

A large, stylized graphic of a flame or smoke plume. The top portion is a solid grey shape, while the bottom portion is a solid blue shape. The two shapes are separated by a white, irregular, flame-like cutout. The overall shape is asymmetrical, with the blue base on the left and the grey top on the right.

Concept Fire Engineering Strategy

175-177 Cleveland St & 6-8 Woodburn St, Redfern NSW 2016

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Executive Summary

YPI2B Ownership Trust No. 6 has appointed MCD Fire Engineering Pty Ltd to carry out an initial review of the findings of concept drawings of the subject development from a fire engineering viewpoint. The intention of this report is to provide some preliminary fire engineering advice and conceptual fire engineering feasibilities for the proposed development consisting of the construction of a multi-generational co-working boarding house building at 175-177 Cleveland St & 6-8 Woodburn St, Redfern NSW 2016.

The matters detailed in the BCA Assessment relate to a high-level fire and life safety review and the following matters have been identified as having a scope to rectify that does not have to strictly comply with the deemed-to-satisfy (DtS) provisions of the BCA. As such Performance Solutions are sought from an Accredited Certifier – Fire Safety (formerly referred to as a C10 Accredited Fire Safety Engineer) to provide an alternative scope of works to address the variations to the DtS Provisions of the BCA/NCC.

The intent of this conceptual report is to provide a high-level fire engineering input for the project in order to document the likely fire safety measures for the building in order to achieve compliance with the relevant Performance Requirements of the BCA. The following is the currently agreed high level scope for fire engineering, the performance requirements listed in the tables below are the minimum Performance Requirements that must be considered, should the fire engineer identify more relevant Performance Requirements these are to be also considered.

Table 1: Summary of Performance Solution

No	DtS Clause	Description of non-compliance	Performance Requirement (A2.2(3) & A2.4)	Method of achieving Performance Solutions (A2.2(1))	Assessment Method (A2.2(2))
1.	Spec C1.1, Clause 2.7	To review and permit garbage chute discharge into garbage room on Basement level without being fire rated at bottom of the shaft. Instead, the garbage room is to be fire separated from remainder of Basement floor and itself forms the base of the shaft.	CP1, CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
2.	Spec C1.1, Clause 3.1	To review and permit reduced FRLs to the Class 7b components (storage, bike racks) on basement level from 4 hrs down to 2 hrs.	CP1, CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
3.	Spec C1.1, Clause 3.1	To review and permit reduced FRLs to the Class 6 retail components on Ground Floor from 3 hrs down to 1.5 hrs.	CP1, CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
4.	Spec C1.1, Clause 3.1	To review and permit that the linear gap of the typical curtain wall system will be smoke sealed in lieu of fire sealed.	CP1, CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
5.	C1.1, C3.11	To review and permit the non-fire-isolated stair and the communal spaces are not fire separated from the corridor space which service the class 3 units on Levels 1-4.	CP1, CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
6.	C2.14	To review and permit extended length of public corridors on Levels 1-5 up to 50 m instead of 40 m.	CP2, EP2.2	A2.2(1)(a)	A2.2(2)(b)(ii)

No	DtS Clause	Description of non-compliance	Performance Requirement (A2.2(3) & A2.4)	Method of achieving Performance Solutions (A2.2(1))	Assessment Method (A2.2(2))
7.	C3.2(a)	To review and permit a performance-based protection to the openings (windows at south-eastern corners with slight setback from boundary) located within 3 m of southern boundary on Levels 1-4.	CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
8.	C3.2(b)	To review and permit the openings along southern corridor (to be protected as per BCA C3.4) on Levels 1-6 comprising of more than 1/3 of the façade area.	CP2	A2.2(1)(a)	A2.2(2)(b)(ii)
9.	D1.3	To review and permit a non-isolated stair near break-out space with partial openness serves or passes by up to 7 storeys.	CP2, DP5, EP2.2	A2.2(1)(a)	A2.2(2)(b)(ii)
10.	D1.4	To review and permit extended travel distance on <u>Basement level</u> as follows: <ul style="list-style-type: none"> Up to 25 m to a point of choice instead of 20 m. Up to 45 m to the nearest exit instead of 40 m. 	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(d)
11.	D1.4, D1.5	To review and permit extended travel distance on <u>Ground Floor</u> as follows: <ul style="list-style-type: none"> Up to 35 m to a point of choice instead of 20 m. Up to 50 m to the nearest exit instead of 40 m. Up to 70 m between exits instead of 60 m. 	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(d)
12.	D1.4	To review and permit extended travel distance to a point of choice up to 35 m instead of 20 m from communal area on Level 6 roof top.	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(d)
13.	D1.5	To review and permit extended travel distance between alternative exits up to 60 m instead of 45 on Levels 1-3.	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(d)
14.	D1.7(a)	To review and permit the fire hydrant and sprinkler pump room open directly into a fire-isolated stair.	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(b)(ii)
15.	D1.7(b)	To review and permit the main fire stair at east wing serving upper levels to discharge on Ground Floor into a covered area not complying with BCA D1.7(b).	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(b)(ii)
16.	D1.7(c)	To review and permit the egress route following the discharge of main fire stair at east wing serving upper levels passes by unprotected openings within 6 m.	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(b)(ii)
17.	D1.9	To review and permit extended travel distance following the discharge of a non-fire-isolated stair serving commercial / co-working space at north-western corner: <ul style="list-style-type: none"> Up to 30 m instead of 15 m to a point where two egress in opposite directions can be made. Up to 45 m instead of 30 m to nearest open space exit (where there are two available exits in opposite directions). 	DP4, EP2.2	A2.2(1)(a)	A2.2(2)(d)
18.	E1.3	To review and permit fire hydrant/sprinkler booster: <ul style="list-style-type: none"> To be located off Woodburn St, not adjacent to the vehicular entrance off Eveleigh St. To not be located within sight of main entry due to multiple entrances to the site. 	EP1.3	A2.2(1)(a)	A2.2(2)(b)(ii)

No	DtS Clause	Description of non-compliance	Performance Requirement (A2.2(3) & A2.4)	Method of achieving Performance Solutions (A2.2(1))	Assessment Method (A2.2(2))
19.	E1.3	To review and permit fire hydrant outlet being located more than 4 m (up to 7 m) from main open/external stair.	EP1.3	A2.2(1)(a)	A2.2(2)(b)(ii)
20.	E1.4	To review and permit the omission of fire hose reels to two garbage rooms with garbage chute (being fire separated) on Basement floor.	EP1.1	A2.2(1)(a)	A2.2(2)(b)(ii)
21.	E1.5	To review and permit the access to the sprinkler isolation valves being via means of a fire-isolated stair on basement level where they are located within the pump room in lieu of being located on a level provided with direct egress to a road or open space.	EP1.4	A2.2(1)(a)	A2.2(2)(b)(ii)
22.	E1.5	To review and permit the omission sprinkler protection to the following areas: <ul style="list-style-type: none"> ▪ Main Switch board room. ▪ Substation compartment (Due to energy authority requirements). 	EP1.4	A2.2(1)(a)	A2.2(2)(b)(ii)

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1 Introduction

1.1 Objective

YPI2B Ownership Trust No. 6 has appointed MCD Fire Engineering Pty Ltd to carry out an initial review of the findings of concept drawings of the subject development from a fire engineering viewpoint. The intention of this report is to provide some preliminary fire engineering advice and conceptual fire engineering feasibilities for the proposed development consisting of the construction of a multi-generational co-working boarding house building at 175-177 Cleveland St & 6-8 Woodburn St, Redfern NSW 2016.

1.2 Applicable Legislation

The primary legislation applicable to the development is the National Construction Code (NCC), Volume One aka as the BCA 2019 (Amendment 1): Building Code of Australia. The BCA provides a set of prescriptive requirements, *Deemed-to-Satisfy* (DtS) Provisions that if meet, are deemed an acceptable level of safety and achieve compliance with the Performance Requirements of the BCA. Deviations from the BCA DtS Provisions must be shown and be addressed as a Performance Solutions to demonstrate they comply with the BCA Performance Requirements.

This Report is not a Performance Solution Report, but rather a Conceptual Fire Engineering Strategy that sets down the intentions or proposed fire safety strategy and likely fire engineering Performance Solution requirements.

The assessment of a Performance Solution can be undertaken using a variety of methods. These are defined in BCA Clause A2.2(3) and A2.4. One or more, or a combination of these methods can be adopted to determine whether the proposed Performance Solution complies with the BCA Performance Requirements. The relevant BCA Performance Requirements are determined in accordance with BCA Clause A2.2(3) and A2.4. The Methods of achieving the Performance Solutions and Assessment Method for Performance Solution are presented below in Table 2.

Table 2: Methods of achieving the Performance Solutions and Assessment Method for Performance Solution

BCA Clause A2.2(1)	BCA Clause A2.2(2)
<p>A Performance Solution is achieved by demonstrating—</p> <ul style="list-style-type: none"> (a) compliance with all relevant Performance Requirements; or (b) the solution is at least equivalent to the Deemed-to-Satisfy Provisions. 	<p>A Performance Solution must be shown to comply with the relevant Performance Requirements through one or a combination of the following Assessment Methods:</p> <ul style="list-style-type: none"> (a) Evidence of suitability in accordance with Part A5 that shows the use of a material or product, plumbing and drainage product, form of construction or design meets a Performance Requirement. (b) Verification Methods including the following: <ul style="list-style-type: none"> (i) the Verification Methods in the NCC; or (ii) Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements (c) Expert Judgement (d) Comparison with the Deemed-to-Satisfy Provisions

The following New South Wales Legislation is applicable:

- NSW Environmental Planning and Assessment Act, 1979 and subsequent amendments
- NSW Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation, 2021 and subsequent amendments

1.3 Stakeholders and Documentation

The relevant stakeholders in the design of this development are listed in Table 3 below.

Table 3: Relevant Stakeholders

Name	Organisation	Role
-	YPI2B Ownership Trust No. 6	Client
Tom Cook	Mecone	Client Representative
Mark Shapiro	Mark Shapiro Architects	Architect
Joshua Hawke	Steve Watson and Partners Pty Ltd	BCA Consultant
TBA	TBA	Principal Certifier (at CC Stage only)
Fire Commissioner	Fire + Rescue NSW	Referral Agency (at CC Stage only)
Mark McDaid, Lei Wang, Lin Li	MCD Fire Engineering Pty Ltd	Fire Engineering

1.3.1 Use and Location

The building is located at 175-177 Cleveland St & 6-8 Woodburn St, Redfern. The proposed uses include mail BCA Class 3 (Boarding house), and associated BCA Class 6 (Retail/Café), BCA Class 7a (Carpark) and BCA Class 7b (Storage). The Fire Service can access the building from Cleveland St, Woodburn St or Eveleigh St as shown in Figure 1.

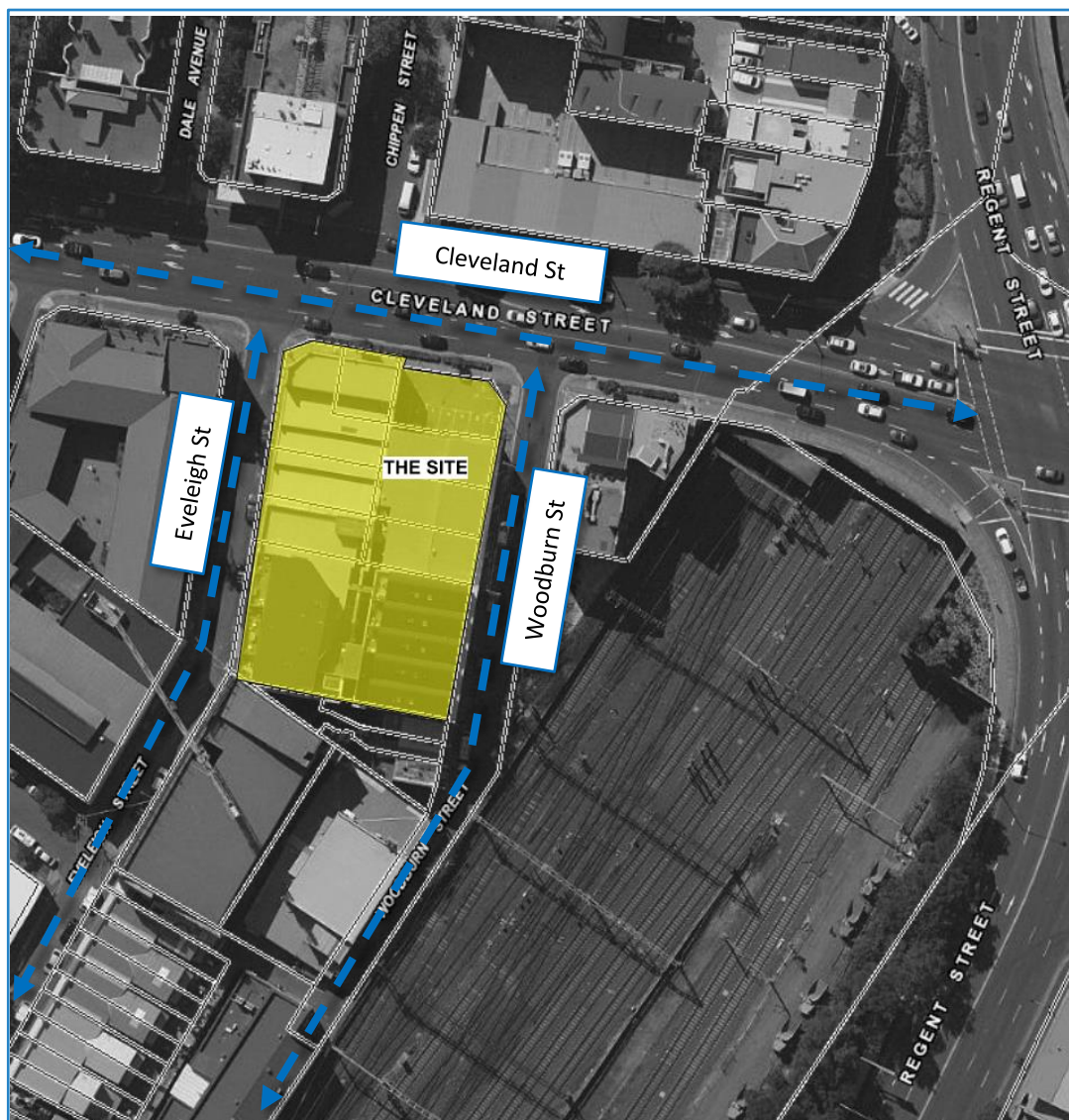


Figure 1: Sit plan brigade access

1.3.2 Size and shape

The building will comprise of 8 levels (Basement, Ground floor, Level 1- Level 6). The site footprint is 2,016.9 m². Refer to Appendix A for more details.

1.3.3 Exit arrangements

The exit provisions for each level are shown in Figure 2.

Note: the “green arrows” used in the following figures are illustrative only and not the confirmed exit / directional exit sign posting locations (to be confirmed by electrical engineer).

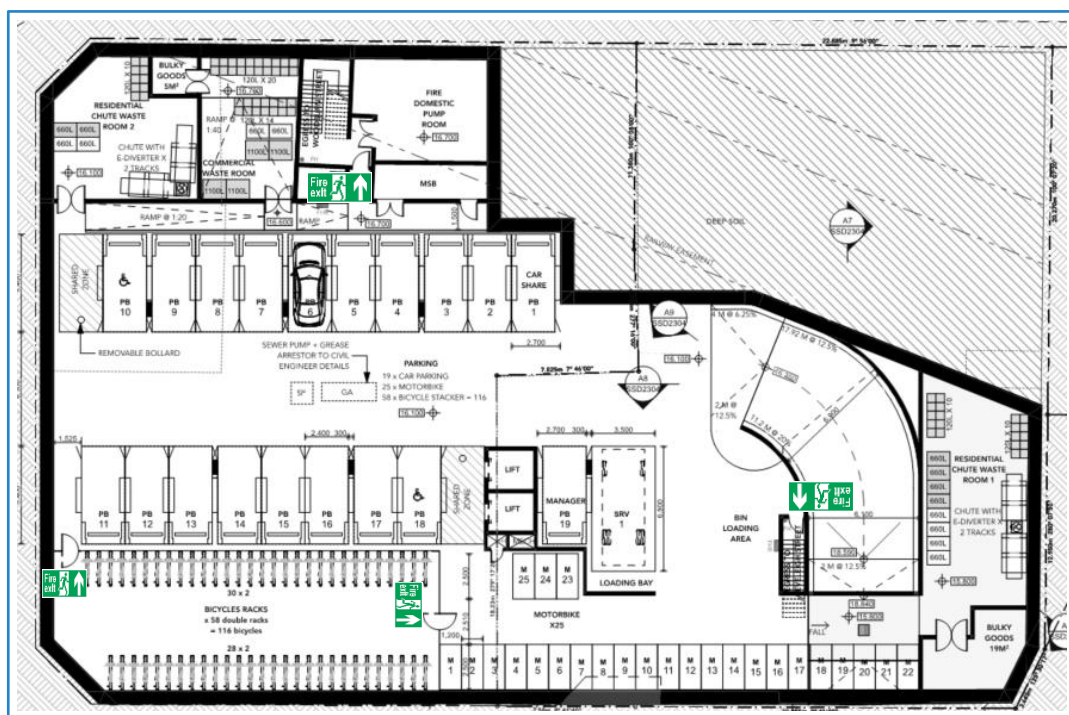


Figure 2: Exit provisions for Basement

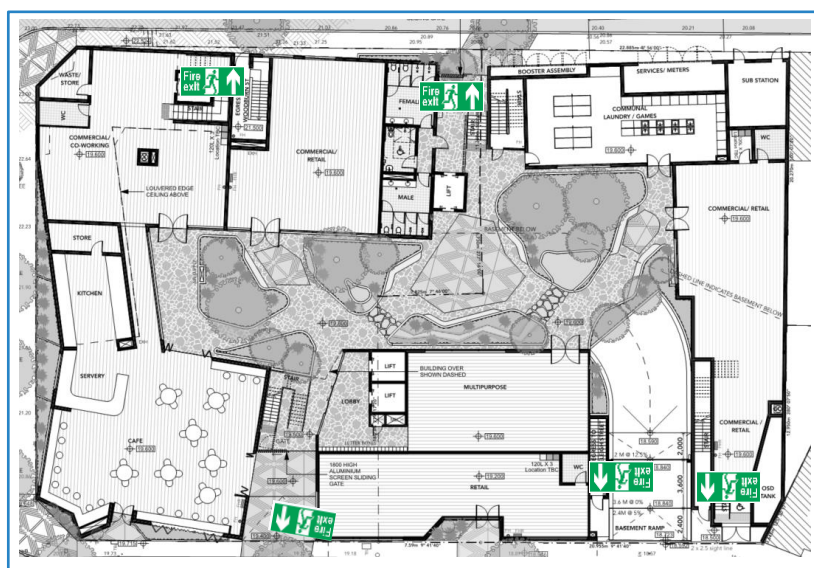


Figure 3: Exit provisions for Ground Floor



Figure 4: Exit provisions for Level 1



Figure 5: Exit provisions for Level 2 (typical for Levels 2-5)

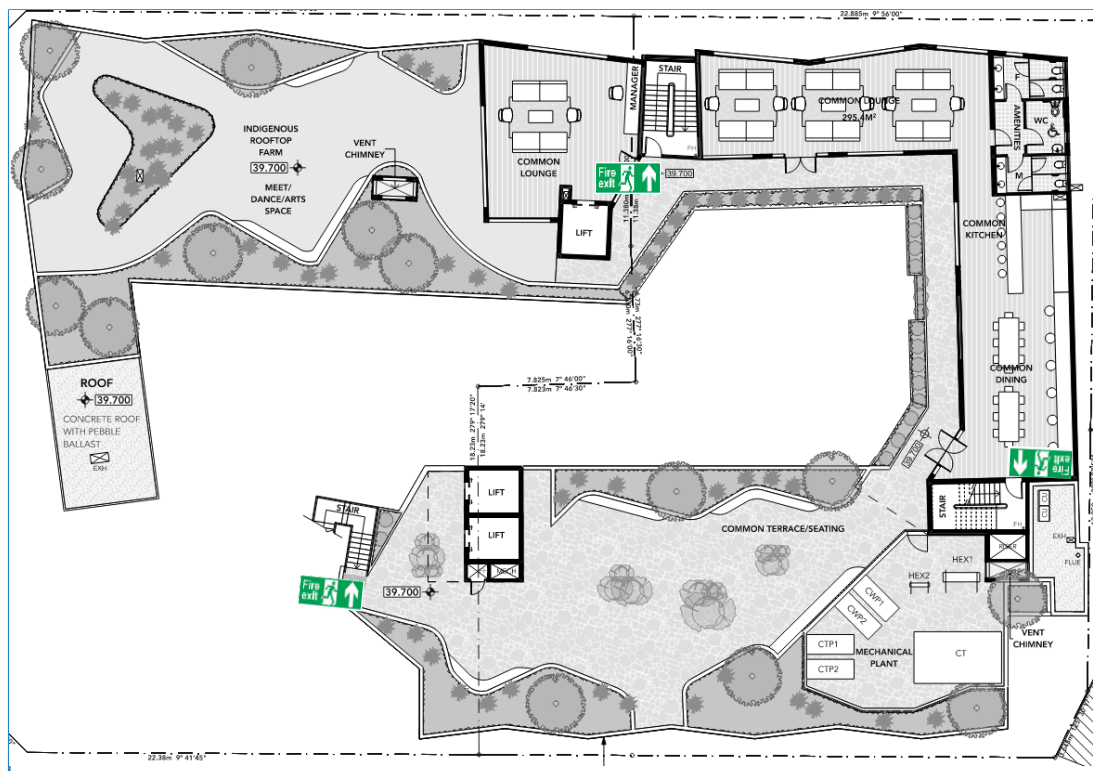


Figure 6: Exit provisions for Level 6

1.4 Occupant Characteristics

Building occupants can generally be classified into separate distinctive groups: staff, residents, and customers/visitors. All occupants are assumed to be representative of the general population with no specific or unusual distributions in respect to gender, age and physical or mental attributes. A detailed description is contained in Table 4 below:

Table 4: Occupancy Characteristics

Characteristic	Description
Familiarity	<p>Residents: Residents are expected to be familiar with the layout of the building and the location of exits.</p> <p>Staff: Staff are also expected to be present which are familiar with the layout of the building and the emergency procedures.</p> <p>Customers/visitors: Customers/visitors will generally be aware of the route they entered the building and are more likely to evacuate the building via this route even if other exits are closer.</p>
Awareness	<p>Residents: As a residential building, occupants may be asleep and may also be under the influence of alcohol or drugs at some times.</p> <p>Staff: Staff are expected to be alert and sober.</p> <p>Customers/visitors: Customers/visitors may be under the influence of alcohol or other mild narcotics at some times.</p>
Mobility	<p>Residents: Residents are considered to be representative of the general population with some members having hearing, visual or mobility impairment and assumed to be assisted by staff.</p> <p>Staff: Any hearing, visual or mobility impaired staff are assumed to be able to self-evacuate or be assisted by other staff members.</p>

Characteristic	Description
	Customers/visitors: Customers/visitors are considered to be representative of the general population including a limited proportion of mobility impaired occupants. These occupants may require crutches, a wheelchair or similar to evacuate on their own or need assistance from other occupants and / or staff.
Training	<p>Residents: Residents are expected to have received some initial form of emergency / first aid training with regard to the evacuation procedures and fire equipment location and use, but for the purposes of the assessment, all occupants are assumed to be untrained.</p> <p>Staff: The staff are expected to have received some form of emergency / first aid training.</p> <p>Customers/visitors: Customers/visitors are expected to have no form of emergency / first aid training and for the purposes of the report, are assumed to be untrained.</p>
Age	All occupants are considered to be representative of the general population with no specific or unusual distributions in respect to gender or age.
Culture / language	<p>All occupants are considered to be representative of the general population with some members having varying cultural backgrounds and languages.</p> <p>Although some occupants may have English as their second language, they are expected to understand signs or verbal instructions in English to the degree necessary to not adversely impact upon evacuation.</p>
Occupancy Loading	Occupancy levels and distribution throughout the building is assumed to be in accordance with the occupancy loadings of Table D1.13 of the BCA.

1.5 BCA Building Information Characteristics

The initial review has identified the following information for the building as listed in Table 5.

Table 5: Relevant Building Information

BCA Clause	Description
Schedule 3	Effective Height
A6	Occupancy Classification
C1.1	Minimum Type of Construction
C1.2	Rise in Storeys
C2.2	Fire Compartment Floor Area and Volume

23.9 m (Level 6 (RL39.7) – Basement (RL15.8))

BCA Class 3 (Boarding House)
 BCA Class 6 (Retail/Cafe)
 BCA Class 7a (Carpark)
 BCA Class 7b (Storage)

Type A

8

BCA Class 3 – N/A
 BCA Class 6, 7a, 7b < 5,000 m², 30,000 m³

2 Conceptual Fire Safety Measures


The following high level fire safety measures should be read in conjunction with a BCA review for the building. These measures aim to act as a base point of any further and more detailed fire engineering assessment and reports as part of the Certification / Approvals processes.

It is outlined herein that, subject to the preliminary fire safety measures being incorporated into the design as detailed in Table 6 below as part of the concept fire safety design, and in conjunction with DtS fire safety measures as listed in a BCA Assessment Report, the future fire engineering assessments undertaken should be able to demonstrate that the identified deviations from the Deemed-to-Satisfy (DtS) Provisions meet the relevant Performance Requirements of the BCA. All other aspects of the proposed works are understood to be in accordance with the BCA DtS Provisions or as accepted by the Principal Certifier/Council.

Table 6: Required Fire Safety Features

Fire Safety Measure	Description
Construction Requirements (general)	In accordance with Part C of the BCA, the building is required to be of Type A construction. All building elements are required to have a fire resistance level (FRL) as listed in Table 3 of Specification C1.1 of the BCA, except where addressed as a performance solution. All penetrations in fire rated construction shall be fire stopped in accordance with the BCA DtS requirements.
Fire stopping at penetrations through fire rated elements	<ul style="list-style-type: none"> ▪ All new / modified penetrations through fire rated elements (wall, floor, ceiling etc) shall be fire stopped/sealed in accordance with BCA C3.15/Spec C3.15 and/or tested systems. ▪ It is recommended that an independent fire stopping specialist specify, check and install all fire stopping systems to service penetrations. ▪ A Fire stopping schedule/register shall be prepared by detailing the full FRL, product/system used, location of application, date of installation, personnel for the installation, test/assessment report, completed photo, label, etc. ▪ The register / schedule shall include, but not be limited to incorporating the following (as a minimum): <ul style="list-style-type: none"> ▪ Itemised / numerical list of each fire stopping system. ▪ Location (Level, Room, Space, etc) ▪ Type of service (mechanical, electrical, hydraulic, plastic, copper, metal, cables, etc) ▪ FRL of fire stopping system (FRL/FRL/FRL) ▪ Building Element the system is installed (i.e. Wall, Floor, Shaft, Ceiling) ▪ Construction Type (i.e. Concrete, blockwork, Hebel, Speedpanel, Plasterboard, etc) ▪ System Description (i.e. Promatect, Maxilte, Intubatt, Intumastic HP, etc) ▪ Supplier (i.e. Trafalgar, Promat, TBA Firefly) ▪ Orientation (vertical, horizontal). ▪ Test Standard (i.e. AS1530.4, AS 4072.1, etc) ▪ Test Report/Assessment Report (and hyperlink to the full report) from NATA / Registered Testing Authority (e.g. CSIRO, BRANZ, Warrington/Exova) ▪ Installation Company (name) ▪ Installation person (installers name) ▪ Installation Checklist / Certification of As-Installed: <ul style="list-style-type: none"> ▪ Installed By (Company) ▪ Passive Fire Label Fitted and Correct? ▪ Penetration in Fire Rated Construction Built Correctly? ▪ Installation in Accordance with the Test Report? ▪ Photograph (hyperlink) ▪ Certified in Accordance with Test Report? ▪ Certified By (Company) ▪ Certified By (Installer Name)

Fire Safety Measure	Description
	<ul style="list-style-type: none"> ▪ Date of Inspection / Test ▪ Comments
General Requirement - Electrical/Comms rooms/cupboard along path of travel	<p>In accordance with BCA Clause D2.7, any Electrical/Comms rooms/cupboard located along path of travel shall be smoke sealed/separated from the remaining area:</p> <ul style="list-style-type: none"> ▪ Any penetration through the Electrical/Comms rooms/cupboard shall be smoke sealed. ▪ The doors to the Electrical/Comms rooms/cupboard shall be fitted with ambient and medium smoke seals (refer to below separate section for detailed requirements for smoke seals). ▪ The doors to the Electrical/Comms rooms/cupboard, <u>if not fire doors</u>, shall be fitted with non-combustible backing such as metal sheeting, FC sheeting, plasterboard etc.
Fire safety doors and exit doors – general requirements of statutory signage	<p>General requirement - BCA D2.23</p> <p>Fire doors and smoke doors (except for SOU entry doors) must be provided with a sign in 20 mm capital lettering on both sides of the doors as required in BCA D2.23. The signs are required to be as follows:</p> <ul style="list-style-type: none"> ▪ to fire or smoke doors held open with automatic closing hold-open devices: <p style="text-align: center;">FIRE SAFETY DOOR – DO NOT OBSTRUCT</p> ▪ to self-closing fire or smoke doors: <p style="text-align: center;">FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN</p> ▪ to a door discharging from a fire-isolated exit: <p style="text-align: center;">FIRE SAFETY DOOR – DO NOT OBSTRUCT</p> <p>General requirement – EP&A Clause 183</p> <p>Fire safety notices shall be provided to any fire-isolated stairway, passageway or ramp as required in EP&A Clause 183. The notice shall contain the wording as follows. The words “OFFENCE RELATING TO FIRE EXITS” in the notice must be in letters at least 8 millimetres high, and the remaining words must be in letters at least 2.5 millimetres high:</p> <p style="text-align: center;">“OFFENCE RELATING TO FIRE EXITS</p> <p style="text-align: center;"><i>It is an offence under the Environmental Planning and Assessment Act 1979:</i></p> <p style="text-align: center;"><i>(a) to place anything in or near this fire exit that may obstruct persons moving to and from the exit, or</i></p> <p style="text-align: center;"><i>(b) to interfere with or obstruct the operation of any fire doors, or</i></p> <p style="text-align: center;"><i>(c) to remove, damage or otherwise interfere with this notice.”</i></p>
Fail-safe to doorways	<ul style="list-style-type: none"> ▪ All automatic sliding doors, where serving as a path of travel or an exit in a fire emergency, shall fail safe to open and remain in open position on a general fire alarm. ▪ All doorways that are normally secured/locked, where serving as a path of travel or an exit in a fire emergency, shall fail safe to unlock on a general fire alarm.
Roof photovoltaic panels	<p>The installation of photovoltaic panels (solar panels) on rooftop shall comply with the following requirements:</p> <ul style="list-style-type: none"> ▪ The installation of photovoltaic panels (solar panels) must be undertaken by either a licensed builder or a licensed electrical contractor. ▪ The system installed, whether connected to the electricity grid or in a stand-alone situation, must be compliant with applicable Australian Standards. ▪ For more information on solar panel safety, visit the Fair Trading website. <p>The use of photovoltaic panels (solar panels) shall follow the general requirements from FRNSW as outlined below:</p> <ul style="list-style-type: none"> ▪ An A4 notice on fade resistant material shall be displayed at the FIP notifying attending fire fighters as to the existence of the photovoltaic panels (solar panels) on the roof of the building. The notice shall include: <ul style="list-style-type: none"> ○ the location of the panels. ○ the location of all associated isolation switches, AC and DC isolators for the shut-off of generated electricity.

Fire Safety Measure	Description
	<ul style="list-style-type: none"> ○ If the PV automatically isolate on fire trip, a statement shall be provided detailing this provision that can clearly be identified by firefighters. ○ A statement in 25 mm font stating (or similar): Photovoltaic (PV) Panels Present PV panels are mechanically fixed to the roof as shown below [Block Plan to show location and distribution of PV panels] ▪ A sign shall be provided on the front face of the associated isolation switches, AC and DC isolators for the shut-off of generated electricity, similar to the following: 
Smoke seals	<p>Where required for <u>ambient and medium temperature rated smoke seals</u>, they shall have a smoke leakage rate of < 40 m³/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS1530.7. The smoke seals shall be fitted to all sides of the door including the bottom side. When selecting the smoke seals, the following shall be considered:</p> <ul style="list-style-type: none"> ▪ Considerations shall be made when selecting smoke seals products such that they shall be compatible with the fire doors, such as the gaps around the perimeters of the doors and if the seals are suitable for the floor covering (if applicable). ▪ The installation of smoke seals shall be the same as that for the tested specimen and the provisions of AS 6905-2007. The clearances, seal contacts and other critical design attributes for fire doors shall be within the range established by test to AS 1530.7 and any variations permitted by AS 6905-2007. ▪ Recommended smoke seals products are Lorient LAS1212 & LAS1515 Batwing Perimeter Seals door frame perimeters and LAS8001si, LAS8002si, LAS8003si, LAS8005si, LAS8008si and LAS8009si threshold drop seals. Test Report EWFA Report No: 33937100.1 by Exova Warringtonfire for the above mentioned Lorient smoke seals have been reviewed, which demonstrates a smoke sealing performance that meets the set criteria above. <p>Where required for <u>intumescent fire & smoke seals</u>, they shall have a smoke leakage rate of < 40 m³/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS1530.7. When selecting the smoke seals, the following shall be considered:</p> <ul style="list-style-type: none"> ▪ Considerations shall be made when selecting smoke seals products such that they shall be compatible with the fire doors, such as the gaps around the perimeters of the doors and if the seals are suitable for the floor covering (if applicable). ▪ The fire seals shall be approved for use on proprietary AS1905.1 fire door assemblies for at least 2 hour fire rating. ▪ The installation of smoke seals shall be the same as that for the tested specimen and the provisions of AS 6905-2007. The clearances, seal contacts and other critical design attributes for fire doors shall be within the range established by test to AS 1530.7 and any variations permitted by AS 6905-2007. ▪ Recommended smoke seals product is LAS1812 LSS intumescent fire & smoke seals.
Garbage room enclosing bottom of garbage chute	It is permitted to not have a fire separation at the bottom of the shaft for garbage chute, but rather having the garbage room enclosing the garbage chute to be fire separated from the remainder of basement with 2 hour fire rated construction (in consideration of overall reduction of FRL's to Class 7b areas).
Reduced FRLs to the Class 6/7b components	Initial calculations by MCD Fire Engineering show that the FRLs to the Class 6/7b areas may be reduced to 90/120 minutes, respectively, but still comply with the relevant performance requirements of the BCA.

Fire Safety Measure	Description
	<p>A detailed quantitative assessment will be undertaken in the performance solution (in CC stage) to demonstrate that the burnout time is less than 90/120 minutes and therefore the FRLs to the Class 6/7b areas can be reduced to 90/120 minutes.</p> <p>The reduction of FRLs applies to the walls surrounding the rooms, slab above and any services penetrations through the fire rated walls/slab.</p> <p>The waste chute rooms and any enclosed storage room within Basement shall be fire separated from the remainder of the basement with 2 hour fire rated construction.</p> <ul style="list-style-type: none"> ▪ The doors to the waste chute rooms and any enclosed storage room shall be fitted with intumescent fire & smoke seals that both serves both smoke sealing (up to 200°C medium temperature) and fire sealing (with intumescent strip). Refer to separate section in this Table for detailed required for smoke seals. ▪ If mechanical ventilation system is provided to the waste chute rooms and any enclosed storage room, it shall have an automatic shutdown feature in fire mode in accordance with AS/NZS 1668.1 as prescribed by BCA Clause E2.2(a) and Table E2.2a, and motorized fire dampers (FRL -/120/-) for the mechanical ventilation system shall be installed and close upon shutdown of the mechanical ventilation system during fire mode in accordance with AS/NZS 1668.1 as prescribed by BCA Clause E2.2(a) and Table E2.2a.
Linear gap of the typical curtain wall system	It is permitted that the linear gap of the typical curtain wall system is smoke sealed in lieu of fire sealed.
Open stair and adjacent break out space	<p>It is permitted to have a non-isolated stair connecting up to 7 levels, and it is permitted that the open stair and the adjacent break out space are not fire separated from the public corridor as per the bounding construction requirements.</p> <p>The above will be assessed via performance solutions in the CC stage relying on the ventilation/openness at this portion of the public corridor being sufficiently open to allow free ventilation of smoke from a fire event affecting the evacuation route.</p>
Extended length of public corridor	<p>It is permitted to have extended length of public corridor up to 50 m.</p> <ul style="list-style-type: none"> ▪ All sou entry doors and any enclosed communal rooms shall be provided with a self-closing -/60/30 fire door and fitted with ambient and medium temperature rated smoke seals. ▪ The public corridors on Ground Floor – Level 5 are prohibited to have storage of combustibles (long or short term). Signage shall be provided on the wall stating “STORAGE OF COMBUSTIBLES STRICTLY PROHIBITED IN CORRIDOR”, text minimum 20 mm in height in a colour contrasting with the background. ▪ Smoke separation shall be provided to public corridors in accordance with BCA Spec C2.5 (i.e., smoke rated construction and self-closing smoke doors fitted with smoke seals (doors may be permitted to be held open on magnetic devices linked to detection on each side (within 1.5 m) of the doors, to release on fire trip). ▪ The smoke doors within public corridors shall swing in both directions to allow the occupants egress.
Ground Floor open courtyard and Level 6 roof top communal area	<ul style="list-style-type: none"> ▪ Suitable occupant warning devices such as horn speakers or strobes shall be provided to Ground Floor open courtyard and Level 6 roof top communal area. ▪ Exit sign and emergency lighting (where applicable) shall be provided to Ground Floor open courtyard and Level 6 roof top communal area in accordance with BCA Clause E4.2 and E4.5 respectively, and AS/NZS 2293.1-2018, as per the requirement of BCA G6.8 for “occupiable outdoor area”. ▪ Compliant coverage for fire hydrants and fire hose reels shall be provided to Ground Floor open courtyard and Level 6 roof top communal area. ▪ A 2.5 kg ABE portable fire extinguisher shall be provided at the far corner of the Level 6 roof top communal area at the most-disadvantaged location in terms of travel distance. ▪ The seating/table in Ground Floor open courtyard and Level 6 roof top communal area shall not contain foamed plastics, such as latex foams, polyethylene (PE) foams, polyvinyl chloride (PVC) foams, and expanded or extruded polystyrene foams.

Fire Safety Measure	Description
Openings within 3 m of boundaries	<p>The windows at south-eastern corners with slight setback from boundary, located within 3 m of southern boundary on Levels 1-4, shall have the window pane (within 2.2 m) nearest to the southern boundary be fixed shut.</p> <p>The openings along southern corridor on Levels 1-6 shall be protected as per BCA C3.4, but they are permitted to comprise of more than 1/3 of the façade area.</p> <ul style="list-style-type: none"> All openings along southern corridor on Levels 1-6 shall be protected by as per BCA C3.4, with wall-wetting sprinklers, fire shutters, fire rated windows etc. Note where drenchers are used, consideration shall be given to impact due to mullion/transoms and water supply demand. The glazing shall be minimum 6 mm toughed glass. The design of glazing structure shall ensure there is no large failure/collapses due to large area of glazing, i.e., to permit one window to break/fail but that does not cause the entire façade of glazing on that level to fail / fall off due to the connections/frames.
Extended travel distances	<p>The following extended travel distances are permitted:</p> <p><u>Basement:</u></p> <ul style="list-style-type: none"> Up to 25 m to a point of choice instead of 20 m. Up to 45 m to the nearest exit instead of 40 m. <p><u>Ground Floor:</u></p> <ul style="list-style-type: none"> Up to 35 m to a point of choice instead of 20 m. Up to 50 m to the nearest exit instead of 40 m. Up to 70 m between exits instead of 60 m. <p><u>Levels 1-3:</u></p> <ul style="list-style-type: none"> Up to 60 m between exits instead of 45 m. <p><u>Level 6 roof top:</u></p> <ul style="list-style-type: none"> Up to 35 m to a point of choice instead of 20 m. <p><u>Discharge of a non-fire-isolated stair serving commercial / co-working space at north-western corner:</u></p> <ul style="list-style-type: none"> Up to 30 m instead of 15 m to a point where two egress in opposite directions can be made. Up to 45 m instead of 30 m to nearest open space exit (where there are two available exits in opposite directions).
Discharge of fire-isolated stair	<p>It is permitted to have the main fire stair at east wing serving upper levels to discharge on Ground Floor into a covered area not complying with BCA D1.7(b), and that the egress route following the discharge of this stair passes by unprotected openings within 6 m.</p> <ul style="list-style-type: none"> The storage of combustibles (long or short term) is prohibited within the discharge area of the fire stair and along the egress route to reach open space. Signage shall be provided on the wall stating “STORAGE OF COMBUSTIBLES STRICTLY PROHIBITED IN THIS AREA”, text minimum 20 mm in height in a colour contrasting with the background. The door to adjacent toilets, which is within 6 m of the egress route following discharge from fire stair, shall be a self-closing -/60/30 fire door. The window to female toilets shall be fixed shut and fitted with 6 mm toughened glass. A sprinkler head shall be located within 0.5 m of the door to toilets and window to female toilet.
Automatic fire detection and alarm system	<p>The building shall be provided with an automatic fire detection and alarm system in accordance with BCA 2019 (Amendment 1) Spec E2.2a and AS 1670.1-2018.</p> <p><u>In addition to any DtS provisions</u> in BCA 2019 (Amendment 1) Spec E2.2a and AS 1670.1-2018, the following are noted:</p> <p><u>Basement - carparking area</u></p>

Fire Safety Measure	Description
	<p>In accordance with BCA Spec E2.2a Clause 6 (Smoke detection for smoke control systems), i.e., AS 1670.1 smoke detection (Section 7) with smoke detectors for controlling carpark exhaust system purpose.</p> <p><u>Basement – enclosed areas/rooms</u></p> <p>In accordance with BCA Spec E2.2a Clause 4 (Smoke detection system), i.e., AS 1670.1 smoke detection (Section 4) with smoke detectors for fire detection and alarm purpose.</p> <p><u>Ground Floor, Levels 1-6</u></p> <p>In accordance with BCA Spec E2.2a Clause 4 (Smoke detection system), i.e., AS 1670.1 smoke detection (Section 4) with smoke detectors for fire detection and alarm purpose.</p> <p><u>General requirements for detectors</u></p> <ul style="list-style-type: none"> ▪ To offset the extended travel distances, it is required that the spacing of the smoke detectors throughout the building shall be reduced to 7 m × 7 m grid. The distance from smoke detectors to any end wall or deep beams/bulkhead shall be no more than 3.5 m. ▪ Refer to Clause 5.1.2 of AS 1670.1-2018 (or Clause 5.1.6 of AS 1670.1-2015) for detailed requirements for location of detectors on level surfaces with deep beams/bulkhead. ▪ Each individual room/area shall be provided with detectors, except where permitted under AS 1670.1-2018 to not detectors. ▪ The following general requirements to detectors shall be noted: <ul style="list-style-type: none"> ○ Where an area is divided into sections by walls, partitions or storage racks reaching within 300 mm of the ceiling (or the soffits of the joists where there is no ceiling), each section shall be treated as a room, and shall be protected. ○ A clear space for access of at least 300 mm radius, to a depth of 600 mm, shall be maintained from the detector or sampling point. Minor building structure and service occupying this space shall not exceed 25 percent of the clear space provided it does not prevent access to the detector. ○ Detectors shall not be installed closer than 900 mm to any air supply opening.
Building Occupant Warning System (BOWS)	<p>A Building Occupant Warning System (BOWS) shall be provided throughout in accordance with BCA Spec E2.2a Clause 7 and AS 1670.1-2018.</p> <ul style="list-style-type: none"> ▪ The Building Occupant Warning System (BOWS) shall be interconnected with the AS 1670.1-2018 smoke detection system and the AS 2118.1-2017 sprinkler system. ▪ One occupant warning speaker forming part of the AS 1670.1 BOWS shall be located inside each bedroom with the SOU to achieve an A-weighted sound pressure level of 75dB at the bedhead with all doors closed. ▪ Suitable occupant warning devices such as horn speakers or strobes shall be provided to Ground Floor open courtyard and Level 6 roof top communal area. ▪ The building occupant warning system shall include voice annunciation instead of alert tones in accordance with Clause 4.8 of AS 1670.4-2018. The evacuation messages shall include the following verbal announcements (or to the effect of): “EMERGENCY, EMERGENCY, EVACUATE NOW”.
Fire sprinkler system	<p>The building shall be provided with a fire sprinkler system in accordance with BCA Spec E1.5/E1.5a and AS 2118.1-2017 with the following additional requirements:</p> <ul style="list-style-type: none"> ▪ Note: The requirement of AS 2118.1-2017 sprinkler system instead of FPAA101D or FPAA101H system as per BCA Spec E1.5a is with the consideration of the multiples performance solutions required in this building. ▪ All ceiling mounted sprinkler heads shall be fast response with an RTI of 50 (m·s)^{1/2} or less in accordance with the requirements of AS 2118.1-2017. ▪ Activation temperature of 68°C except where otherwise required by AS 2118.1-2017 (such as under glazed skylights and roof areas). ▪ Activation of the sprinkler system shall activate the Building Occupant Warning System. ▪ The sprinkler system shall be permanently connected with a direct data link or other approved monitoring system to a fire station or fire station dispatch centre in accordance with AS 2118.1-2017.

Fire Safety Measure	Description
	<ul style="list-style-type: none"> System component fault monitoring shall be provided in accordance with clause 3.5.5 of AS 2118.1-2017. A sprinkler head shall be located within 0.5 m of the door to toilets and window to female toilet on Ground Floor, exposing the egress route (within 6 m) from discharge of fire stair. Attention is drawn to the specific requirements of AS 2118.1-2017 with regard to height of storage / racking and clearances below sprinkler heads, generally required to be at least 500 mm. Where the sprinklers heads are located above a storage cage, a perforated barrier shall be installed to the top of the cage to ensure there is no storage within the 500 mm clearance below the sprinkler heads. <p><u>The following DtS departures for the fire sprinkler system are permitted:</u></p> <ul style="list-style-type: none"> The fire sprinkler booster, being located off Woodburn St, is not adjacent to the vehicular entrance off Eveleigh St and is not within sight of main entry due to multiple entrances to the site. The access to the sprinkler isolation valves is via means of a fire-isolated stair on basement level where they are located within the pump room in lieu of being located on a level provided with direct egress to a road or open space. The omission of sprinkler protection to the following areas: <ul style="list-style-type: none"> Main Switch board room. Substation compartment (Due to energy authority requirements). The above areas with omission of sprinkler protection shall be fire separated from remainder of the building with 2 hour fire rated construction.
Fire hydrant system	<p>A fire hydrant system shall be provided in accordance with BCA 2019 (Amendment 1) Clause E1.3 and AS 2419.1-2005, except for those departures that are addressed via performance solutions as follows:</p> <p><u>Fire hydrant outlet location</u></p> <ul style="list-style-type: none"> The fire hydrant outlet next to open stair on Levels 1-6 is permitted to be located more than 4 m (up to 7 m) from main open/external stair. <p><u>Fire hydrant booster location</u></p> <ul style="list-style-type: none"> The fire sprinkler booster, being located off Woodburn St, is permitted to be not adjacent to the vehicular entrance off Eveleigh St and be not within sight of main entry due to multiple entrances to the site. A fadeproof and weatherproof Block Plan shall be provided in accordance with the AS 2419.1-2005 requirements, and each placed at the fire hydrant booster and fire sprinkler booster. Refer to AS 2419.1-2005 Clause 7.11 for detailed requirements for block plans. The block plan shall be orientated to reflect the actual layout of the site from the location of the block plan being viewed. The block plan shall include the surrounding street access routes and each building layout. Alternatively, a separate site plan can be provided next to fire hydrant block plan, which shows the location of both of pedestrian and vehicular entrances and the building layout. A signage shall be provided next to the pedestrian entrance at western façade (off Eveleigh St) and the vehicular entrance at south-western corner of the site, stating “FIRE HYDRANT BOOSTER & FIRE SPRINKLER BOOSTER ON WOODBURN STREET”. The sign shall comprise of capital letters not less than 50 mm high in a colour contrasting with the background. The sign shall be weather/fade proof and mechanically fixed on a wall/fence or a standalone post. The signage shall be listed as an Essential Fire Safety Measure and included on the Fire Safety Schedule. The fire hydrant booster and fire sprinkler booster assembly connections and all valves must be fitted with Storz aluminium alloy delivery couplings manufactured and installed in accordance with clauses 7.1 and 8.5.11.1 of AS 2419.1-2005. Blank caps must be fitted to the couplings via a Storz thread. Refer to guide sheet no. 4 ‘Fire brigade hose couplings’ prepared by Fire and Rescue NSW for more information. This document is available at www.fire.nsw.gov.au.

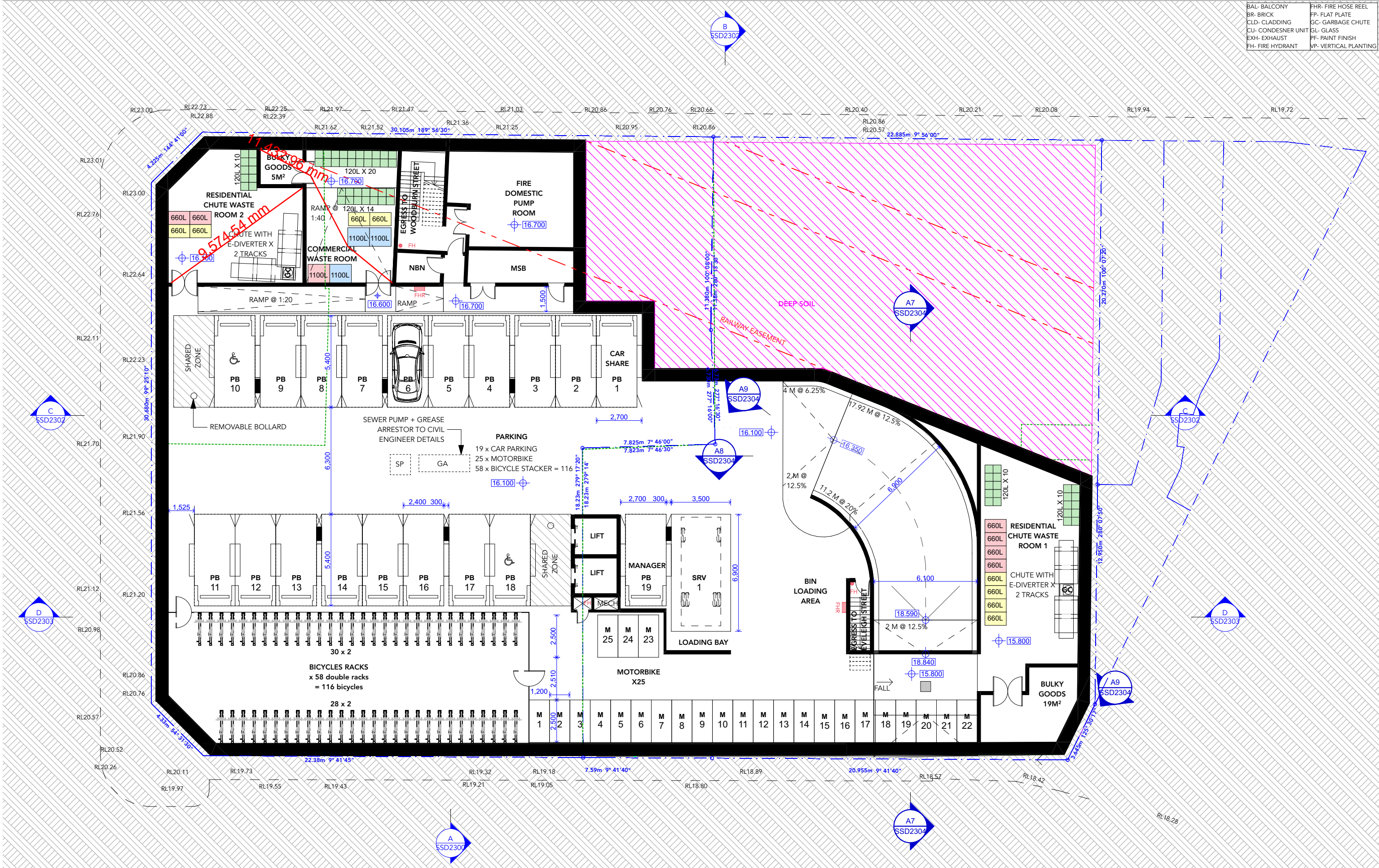
Fire Safety Measure	Description
	<ul style="list-style-type: none"> Refer to Appendix B for an Information Sheet for Installation of Fire Hydrants (Extract from AS 2441-2005).
Fire hose reels	<p>Fire hose reels shall be provided to Basement level in accordance with BCA 2019 (Amendment 1) Clause E1.4 and AS 2441-2005.</p> <ul style="list-style-type: none"> It is permitted to omit the provision of fire hose reels to the two garbage rooms with garbage chute (being fire separated) on Basement floor. One multi-purpose Type ABE 2.5 kg extinguisher shall be provided inside the two garbage rooms with garbage chute (being fire separated) on Basement floor. Refer to Appendix C for an Information Sheet for Installation of Fire Hose Reels (Extract from AS 2441-2005).
Portable fire extinguishers	<p>Portable fire extinguishers shall be provided to the building in accordance with BCA 2019 (Amendment 1) Clause E1.6 and AS 2444.</p> <ul style="list-style-type: none"> One multi-purpose Type ABE 2.5 kg extinguisher shall be provided inside the two garbage rooms with garbage chute (being fire separated) on Basement floor. A 2.5 kg ABE portable fire extinguisher shall be provided at the far corner of the Level 6 roof top communal area at the most-disadvantaged location in terms of travel distance. Refer to Appendix D for an Information Sheet for Installation of Portable Fire Extinguishers (Extract from AS 2444-2001).
Emergency lighting and exit signs	<p>Emergency lighting and exit signage shall be provided in accordance with BCA 2019 (Amendment 1) Clause E4.2 and E4.5 respectively, and AS/NZS 2293.1-2018.</p> <ul style="list-style-type: none"> Exit sign and emergency lighting (where applicable) shall be provided to Ground Floor open courtyard and Level 6 roof top communal area in accordance with BCA Clause E4.2 and E4.5 respectively, and AS/NZS 2293.1-2018, as per the requirement of BCA G6.8 for “occupiable outdoor area”.
Management in use	<p>An emergency management and evacuation plan shall be developed and implemented prior to Occupation Certificate. The plan should satisfy the requirements of AS 3745.</p>
Maintenance	<p>A maintenance program shall be developed with all essential safety measures (active, passive and management) maintained in accordance with AS 1851 and AS 2293.2 for the building, and is to incorporate system interface testing, where relevant.</p>

3 Key Assumptions and Limitations

- This report is consistent with the fire safety provisions, objectives and limitations of the NCC 2019 (Amendment 1) - Building Code of Australia (BCA) Volume One:
 - All new works associated with the works comply with the current DtS provisions of the BCA except for any specific Performance Solution report carried out in addressing DtS non-compliances.
 - This report excludes the assessment and design against fires that include incendiary ones involving accelerants, explosives, multiple ignition sources, or acts of terrorism.
 - The concepts outlined in this report assume a complete and operational building, and do not address protection of the building during construction, renovation or demolition.
 - All of the fire safety systems are assumed to be designed, installed and operate in accordance with the appropriate Australian standards, other design codes, legislation and regulations relevant to the project unless specifically stated otherwise. All essential services equipment will be maintained, to the operational capacity to which they were designed, installed, commissioned and certified, in accordance with the manufacturer's instructions. As such, all essential services equipment and management plans, etc discussed within this report are assumed to function correctly during a fire situation.
 - Access and Egress provisions for persons with disabilities including compliance with the Disability Discrimination Act (DDA) are considered to the same degree as the BCA.
 - Unless stated otherwise, protection of property (other than within the subject property), business continuity, interruption or losses, environmental impacts, personal or moral obligations of the owner/occupier, reputation, amenity or non-fire related matters in the building such as health, security, energy efficiency, and occupational health & safety or the costs associated with any fire damages are specifically excluded from this analysis.
- **This report is not a Performance Solution Report.**
- This report is not a compliance or conformance audit for any fire safety system. For example, operational checks of fire safety equipment, verification of construction techniques, fire resistance levels or the witnessing of fire drills or exercises are specifically excluded from the scope of this report.
- The findings and outcomes of this report apply only to the subject building / works and must not be utilised for any other purpose. Any modifications, extensions, change of use, etc. to the building, fire safety measures or essential services equipment, from that described in this report may invalidate the findings, necessitating a re-assessment.

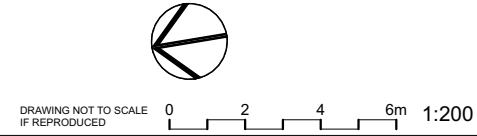
Appendix A Proposed Drawings

BAL- BALCONY
BR- BRICK
CLD- CLADDING
CU- CONDENSER UNIT
EXH- EXHAUST
FH- FIRE HYDRANT
FHR- FIRE HOSE REEL
FP- FLAT PLATE
GC- GARBAGE CHUTE
GL- GLASS
PF- PAINT FINISH
VP- VERTICAL PLANTING



P08	12/8/22	FOR CONSULTANTS CO-ORDINATION
P07	31/7/22	FOR CONSULTANTS CO-ORDINATION
P06	21/7/22	FOR COUNCIL CONSULTATION
ISSUE	DATE	REVISION

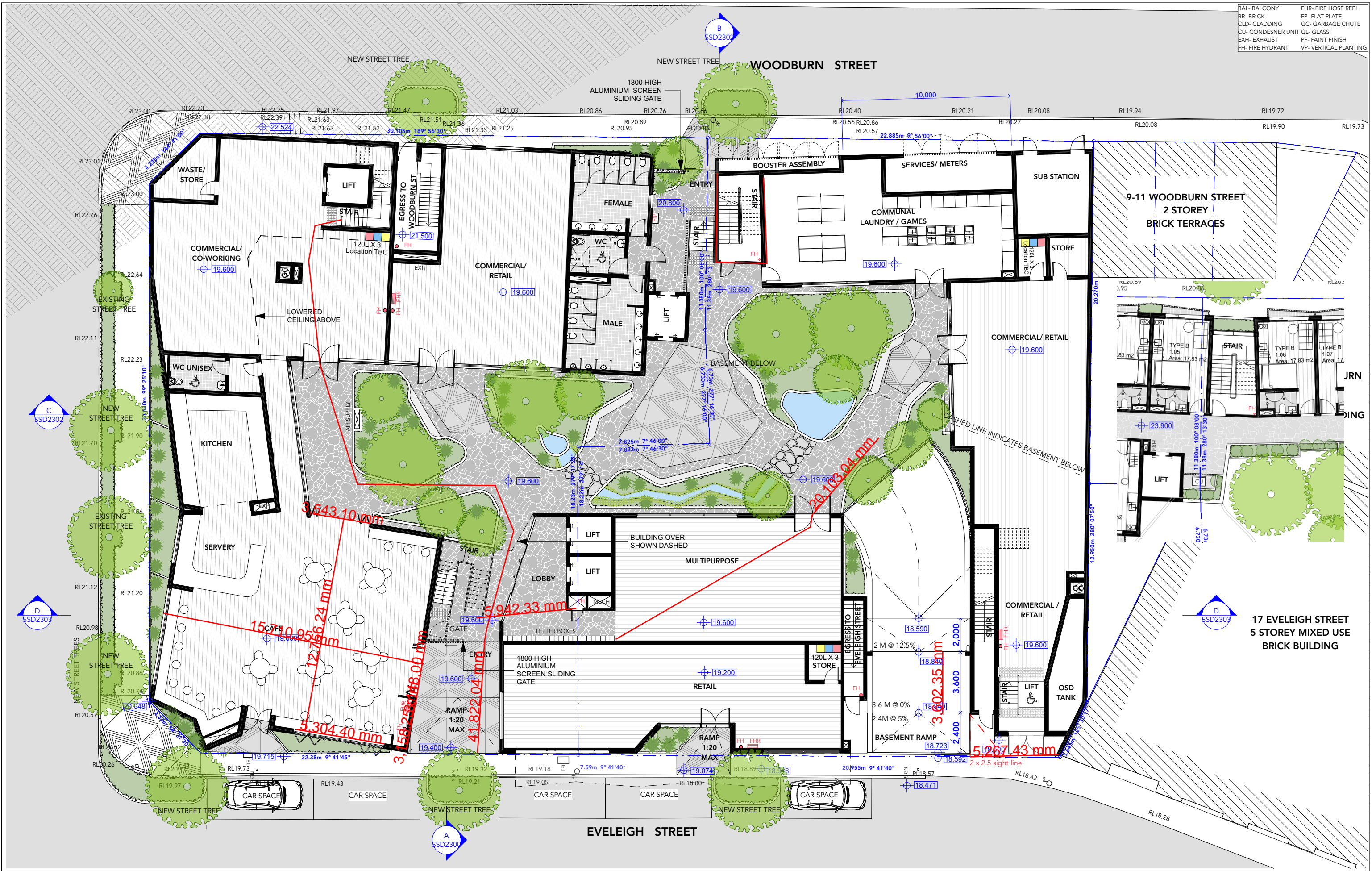
PRELIMINARY 25/8/22



PROJECT:
PROPOSED CO-LIVING DEVELOPMENT

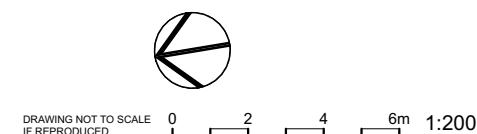
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BASEMENT PLAN

PROJECT NO:
21022
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PLOTTED: 25/8/22
DRAWING NO: **SSD2001**
REV: **P08**



P08	12/8/22	FOR CONSULTANTS CO-ORDINATION
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PRELIMINARY 25/8/22



PROJECT:
PROPOSED CO-LIVING DEVELOPMENT
175-177 Cleveland St & 6-8 Woodburn St
DRAWING:
GROUND FLOOR PLAN

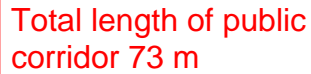
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DRAWING NO: REV:
SSD2002 P08

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EXH- EXHAUST
FH- FIRE HYDRANT
FHR- FIRE HOSE REEL
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GC- GARBAGE CHUTE
GL- GLASS
PF- PAINT FINISH
VP- VERTICAL PLANTING

WOODBURN STREET

B
SSD2302

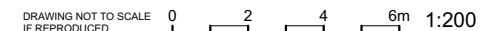




PRELIMINARY 25/8/22



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PLOTTED: 25/8/22
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PRELIMINARY 25/8/22

PROJECT NO:
21022
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PLOTTED: 25/8/22
DRAWING NO: REV:
SSD2005 P08

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EXH- EXHAUST
FH- FIRE HYDRANT
FHR- FIRE HOSE REEL
FP- FLAT PLATE
GC- GARBAGE CHUTE
GL- GLASS
PF- PAINT FINISH
VP- VERTICAL PLANTING



P08	12/8/22	FOR CONSULTANTS CO-ORDINATION
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ISSUE	DATE	REVISION

PRELIMINARY 25/8/22



DRAWING NOT TO SCALE
IF REPRODUCED

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PROJECT:
PROPOSED CO-LIVING DEVELOPMENT

175-177 Cleveland St & 6-8 Woodburn St
DRAWING:
LEVEL 4 PLAN

PROJECT NO:
21022
SCALE: 1:200 @A3
PLOTTED: 25/8/22
DRAWING NO:
SSD2006 P08

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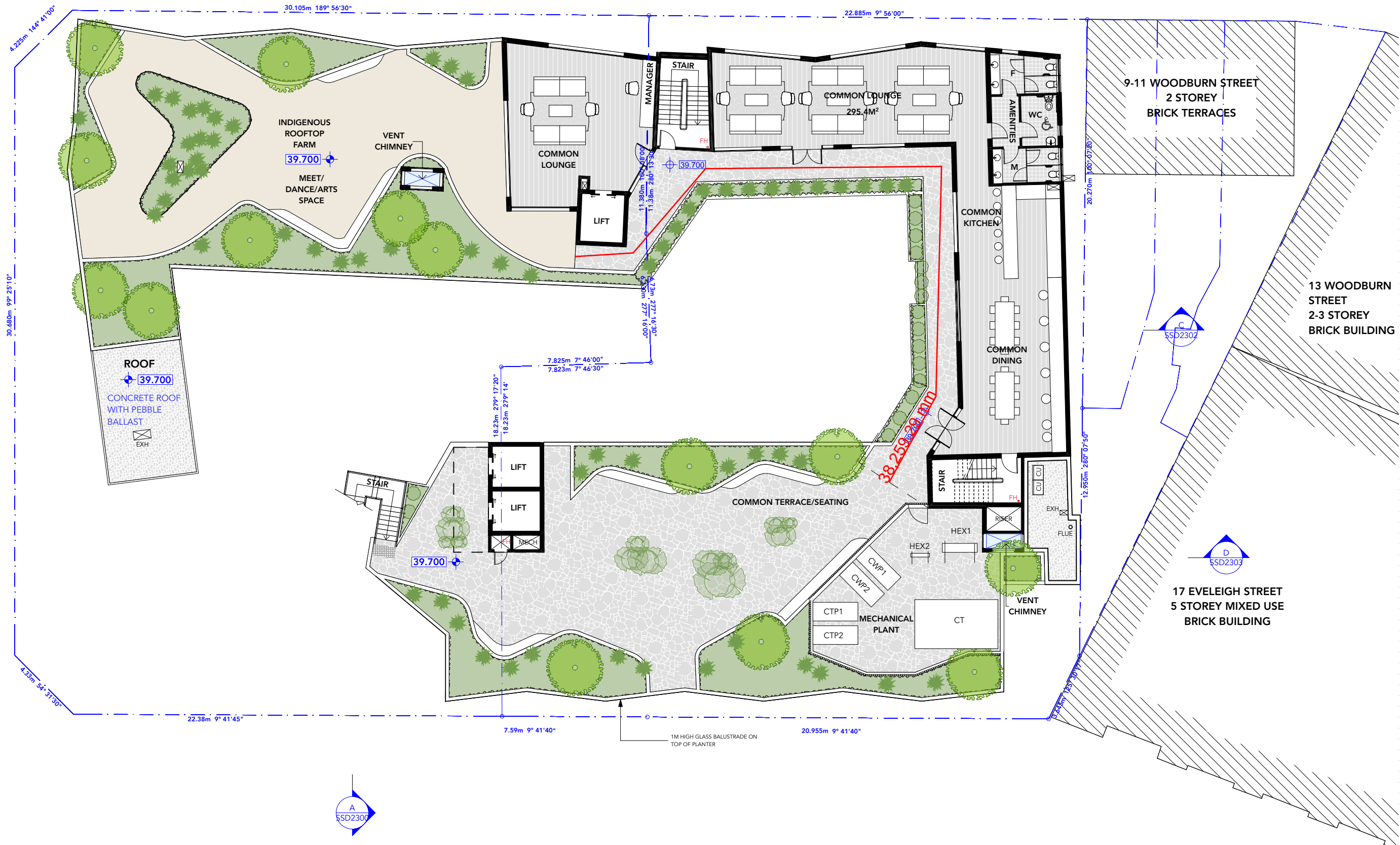
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PROPOSED CO-LIVING DEVELOPMENT

175-177 Cleveland St & 6-8 Woodburn St
DRAWING:
LEVEL 5 PLAN

PROJECT NO:
21022
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PLOTTED: 25/8/22
DRAWING NO: **SSD2007**
REV: **P08**

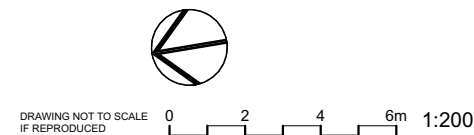
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BR- BRICK
CLD- CLADDING
CU- CONDENSER UNIT
EXH- EXHAUST
FH- FIRE HYDRANT

FHR- FIRE HOSE REEL
FP- FLAT PLATE
GC- GARBAGE CHUTE
GL- GLASS
PF- PAINT FINISH
VP- VERTICAL PLANTING
- CT- COOLING TOWER
HHB- HEATING HOT WATER BOILER
HEX- HEAT EXCHANGER
CTP- COOLING TOWER PUMP
CWP- CONDENSER WATER PUMP
HHWP- HEATING HOT WATER PUMP



P08	12/8/22	FOR CONSULTANTS CO-ORDINATION
P07	31/7/22	FOR CONSULTANTS CO-ORDINATION
P06	21/7/22	FOR COUNCIL CONSULTATION
ISSUE	DATE	REVISION

PRELIMINARY 25/8/22



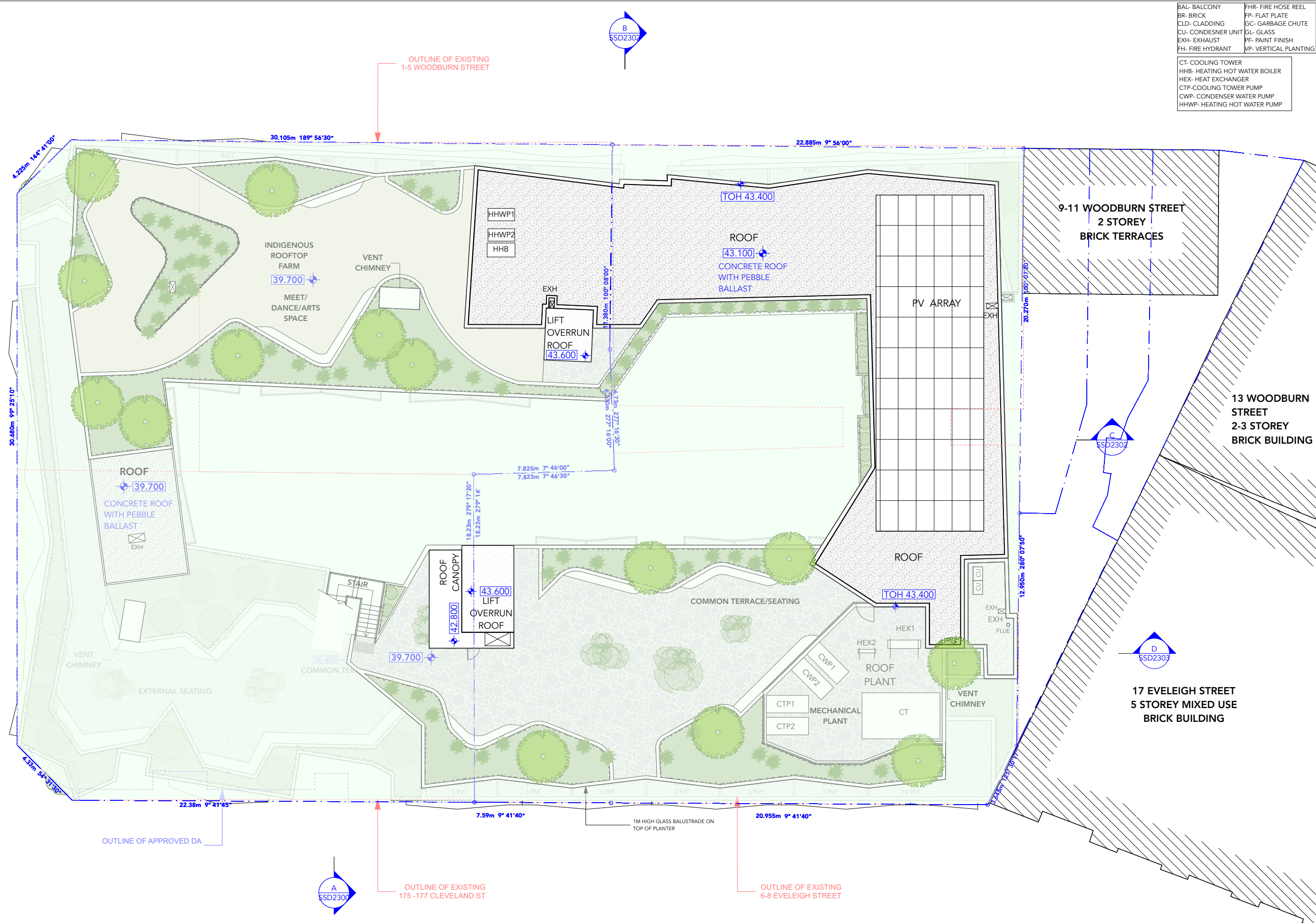
PROJECT:
PROPOSED CO-LIVING DEVELOPMENT

175-177 Cleveland St & 6-8 Woodburn St
DRAWING:
LEVEL 6 PLAN

PROJECT NO:
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PLOTTED: 25/8/22
DRAWING NO: **SSD2008**
REV: **P08**

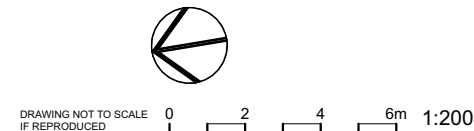
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BR- BRICK
CLD- CLADDING
CU- CONDENSER UNIT
EXH- EXHAUST
FH- FIRE HYDRANT

FHR- FIRE HOSE REEL
FP- FLAT PLATE
GC- GARBAGE CHUTE
GL- GLASS
PF- PAINT FINISH
VP- VERTICAL PLANTING
- CT- COOLING TOWER
HHB- HEATING HOT WATER BOILER
HEX- HEAT EXCHANGER
CTP- COOLING TOWER PUMP
CWP- CONDENSER WATER PUMP
HHWP- HEATING HOT WATER PUMP



P08	12/8/22	FOR CONSULTANTS CO-ORDINATION
P07	31/7/22	FOR CONSULTANTS CO-ORDINATION
P06	21/7/22	FOR COUNCIL CONSULTATION
ISSUE	DATE	REVISION

PRELIMINARY 25/8/22



PROJECT:
PROPOSED CO-LIVING DEVELOPMENT

175-177 Cleveland St & 6-8 Woodburn St

DRAWING:
ROOF PLAN

PROJECT NO:
21022

SCALE: 1:200 @A3
PLOTTED: 25/8/22
DRAWING NO: **SSD2009**
REV: **P08**

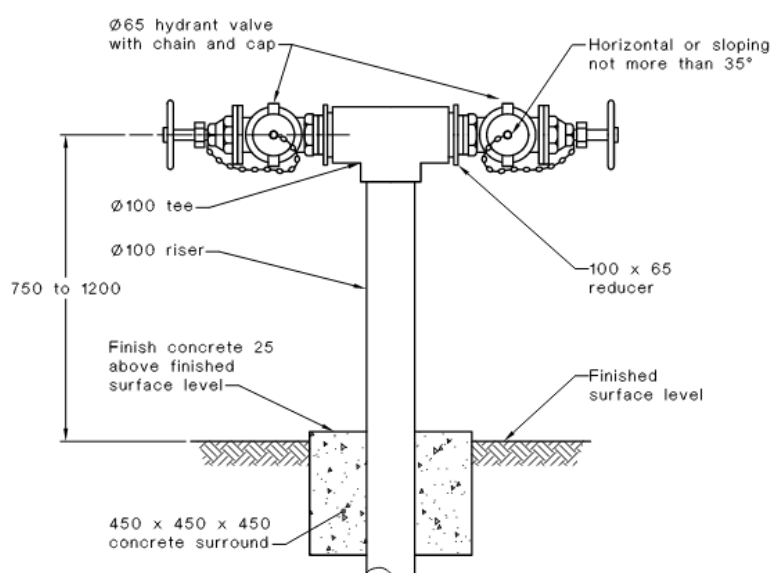
Appendix B Fire Hydrant System (Extract from AS 2419.1-2005)

Information Sheet – Fire Hydrant System Installation

(Extract from AS 2419.1-2005)

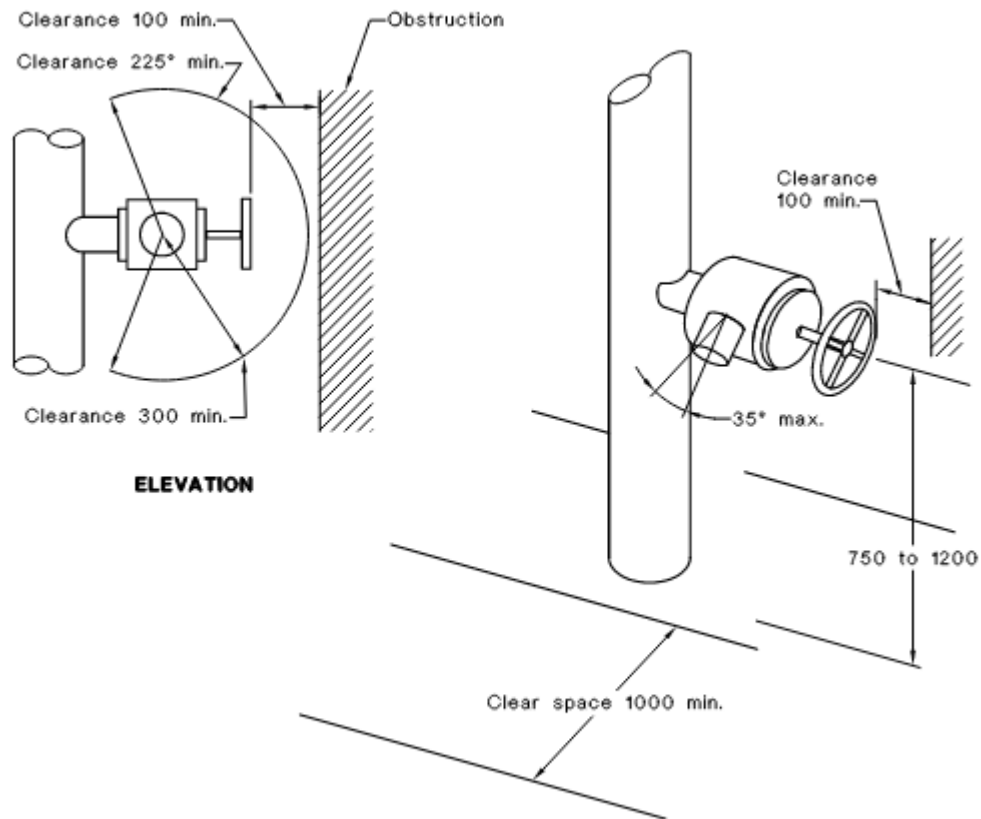
The following is an extract from the Australian Standard AS 2419.1-2005, prepared by MCD Fire to assist you with the installation of fire hydrant systems. This “information Sheet” is for **guidance only** to assist users in ensuring the common defects found on buildings are detected as early as possible. This will avoid delays and compliance with the relevant BCA Clause and Australian Standards to be confirmed by the relevant practitioner (Competent Fire Safety Practitioner, CFSP, where applicable).

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DIMENSIONS IN MILLIMETRES
FIGURE 3.2.2.1 EXAMPLE OF AN EXTERNAL FIRE HYDRANT





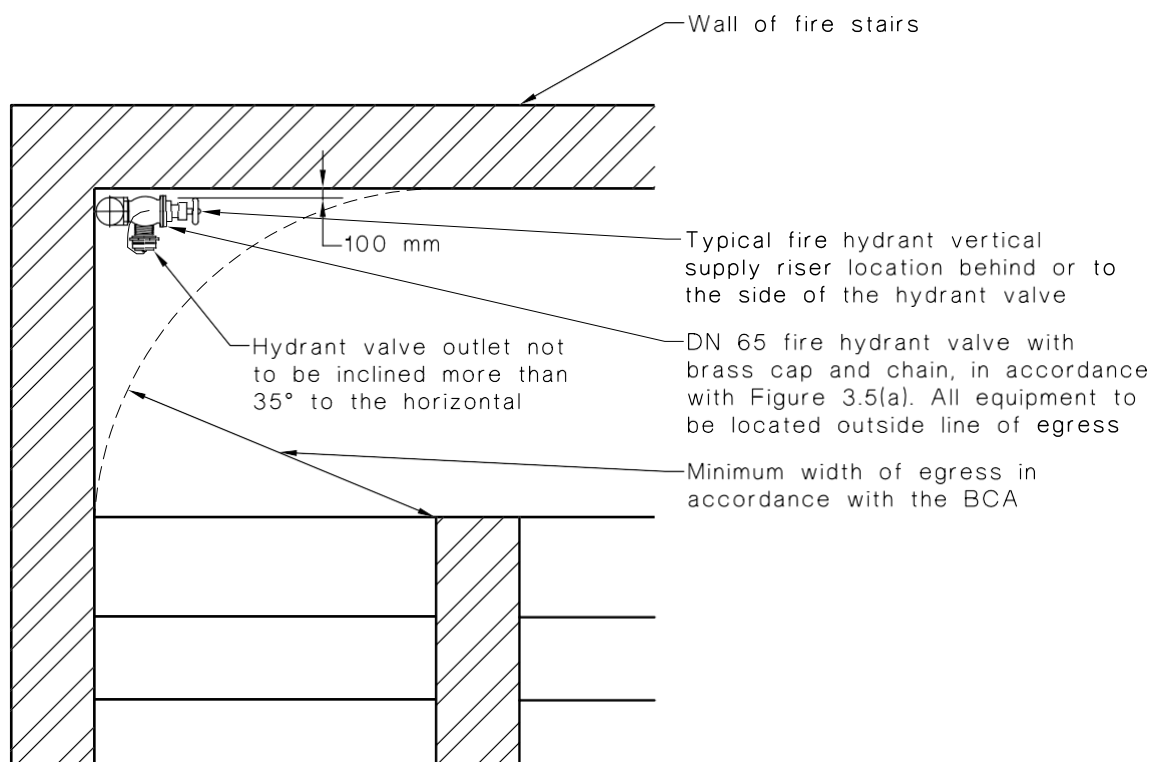
(a) Typical fire hydrant location and clearances

DIMENSIONS IN MILLIMETRES

FIGURE 3.5.1 (in part) FIRE HYDRANT ACCESSIBILITY AND CLEARANCE



(non-compliant example, requiring slight adjustment)



DIMENSIONS IN MILLIMETRES

FIGURE 3.5.1 (in part) FIRE HYDRANT ACCESSIBILITY AND CLEARANCE



3.6 FIRE HYDRANT CABINETS, ENCLOSURES OR RECESSES

3.6.1 General

Where cabinets, enclosures or recesses are supplied, they shall —

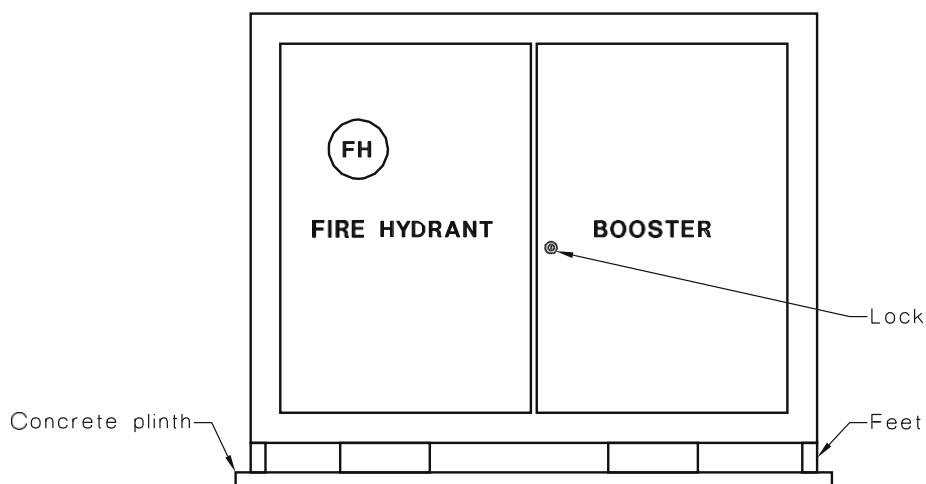
- (a) be of sufficient size to house all equipment;
- (b) be of a design that facilitates access to and handling of equipment;
- (c) have any doors fitted so that when open they do not encroach on exits or inhibit access to firefighting equipment;
- (d) be used to contain firefighting pipework and equipment only; and
- (e) if external, be of weatherproof design and fitted with hinges of stainless steel or copper alloy.

NOTE: Where fire hose reels complying with AS/NZS 1221 (see Appendix G) are installed in conjunction with a fire hydrant, they may be enclosed in the same cabinet, where practicable.

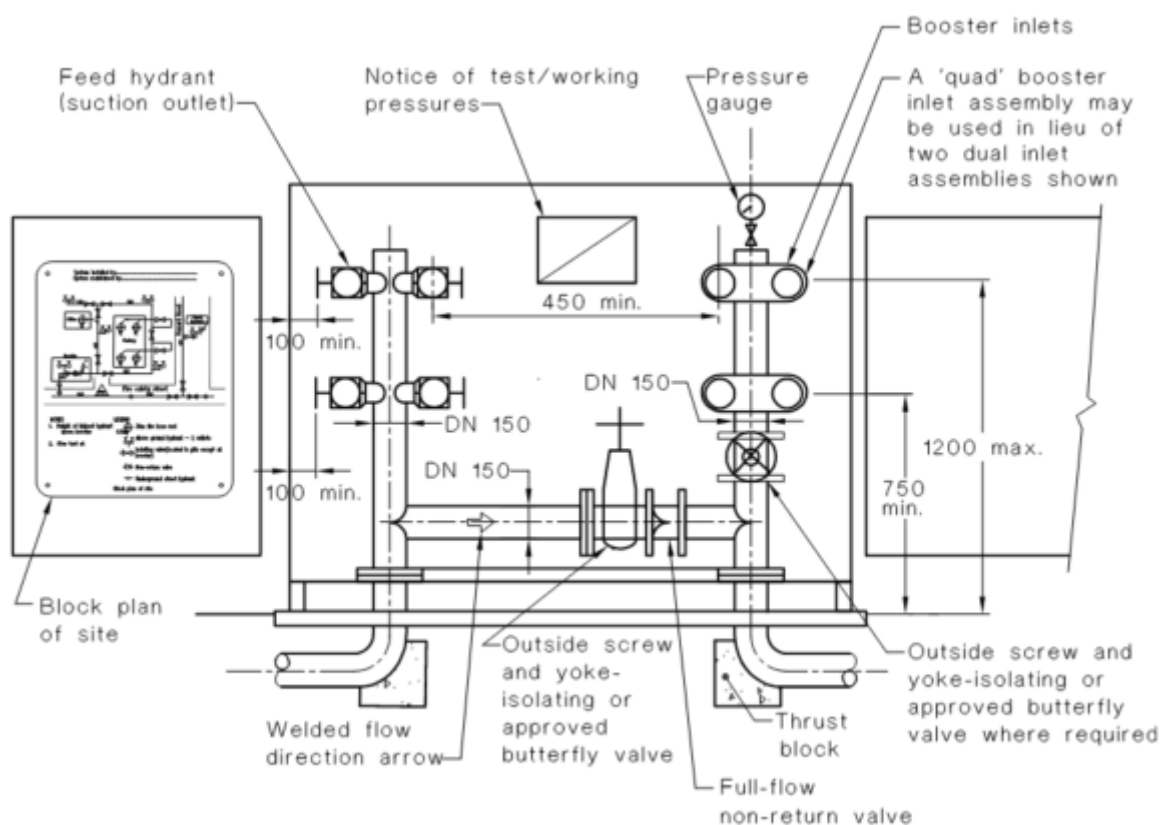
3.6.2 Cabinet enclosure and recess identification

The words 'FIRE HYDRANT' in letters of a contrasting colour to that of the background, shall be marked on each cabinet, enclosure and recess. Where a fire hose reel is enclosed in the same cabinet, the words 'FIRE HYDRANT—HOSE REEL' shall be used. The lettering height shall be —

- (a) for external fire hydrants, 75 mm; or
- (b) for internal fire hydrants, 50 mm.



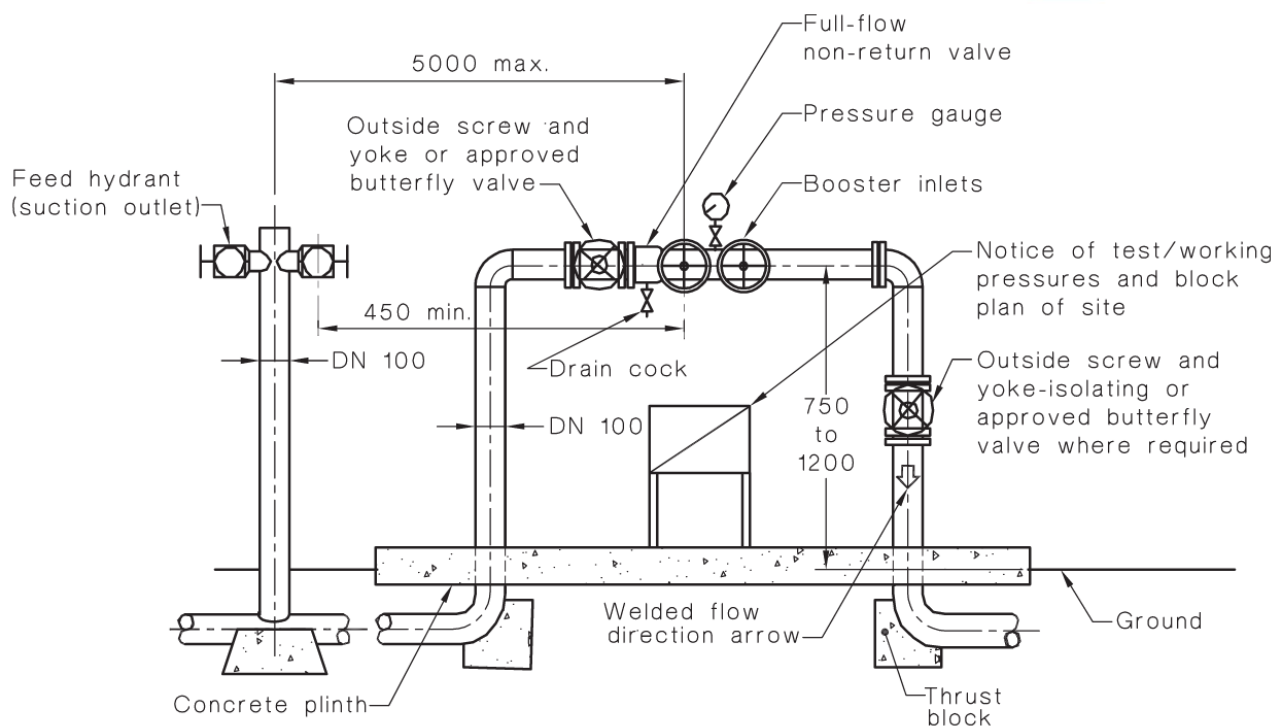
(a) Enclosure



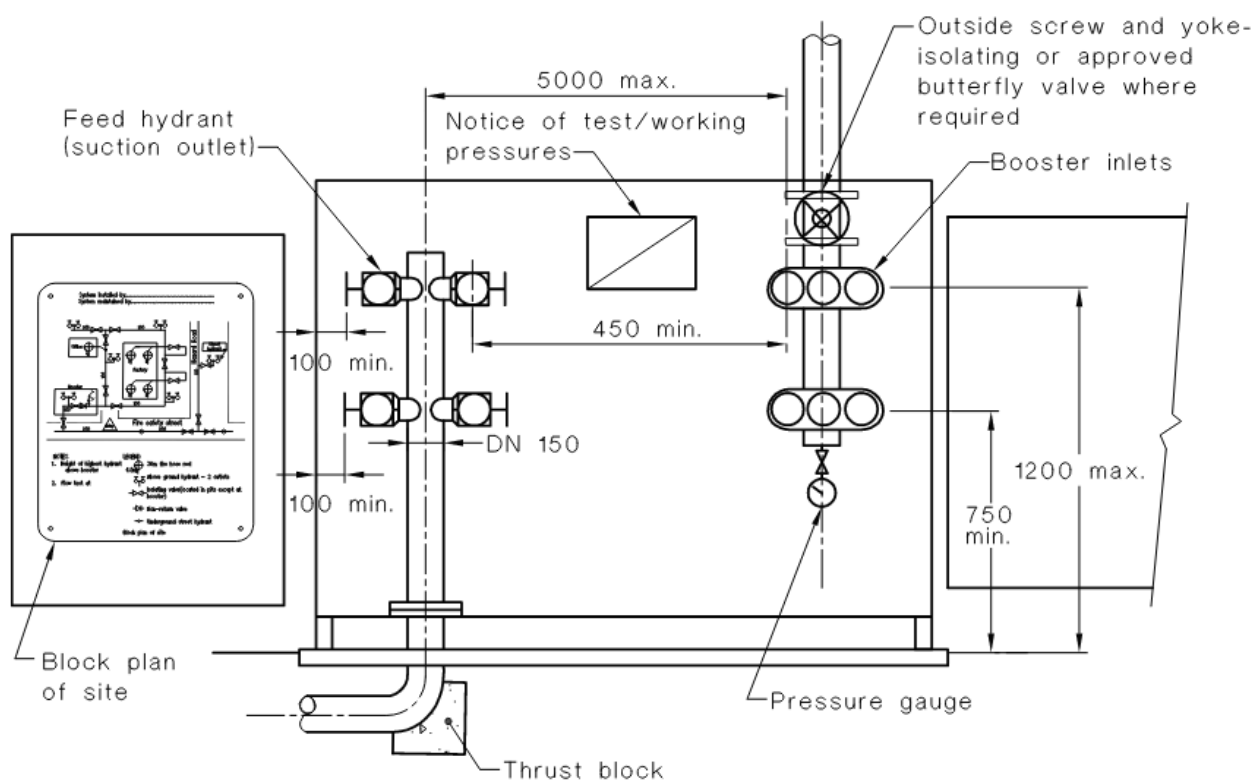
(b) Typical arrangement within closure

DIMENSIONS IN MILLIMETRES

FIGURE 7.4 (in part) TYPICAL BOOSTERS ARRANGEMENT (>50 kPa PRESSURE AT BOOSTER INLET)



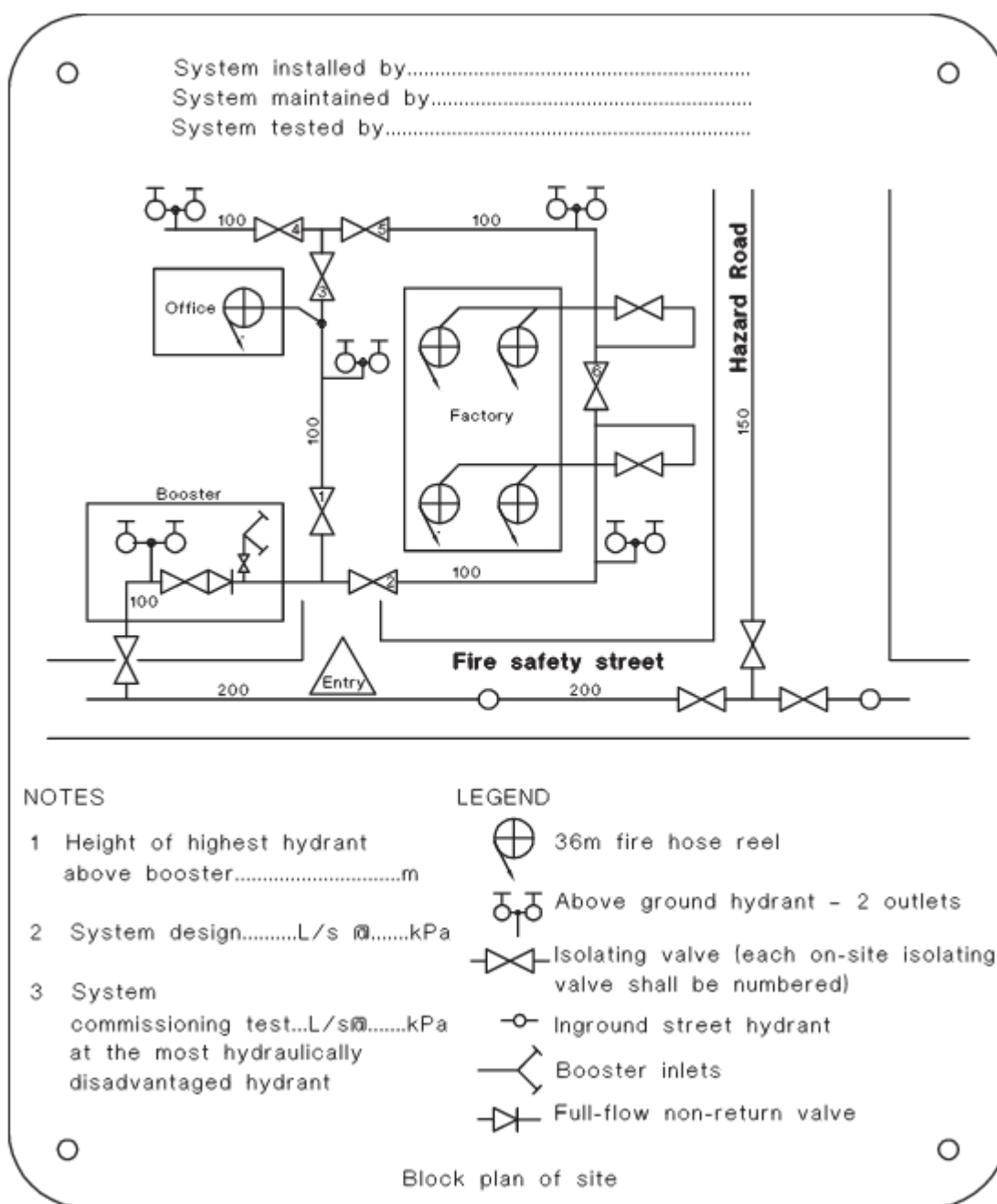
(c) Typical arrangements without closure



DIMENSIONS IN MILLIMETRES

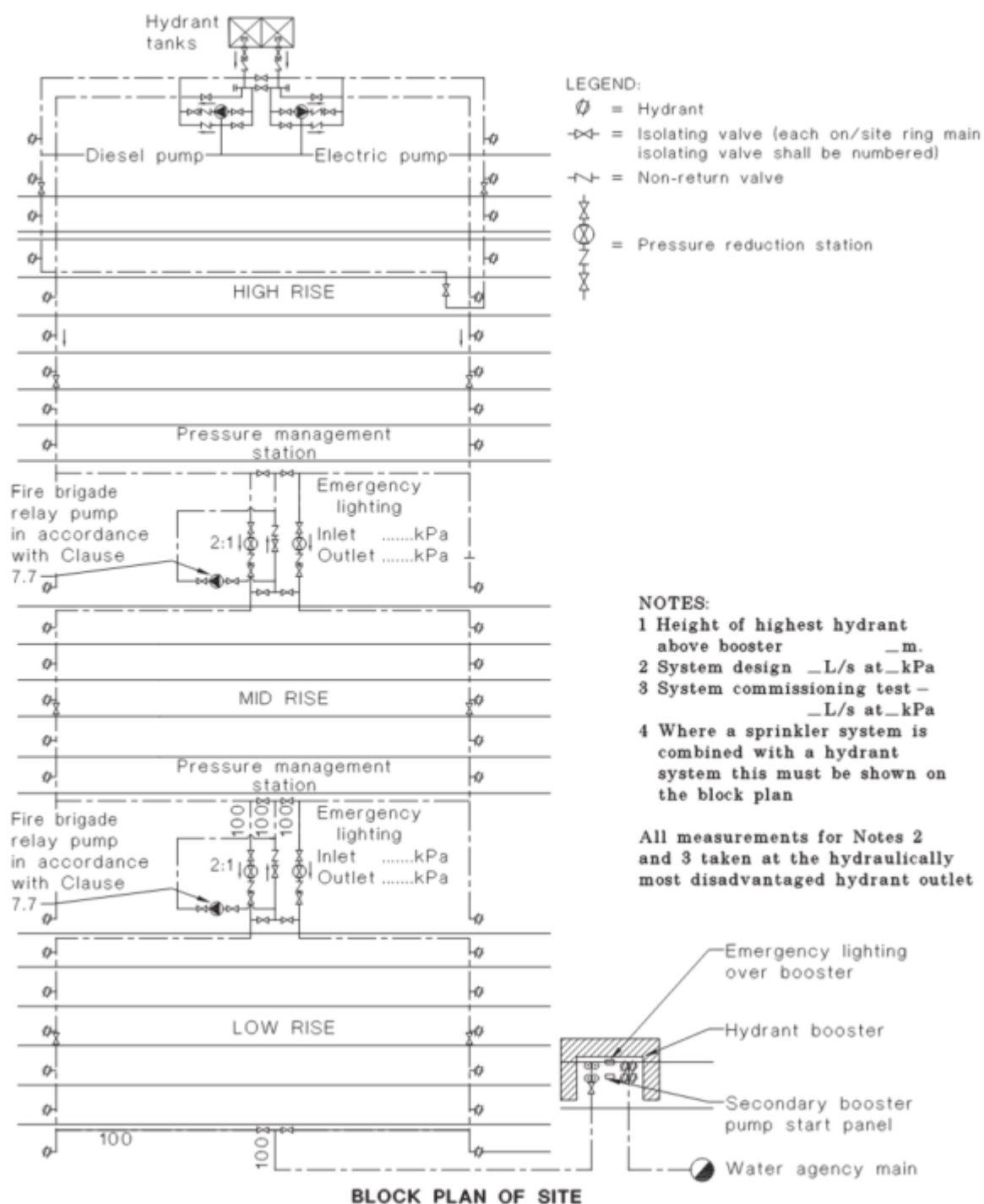
(d) Typical arrangement for a high-rise tank-fed system

FIGURE 7.4 (IN PART) TYPICAL HIGH-RISE TANK-FED BOOSTER ARRANGEMENT
($>50\text{kPa}$ PRESSURE AT BOOSTER INLET)



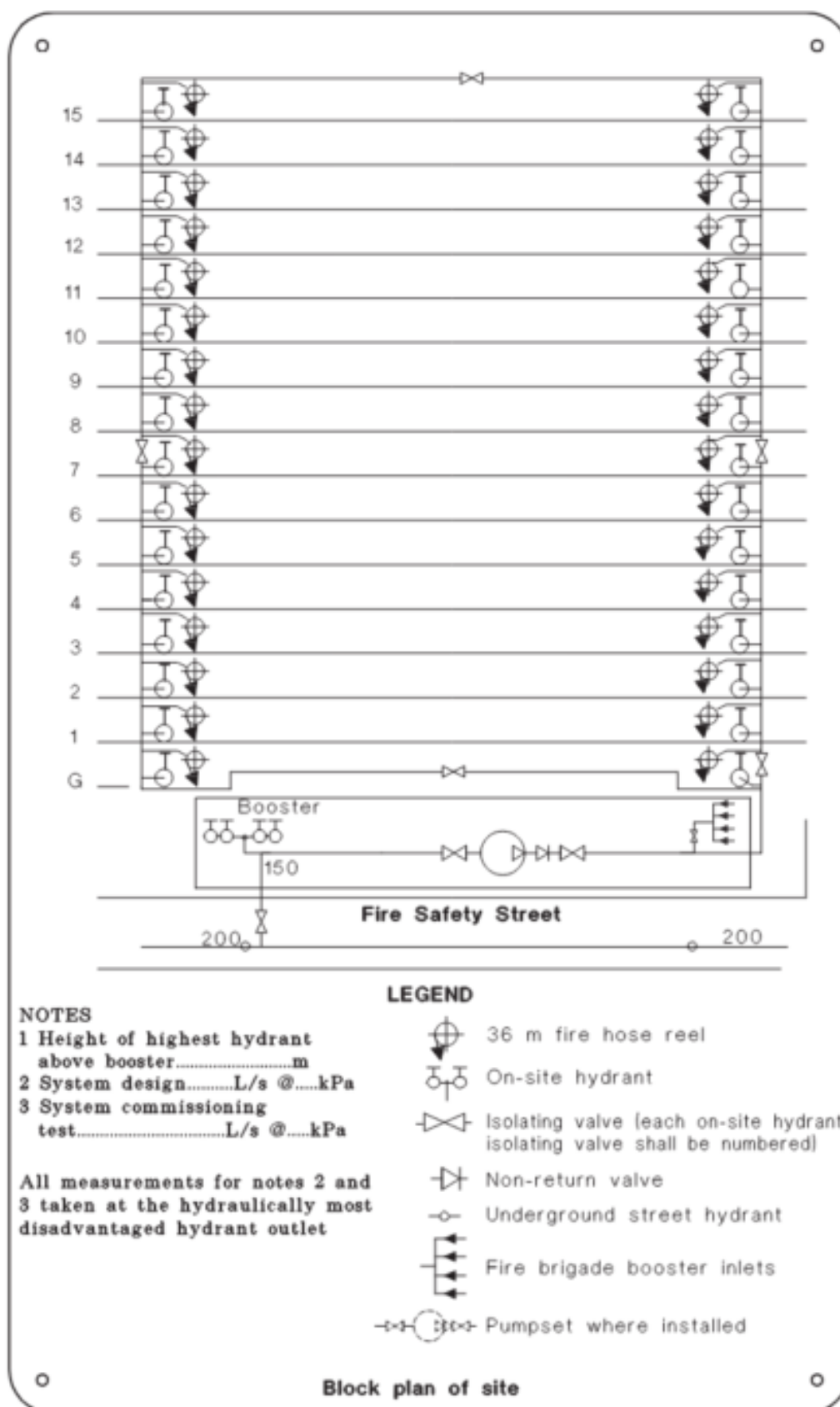
(a) For low-rise installations

FIGURE 7.11 (in part) TYPICAL BLOCK PLAN



(b) For high-rise installations Example 1

FIGURE 7.11 (in part) TYPICAL BLOCK PLAN



(c) For high-rise installations — Example 2

FIGURE 7.11 (in part) TYPICAL BLOCK PLAN

8.5.2 External pipework

External pipework shall be located below ground as far as is practicable. Where it is not possible to install pipework below ground, provision shall be made to protect the pipework, if necessary, from freezing.

Provision shall be made to protect the pipework and any supporting structure from damage by fire.

8.5.3 Internal pipework

Where internal above-ground pipework is installed, it shall be protected from the effects of fire by one of the following methods:

- (a) An automatic fire sprinkler system which shall comply with AS 2118.1.
- (b) Fire rating the pipe supports in accordance with Clause 8.7.4.
- (c) Installing in a fire-isolated stair or fire-resisting shaft.
- (d) Protecting with barriers capable of resisting the effects of fire for a period not less than 60 min.

Where the pipework is of copper and may be exposed to fire in a building that is not protected by sprinklers, the pipework shall be protected using materials that will provide a FRL of not less than -/60/60; or installed in a fire isolated-stair or fire-resisting shaft; or located above a ceiling system that achieves a resistance to the incipient spread of fire for a period of not less than 60 min.

Where appropriate, exposed internal pipework shall also be protected from mechanical damage.

8.5.4 Ring main

Fire hydrants shall be connected to a ring main where any of the following conditions apply:

- (a) There are large isolated buildings in accordance with Specification C2.3 of the BCA.
- (b) The building(s) has an effective height in excess of 25 m.

C8.5.4 The reliability of a fire hydrant system is increased by the installation of a ring main.

8.5.5 Ring main design criteria

Where a ring main is installed, it shall comply with the following:

- (a) Each ring or pressure zone shall be able to be isolated in 25% increments, whilst maintaining not less than 50% of the fire hydrants required to protect each fire compartment (see Figure 8.5.5).
- (b) Risers shall be installed in fire-isolated stairs or fire-isolated shafts.
- (c) In buildings exceeding 25 m effective height, the interconnection of the ring main risers shall be located at not more than 50 m intervals and be within the physical limits of the pressure zone they serve (see Figure 7.11(b)).
- (d) In buildings exceeding 25 m effective height, risers feeding the same zone of protection shall not be located in the same shaft. This does not apply to fire stairs that cross over each other, i.e., scissor stairs.
- (e) Hydraulic losses may be calculated with flow through both paths of the ring main

8.6.5.4 Fusion-bonded epoxy coating

Fusion-bonded epoxy-coated steel or ductile iron pipe, couplings or fittings shall have a minimum film thickness of 200 μm , applied in accordance with AS/NZS 3862 or AS/NZS 4158.

8.7 SUPPORT OF FIRE HYDRANT PIPEWORK

8.7.1 General

Pipe supports for a fire hydrant system shall address—

- (a) stresses and loads that may be imposed on the support system from all external causes, including differential movement of the building structure under normal and fire conditions, and all internal causes, including pressure reactions;
- (b) transmission of vibration; and
- (c) the effects of corrosion.

8.7.2 Pipe support design

Pipework associated with fire hydrant systems shall be adequately supported by either—

- (a) a pipe support system, the individual components of which comply with the requirements of Clause 8.7.5; or
- (b) pipe supports and fasteners that are capable of supporting two times the mass of the pipework filled with water plus a mass of 115 kg at each point of support.

In addition to providing support for the pipework, pipe-support systems shall be designed to prevent sway in the pipework.

NOTE: Verification by test may be used to confirm the structural adequacy of the design.

8.7.3 Materials for pipework support

Pipework supports and components shall be of ferrous material.

In aggressive environments, or where exposed to weather, all components of supporting systems, including anchors, shall be protected against corrosion.

Pipe supports shall be protected from direct contact with copper pipe or pipe fittings.

8.7.4 Fire rating of pipework supports

Where pipework is likely to be exposed to fire in a building that is not protected by sprinklers, then the pipe supports shall have a FRL not less than 60/–/–, while maintaining a pipe-support temperature of not less than 500°C when tested in accordance with AS 1530.4; or other measures shall be taken to prevent its early collapse when exposed to fire.



8.7.5 Requirements for pipe-support components

8.7.5.1 U-bolts used for clamping down

U-bolts used for clamping down shall conform to the dimensions given in Table 8.7.5.1.

Appendix C Fire Hose Reels (Extract from AS 2441-2005)

Information Sheet – Fire Hose Reels Installation

(Extract from AS 2441-2005)

The following is an extract from the Australian Standard AS 2441-2005, prepared by MCD Fire to assist you with the installation of fire hose reels. This “information Sheet” is for **guidance only** to assist users in ensuring the common defects found on buildings are detected as early as possible. This will avoid delays and compliance with the relevant BCA Clause and Australian Standards to be confirmed by the relevant practitioner (Competent Fire Safety Practitioner, CFSP, where applicable).

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6.5 PIPE AND PIPE FITTINGS

Pipes and fittings used in hose reels systems shall comply with one of the following:

- a) AS 2419.1 where connected to fire hydrant systems.
- b) AS/NZS 3500.1 where connected to another water supply.
- c) AS 2118.1 where connected to automatic fire sprinkler systems.

7 CONNECTION FITTING

Fire hose reel assemblies shall have the connection fitting installed on the outlet side of a stop valve. The connection fitting shall be DN 25.

Flexible connections between the stop valve and the hose reel shall not be used unless they form part of a hose reel complying with AS/NZS 1221.

8 FIRE HOSE REEL PUMP

Where a pump set is installed, it shall comply with the appropriate requirements of AS 2941 including any specific requirements for fire hose reels.

9 SELECTION

Hose reels shall be selected and distributed according to the level of Class A fire hazard likely to be encountered in the area to be protected, as prescribed in Table 9.

TABLE 9 - FIRE HOSE REEL SELECTION

Size of hose DN	Light hazard	Ordinary hazard	High hazard
19	Y	Y	Y - If sprinklered to AS 2118
25	Y	Y	Y

NOTE: Y indicates the selection is satisfactory

10 LOCATION

10.1 GENERAL

Each fire hose reel shall be located -

- (a) along the normal paths of travel to an exit; and
- (b) in a readily accessible position, in accordance with the requirements of the Building Code of Australia (BCA).

Note: FHR's shall generally be placed within 4 m of the exits.

Fire hose reels shall not be located -

- (i) in positions where access could present a hazard to the potential user; or
- (ii) in fire-isolated exits.

Access to fire hose reels shall not be obstructed, e.g., from items such as furniture.

Where a fire hose reel is installed in an external situation or an aggressive environment, it shall be protected by a cabinet or other suitable means.

Aggressive environments include the following:

- (A) Exterior situations exposed to the sun, ultraviolet radiation, wind, rain or salt spray.
- (B) Corrosive atmospheres.
- (C) Abnormally dusty or moisture-laden atmospheres.
- (D) Environments that subject the hose reels to continuous or intense vibrations.
- (E) Environments having extremes of temperature.

10.2 SYSTEM COVERAGE

Where a fire hose reel system is required in a building it shall be suitable to allow the occupants to undertake initial fire suppression without being placed in any immediate danger.

The maximum coverage for a fire hose reel shall comply with the following requirements:

- (a) All points on a floor shall be within reach of a 4 m hose stream issuing from a nozzle at the end of the hose laid on floor. The hose length shall not exceed 36 m.
- (b) The distance from a hose reel to the nominated point shall be taken as the most direct laid-on-ground or floor route.
- (c) The location of internal walls, partitions, doorways, storage racking, and any other fixed obstructions, which would restrict normal hose coverage throughout the building or area to be protected, shall be considered when determining the number and location of fire hose reels.

NOTE: In the case of car parks, the coverage is based on the arc of hose length +4 m.

- (d) The coverage shall be in compliance with the requirements stipulated in the BCA.

10.3 SITING OF FIRE HOSE REELS

Fire hose reels shall be sited so that there is no interference with the running out of the hose in its intended direction or directions of use.

10.4 FIRE HOSE REEL LOCATION SIGNS

10.4.1 Location Signs

The fire hose reel location sign shall have symbol, border and letters in white on a red field, approximating R13 signal red of AS 2700 (see Figure 10.1).

10.4.2 Sign location

A location sign shall be provided above or adjacent to a fire hose reel located in a recess, cavity or an obscure location.

Signs shall be positioned so as to be clearly visible to persons approaching the fire hose reel location.

10.4.3 Mounting height

Signs shall be mounted not less than 2.0m above floor level, or at a height that makes them most apparent to a person of average height and visual acuity approaching the fire hose reel locations.

10.4.4 Cabinet or Enclosure

Where a cabinet or enclosure is used, the open door—

- (a) shall not encroach on the required width or path of travel to an exit or doorway; and
- (b) shall not obstruct the hose from being run out in any of its intended directions of use.

The cabinet or enclosure shall be marked with the words 'FIRE HOSE REEL' in letters at least 50 mm high in a colour providing a high contrast with that of the background. The door may also be marked with a location sign complying with Figure 10.1.

NOTE: The required width or path of travel may be determined from the BCA.

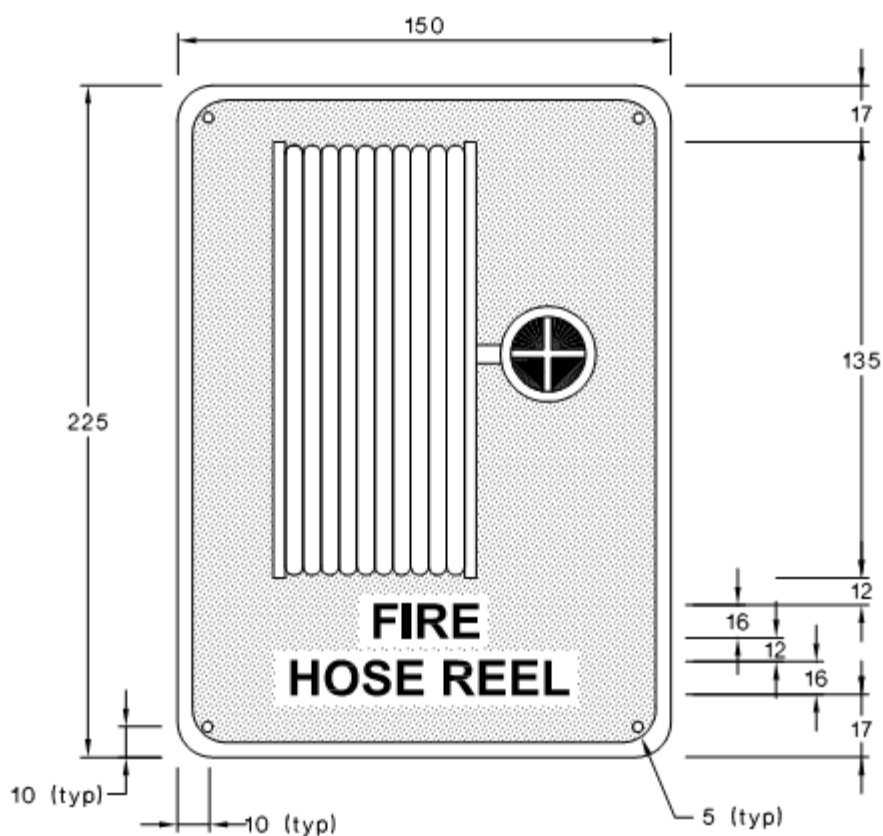
Where fire hose reels are likely to incur unauthorized interference, the cabinet may be locked. Locked cabinets shall be provided with a frangible panel to provide access to the latching device. The panel shall be not less than 150×150mm, and the panel material shall comply with the requirement for frangibility set out in AS 2362.24.

NOTE: The design of the frangible panel should ensure that a cutting hazard is not created when the panel is broken.

The cabinet and its door shall provide a radial clearance of not less than 100mm (see Figure 10.2).

Non-fire equipment or services shall not be installed within the cabinet. The prescribed radial clearances shall be maintained.

NOTE: Storage of non-firefighting equipment, e.g. brooms and cleaning aids, is not permitted in any fire hose reel cabinet, enclosure or recess.

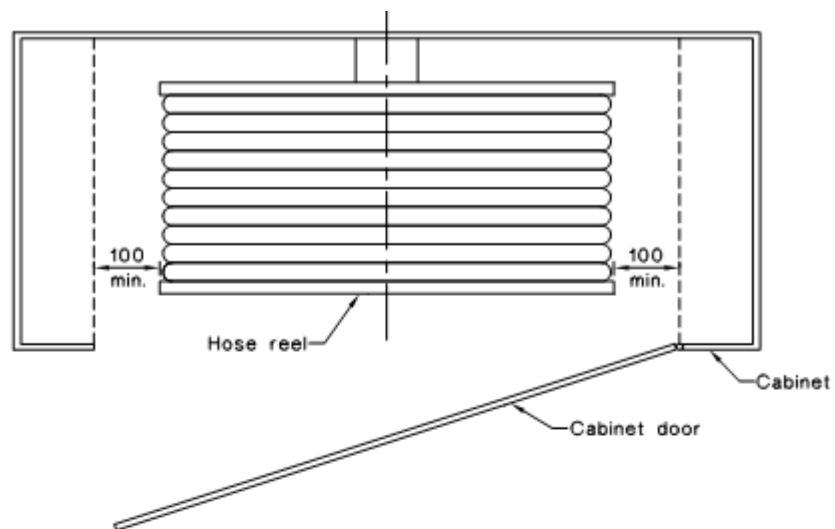


DIMENSIONS IN MILLIMETRES

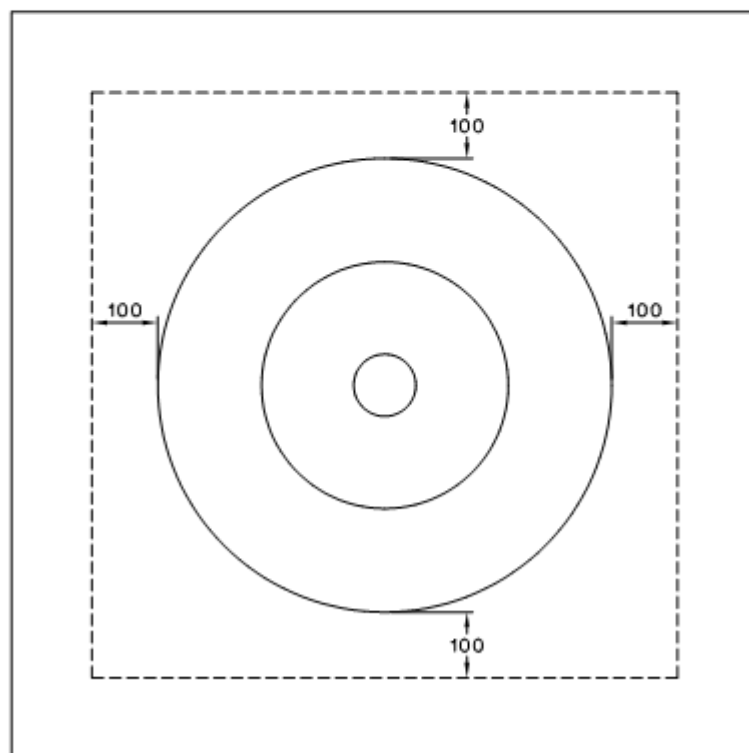
NOTES:

- 1 All dimensions shown are minimum. Any enlargement of the sign should have all dimensions proportional to those shown above.
- 2 For the colours of the sign, see Clause 10.4.1. The shaded area is red field.

FIGURE 10.1 LOCATION SIGN



(a) Top view



(b) Front view

DIMENSIONS IN MILLIMETRES

FIGURE 10.2 FIXED HOSE REEL CLEARANCE

11 MOUNTING

The fire hose reel mounting shall comply with the following requirements:

- (a) Surface-mounted fire hose reel assemblies shall be mounted so that the full diameter of the drum, bearing the operating instructions, is facing the access point. For fire hose reels of other types, the instructions shall be located so that relevant instructions are visible when the fire hose reel is both in the stored and operational position.

NOTE: This is not necessarily to be taken as requiring the instructions to be on the outside of any cabinet door.

- (b) The fire hose reel assembly shall be suitably mounted at a spindle height of between 1400 mm and 2400 mm above floor level. The stop valve shall be mounted at 1000 ± 100 mm above floor level. (see Figure 11.1.)

NOTE: The recommended mounting height of the centre of the fire hose reel is 1500 mm above floor level.

- (c) The stop valve assembly and instructions shall be visible and readily accessible when the fire hose reel is ready for operation and shall be not more than 2000 mm from the spindle of the hose reel assembly. A clearance of not less than 100 mm shall be provided around the stop valve handwheel or handle at any point where an operator needs to place their hand.
- (d) When the fire hose reel is surface-mounted or in a recess, cabinet or cavity, there shall be a minimum radial clearance of 100 mm between the reel rim and any obstruction to the sides, above and below that does not form part of the fire hose reel assembly (see Figure 10.2). In the case of swing-type fire hose reels and those housed in cavities, the above clearance applies when the fire hose reel is withdrawn from the cabinet or cavity.
- (e) Where a fire hose reel is fixed in a cabinet or recess, the hose guide shall protrude beyond the recess when the hose is run out unless the requirements of Clause 12(b) can be met without the hose guide protruding.
- (f) Where a fire hose reel is mounted in a cabinet, the cabinet door(s) shall be openable by single-handed operation of the latching mechanism.
- (g) The fire hose reel and its mounting shall be firmly secured to the mounting surface in accordance with the installation instructions provided with the fire hose reel in accordance with AS/NZS 1221.

The structure on which the fire hose reel is mounted shall be capable of withstanding a force of 1 kN.

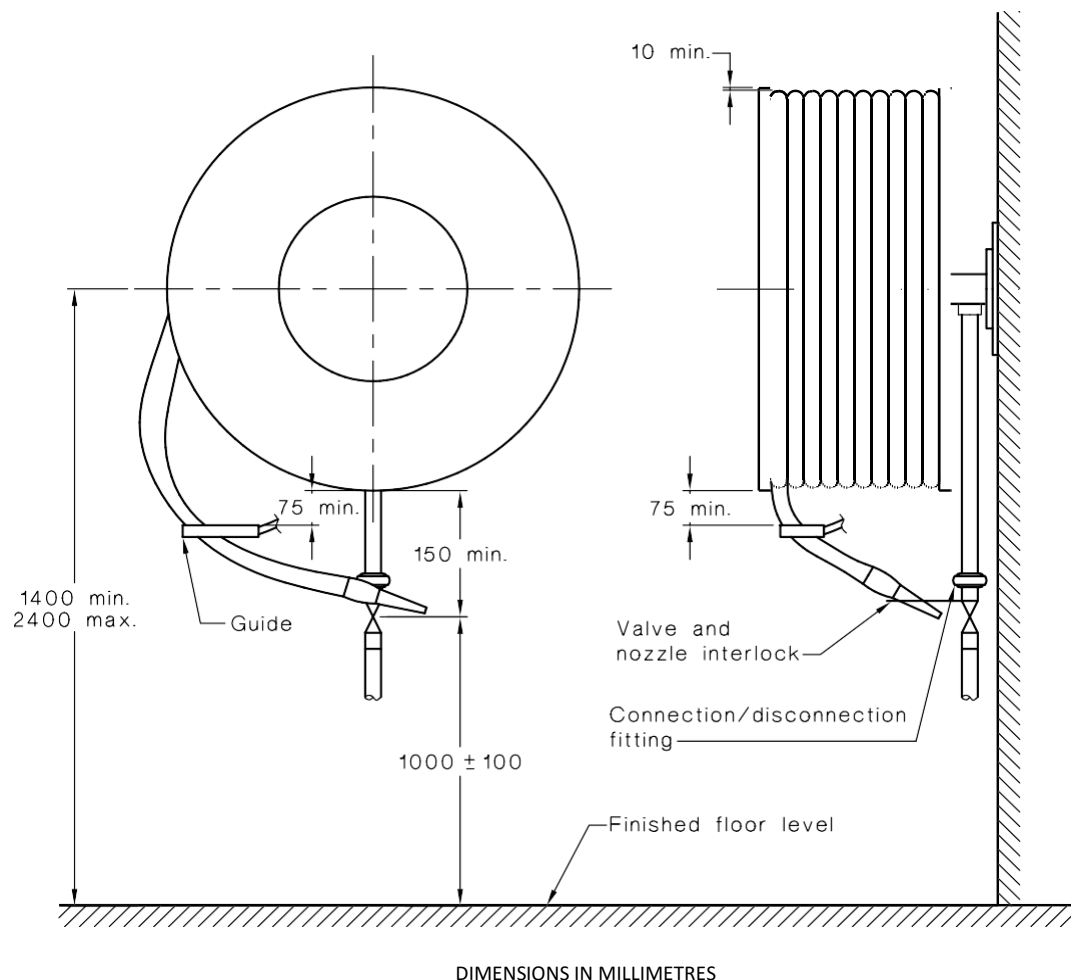


FIGURE 11.1 TYPICAL ARRANGEMENT OF FIXED TYPE HOSE REEL

12 COMMISSIONING PROCEDURE

After installation of the assembly, the following points shall be checked:

- That there is no leakage of water from the fire hose reel assembly when the hose is charged with water and pressurized with the nozzle closed.
- That the hose can be withdrawn easily in any of its intended directions of use; that is the hose shall be capable of being unwound when subject to horizontal pull not exceeding 100 N until the hose contacts the ground (see 'reel unwind test' in AS/NZS 1221).
- That the flow rate with the nozzle in the jet mode is operational by discharging water into a container. The rate of flow shall be not less than that given in Table 6.1.
- That any defects found have been corrected.
- That with the stop valve open, the hose is rewound in even layers, the nozzle re-engaged correctly in the interlock and the stop valve then closed.
- That the discharge nozzle has been opened to depressurize the hose and then closed.

Appendix D Portable Fire Extinguishers – Information Sheet for Installation (Extract from AS 2444-2001)

Information Sheet – Portable Fire Extinguishers Installation

(Extract from AS 2444-2001)

The following is an extract from the Australian Standard AS 2444-2001, prepared by MCD Fire to assist you with the installation of portable fire extinguishers. This “information Sheet” is for **guidance only** to assist users in ensuring the common defects found on buildings are detected as early as possible. This will avoid delays and compliance with the relevant BCA Clause and Australian Standards to be confirmed by the relevant practitioner (Competent Fire Safety Practitioner, CFSP, where applicable).

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3.1 GENERAL

Extinguishers shipped empty or partially dismantled shall be fully assembled and charged strictly in accordance with the manufacturer’s instructions. The extinguisher shall be commissioned and installed in accordance with AS 1851.1, and located in accordance with this Section.

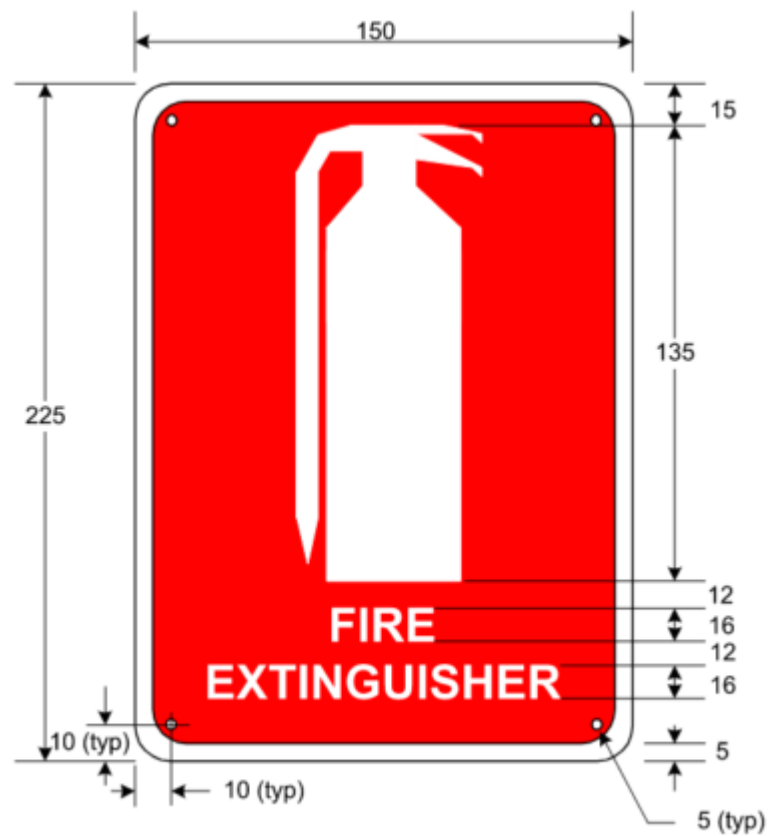
3.2 EXTINGUISHER LOCATION

Each extinguisher shall be located in a conspicuous and readily accessible position. Extinguishers shall not be located in positions where access could present a hazard to the potential user. Where practicable, extinguishers shall be located along normal paths of travel and near exits.

For all installations, extinguishers in and around buildings shall comply with Items (a) and (b) below. Domestic installation, defined as Class 1a building in the Building Code of Australia, is exempt.

Extinguishers shall—

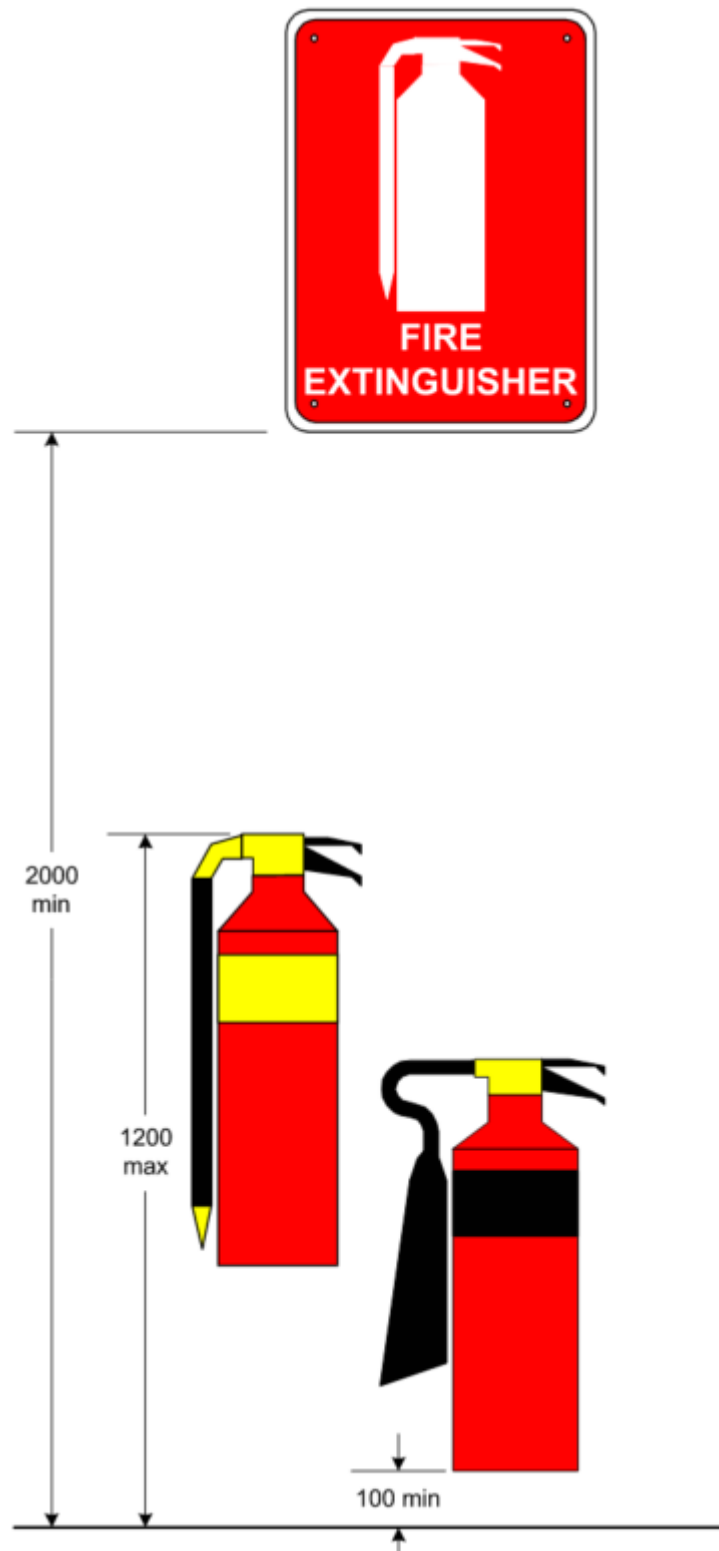
- a) have their locations clearly indicated by placement of the location sign as shown in Figure 3.1; and
- b) be mounted at the appropriate height shown in Figure 3.2 and varied only where there is a possibility of dislodgment and then only where ready accessibility is maintained.



DIMENSIONS IN MILLIMETRES

NOTE: All dimensions shown are minimum. Any enlargement of the sign should have all dimensions in proportion to those shown above.

FIGURE 3.1 TYPICAL FIRE EXTINGUISHER LOCATION



DIMENSIONS IN MILLIMETRES

FIGURE 3.2 MOUNTING HEIGHTS FOR PORTABLE FIRE EXTINGUISHERS AND LOCATION SIGNS

3.3 EXTINGUISHER LOCATION SIGNS

3.3.1 Sign size

The size of the sign shall be determined by—

- (a) the location at which the sign shall be legible; and
- (b) the distance at which the sign shall be legible.

3.3.2 Location signs

The extinguisher and fire point location signs shall have symbol, border and letters in white on a red field, approximating R13 Signal Red of AS 2700 (see Figure 3.1).

3.3.3 Sign location

A sign shall be provided above or adjacent to an extinguisher. A single sign may be employed to indicate multiple extinguishers in one location, even if different types are grouped together.

Signs shall be positioned so as to be clearly visible to persons approaching the extinguisher.

3.3.4 Mounting height

Signs shall be mounted not less than 2.0 m above floor level, or at a height that makes them most apparent to a person of average height and visual acuity approaching the extinguisher location.

3.4 VISIBILITY

The extinguisher, or extinguisher location sign, shall be clearly visible from a distance up to 20 m in all directions of approach.

3.5 SUPPORT

Each extinguisher shall be supported by an appropriate support fitting or bracket, or placed in a cabinet or enclosure with the front of the extinguisher facing outward.

Where an extinguisher is fitted in a vehicle, it shall require a suitable restraining bracket to withstand forces that result from vehicle impact or braking.

3.6 CABINET OR ENCLOSURE

Where a cabinet or enclosure is used, the open door shall not encroach on the required width of path of travel to an exit or doorway. In addition to the location sign referred to in Clause 3.3, the cabinet or enclosure shall be marked with the words 'FIRE EXTINGUISHER' in letters at least 32 mm high in a colour contrasting with the background unless the door has not less than 50% of its surface area fabricated from transparent material that permits visual identification of the cabinet's contents. Where extinguishers are likely to incur unauthorized interference, the cabinet may be locked. Locked cabinets shall be provided with a frangible panel to provide access to the latching device or extinguisher. The panel shall be not less than 150 × 150 mm, and the panel material shall comply with the requirements for frangibility set out in AS 1603.5.

3.7 RECORD OF TYPE AND DISPOSITION

Records of the type, disposition and location of fire extinguishers shall comply with the appropriate requirements set out in AS 1851.1.