



Fire Safety Design Report



Alterations to Blocks S & TO

St Mary's School
3 Stephenson Street
Blenheim

Reference	Revision	Date	Comment
16114R01	-	7 th September 2016	

INTRODUCTION

This assessment has been undertaken in order to review the proposed alterations to the existing classroom Blocks S & TO at St Mary's School, 3 Stephenson Street, Blenheim 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 Section 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

The existing school blocks S & TO at St Mary’s School are single storey and of timber frame construction.

PROJECT DESCRIPTION

The proposed work is limited to;

Block TO

Foundation upgrade to improve it’s seismic performance.

Block S

Minor removal of some existing partitions.

Replacement of existing door.

BASIS OF REPORT

This assessment has been based on the drawings forming Appendix 1 of this report.

PART 1: GENERAL**Risk group**

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

Design occupancy

The design occupancy for each of the two blocks are calculated below in accordance with Table 1.2, C/AS4.

Design Occupancy – Block TO			
Activity	Occupant Density (m / person)	Approx. floor area (m)	Occupant load
Classroom 5	2	132	66
Classroom 13	2	75	38
Classroom 14	2	78	39
Classroom 15	2	88	44
Office	10	10	1
Resource	10	15	2
Store	100	22	1
Ancillary areas	Used by persons counted elsewhere		0
Design Total			*
Design Occupancy – Block S			
Activity	Occupant Density (m / person)	Approx. floor area (m)	Occupant load
Classroom 3,5	2	162	81
Library	7	77	11
Teachers workroom	10	39	4
Resource	10	16	2
Store	100	28	1
Ancillary areas	Used by persons counted elsewhere		0
Design Total			*

* The calculated design occupancy is well in excess of which 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 buildings are single storey.

Fire safety systems

A Type 2 manual fire alarm system is required within each building and currently a Type 2 manual fire alarm systems is present. The Type 2 manual fire alarm system shall be altered if required to suit the proposed alterations 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 buildings.

PART 3: MEANS OF ESCAPE

Number of escape routes

The blocks have multiple escape routes which terminate at a safe place (outside) as indicated on the attached plans, and this satisfies the requirements of the Acceptable Solutions.

Escape route width

The clear egress width from the altered areas are 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
Block T,O	8m	29m
Block S	7m	17.5m

Signage

Non-Illuminated exit signs shall be provided above the exit doors as indicated on the attached plans 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.

PART 4: CONTROL OF INTERNAL FIRE AND SMOKE SPREAD**Interior surface finishes**

Any new internal surface finishes (paints etc) on ceilings and walls within the proposed classroom 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

New flooring (carpet, vinyl etc) if any 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) if any 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

N/A, however the blocks are 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

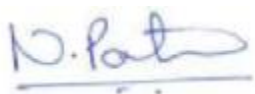
There are no changes proposed to the existing compliance schedule issued for the building.

SUMMARY

1. The Type 2 manual fire alarm system shall be altered if required to suit the proposed alterations in accordance with the version of NZS 4512 to which the base system was installed.
2. 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.
3. Non - illuminated exit signs shall be provided above the exit doors as indicated on the attached plan in accordance with clause F8/AS1.
4. Any new interior surface finishes (paints etc) on ceilings and walls shall comply with the requirements of this report.
5. Any new flooring (carpet, etc) shall have a critical radiant heat flux of not less than that specified in this report.
6. 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



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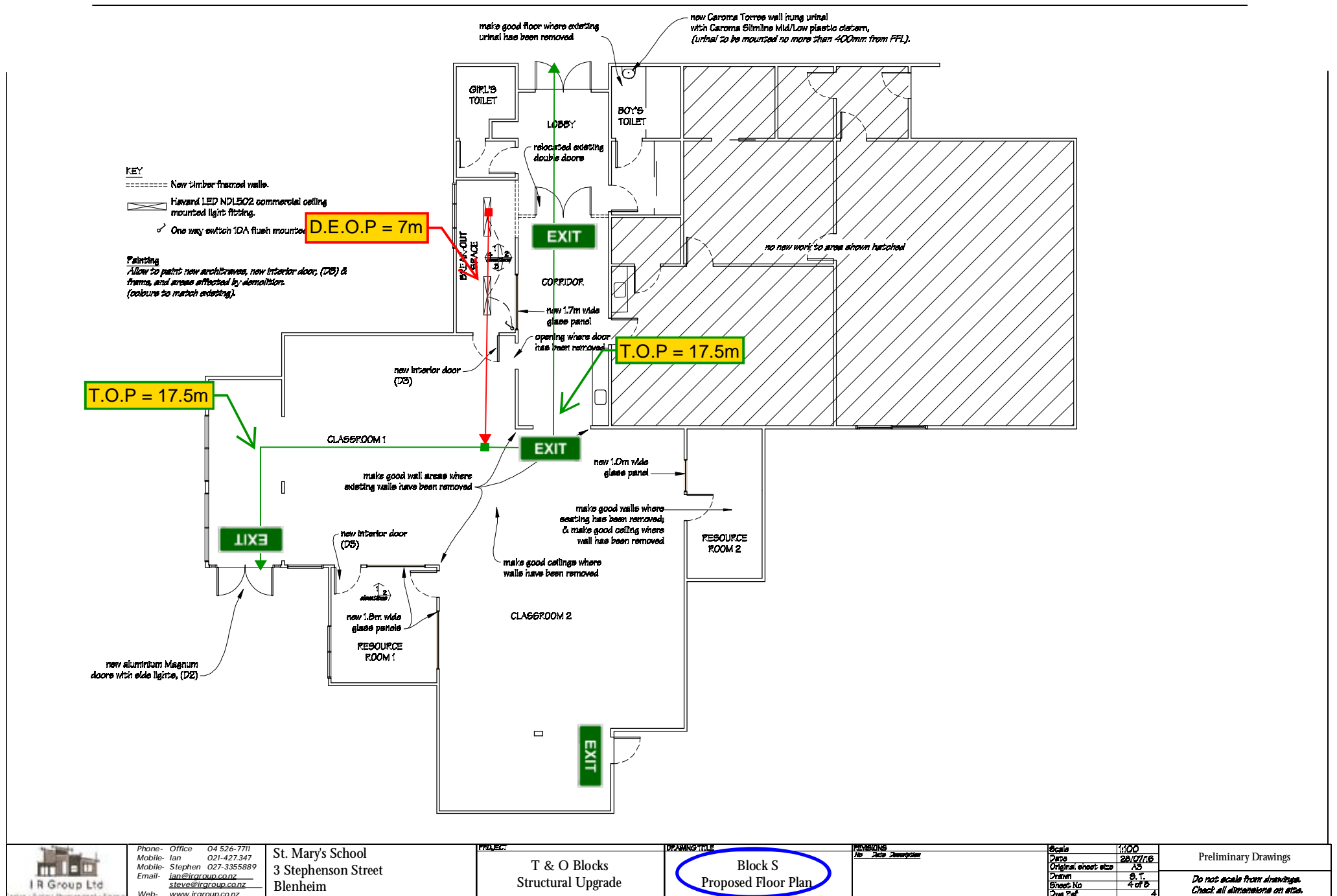
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APPENDIX 1

DRAWINGS



D.E.O.P = 8m

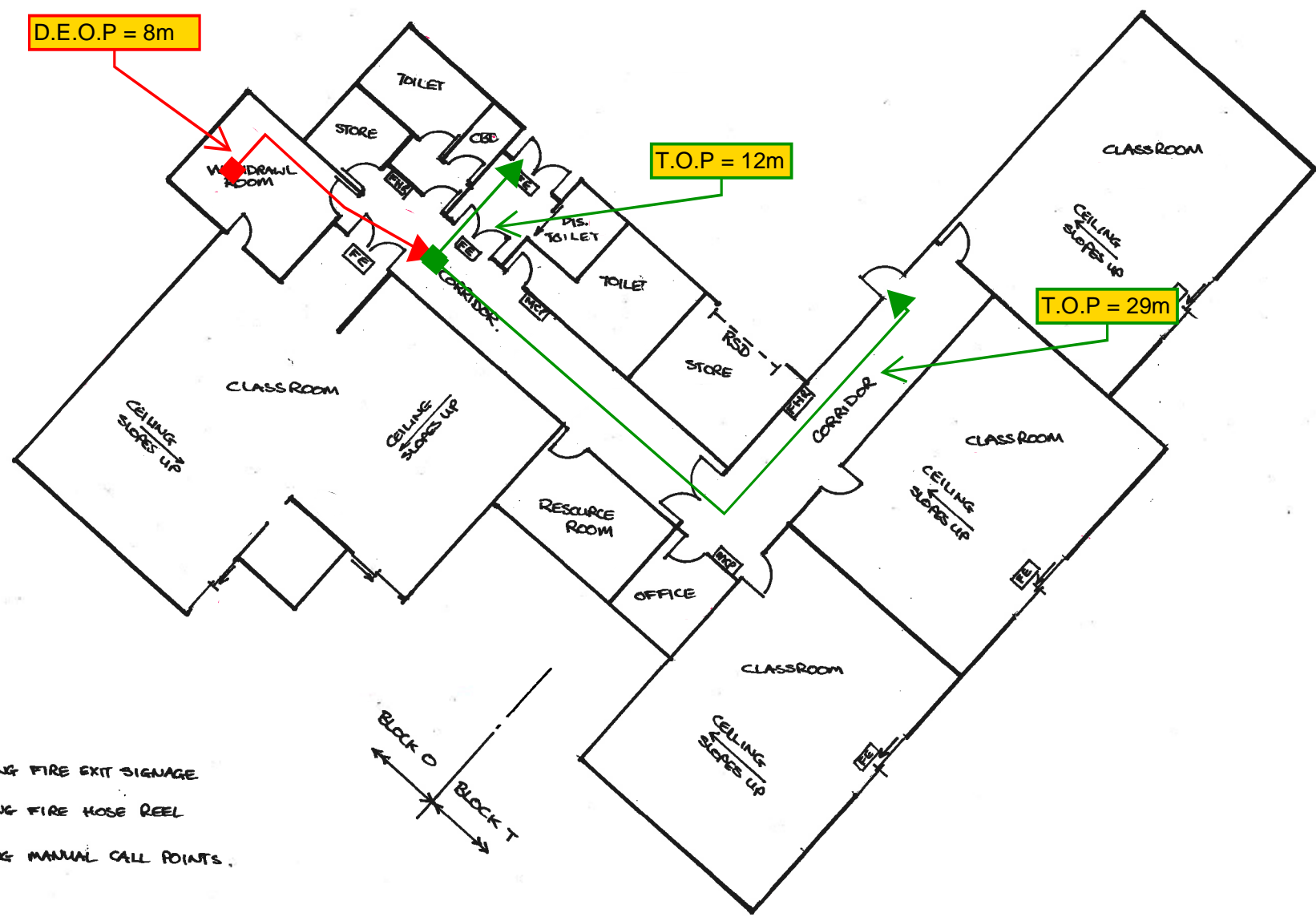
T.O.P = 12m

T.O.P = 29m

- [FE] EXISTING FIRE EXIT SIGNAGE
- [FHR] EXISTING FIRE HOSE REEL
- [MCP] EXISTING MANUAL CALL POINTS

BLOCK O
BLOCK T

PLAN BLOCK T & O
(N 1:125)

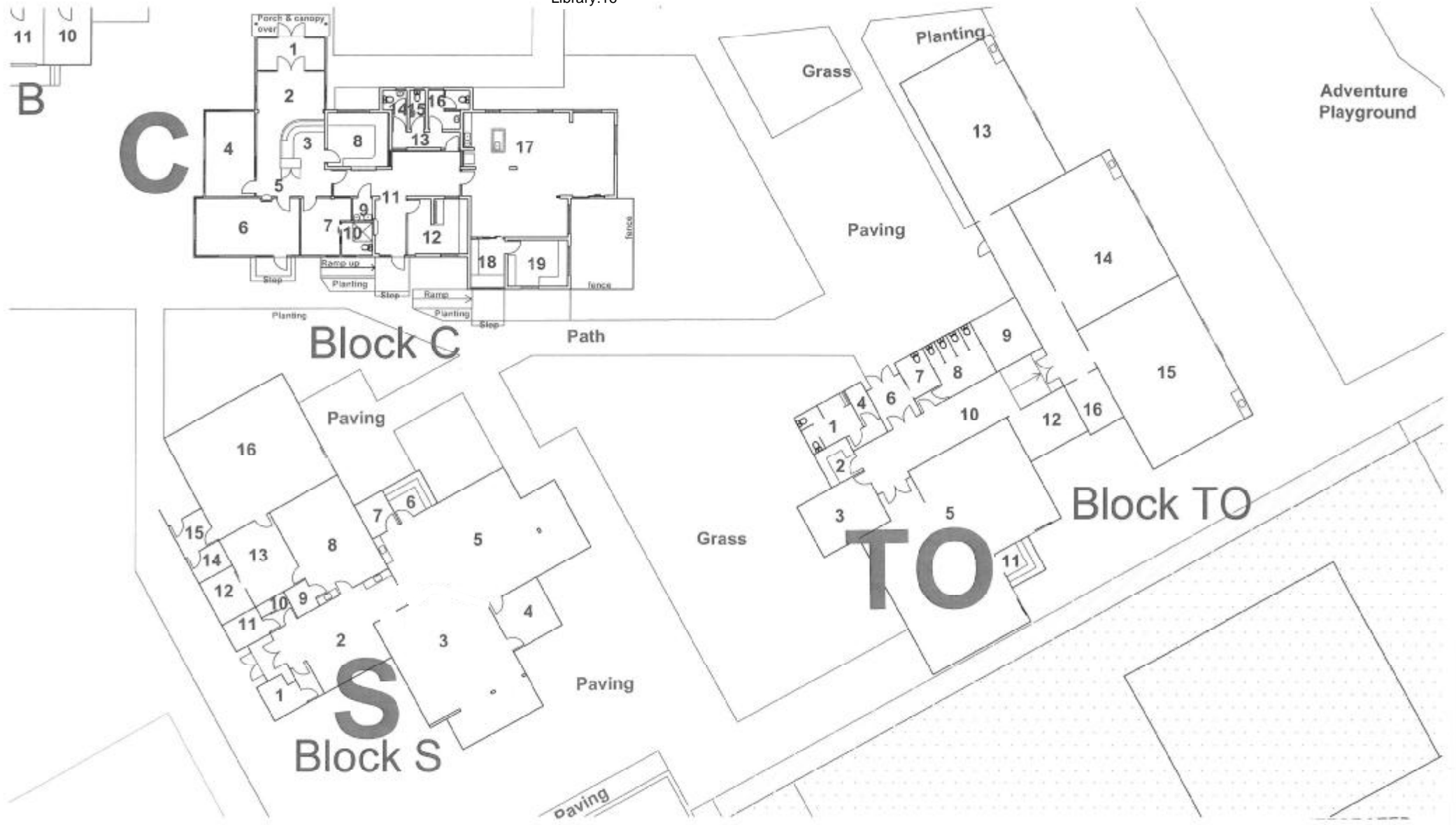


Block S

Classrooms: 3,5
Withdraw room: 13
Teachers workroom: 8
Resource: 4, 9
Store: 7
Cloakroom, lockers:14,15
Toilets: 1, 11
Library:16

Block T/O

Classrooms: 5,13,14,15
Withdraw room: 3
Office: 16
Resource: 12
Store: 2, 4, 9
Toilets: 1, 7, 8



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