



Fire Safety Design Report



New Toilet Block Extension

**Wainuioru Primary School
Corner Westmere & Stronvar Roads
Masterton District**

Reference	Revision	Date	Comment
16086R01	-	28 th July 2016	

INTRODUCTION

This assessment has been undertaken in order to review the proposed toilet block extension to the existing Wainuioru Primary School building at the corner of Westmere and Stronvar Roads, Masterton District 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), 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 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 not have more than 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” and it is important that the owners understand their legal 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

Wainuioru School is a relatively small primary school based in the rural area of Wainuioru, Masterton District. It has a single teaching block with four classrooms, admin area, resource and staffroom. The building is single storey and of timber frame construction.

PROJECT DESCRIPTION

The proposed work is limited to a small toilet block extension to the teaching block.

BASIS OF REPORT

This assessment has been based on the drawings forming Appendix 1 of this report as well as a site visit undertaken on the 28th of July 2016.

PART 1: GENERAL

Risk group

The principal risk group for the building is CA in accordance with Table 1.1, C/AS4.

Design occupancy

The school has a current occupancy of 85 students, 6 teachers, 2 admin staff and 1 principal giving a total occupancy of 94 persons.

The design occupancy based on C/AS4 is considered to be;

Classrooms 250m² approx. / 2.5m² per person = 100 persons

Admin area 33m² approx. / 10m² per person = 4 person

Ancillary areas (counted elsewhere) = 0 persons

Total = 104 persons

The design occupancy is more than actually occurs however will be used for the purposes of this assessment.

PART 2: FIRECELLS, FIRE SAFETY SYSTEMS AND FIRE RESISTANCE RATINGS

Escape heights

The existing building is single storey.

Fire safety systems

A Type 2 manual fire alarm system is required within the building and currently a Type 2 manual fire alarm systems is present with supplementary heat and smoke detection. The Type 2 manual fire alarm system shall be extended within the proposed toilet block as required in accordance with the version of NZS 4512 to which the base system was installed.

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

PART 3: MEANS OF ESCAPE

Number of escape routes

The building has a number of escape routes which terminate at a safe place (outside) as indicated on the attached plan, and this satisfies the requirements of the Acceptable Solutions.

The existing rear exit from the northern classroom shall be relocated as indicated on the attached plan to ensure two means of escape continue to be available from the classroom.

Escape route width

The clear egress width from the altered area is required to be a minimum of 850mm for horizontal travel (1200mm along the accessible route and 760mm through doorways) in accordance with C/AS4.

Escape route length

The following are the allowable and actual worst case escape distance from the altered area of 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
Worst case	4.5m	21m

The actual escape distances are within the allowable maxima.

Signage

Non-illuminated exit signs are provided along the escape routes in accordance with clause F8/AS1. No exit signs are required within the proposed toilet block extension. A non-illuminated exit sign shall be provided over the new rear exit door of the northern classroom in accordance with clause F8/AS1.

Emergency lighting

In accordance with clause F8/AS1 emergency lighting is not required as the escape distances to the nearest exit do not exceed 20 metres and there are no changes in level within the building.

PART 4: CONTROL OF INTERNAL FIRE AND SMOKE SPREAD

Interior surface finishes

Any new internal surface finishes (paints etc) on ceilings and walls are required to satisfy the group number requirements of Section 4.17.7, C/AS4.

Surface Finishes	
Location	Group Number
> 1.2m off the ground	2S or less
< 1.2m off the ground	3 or less

Please refer to Appendix 2 for the Resene Paint Test data which may be used to satisfy the above requirements.

Flooring

The proposed flooring (carpet, vinyl etc) shall have a critical radiant heat flux of not less than that specified in Table 4.2 of C/AS4 being 2.2 kW/m². This information can be obtained from the flooring manufacturer.

Suspended flexible fabrics (curtains etc)

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

PART 5: CONTROL OF EXTERNAL FIRE SPREAD

The proposed extension is remote from the boundaries and therefore the external walls may be 100% unprotected.

FIRE SAFETY INSPECTIONS

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

COMPLIANCE SCHEDULE

There are no changes proposed to the existing compliance schedule issued for the building.

MINISTRY OF EDUCATION FIRE SAFETY AND DESIGN GUIDELINES

The following describes additional fire safety recommendations of the Ministry of Education (M.o.E) for state schools. These recommendations are derived from the recently issued Ministry of Education Fire Safety and Design Guidelines for Schools July 2008, and where

these requirements exceed those of the building code these have been identified as M.o.E requirements, and the decision as to whether these are to be incorporated or not, is a decision for the school board of trustees.

Means of escape

There are a minimum of a single means of escape from each space having less than 50 persons which satisfy the M.o.E guidelines.

Fire fighting facilities

The guideline require fire service vehicle stand areas to be provided within 18 metres from the building to be protected and this requirement is satisfied.

There is no requirement to provide fire hose reels. Note however that the NZFS may require provision of portable multi-purpose dry-powder fire extinguishers (for combined fire classes A, B and E) under regulation 10 of the Fire Safety and Evacuation Regulations 1992. Discuss the provision of appropriate portable fire extinguishers, including training in their use, with the NZ Fire Service.

Fire alarm

The M.o.E requires that the existing manual fire alarm system be retained and altered if required to suit the alterations in accordance with the version of NZS 4512 to which the base system was installed.

Sprinklers

The existing block is not classed as a new school nor is the extension resulting in the block exceeding 1000m², and therefore there is no requirement to provide sprinklers in accordance with the other M.o.E Guidelines.

Building separations

For buildings of single storey construction, the M.o.E guidelines require a building separation of not less than 6m from other buildings on the school site. Separation is to be measured from the maximum point of eaves overhang. The existing building satisfies this requirement.

Surface finishes

New surface finishes should meet the requirements of the NZBC as specified above and therefore will satisfy the M.o.E requirements.

Fire separations

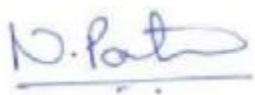
Except where sprinklered, school buildings are required to be subdivided with 60 minute fire separation so as to create a maximum firecell size of three classrooms. The existing building has four classrooms and is considered to comply to at least the same extent as before.

SUMMARY

1. The School Board of Trustees and the Ministry of Education are to approve the fire safety proposals as specified in this report.
2. The Type 2 manual fire alarm system shall be extended if required within the proposed addition in accordance with the version of NZS 4512 to which the base system was installed.
3. Provide a rear exit from the northern most classroom.
4. The clear egress width from the altered area is required to be a minimum of 850mm for horizontal travel (1200mm along the accessible route and 760mm through doorways) in accordance with C/AS4.
5. A non-illuminated exit sign shall be provided over the new rear exit door of the northern classroom in accordance with clause F8/AS1.
6. Any new interior surface finishes (paints etc) on ceilings and walls shall comply with the requirements of this report.
7. Any new flooring (carpet, etc) shall have a critical radiant heat flux of not less than that specified in this report.
8. Any new suspended flexible fabrics (curtains etc) shall have a flammability index of no greater than 12 when tested to AS 1530 Part 2.

Report Prepared by

Vishnu Fire Safety Limited



Nirav Patel

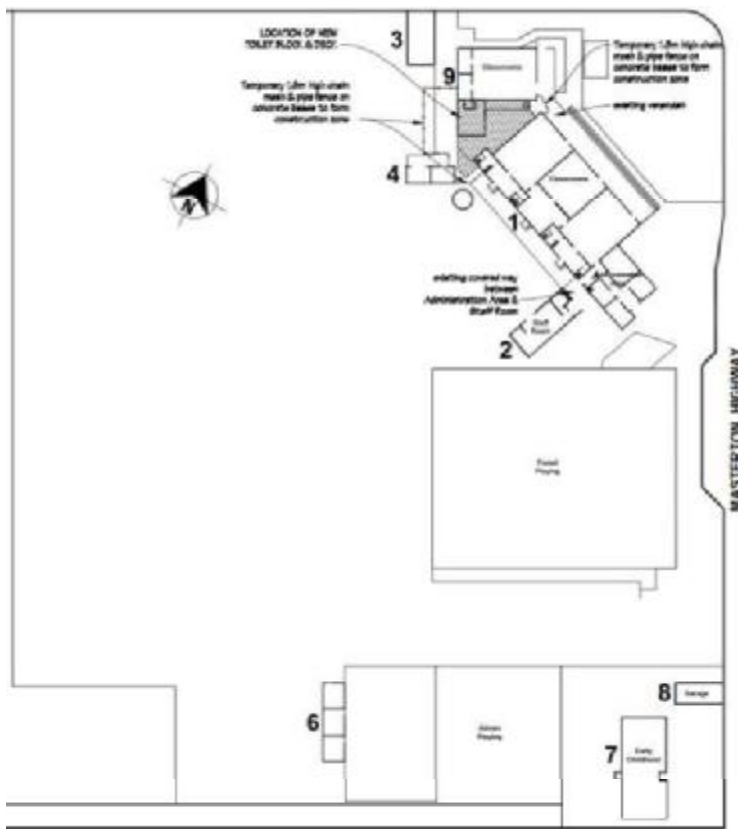
Fire Engineer / Director

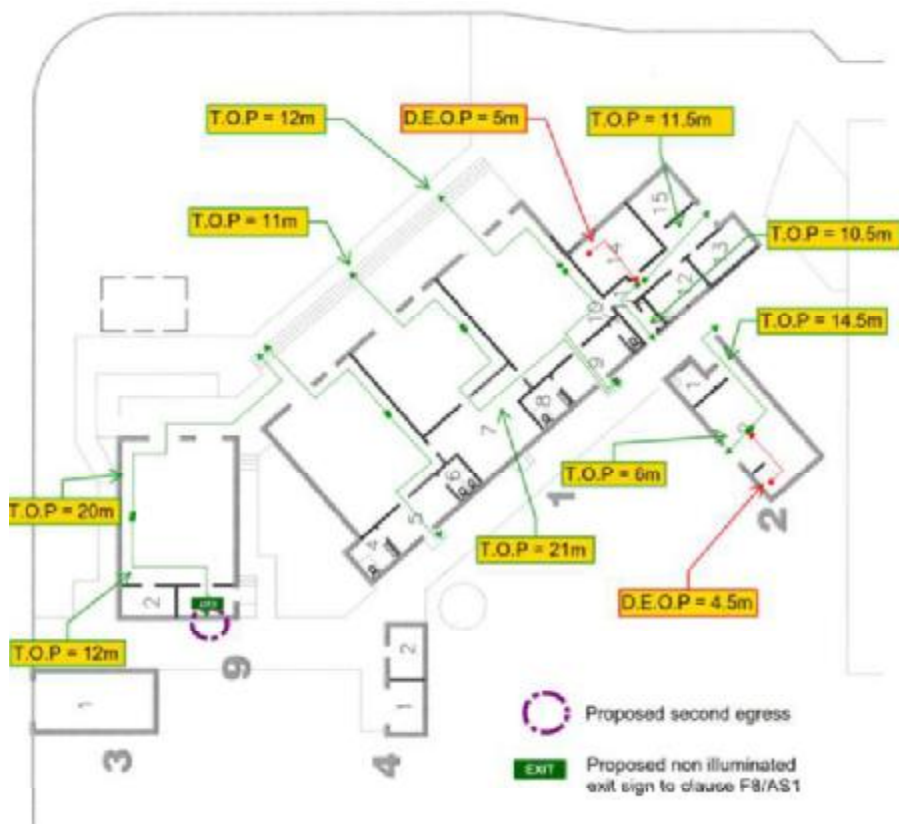
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APPENDIX 1

DRAWINGS





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*
6mm 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