Seismic Strengthening, Plumbing World
40 Bouverie Street, Petone, Lower Hutt

PWMC Property Investments Limited

Fire Engineering Strategy

Holmes Fire

Version A
12 August 2020
109964.02.FESM001

Holmes Fire

Level 2, Chartered Accountants House, 50 Customhouse Quay
PO Box 942
Wellington 6140
holmesfire.com

Issue Authorisation

Project: Seismic Strengthening, Plumbing World, 40 Bouverie Street, Petone, Lower Hutt

Project No. 109964.02

Version	Date	Status	Prepared	Reviewed
A	12 August 2020	For building consent	WXK	ASS

Version	Extent of Revision

This report caters specifically for the requirements for this project and this client. No warranty is intended or implied for use by any third party and no responsibility is undertaken to any third party for any material contained herein. This report is produced and signed solely on behalf of Holmes Fire and no liability whatsoever accrues to the authors.

New Zealand Building Regulations do not impose specific requirements on a building owner to protect their own property. Consideration of protection of the building owner's property is not included in this design beyond the extent which arises from compliance with the Building Code, unless specifically noted otherwise. Accordingly, in the event of a fire, it is possible that the property loss could be significant.

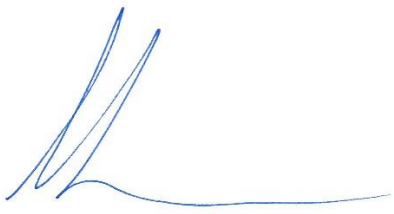
It is assumed that the details of these documents are read and understood. Holmes Fire should be contacted if there are any queries regarding interpretation or meaning of the content. Holmes Fire takes no responsibility for the misinterpretation by others.

Submission of this Fire Engineering Strategy document for Building Consent Authority approval implies full understanding and acceptance of the above.

Written By:

Wyn Klaassen
BTech (Fire)

Reviewed by:



Andrew Shearer
BE(Hons), MEngSt(Fire)

1 PURPOSE

The purpose of this report is to determine the minimum fire safety precautions required within the existing building located at 40 Bouverie Street, Petone, Lower Hutt to demonstrate compliance with Section 112 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 the New Zealand Building Code relating to means of escape from fire are satisfied to the extent required by the Act.

This is not a 'For Construction' document in isolation but a performance based 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 Engineering Strategy are expected to have read this report, understood the implications as it affects their scope of work, and incorporated the relevant fire requirements into their drawings, specifications, and other construction documents.

2 PROJECT DETAILS

Building Description

The building at 40 Bouverie Street, Petone was constructed in the 1970's and is divided into three spaces/tenancies and are served by single systems (such as the fire alarm system that is sitewide), these spaces/tenancies are:

- Tenancy 1, Ministry for Primary Industries, 3 floor levels,
- Tenancy 2, AMS group, Ground floor with small area intermediate floor, and
- Tenancy 3, Plumbing World, single level.

The building has a sprinkler system, manual call points, emergency lighting and illuminated exit and directional signage.

Proposed Works

The proposed works are limited to a seismic upgrade of the Plumbing World tenancy/space by way of additional steel support to the portal frames, there are no changes proposed to any internal wall/partition or any other areas of the building as part of the proposed works.

3 DESIGN APPROACH

Compliance Pathway

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

- C/AS2 – Acceptable Solution for Buildings other than Risk Group SH, 1st Edition, 27th June 2019.

Assumptions

The design is based on the following assumptions:

- There are no Memorandum of Encumbrances or similar that exist or proposed which relate to fire.
- The Building Importance Level is not IL4 or IL5.
- The fire design is based around an all out evacuation strategy. Upon alarm all occupants evacuate to a place of safety outside the building.

- There are no past agreements with the Building Owner and the Building Consent Authorities for progressive fire safety upgrades or similar.
- The Building has a current Building Warrant of Fitness and the systems within the building are functional and compliant.
- There are no solid fuel, gas burning, and oil fired appliances and open fires, proposed in the works.
- There are no specific spaces for which the sprinkler system is not permitted to be installed as defined by other disciplines.
- No unit title or similar other boundary arrangements exist or are proposed.

FENZ Design Unit Review

In accordance with section 46(1) of the Building Act 2004 some kinds of applications for Building Consent must be provided to Fire Emergency New Zealand for review. The proposed fire engineering design solution contained herein;

- Constitutes an internal fit-out that does not incorporate a change of use.
- 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 and does not involve other than minor alterations to the fire safety systems.

Therefore, under the Gazette we believe that this application is not required to be forwarded to Fire Emergency New Zealand for review.

4 WORK BY OTHERS

Access Routes

Escape route widths specified in this fire engineering strategy are the minimum widths for fire safety only and may not specifically address requirements for access for people with disabilities.

This report does not detail all requirements required for compliance with D1 and we understand that the compliance with D1 will be documented by others.

Visibility in Escape Routes

The design of systems to achieve compliance with F6 of the NZBC is outside the scope of this report. Any comments in the Fire Engineering documentation regarding visibility in escape routes are for purposes of assisting the designers responsible for F6 compliance.

The design of systems to provide artificial lighting to escape routes (both internal and external paths) in compliance with G8 of the NZBC is outside the scope of this report.

Wayfinding/Signage

The design of exit signage for compliance with F8.3.3 a) of the NZBC is outside the scope of this report. Any comments in the Fire Engineering documentation regarding exit signage positioning and signage icons on the attached Fire Strategy Sketches are for purposes of identifying the required egress routes in assisting the designers responsible for clause F8.3.3 a) compliance.

Structure

Defining the period of fire resistance and fire severity in consideration of clause C6.2 b, c, and d of the NZBC is addressed by this fire strategy. Identification of the structural systems needed for structural

stability to achieve the performance requirements and the means of achieving this requirement is to be provided by others.

HSNO

This Fire Engineering Strategy does not specifically consider requirements for Hazardous Substances and New Organisms (HSNO). Therefore, clause C5.7 c) of the NZBC is not covered by this report.

If the building will contain hazardous substances (as defined under the HSNO Act) we expect that specialists will complete a review of the requirements for safe storage of these materials and advise of any fire safety additions (eg. fire rated enclosures and signage) that arise out of this review.

Fire Safety and Evacuation of Building Regulations

Preparation and approval of any required Evacuation Scheme or Evacuation Plan, is to be provided by others.

Property Protection

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

We have not received any specific advice regarding protection of the building or its contents. Should the owner wish to protect the building structure and contents within, they may choose to investigate the installation of additional fire rating, an early warning detection or specialist suppression system. This is entirely at the discretion of owner.

5 SCOPE OF WORKS

We believe that the proposed work to will comply with the objectives of the New Zealand Building Code clauses C1 to C6 Protection from Fire, to the extent required by the Building Act, based on implementation of the following Scope of Works. This is required to be read in conjunction with the Fire Strategy Sketches.

5.1 Fire Safety Systems

5.1.1 The existing sprinkler system shall be altered if required to remain compliant with NZS 4541 as amended by Appendix B of C/AS2.

5.2 Escape Route Requirements

5.2.1 All escape routes are to be maintained as these exist with respect to width, hight and availability, exit doors and final exits.

5.2.2 The existing emergency lighting system in the area of alteration is to be altered as necessary to maintain compliance with F6.

5.2.3 The existing exit signage in the area of alteration is to be altered as necessary to maintain compliance with F8.

Note that exit sign symbols are shown on the attached Fire Strategy Sketches to identify the required egress paths. The design of the exit signage system is to be provided by others.

5.2.4 Signage for the fire related safety features of the building shall be altered as necessary throughout the area of alteration to maintain compliance with F8.

5.3 Limitation on Internal Materials Usage

5.3.1 Throughout the building any new internal surface finishes shall meet the following early fire hazard indices limitations (when tested to ISO 9705:1993 as per C/VM2 Clause A1.2, or ISO 5660:2002 as per C/VM2 Clause A1.3).

Table 1: Group Number limitations

Building Elements	Location	Maximum Material Group[1]
Ceilings	Crowd spaces	2
Walls	Crowd spaces	3

Note 1: Any lower Group Numbers, and Group Number -S than that specified will meet the requirement.

Note surface finish controls do not apply to:

- Small areas of non-conforming product within a space with a total aggregate surface area not more than 5.0 m^2.
- Electrical switches, outlets, cover plates and similar small discontinuous areas.
- Pipes and cables used to distribute power or services.
- Handrails and general decorative trim of any material such as architraves, skirtings and window components including reveals, provided these do not exceed 5% of the surface area of the wall or ceiling to which it is attached.
- Damp-proof courses, seals, caulking, flashings, thermal breaks and ground moisture barriers.
- Timber joinery and structural timber building elements constructed from solid wood, glulam or laminated veneer lumber. This includes heavy timber columns, beams, portals and shear walls not more than 3.0 m wide, but does not include exposed timber panels or permanent formwork on the underside of floor/ceiling systems.
- Individual doorsets.
- Continuous areas of permanently installed openable wall partitions not more than 3.0 m high and having a surface area of not more than 25% of the divided room floor area or 5.0 m^2, whichever is less.

The correlation of wall and ceiling surface finishes derived from Australian or European classifications to the Group Number requirements of NZBC Clause 3.4(a) can, without the need for further testing, be taken as described in the following.

Table 2: Australian or European correlations

Group Number to NZBC Clause C3.4(a)	Australian Group Number to NCC Specification C1.10 Clause 4 using AS ISO 9705:2003	European Classification to EN 13501-1:2007+A1:2009
2	Group 2	Class C
3	Group 3	Class D

5.3.2 Any new foamed plastic building materials or combustible insulating materials form part of a wall, ceiling or roof system, the completed system (foamed plastic and/or foamed plastic plus a surface lining) is required to meet 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 latest versions of AS 1366. It is strongly recommended that foamed plastic materials are not used.

5.3.3 Throughout the building any new flooring shall meet the following critical radiant flux limitations (when tested to ISO 9239-1:2010).

Table 3: Critical flux limitations for flooring.

Area of Building	Minimum Critical Radiant Flux [kW/m²]
All occupied spaces	1.2

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

5.3.5 Throughout the area of works any new 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 NZS/AS 1530.2:1993).

Appendix A – Verification

A.1 Building Characteristics

The occupancy of the building is as follows:

Table 4: Summary of Risk Groups and Occupant Loads in Building

Tenancy	Level	Description	Risk Group	Area1 [m²]	Occupant Density [m²/person]	Occupant Load
Tenancy 1	G	Offices	WB	370	10	37
		Workshop	WB	80	5	16
	Mezz	Workshop Showers / Toilet	WB	20	0[1]	0
	1	Offices	WB	320	10	32
	2	Offices	WB	320	10	32
Tenancy 2	G	Office	WB	122	10	12
		Warehouse Storage	WB	165	100	2
		Workshop	WB	40	5	8
	Mezz	Office	WB	85	10	9
		Staff Room / Kitchen	WB	25	5	5
Tenancy 3	G	Office	WB	185	10	18
		Showroom	CA	294	10	29
		Bulk Retail	CA	134	5	27
		Warehouse Storage	WB	537	100	5
					Total	**227**

The occupant load above is as prescribed by C/AS2 and is higher than what exist, we will however use this higher value for conservatism. Lifts, staff rooms, toilets and store rooms have not been included to avoid duplication.

The occupant load table above was obtained from historic information, as confirmed on the current compliance schedule, reference CS 1335.

A.2 Fire Safety Systems

The following summarises the fire safety precautions for the building from C/AS2.

Table 5: Fire Safety Systems Required

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

Risk Group	Occ. Load	Escape Height [m]	Systems	Notes
WB	< 100	4 to 10	4, 9, 18[1]	Where the environment is challenging for smoke detection, the Type 4 may be substituted with a Type 3 with supplementary smoke detection ≤5.0 m storage height limit, apex height no greater than 8.0m and firecell floor area not exceeding 4,200m^2.

Explanatory Notes:

1) A fire hydrant system is 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 6: Fire Resistance Ratings Required

Risk Group	Life Rating [min]	Property Rating [min]
CA (sprinklered)	30	60
WB (sprinklered)	30	60

Given the above the proposed fire safety features are shown below with comparison to the requirements of C/AS2.

Table 7: Proposed Fire Safety Precautions

Feature	C/AS2 Requirement	Existing/Proposed Features
Fire Rating	30 minutes fire resistance between firecells.	(30)/30/30 between firecells. Existing fire rating created by concrete walls, plasterboard partitions. All fire separations are to be retained and considered to comply as before the minor works proposed.
	30 minutes to intermediate floors and supporting elements.	Existing fire rating created by plasterboard linings to the underside of intermediate floors. All fire separations are to be retained and considered to comply as before the minor works proposed.
Alarm System	An automatic smoke detection system with manual call points.	Automatic fire sprinkler system with manual call points. The fire safety systems are to be retained and maintained to standards of installation, we believe this to be NZS 4541:1992 and NZS 4512:1997. As such these system comply with the requirements of the New Zealand Building Act.

Feature	C/AS2 Requirement	Existing/Proposed Features
Fire Hydrant System	A charged fire hydrant system is not required as Fire Service hose run distance is less than 75 m.	A charged fire hydrant system is not provided or proposed.
Prevention of Smoke Spread	The centralise HVAC system is to shut down on fire alarm.	We understand that the HVAC systems shut down on fire alarm.
Visibility in Escape Routes	Emergency lighting is required in accordance with F6.	Emergency lighting is provided in accordance with F6. The emergency lighting system is to be retained and maintained to standards of installation; we believe this to be AS/NZS 2293:1995. As such this system comply with the requirements of the New Zealand Building Act
Exit & Directional Signage	Exit and directional signage required accordance with F8.	Illuminated exit and directional signage is provided in accordance with F8/AS1. The illuminated exit and directional signage is to be retained and maintained to F8/AS1.

A.3 Means of Egress

A.3.1 Escape Route Features

The following summarises the configuration of the escape routes within the building.

Tenancy 1 (Area of Alteration)

Ground Floor

The occupants on the ground floor office space are provided with two means of egress either via either of the two safe path stairwells. The main stairwell exits directly onto Bouverie St while the other stairwell exits to the surrounding driveway of the building which also exits directly onto Bouverie Street.

The workshop area is provided with a single means of escape that exits directly to the surrounding driveway of the building which exits directly onto Bouverie Street.

Upper levels

The occupants on the upper levels have the ability to access one of the two exits available. Occupants are able to use the west stair which is the main entrance stairwell to the building. Alternatively there is an east stairwell, this stairwell discharges to the driveway of the building that leads onto Bouverie Street.

Tenancy 2

Ground Floor

The occupants on the ground floor are provided with two means of egress either via the entrance directly onto Bouverie St while the other door exits to the surrounding driveway at the rear of the building which also exits directly onto Bouverie Street.

Mezzanine Floor

The occupants on the mezzanine have access to the internal stairwell which exits directly to main entrance to the building. Alternatively the stairs can also discharge to the driveway of the building that leads onto Bouverie Street.

Tenancy 3

The occupants with this tenancy are provided with four means of egress directly to the outside, with three exiting onto Bouverie Street and one to the surrounding driveway of the building which also exits directly onto Bouverie Street.

A.3.2 Escape Route Widths

The following summarises the allowable and actual escape route widths provided within the Plumbing World Tenancy (Tenancy 3).

Table 8: Egress Width Requirements - Horizontal

Description	Occ. Load	Total Width Required [mm]	Width Required Horiz.[1] [mm]	Width Actual Horiz. [mm]
Plumbing World	79	< 850	2x850	4x850

Doors are required to achieve a clear width of no less than 760 mm and the existing doorsets exceed this minimum requirement. No new doorsets are proposed and none of the existing doorsets are proposed to be altered.

The above shows that the escape route widths within the building comply with the minimum requirements of C/AS2.

A.3.3 Travel Distances

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

Table 9: Summary of Actual and Permitted Travel Distances

Tenancy	Level	Description	DEOP Permitted [m]	DEOP Actual [m]	TOP Permitted [m]	TOP Actual [m]
Plumbing World	G	Office / Retail / Warehouse	50	15	120	25, 45

The above shows that the travel distances within the building comply with the maximum permitted by C/AS2

A.4 Internal Spread of Fire

As plumbing world tenancy to which the works are proposed, is a single firecell and the fire separations to other tenancies (or floors) are unchanged by the proposed works and will continue to comply as with the New Zealand Building Act to the same extend as before in accordance with Section 112 of the Act.

The underside of the intermediate floor remains unchanged by the proposed works and the fire rating below the intermediate floor will continue to comply to the same extent as before the proposed works in accordance with Section 112 of the New Zealand Building Act.

Holmes

Drawn: WXK Date: 12/8/2020

Job No	Sheet No	Rev
109964.02	FSK1	A

EXIT Exit Sign (Indicative)

2 m Egress Travel Distance (Dead End Open Path)

2 m Egress Travel Distance (Total Open Path)

BOUVERIE STREET

BOUVERIE STREET

Right of Way

Existing Garden

Entry

811 New asphalt ramp

Ramp falls

805 New ashphaltic sealed parking area

813 Ø120mm fixed steel bollards

Existing Ramp

85.89m, 294° 0' 0"

new matching pebble garden

falls

Build new concrete edge to enclose planter matching with other sides

Achieve smooth transition between new and existing asphalt ground

part of existing pebble garden

Achieve smooth transition between new and existing asphalt ground

816 Realign exiting fence

window

Store 6m²

Facilities 15 m²

EXIT

Administration

163 m²

(no alteration work is to be carried out in this area)

25 m

45 m

15 m

Showroom

294m²

(provide floor finishes as shown on detail layout)

Existing Sprinkler Inlet

Wash Room

Toilets

Facilities 51m²

cpd

Lunch Room

DB

Branch Manager Office 11m²

Spare Office 11m²

Existing Piers

Roller Door

Roller Door

Yard

98 m²

Build new 2m high galv. metal chainlinked fence with hinged gates

15,245

6,525

bollards

38.69m, 204° 14' 0"

N