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NEW PLUNKET ROOMS

LINDEN AVENUE
TAWA

TAWA / LINDEN PLUNKET

VERSION A

17 DECEMBER 2014

113092FES01A.DOC



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ISSUE AUTHORISATION

Project: New Plunket Rooms, Linden Ave

Project No. 113092

Version	Date	Status	Written	Reviewed
A	17 December 2014	For Consent	TOB	MCH

Version	Extent of revision

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The building owner must be aware that the fire safety solutions described in this report address the requirements of the Building Code. Consideration of protection of the building owner's property is not included unless this has been specifically requested.



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1 PURPOSE

The purpose of this report is to determine the minimum fire safety precautions that must be installed within the proposed Plunket Building in Tawa, Johnsonville to demonstrate compliance with Section 17 of the New Zealand Building Act 2004 with respect to the fire regulations.

This is a legal requirement whereby it must be shown that after the completion of works, the objectives of clauses of the New Zealand Building Code relating to means of escape from fire, protection of other property, and structural and fire rating behaviour are satisfied.

This Fire Safety Strategy Report includes a performance based Scope of Works advising of fire safety issues affecting architecture, building services and structure in accordance with the requirements of the New Zealand Building Code.

As such this report is a performance document that is intended to be used by the Architect and other consultants in implementing their detailed designs and preparing their working drawings and specifications. The consultants whose documentation is required to incorporate the requirements of this Fire Safety Strategy Report are expected to have read this report, understood the implications as it affects their scope of work and have incorporated the relevant fire safety requirements into their drawings and specifications.

This is not a 'For Construction' document, and shall be read in conjunction with all other appropriate project design documents (drawings, specifications, and other documents) prepared by the other design disciplines.

2 DESIGN PHILOSOPHY

To demonstrate compliance with the relevant fire safety clauses of the Building Code, the following Compliance Documents have been adopted as the design basis:

1. C/AS4 –Acceptable Solution for Buildings with Public Access and Educational Facilities, Risk Group CA, Amendment 3, 1 July 2014.

The basis of this design is built on the assumption that no sleeping activities are planned in the proposed building. The solutions proposed in this report does not allow for sleeping activities.

2.1 Fire Service Design Review Unit

In accordance with section 46(1) of the Building Act 2004 some kinds of applications for Building Consent must be provided to the New Zealand Fire Service Commission for review by the Fire Service Design Review Unit.



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The proposed fire engineering design solution contained herein establishes compliance in accordance with the provisions of an applicable compliance document, does not involve a modification or waiver of clauses C1–6, D1, F6 or F8 of the Building Code, under section 67 of the Building Act, and does not involve other than minor alterations to the fire safety systems, therefore under Clause 2 of the Gazette we believe this application need not be forwarded to the Fire Service Design Review Unit.

3 GENERALLY

The proposed building is a single level construction and the main use is to provide facilities for child health care services. There is an existing house (risk group SM/SH) on the same title and the two buildings are under common ownership.

3.1 Proposed works

The proposed works consists of the construction of a new building in compliance with the Acceptable Solutions. The building will be used as a child healthcare facility. As the occupant load of the spaces does not exceed 50 no fire alarm system is required under C/AS4.

4 SCOPE OF WORKS

We believe that the proposed new Plunket Building will be in compliance with the objectives of the New Zealand Building Code to the extent required by the Building Act, based on implementation of the following Scope of Works. This shall be read in conjunction with the attached Fire Safety Sketches.

4.1 Active Fire Safety Systems

- 4.1.1 A new manual fire alarm system is proposed to be installed throughout the building in accordance with NZS 4512.

4.2 Means of Escape and Wayfinding

- 4.2.1 All locking devices on doors on escape routes shall be clearly visible, located where such a device would normally be expected, designed to be easily operated without a key or other implement and allow the door to open in a normal manner.
- 4.2.2 Doors on escape routes that are fitted with electronic locking devices shall also be fitted with a push button or switch that releases the lock and allows the door to be opened (in the direction of escape) without a swipe card or key code, unless the doors act under free handle. This push button or switch may be placed behind a break-glass panel but must be clearly labelled "Emergency door release". Electromechanical locks that are not free handle are required to unlock (fail safe/open) in the event of power failure or door malfunction.



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- 4.2.3 Escape routes shall comply with NZBC D1. Stairs, landings, handrails, doors, vision panels and openings shall comply with the Acceptable Solution D1/AS1.
- 4.2.4 Emergency lighting is required to be installed within the building in accordance with F6/AS1.
- 4.2.5 Exit signage is required to be installed throughout the building in accordance with F8/AS1 (note that F8/AS1 4.5.1 permits signs to be internally illuminated, externally illuminated or photoluminescent).

Indicative locations of exit signs are shown on the attached plans; however these do not take account of possible obscuration due to the installation of storage racks, plant, furniture and other fittings and therefore should not be assumed to depict all required signs.

- 4.2.6 Fire related safety features within the building are required to be provided with signage in accordance with F8/AS1. This includes signs to door release buttons or switches.

4.3 Control of Internal Fire and Smoke Spread

- 4.3.1 Primary supporting structures for all fire rated elements are required to achieve a fire resistance rating of not less than 120/-/- under the design dead and live loads required by NZBC B1 and any additional loads caused by the fire (e.g. from deformations/elongations of building elements due to elevated temperatures).

The structural engineer is required to identify the supporting structure for all fire rated elements and these are in turn required to be suitably fire rated or demonstrated by calculation to not require treatment.

Fire rated walls may be cantilevered from a structural base having a FRR of no less than the building element concerned, or be supported by primary elements outside the firecell.

- 4.3.2 Throughout the building the internal surface finishes shall meet the following early fire hazard indices limitations (when tested to ISO 9705 as per C/VM2 Clause A1.2, or ISO 5660 as per C/VM2 Clause A1.3).

Building Elements	Location	Maximum Material Group
Ceilings and walls	All occupied spaces	2S
HVAC ducts	Internal surfaces	1S
	External surfaces	3



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4.3.3 Any foamed plastic building materials or exposed combustible insulating materials forming part of a wall, ceiling or roof system are required to have a completed system (foamed plastic and/or foamed plastic plus a surface lining) meeting the above maximum material group number as applicable for the location of this building material. In addition the foamed plastic is to meet the flame propagation criteria as specified in AS 1366. It is strongly recommended that foamed plastic materials are not used.

4.3.4 The flooring shall meet the following critical radiant flux limitations (when tested to ISO 9239-1).

Area of Building	Minimum Critical Radiant Flux [kW/m ²]
All occupied spaces	1.2

4.3.5 Within the building any suspended flexible fabrics shall have a Flammability Index of no greater than 12 (when tested to AS 1530.2).

4.3.6 Flexible fabrics used as underlay to roofing or exterior cladding that is exposed to view, shall have a flammability index of no greater than 5 (when tested to AS 1530.2).

4.3.7 Any downlights shall be designed and installed to C/AS4 Part 7 and the manufacturer's requirements.

4.4 Control of External Fire Spread

4.4.1 In general the south and east boundary walls are required to achieve a FRR of no less than (120)/120/120sm. The windows shown in the façade are permitted to be non fire rated as they are within the total permitted unprotected areas.

The scope of works above lists the fire safety precautions needed for compliance with the fire safety requirements of the Building Code, this scope of works should be read with the plans appended to this report. Information contained within the following sections of this report is technical information intended to assist in the approvals process only.



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5 MEANS OF ESCAPE

5.1 Risk Groups and Occupant Loads

The following is a summary of the design occupancies and risk group classifications within the building.

Table 1: Summary of Risk Groups and Occupant Loads

Level	Description	Risk Group	Area [m ²]	Occupant Density [m ² /person]	Occupant Load
G	PINS/meeting room	CA/WB	42	2.5	17
G	Toy Library	CA	45	7	6
G	Waiting Area	CA	16	10	2
G	Clinic 1&2	CA	28	5	6
G	Store room 1&2	WB	10	100	1
	Total				32

Explanatory Note:

1. Kitchen, ablution and circulation areas are not included to avoid duplication.

The above occupant loads are based upon the methods recommended in the Acceptable solutions C/AS1 to C/AS7.

5.2 Fire Safety Precautions and Fire Resistance Ratings

The following summarises the fire safety precautions for the building from C/AS1 to C/AS7.

Table 2: Fire Safety Systems Required

Risk Group	Occ. Load	Escape Height [m]	Systems	Notes
CA	<100	<4	2 ¹ , 18 ²	

Explanatory Notes:

1. Not required where the escape routes serve no more than 50 people (in a single level building where the Risk Group is CA, WB).



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2. Not required where Fire Service hose run distance from the point of Fire Service vehicular access to any point on any floor is less than 75 m.

Table 3: Fire Resistance Ratings Required

Risk Group	Life Rating [min]	Property Rating [min]
CA	60	120

Given the above the proposed fire safety features are shown below with comparison to the requirements of C/AS4.

Table 4: Proposed Fire Safety Precautions

Feature	C/AS4 Requirement	Existing/Proposed Features
Fire Rating	(60)/60/60 between firecells.	(60)/60/60 between firecells. The building is considered a single firecell.
Alarm System	A manual fire alarm system.	A manual fire alarm system.
Visibility in Escape Routes	Emergency lighting fixtures to be provided in accordance with F6/AS1.	Emergency lighting fixtures to be provided in accordance with F6/AS1.
Fire Hydrant System	Not required as Fire Service hose run distance is less than 75 m.	Not required as Fire Service hose run distance is less than 75 m.

5.3 Escape Route Features

The building has 2 exits less than 8 meters apart, this is acceptable as the escape route serves less than 50 people.

5.4 Escape Route Widths

As the occupant loads of each area are less than 50, the required horizontal egress width is 700 mm. From inspection of the plans the exit widths within the building comply from all spaces.

5.5 Travel Distances

The following summarises the allowable and actual travel distances, taking into account the permitted distances based on the installed fire safety systems.



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Table 5: Summary of Actual and Permitted Travel Distances

Level	Description	DEOP Permitted [m]	DEOP Actual [m]	TOP Permitted [m]	TOP Actual [m]
G	Toy Library	20	15	50	N/A

The above shows that the travel distances within the building comply with the maximum permitted by C/AS4.

6 SPREAD OF SMOKE AND FIRE

6.1 Internal Fire Rating Requirements

As the Life Rating of the building is 60 minutes, it is required under C/AS4 that each firecell be separated with bounding construction that achieves a FRR of no less than (60)/60/60sm. No internal fire separations are required or proposed.

6.2 Spread of Fire to Neighbouring Property

Controls relating to horizontal fire spread have been undertaken utilising the methodology described in the Appendix A of the Commentary for C/VM2 as permitted by MBIE. The design FLED value of the building is 800MJ/m² as the building is considered an office and child care type environment.

The required property rating (that is applied to external walls and supporting structure as identified below) is 120 minutes.

NORTH FACE

The north face of the building faces Linden Avenue and is therefore not required to be assessed with respect to spread of fire to this boundary.

EAST FACE

The east face of the building faces a relevant boundary. The enclosing rectangle assessment of this face is summarised in the table below.

SOUTH FACE

The south face of the building faces an adjacent building containing sleeping risk groups, the enclosing rectangle assessment of this face to a notional boundary is summarised in the table below.



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WEST FACE

The west face of the building faces a relevant boundary. The enclosing rectangle assessment of this face is summarised in the table below.

Table 6: Enclosing Rectangle Analysis

Face	Risk Group	Enclosing Rectangle H x W [m]	Distance to Boundary [m]	Permitted Unprot. Area [%]	Actual Unprot. Area [%]
Level 0, West	CA	3 x 6	5	100	32
Level 0, West	CA	3 x 15	8	100	22
Level 0, South	CA	3 x 15	1	26	9
Level 0, East	CA	3 x 20	2.9	45	7

- No less than 74% of the south face is required to be fire rated from the inside to achieve a FRR of no less than the property rating of 120/120/120.
- No less than 55% of the east face is required to be fire rated from the inside to achieve a FRR of no less than the property rating of 120/120/120.

The maximum individual unprotected area for Risk Groups CA at 2 m boundary separation distance is 35 m² and is complied with as the largest is approximately 6 m².

Where walls require only partial fire rating due to the above percentages of unprotected area it is recommended for buildability that the entire wall, (with the exception of windows) be constructed as a fire rated system. This may assist avoiding possible differences in lining thickness on the internal faces of the wall.

7 STRUCTURAL STABILITY

The failure of non-fire rated construction i.e. walls and roofs etc in the vicinity of fire separations must not compromise the stability or integrity of these fire separations for a period not less than the required fire resistance rating of the Property Rating. It is therefore the responsibility of the structural engineer to identify the supporting structure of all fire rated elements.

8 DUTY OF CARE

Please note that the solution we are proposing herein will meet the requirements of the New Zealand Building Code to the extent required by the Building Act with respect to the means of escape from fire, protection of other property, and structural and fire rating behaviour only.



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Under the New Zealand Building Act 2004, there is no requirement for the building owner to protect their own property other than to satisfy the life safety objectives of the Building Act. As such, in the event of a fire, it is possible that the property loss within the building could be significant.

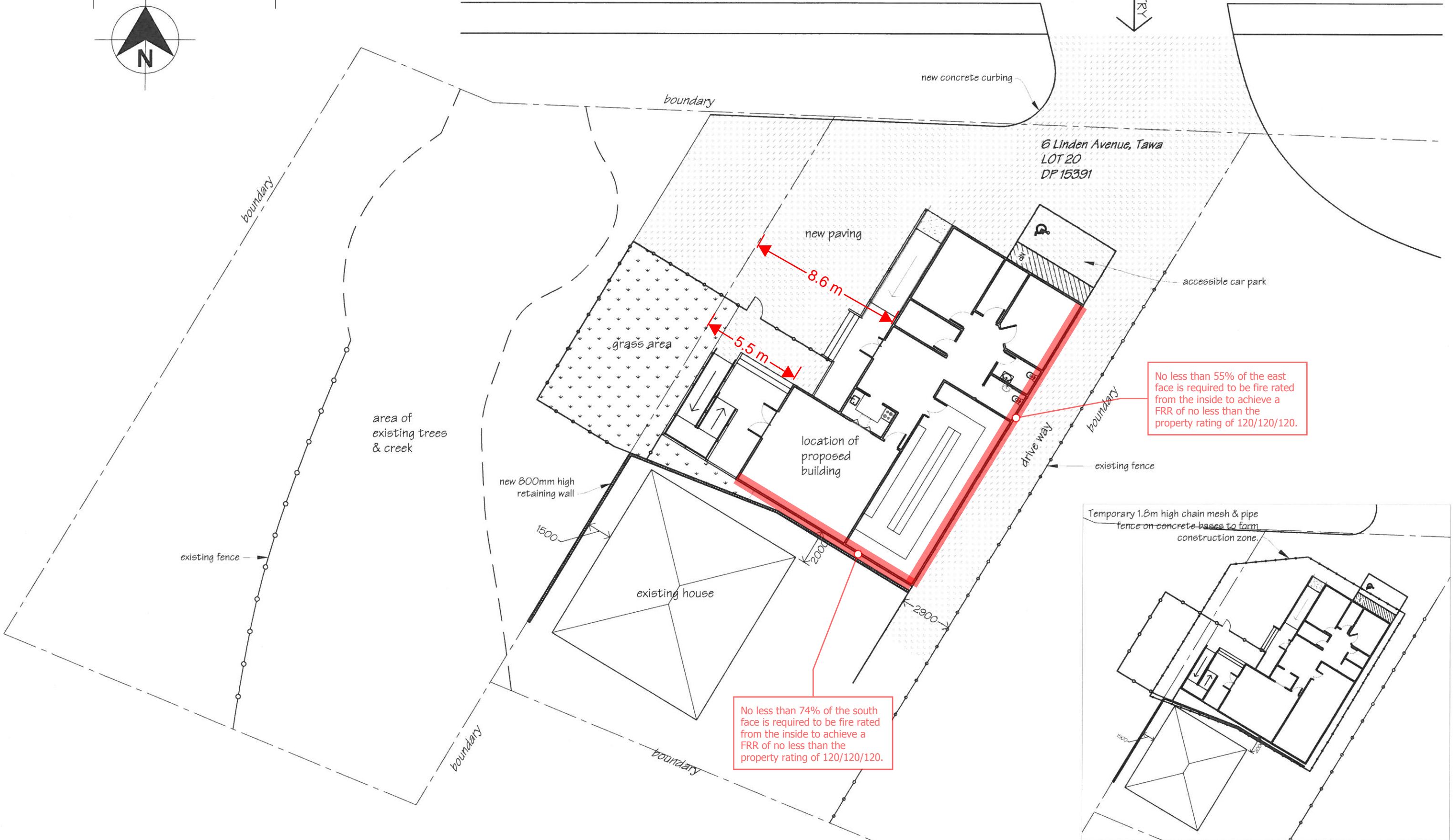
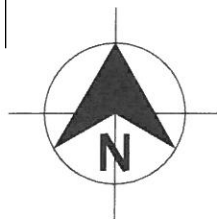
By not providing an alarm system, notification to the New Zealand Fire Service will be dependant on human response to a fire. As such, in the event of a fire, it is possible that the property loss and consequent business disruption could be significant.

Should the owner wish to protect the building structure and contents within, they may choose to investigate the installation of an early warning detection or specialist suppression system. This is however entirely at the discretion of owner.

The extent of emergency lighting specified in this fire report are minimum for fire safety only and does not specifically account for lighting that may be needed for other emergencies. Please note that other emergency lighting not specified in this report and not related to fire safety may be required for compliance with Clause F6 of the New Zealand Building Code.

Escape route widths specified in this fire report are minimum widths for fire safety only and do not specifically account for widths that may be needed for access for people with disabilities. Also note that other escape routes features (not specified in this report) and not related to fire safety may be required for compliance with Clauses D1 and F4 of the New Zealand Building Code.

Submission of this Report for Building Consent implies full understanding and acceptance of the above.





Drawn: TOB Date: 17/12/2014

Job No 110711.00 Sheet No FS 102 Rev A

This sketch does not constitute a complete fire engineering design or detail. Detailed construction drawings are provided by others. Best viewed in colour. Not all fire separations around ducts and shafts are shown.

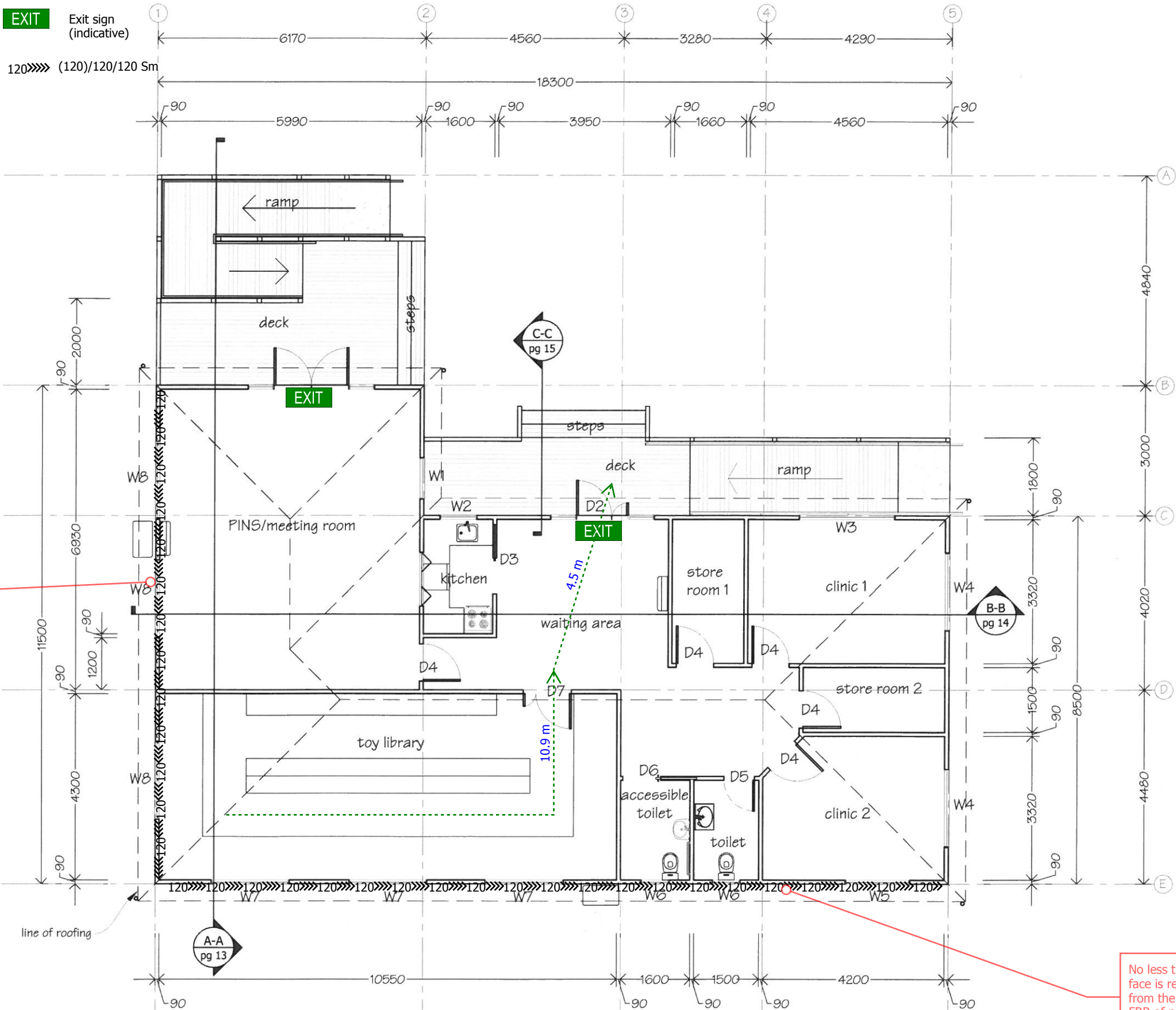
Legend

1 m Travel distance

EXIT Exit sign (indicative)

120 (120)/120/120 Sm

No less than 74% of the south face is required to be fire rated from the inside to achieve a FRR of no less than the property rating of 120/120/120.



No less than 55% of the east face is required to be fire rated from the inside to achieve a FRR of no less than the property rating of 120/120/120.

SECOND SECTION OF BUILDING



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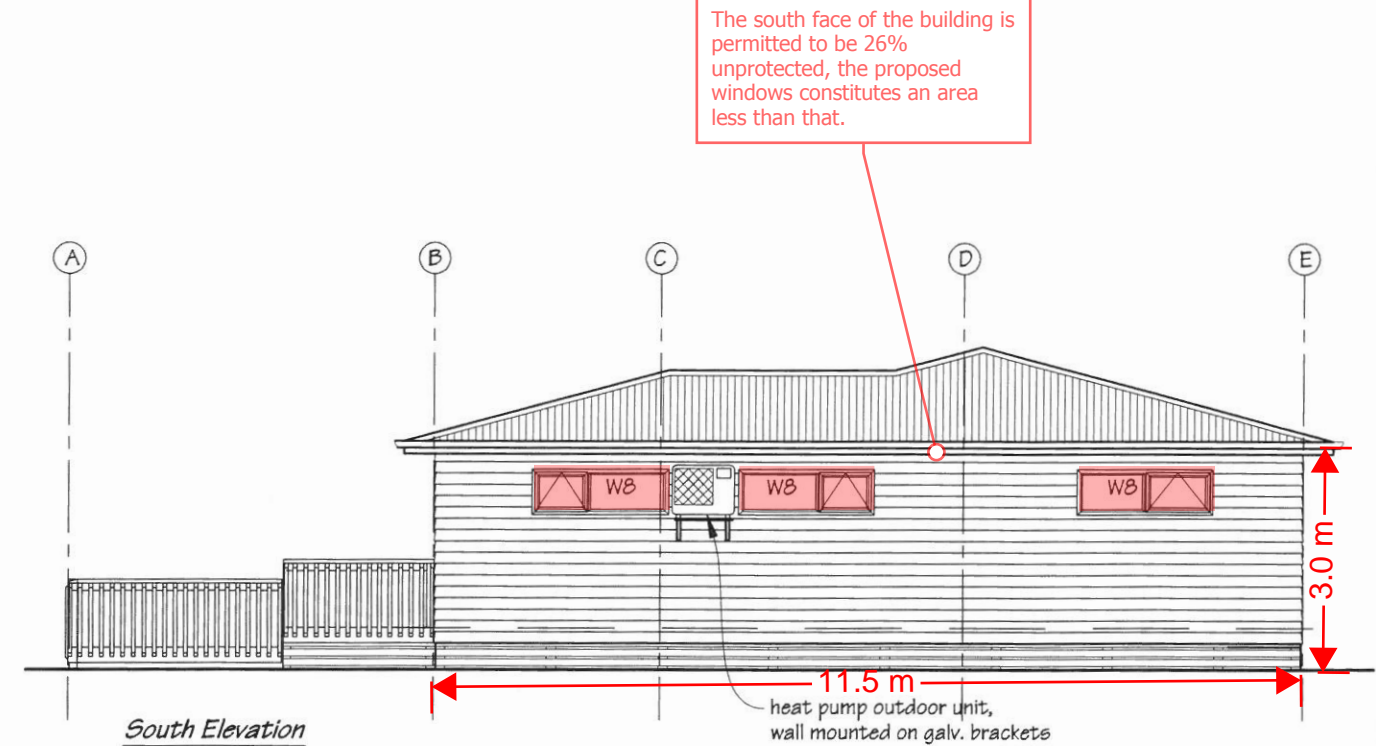
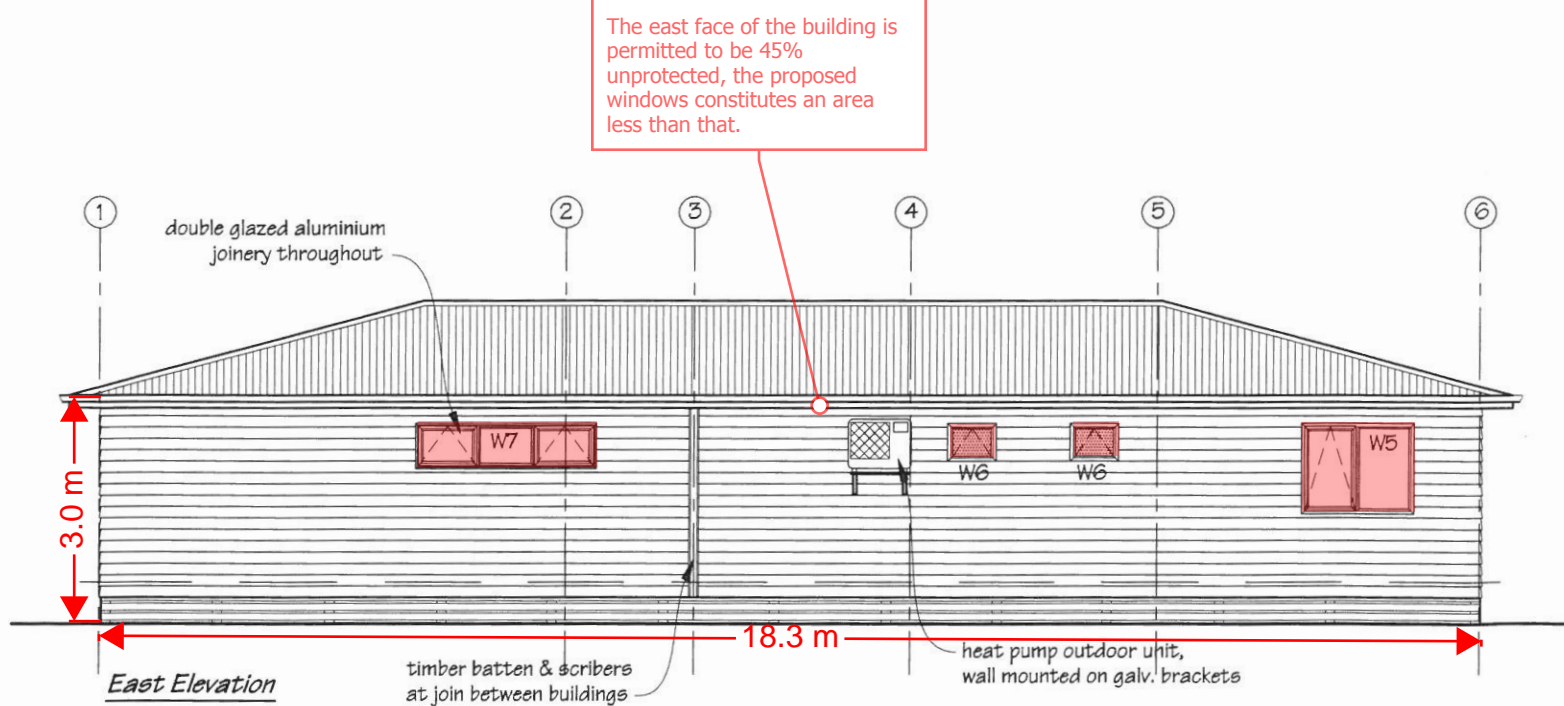
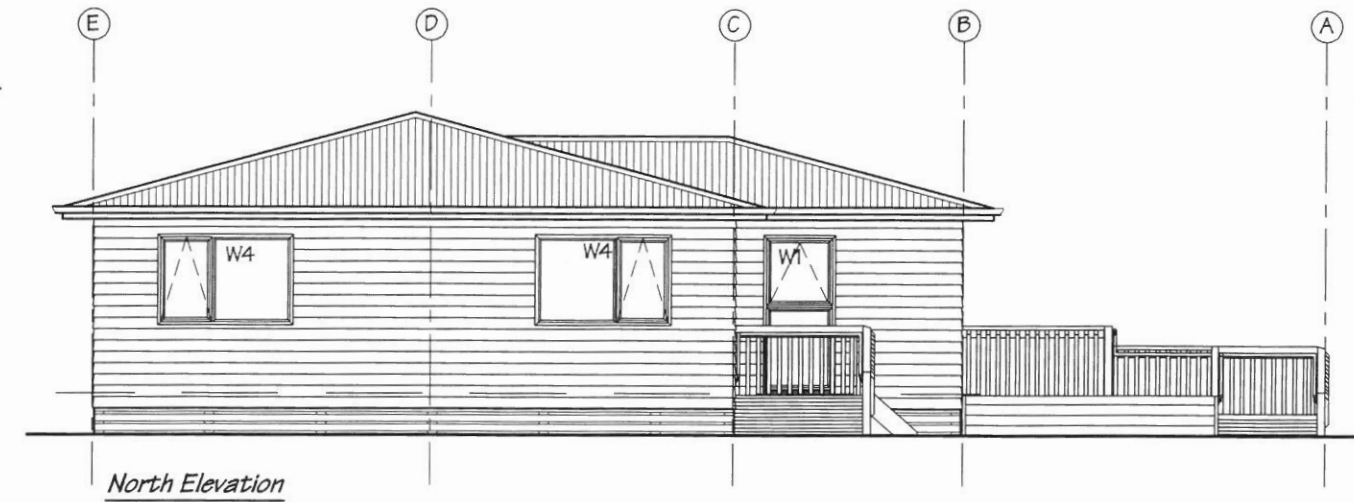
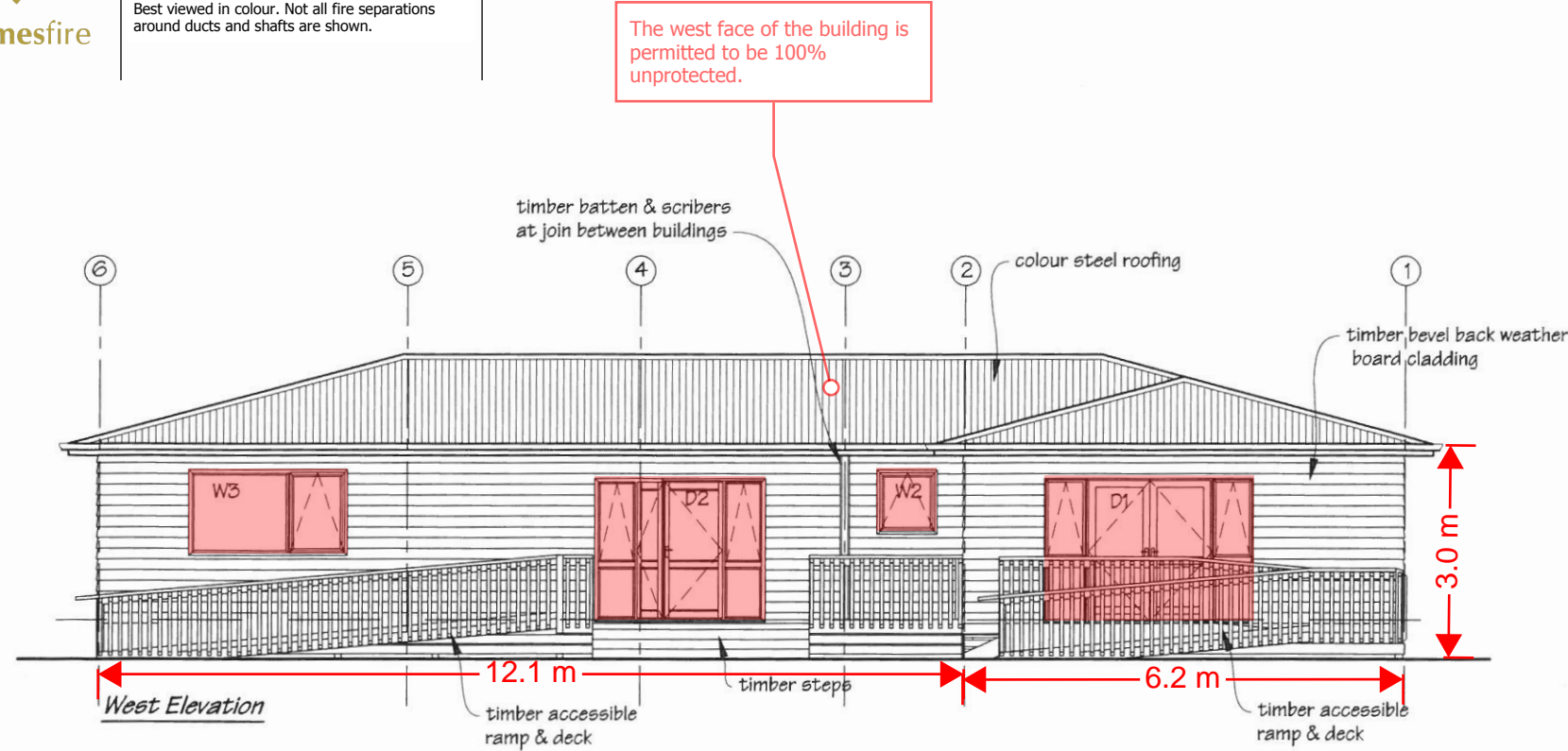
PROJECT
New Plunket Building

DRAWING TITLE
Proposed Floor Plan

REVISIONS
No Date Description

Scale 1:100
Date 10/7/2014
Original sheet size A3
Drawn S. T.
Sheet No 4 of 24
Dwg Ref 4 - A3

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



PAINTING
Allow to paint weatherboard cladding, fascia & barge boards, and all miscellaneous exterior timber trim.
(colours to be advised)