/L)	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 sqm/L)	Resene ClinicalCote Satin (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 11 sqm/L)	Resene ClinicalCote Low Sheen (SR 15 sqm/L)	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 & Seal (SR 6 sqm/L)	Resene ClinicalCote Satin (SR 14 sqm/L)	1-S (NZBC) 1 (NCC)	FH4925
13mm Paperfaced Plasterboard	Resene Broadwall Surface Prep & Seal (SR 6 sqm/L)	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 sqm/L)	1-S (NZBC) 1 (NZBC)	FAR3981
13mm Paperfaced Plasterboard	Resene Broadwall Waterborne Wallboard Sealer (SR 10 sqm/L)	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 Uracryl 802 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139*
6mm Fibre Cement Board	Resene Quick Dry (SR 12 sqm/L)	Resene Uracryl 803 (SR 16 sqm/L)	1-S (NZBC) 1 (NCC)	FH5139*
6mm Fibre Cement Board	Resene Sureseal (SR 12 sqm/L)	Resene Uracryl 802 (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

Notes:

Test reports give the Group rating determined by application of a paint system to a given substrate thickness. The same Group rating applies to the paint system applied to greater thicknesses of the substrate given in the test report.

The Group rating of a given substrate coated with a standard 3 coat acrylic paint system will be the same as the uncoated substrate.

FH5139*

It is considered that the resulting Group Classifications achieved by paint systems on fibre cement substrates would not be adversely affected if applied to a concrete substrate. Paint system applied at coverage rates not less than the minimum specified for the fibre cement substrate.

31 Jan 2014