The National Construction Code Volume One

Design Development Report

Child & Adolescent Mental Health Services

Nepean Hospital

Revision 3

Date: 20 June 2022

Project No.: 220184

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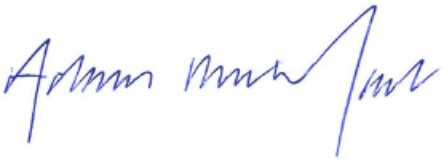
REVISION STATUS				
REVISION	DATE	STATUS	PREPARED BY	REVIEWED BY
0	04.02.2021	Schematic Design Report	Adam Durnford	David Blackett
1	10.08.2021	Schematic Design Report	Adam Durnford	David Blackett
2	13.08.2021	Schematic Design Report	Adam Durnford	David Blackett
3	20.06.2020	Design Development Report	Adam Durnford	David Blackett

Prepared by:



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A. INTRODUCTION

A.1 BACKGROUND / PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Health Infrastructure to undertake a Building Code of Australia (BCA) 2019 Amendment No. 1 assessment of the proposed Child & Adolescent Mental Health Services (CAMHS) Building to constructed as part of the Nepean Hospital Redevelopment.

The proposed building comprises a public entry and carers accommodation on Level 01 and Level 02 comprises bedrooms, recreation and lounge areas and clinical support and assessment services.

On Level 02 there is also enclosed link to the existing Adult Mental Health Facility located to the west of the proposed building.

Figure No. 1 – Proposed perspective of the Child & Adolescent Mental Health Services

A.2 AIM

The aim of this report is to:

- Undertake an assessment of the proposed CAMHS development against the Deemed-to-Satisfy (DtS) provisions of Part C, D, E, F, G & J of the BCA 2019 Amendment No. 1.
- Identify any BCA compliance issues that require resolution/attention for the proposed redevelopment.
- Review the design documentation against the Access to Premises Standards 2010.

A.3 PROJECT TEAM

The following BM+G Team Members have contributed to this Report:

- Adam Durnford (Associate Director)
- David Blackett (Director)

A.4 DOCUMENTATION

The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- Building Code of Australia 2019 Amendment No. 1.
- Guide to the Building Code of Australia 2019.
- Access to Premises Standards 2010.
- Design Development Architectural Drawings as issued by STH dated 26 May 2022.

A.5 REGULATORY FRAMEWORK

Pursuant to Section 19 of the Environmental Planning and Assessment (Building Certification & Fire Safety) Regulation 2021 all new building work must comply with the applicable BCA. In relation to Crown Development, the applicable BCA is the BCA in force at time of calling for tenders or in the absence of calling for tenders, at the time of application for a Crown Certificate.

The BCA Assessment has been prepared in accordance with the Building Code of Australia 2019 Amendment No. 1.

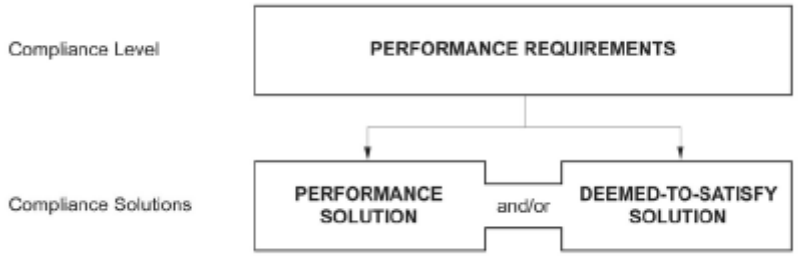
Note: Verification is required as to the proposed timeframe for the calling of tenders for the construction of the proposed CAMHS Building). If the calling of tenders will be prior to the 1 September 2022, the design and construction of the building is permitted to be in accordance with BCA 2019 Amendment No. 1. If the calling of tenders will be post 1 September 2022, then the design of the building will be required to be in accordance with BCA 2022 (Preview has currently been issued by the Australian Building Codes Board).

Notwithstanding the above, if the calling of tenders for the construction of the building will be pre-1 September 2022, verification is required from Health Infrastructure that there is no requirement to design the building to BCA 2022 which comes into force on the 1 September 2022.

A.6 COMPLIANCE WITH THE BCA

The BCA is a performance-based code which contains the 'Performance Requirements' for the construction of buildings. Being a performance-based document, the BCA provides options and flexibility, allowing practitioners to satisfy the Performance Requirements for building by:

- Developing a Performance Solution; or
- Complying with Deemed to Satisfy Provisions (known as a DTS Solution); or
- A combination of the above two options.



This Report has been prepared based on an assessment of the proposed design against the DTS provisions of the BCA and identifies matters which are non-compliance and which BM+G are capable of being subject to a Performance Solution subject to consultation and agreement between all stakeholders.

Where a Performance Requirement is proposed to be satisfied by a Performance Solution, the following steps must be undertaken:

- Prepare a Performance-Based Design Brief (PBDB) in consultation with the project stakeholders.
- Undertake analysis using one or more Assessment Methods listed in Clause A2.2(2) of BCA2019[A1]

- Evaluate the results against the acceptance criteria in the PBDB.
- Prepare a final Performance Solution Report that:
  - Identifies the applicable Performance Requirements and DtS departures identified through Clause A2.2 (3) or A2.4 (3) of BCA2019 [A1] as applicable; and
  - Identifies of all Assessment Methods used; and
  - Includes details of the steps taken under; and
  - Confirms that the applicable BCA Performance Requirement(s) are met; and
  - Stipulates any applicable conditions / limitations required as part of the Performance Solution

A.7 RELEVANT STAKEHOLDERS

The relevant stakeholders for the project are detailed in the table below:

Role	Organisation	Representative(s)
Client Representative	CBRE (H&HE)	Adrian Thompson Ranya Samaan
Architect	Silver Thomas Hanley	Elizabeth Marcos Chirayu Shah Phillip Taylor Bill Kaloudis
Structural Services Engineer	ACOR Consultants	Caitlin Russell Greg Trainor Nathan Pearce Dale Lenden
Civil Services Engineer	ACOR Consultants	Caitlin Russell Greg Trainor Nathan Pearce Dale Lenden
Mechanical Services Engineer	Arup	Stephanie Fulton Mairead Hogan
Electrical Services Engineer	JHA	Luke Wheeler Liam King
Hydraulic Services Engineers	Arup	Song Luo Matthew Stivala
Fire Services Engineers	Arup	Elana Longo Greg Kalisz
Section J Consultant	Arup	Stephanie Fulton Kenisha Pudun

Fire Safety Engineer	Arup	Chris Macdonald Rebekah Chandler
BCA Consultant	Blackett Maguire + Goldsmith	Adam Durnford
Access Consultant	iAccess Consultants	Richard Seidman
Landscape Consultant	Taylor Brammer	Aaron Lakeman George Jerez Revati Shivatare

A.8 LIMITATIONS & EXCLUSIONS

The limitations and exclusions of this report are as follows:

- The following assessment is based upon a review of the architectural documentation.
- The Report does not address matters in relation to the following:
  - Local Government Act and Regulations.
  - Occupational Health and Safety (OH&S) Act and Regulations.
  - WorkCover Authority requirements.
  - Water, drainage, gas, telecommunications, and electricity supply authority requirements.
- BM+G Pty Ltd do not guarantee acceptance of this report by Local Council, NSW Fire Brigades, or other approval authorities.
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A.9 TERMINOLOGY

Building Code of Australia (BCA)

Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in New South Wales (NSW) under the provisions of the EPA Act and Regulation. Building regulatory legislation stipulates that compliance with the BCA Performance Requirements must be attained and hence this reveals BCA's performance based format.

Construction Certificate

Building Approval issued by the Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Construction Type

The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

(i) certain Class 2, 3 or 9c buildings in C1.5; and

(ii) a Class 4 part of a building located on the top storey in C1.3 (b); and

(iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Climatic Zone

Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Deemed to Satisfy Provisions (DtS)

Provisions which are deemed to satisfy the Performance Requirements.

Effective Height

Means the vertical distance between the floor of the lowest storey including the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).

Fire Resistance Level (FRL)

The grading periods in minutes for the following criteria-

(a) structural adequacy; and

(b) integrity; and

(c) insulation,

and expressed in that order.

Fire Source Feature (FSF)

The far boundary of a road which adjoins the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

Health-care building –

A building whose occupants or patients undergoing medical treatment generally need physical assistance to evacuate the building during an emergency and includes—

(a) a public or private hospital; or

(b) a nursing home or similar facility for sick or disabled persons needing full-time care; or

(c) a clinic, day surgery or procedure unit where the effects of the predominant treatment administered involve patients becoming non-ambulatory and requiring supervised medical care on the premises for some time after the treatment.

National Construction Code Series (NCC)

The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupation Certificate

Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open Space

A space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Solution

A method of complying with the Performance Requirements other than by a Deemed-to-Satisfy Solution.

Patient care area

a part of a healthcare building normally used for the treatment, care, accommodation, recreation, dining and holding of patients including a ward area and treatment area.

Performance Requirements of the BCA

A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.

Compliance with the Performance Requirements can only be achieved by-

(a) complying with the DtS Provisions; or

(b) formulating an Alternative Solution which-

(i) complies with the Performance Requirements; or

(ii) is shown to be at least equivalent to the DtS Provisions; or

(c) a combination of (a) and (b).

Sole occupancy Unit (SOU)

A room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and includes a dwelling.

Treatment area

An area within a patient care area such as an operating theatre and rooms used for recovery, minor procedures, resuscitation, intensive care, and coronary care from which a patient may not be readily moved.

Ward area

That part of a patient care area for resident patients and may contain areas for accommodation, sleeping, associated living and nursing facilities.

B. BUILDING CHARACTERISTICS

B.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the proposed CAMHS Building.

BCA Classification:	Class 9a (Health-care Building) Class 3 (Overnight Accommodation)
Storeys Contained	Two (2)
Rise in Storeys:	Two (2)
Effective Height:	< 12m & < 25m
Type of Construction:	Type B Construction
Sprinkler System Installed Throughout	Yes – New building is proposed to be protected throughout with an Automatic Fire Suppression System in accordance with AS 2118.1 – 2017.
Importance Level	Importance Level 2
Climate Zone:	Energy Efficiency Zone 6
Maximum Floor Area:	Max 5,000m^2 compartments for Class 9a Health Care buildings. *Note: 2,000m² compartments applies to all Patient Care Areas within the building.*
Maximum Volume:	Max 30,000m^3 compartments for Class 9a Health Care buildings.
Largest Fire Compartment	748 m^2

Table No. 1 – Summary of building classification items

C. SUMMARY OF KEY COMPLIANCE ISSUES

Based on the Design Development Architectural Drawings prepared by STH, the following is a summary of the key compliance issues identified.

C.1 SUMMARY OF KEY COMPLIANCES ISSUES:

No.	BCA Clause	Description
1.	B1.2	*Importance Level* The new building will be required to be designed and constructed in accordance with the requirements of Importance Level 2 due to the fact that the building does not have a capacity of more than 50 residents (criteria for Importance Level 2) together with the fact that the building is not designed to cater for special post disaster functions (criteria Importance Level 4). Notwithstanding the minimum requirements of the BCA, verification is required to be obtained from Health Infrastructure that the building is not required to be designed in accordance with Importance Level 3.
2.	C1.9	*Aluminium Panels* If aluminium panels are proposed on the external façade of the building, the panels will be required to consist of a single piece of pre-finished metal sheeting having a combustible surface finish not exceeding 1mm thickness and where the Spread of Flame Index of the product is not greater than 0. The product selected will be required to have a current Certificate of Conformity or other appropriate Test Report.
3.	C2.2	*Gap between Concrete Slab and Curtain Wall* Based on a typical external wall construction, it is noted that the small gap between created between the slab edge and external wall is difficult to fire seal in accordance with a tested system. In this instance it is noted that a smoke seal will be provided to the gap between the slab edge and external wall in lieu of a proprietary tested fire seal. The provision of a smoke seal to the gap in lieu of a fire seal is a technical non-compliance with the DtS Provisions of the BCA. The gap between the slab edge and the curtain wall which is to be smoke sealed in lieu of a proprietary fire seal will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by ARUP in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
4.	C2.5	*Excessive Smoke Compartment Size on Level 02* The size of smoke compartment 12 is 518 m^2 which exceeds the maximum permitted size of 500 m^2 by 18 m^2. The size of the smoke compartment is proposed to be assessed as part of a Fire Engineering Assessment to be undertaken by Arup in order demonstrate compliance with the nominated Performance Requirements of the BCA. *Provision of Multiple Fire Compartments on Level 01* The current Architectural Design contains numerous fire compartments on the Level 01. From a compliance standpoint, there is a no requirement for the provision of Fire Compartment 01 (Hydrant Pump Room as the building is sprinkler protected), Fire

No.	BCA Clause	Description
		Compartment 02 (Hot Water Unit), Fire Compartment 05 (Corridor) and Fire Compartment 06 (Loading Dock Lobby). The non-provision of Fire Compartment 02 & 05 will also result in compliant fire hose reel coverage being provided to these rooms.
5.	C2.7	*Fire Wall Separating Class 3 from Class 9c* The fire wall separating the Class 3 area from the Class 9a area on Level 01 is required to have an FRL of not less than 120/120/120 in both directions.
6.	C3.3	*Exposure of External Walls in Different Fire Compartments* Where an internal fire wall intersects at the junction of an external wall, the external walls of the different compartments and any associated openings that are exposed to one another are required to be protected in accordance with Clause C3.3. There are a small number of locations throughout the building where exposure occurs between external walls and their associated openings of different fire compartments on Level 02 of the building. It is proposed to select the external wall of one of the fire compartments where exposure occurs and protect that wall in both directions, and such provide a comparative design to the DtS Provisions of the BCA which require both walls to be rated in one direction. The protection of the external walls and associated openings is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
7.	C3.8, Spec C1.1	*Separation of the Fire Isolated Stairway* The fire isolated stairway located in the northeast part of the building is proposed to be contain drencher protected glazed doors and partial glazed walls separating the stairway by from the remainder of the internal parts of the building. The provision of drencher protected glazing which is not a DTS Solution having regard to the requirements of Clause C3.8 in terms of the protection of openings bounding fire isolated stairways. The provision of drencher protected glazing will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.
8.	C3.11	*Separation of Class 3 Carer Bedroom on Level 01* The Carer Bedroom located on Level 01 which is provided for family members staying overnight is classified as Class 3 in accordance with Part A6 of the BCA. The adjoining lounge area which will be used by family members staying overnight can also be used by other family members visiting patients in the building. In this instance, the lounge area is not directly considered part of the SOU and thus the Carer Bedroom is required to be fire separated from the Lounge area in accordance with Clause C3.11 and Specification C1.1. In accordance with Clause C3.11 and Specification C1.1, the overnight room constitutes a single sole occupancy unit and is required to be fire separated from the Lounge area by construction achieving an FRL of 90/90/90 (load-bearing) or -/60/60 (non-loadbearing). The Carer Bedroom is proposed to be smoke separated only from the adjoining Lounge Area on Level 01. The smoke separation of the bedroom from the lounge area is

No.	BCA Clause	Description
		proposed to be assessed as part of a Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
9.	Clause C3.15	*Water Filled Pipes Systems Comprised of Metal* In accordance with Clause C3.15, a tested system is not required to comply with the insultation criteria relating to the service subject to the pipe system being constructed of entirely of metal and not having any combustible building elements being located within 100mm for a distance of 2000mm from the penetration and combustible materials not being able to be located within 100mm of service for a distance of 2000mm from the penetration. Having regard to the requirements of Clause C3.15 which are difficult to achieve in a health care environment due to the number of services especially in corridors, it is understood that is proposed to permit water filled pipes constructed of metal to not comply with the requirements of Clause C3.15 in terms of the 100mm separation for a distance of 2000mm from the penetration. The proposed design of water filled metal pipes used for fire services, potable water etc with no insultation is proposed to be assessed as part of a Performance Solution to be undertaken by WSP in order to address compliance with the nominated Performance Requirements of the BCA.
10.	Spec. C3.4	*Swing of Fire Safety Doors* Fire safety doors located in fire and smoke walls are required to swing in the direction of egress. There are small number of fire safety doors located in fire and smoke walls on Level 01 & 02 which are required to swing in two directions in order for egress to comply from within the subject parts of the building. The subject doorways are detailed in the figures below. The doorways that swing in one direction only are proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order demonstrate compliance with the nominated Performance Requirements of the BCA.
11.	D1.4	*Egress Travel Distance* Based on the Design Development Architectural Drawings assessed to date, we have undertaken an egress assessment in terms of egress travel distance to an exit and based on our review, we provide the following comments: + Travel distance from the Special Bedrooms is up to 34 m to an alternative exit (4 m over the maximum permitted DtS distance). + Travel distance from the Learning Centre is up to 34 m to an alternative exit (4m over the maximum permitted DtS distance). + Travel distance from the Kitchen is up to 32 m to an alternative exit (2m over the maximum permitted DtS distance). The extended travel distances to an exit will be required to be assessed as part of the Fire Engineering Performance Assessment to be prepared by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
12.	D1.5	*Egress Travel Distance between Alternative Exits*

No.	BCA Clause	Description
		Based on the Design Development Architectural Drawings assessed to date, we have undertaken an egress assessment in terms of egress travel distance between alternative exits and based on our review, we provide the following comments: + Travel distance between alternative exits from the patient care area is up to 55m and 57 m (12 m over the maximum permitted DtS distance). The extended travel distances between alternative exits will be required to be assessed as part of the Fire Engineering Assessment to be prepared by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
13.	D1.7	*Discharge from the Fire Isolated Stairway* Upon discharge from the fire isolated stairway on Level 01 occupants are required to turn left and travel via the walkway as the external stairway is not permitted to be relied upon as an external egress path upon discharge from a Class 9a health care building. The path of external travel that an occupant is required to travel upon discharge from the fire isolated stairway is located less than 6m from the external wall of the building. The provision of the external pathway and ramp within 6 m of the external wall of the building is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
14.	D1.8	*External Stairway Provided in lieu of a Fire Isolated Stairway* The external stairway provided in lieu of fire isolated stairway will be required to be designed in accordance with the requirements of Clause D1.8 as detailed in this Report.
15.	D2.7	*Fire Indicator Panel and EWIS Panel located within* On Level 01 within the building entry which at present also forms part of the fire isolated / separated stairway, the Fire Indicator Panel (FIP) and EWIS Panel are proposed to be located. The provision of the FIP and EWIS Panel within the fire isolated / separated stairway is contrary to the provisions of the DTS Provisions of the BCA. The location of the FIP and EWIS Panel within the fire isolated / separated stairway will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with nominated Performance Requirements of the BCA.
16.	D2.19	*Sliding Door providing Access to the Fire Isolated Stairway on Level 01* A doorway serving as a required exit or forming part of a required cannot be fitted with a sliding door unless the doorway leads directly to open space. The sliding door on Level 01 which leads from the public entry lobby to the fire isolated stairway prior to occupants discharging through the final sliding doors is a non-compliance with Clause D2.19 of the BCA as the subject sliding doors does not lead directly to open space but rather the fire isolated stairway. The provision of the glazed sliding door proving access to the fire isolated stairway on Level 01 of the building will be required to be assessed as part of the Fire Engineering Performance Solution to be undertaken by Arup in order to demonstrate compliance with the Performance Requirements of the BCA.

No.	BCA Clause	Description
17.	Part D3	*Access for a Person with a Disability* Access for a person with a disability will be required to be provided from the allotment boundary, and any accessible car parking spaces associated with the development to the main entrance and then throughout the building. *Class 3 Accessible Sole Occupancy Unit* The Class 3 overnight room provided on Level 01 will be required to be accessible for a person with a disability including access to and within all of the room including the provision of an accessible bathroom (ensuite). The current bathroom (ensuite) design will be required to be modified to be accessible for a person with a disability.
18.	E1.3	*Fire Hydrants* Fire hydrant coverage is required to be provided to serve the building in accordance with AS 2419.1 – 2005. *Fire Hydrant Booster* A fire hydrant booster is required to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access. Although it is to be confirmed, it is understood that the existing fire hydrant booster that will be relied upon for the proposed building will not be located within site of the main entrance of the building. The location of the existing booster in relation to the main entrance of the building will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA. *Access to Locked Cupboard Doors Housing Fire Hydrants* Doors providing access to cupboards housing internal fire hydrants are required to permit free access at all times for FRNSW personnel in accordance with AS 2419.1. It is noted that cupboards containing internal fire hydrants are proposed to be secured locked having regard to the mental health nature of the patients within the building. The secure cupboards housing the internal fire hydrants will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.
19.	E1.4	*Fire Hose Reels* Fire hose reels are required to be installed throughout the building areas in accordance with AS 2441 – 2005. *Access to Locked Cupboard Doors housing FHR's* Doors providing access to cupboards housing internal hose reels are required to permit free access at all times for occupants of the building unless the enclosures are constructed in accordance with Clause 10.4.4 of AS 2441 – 2005.

No.	BCA Clause	Description
		It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the patients of the building. The secure cupboards housing the internal fire hose reels will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA. *Omission of Fire Hose Reel Coverage to Fire Separated Comms Rooms* The Comms Room on Levels 01 & 02 which is proposed to be fire separated from the remainder of the storey will not be provided with compliant fire hose reel coverage due to the fact that the fire hose is not permitted to pass through the fire door in order to achieve fire hose reel coverage. The omission of fire hose reel coverage to the fire separated room will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
20.	E1.5	*Automatic Fire Suppression System* It is noted that an Automatic Fire Suppression System is proposed to be installed throughout the building in accordance with AS 2118.1 – 2017. *Fire Sprinkler Booster* A fire sprinkler booster is required to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access. Although it is to be confirmed, it is understood that the existing fire sprinkler booster that will be relied upon for the proposed building will not be located within site of the main entrance of the building. The location of the existing booster in relation to the main entrance of the building will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.
21.	E1.6	*Access to Locked Cupboard Doors housing Portable Fire Extinguishers* Doors providing access to cupboards housing internal hose reels are required to permit free access at all times for occupants of the building, unless the enclosures are constructed in accordance with Clause 3.6 of AS 2444 – 2001 It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the patients of the building. The secure cupboards housing the internal fire hose reels will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.
22.	E2.2	*Automatic Fire Detection & Alarm System* An Automatic Fire Detection & Alarm System is required to be installed throughout the building in accordance with AS 1670.1 - 2018. Photoelectric type smoke detectors are required to be installed in patient care areas and in paths of travel to exits from patient care areas.

No.	BCA Clause	Description
		Access to Locked Cupboard Doors housing Manual Call Points It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the development. The secure cupboards housing the internal fire hydrants will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA. *Clearance around Manual Call Points installed in Cupboards* As detailed above, manual call points are proposed to be installed in secure cupboards throughout the building having regard to the mental health nature of the building. Manual call points are required to achieve a minimum clearance of 300 mm around them and a clear distance of 600 mm in front in accordance with AS 1670.1 – 2018. When manual call points are installed in cupboards, the minimum required clearance around the manual call points cannot be achieved. The clearance around the manual call points will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA. *Mechanical Air Handling Systems* The mechanical air-handling system systems (other than non-ducted systems with a capacity not more than 1000 litres/second, systems serving critical treatment areas and miscellaneous exhaust air system installed in accordance with Sections 5 and 6 of AS/NZS 1668.1) must shut down automatically on the activation of the Automatic Fire Detection & Alarm System and Automatic Fire Suppression System.
23.	E3.4	*Emergency Lifts* The passenger lift is required to be an Emergency Lift in accordance with Clause E3.4 due to the fact that Level 02 which contains the patient care areas does not have direct egress to a road or open space.
24.	E4.9	An Emergency Warning & Intercom System (EWIS) is required to be installed throughout the entire building in accordance with AS 1670.4 – 2018. *Rationalisation of EWIS Speakers* It is proposed to omit EWIS speakers from patient bedrooms and other sensitive environments where the activation of the speaker within the room may cause trauma to the patient. The rationalisation of EWIS system from within the patient bedrooms will be required to be to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
25.	F1.0	*Weatherproofing of External Walls* Performance Requirement FP1.4 relating to the prevention of water through the external is required to be demonstrated as being complied. There is no specific DtS Clause for this Performance Requirement in respect of external walls.

No.	BCA Clause	Description
		In this instance a Performance Solution Report is required to be prepared to demonstrate that the external wall and roof weatherproofing system meets Performance Requirement FP1.4 and will prevent the penetration of water through the external walls.
26	F2.3	*Sanitary Facilities for Staff and Patients* The number of sanitary facilities provided for both staff and patients is compliant with the DTS Provisions of the BCA based on anticipated staffing numbers. Verification is required from the LHD as to maximum staffing number expected to be within the building at one any one time.
27.	F2.4	*Sanitary Facilities for a Person with a Disability* Facilities for a person with a disability will be required to be throughout the building. In this instance the following sanitary facilities are required to be provided: *Level 1* + One (1) accessible sanitary facility associated with the accessible Carer Bedroom + Once (1) accessible sanitary facility associated with lounge area for use by visiting family members of patients *Level 2* + One (1) unisex accessible sanitary facility for staff + One (1) unisex ambulant sanitary facility for staff + One (1) unisex accessible sanitary facility for patients *Provision of Unisex Ambulant Sanitary Compartments* The provision of unisex ambulant sanitary compartments will be required to be assessed as part of a Performance Solution to be prepared by the appointed Access Consultant as only unisex accessible sanitary facilities are technically permitted by the DtS Provisions of the BCA to be used by both male and females. Ambulant sanitary compartments in accordance with the DtS provisions are required to be provided one for each sex.
28.	Section J	*Section J* The energy efficiency provisions of Section J are applicable to the proposed building. In this regard Parts J1 - Building Fabric, J2, Part J3 - Building Sealing, Part J5 - Air Conditioning and Mechanical Ventilation, Part J6 - Artificial Lighting and Power, and Part J7 - Hot water supply & Part J8 – Access for Maintenance is required to be provided. If the proposed design will not comply with the DtS provisions of the BCA, then a JV3 Assessment will be required to be undertaken to demonstrate compliance with the Performance Requirements of the BCA. It is understood that a JV3 Assessment will be undertaken to demonstrate compliance with the Performance Requirements of the BCA.

Table No. 2 – Summary of key compliance items

C.2 SUMMARY OF ITEMS REQUIRING A FIRE ENGINEERING PERFORMANCE SOLUTION:

No.	DTS CLAUSE	BCA PERFORMANCE REQUIREMENT	DTS DEPARTURE
1.	C2.2, Spec C1.1	CP2, CP3	Smoke sealing of slab edge at the curtain wall construction in lieu of a tested fire stopping system.
2.	C2.5	CP2, CP3	Smoke compartment size of ward area (Fire Compartment 12) exceeds 500 m^2
3.	C3.3	CP2, CP8	Separation of external walls and openings in different fire compartments
4.	C3.8	CP2, CP8	Glazed wall and sliding door bounding the fire isolated stairway on Level 01
5.	C3.11	CP2	Separation of overnight Carers Bedroom from the adjoining Lounge Area
6.	Clause C3.15	CP, CP8	No insultation provided to water filled pipes.
7.	Spec C3.4	CP3, DP4	Swing of fire safety doors located in fire and smoke walls on Level 02.
8.	D1.4	DP4, EP2.2	Extended travel distance to an exit on Level 02
9.	D1.5	DP4, EP2.2	Extended travel distance between alternative exits on Level 02
10.	D1.7	DP5	External path of travel located within 6 m of the external wall of the building upon discharge from the fire isolated (separated) stairway
11.	D2.7	DP5, EP2.2	Provision of the FIP / EWIS Panel within the fire isolated / separated stairway.
12.	D2.19	DP4, DP5	Sliding door leading to the fire isolated stairway on Level 01 in lieu of swing door
13.	E1.3	EP1.3	Location of fire hydrant booster not within sight of the main entrance of the building
14.	E1.3	EP1.3	Secured cupboard housing internal fire hydrants
15.	E1.4	EP1.1	Secured cupboards housing internal fire hose reels

16.	E1.4	EP1.1	Fire hose reel coverage to fire separated rooms
17.	E1.5	EP1.4	Location of fire sprinkler booster not within sight of the main entrance of the building
18.	E1.6	EP1.2	Secured cupboard housing portable fire extinguishers
19.	Spec E2.2a	EP2.2	Clearance around manual call points in internal
20.	E4.9	EP4.3	Rationalisation of EWIS Speakers to patient bedrooms.

Table No. 3 – Summary of required non compliances to be addressed via a Fire Engineering Assessment

The FER process must include input from the LHD and HI, being key stakeholders in the delivery and operation of the hospital project.

C.3 SUMMARY OF ITEMS REQUIRING A PERFORMANCE SOLUTION:

No.	DTS CLAUSE	BCA PERFORMANCE REQUIREMENT	DTS DEPARTURE
1.	D3.1	DP1, DP2	Anti-ligature fixtures and fittings within the patient care areas
2.	F1.0	FP1.4	Weatherproofing of roof and external wall
3.	F2.3	FP2.1	Staff males and females sharing unisex sanitary facilities
4.	F2.4	FP2.1	Anti-ligature fixtures and fittings within the sanitary facilities for a person with a disability
5.	F2.4	FP2.1	Males and females sharing unisex ambulant sanitary compartments

Table No. 4 – Summary of required non compliances to be addressed via a Performance Solution

D. BCA ASSESSMENT

C.1 BCA DEEMED-TO-SATISFY COMPLIANCE ISSUES:

The following comments have been made in relation to the relevant BCA compliance issues associated with the proposed Child & Adolescent Mental Health Service Building at Nepean Hospital.

SECTION B – STRUCTURE

PART B1 – STRUCTURAL PROVISIONS

1. Clause B1.2- Determination of Individual Actions

Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1. This will include the following Australian Standards (where relevant):

1. AS 1170.0 – 2002 General Principles
2. AS 1170.1 – 2002, including certification for balustrading (dead and live loads)
3. AS 1170.2 – 2002, Wind loads
4. AS 1170.4 – 2007, Earthquake loads
5. AS 3700 – 2001, Masonry code
6. AS 3600 – 2018, Concrete code
7. AS 4100 – 1998, Steel Structures and/or
8. AS 4600 – 2005, Cold formed steel.
9. AS 2047 – 1999, Windows in buildings.
10. AS 1288 – 2006, Glass in buildings

Importance Level

The new building will be required to be designed and constructed in accordance with the requirements of Importance Level 2 due to the fact that the building does not have a capacity of more than 50 residents (criteria for Importance Level 3) together with the fact that the building is not designed to cater for special post disaster functions (criteria Importance Level 4).

Notwithstanding the minimum requirements of the BCA, verification is required to be obtained from Health Infrastructure that the building is not required to be designed in accordance with Importance Level 3.

SECTION C – FIRE RESISTANCE

PART C1 – FIRE RESISTANCE AND STABILITY

2. Clause C1.1 – Type of Construction Required

The new building elements will be required to be constructed in accordance with the FRL's detailed in Table 4 of Specification C1.1 for Type B Construction (refer to table below).

TYPE B CONSTRUCTION		
BUILDING ELEMENT	**Class 3**	**Class 9a**
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any fire-source feature to which it is exposed is –		
For *load bearing* parts-		
less than 1.5m	90/90/90	120/120/120
1.5m to less than 3m	90/60/60	120/90/90
3m to less than 9m	90/60/30	120/30/30

9m to less than 18m	90/30/30	120/30/-
18m or more	-/-/-	-/-/-
For *non-load bearing* parts-		
less than 1.5m	-/90/90	-/120/120
1.5m to less than 3m	-/60/30	-/90/60
3m or more	-/-/-	-/-/-
EXTERNAL COLUMN not incorporated in an external wall, where the distance from any fire source feature to which it is exposed is –		
Less than 18m	-/90/90	120/-/-
18m or more	-/-/-	-/-/-
COMMON WALLS & FIRE WALLS	90/90/90	120/120/120
INTERNAL WALLS		
Fire Resisting lift and stair shafts –		
Loadbearing	90/90/90	120/120/120
Non-loadbearing	-/90/90	-/120/120
Between or Bounding Sole Occupancy Units –		
Loadbearing	60/60/60	
Non-loadbearing	-/60/60	
Ventilating, pipe, garbage, and the like shafts not used for the		
discharge of hot products of combustion –		
Loadbearing		
Non-loadbearing		120/90/90
		-/90/90
OTHER LOADBEARING INTERNAL WALLS & COLUMNS	60/-/-	120/-/-
FLOORS	120/120/120	120/120/120
ROOF	-/-/-	-/-/-

Table No. 5 – Required FRL's for building elements

3. Clause C1.9 – Non-Combustible Building Elements

In a building required to be constructed of Type B Construction (in accordance with DtS Provisions) and all buildings (as required by Health Infrastructure Design Guidance Note 32), external walls including all components incorporated in them including all façade covering, framing and insulation, packers are required to be constructed of non-combustible construction.

Aluminium Cladding

In this instance any proposed panels to be used on the external walls of the building will be required to comply with the requirements of Clause C1.9 i.e. single piece of pre-finished metal sheeting having a combustible surface finish not exceeding 1mm thickness and where the Spread of Flame Index of the product is not greater than 0.

No composite aluminium panels can be installed on the external façade of the building.

Appropriate Test Reports / Certificates will be required to be submitted for any Aluminium Cladding demonstrating compliance with Clause C1.9 of the BCA.

Sarking within the External Wall Assembly

Sarking type materials installed within existing or new external walls will be required to have a thickness not exceeding 1mm and have a Flammability Index not greater than 5.

Insulation within the External Wall Assembly

Insulation installed within the external wall assembly will be required to be non-combustible.

Packers

All packers installed with the external wall assembly are required to be non-combustible.

Documentation is required to be provided as relevant to:

- Any external wall claddings.
- Any framing or integral formwork systems i.e., timber framing, sacrificial formwork, etc.
- Any external linings or trims i.e., external UPVC window linings, timber window blades, etc.
- Any sarking or insulation contained within the wall assembly.
- Any packers, insultation of plumbing or mechanical services or any other building element

This is not an exhaustive list, and any element incorporated within any external wall assembly must be identified and provided for review. Any departures from non-combustibility must be advised prior to specification / installation.

An External Wall Disclosure Statement will be required to be submitted prior to the issue of the Crown Certificate that details all elements of the external wall assembly.

Timber Noggins in Fire Walls

Internal non-loadbearing fire walls are required to be constructed of non -combustible construction including all elements that make up the fire / smoke wall.

In this instance timber noggins or plywood are not permitted to be installed within the fire walls. All services, handrails etc will be required to be supported within the fire wall cavity will be required to be constructed of a non-combustible material.

4. Clause C1.10 – Fire Hazard Properties

The fire hazard properties of all new building materials and assemblies as well as all new floor materials, floor coverings, wall and ceiling lining materials used in the development must comply with the requirements of Specification C1.10 of the BCA.

In accordance with Specification C1.10, we note the following requirements:

Critical Radiant Flux of Floor Materials and Floor Coverings

- Patient Care Areas – not less than 2.2 kW/m²
- Non-Patient Care Areas – not less than 1.2 kW/m²
- Fire Isolated Exits – not less than 4.5 kW/m²
- Lifts – not less than 2.2 kW/m²

Wall and Ceiling Lining Materials – Group Number

- Fire Isolated Exit – Group 1
- Public Corridor – Group 1 or 2
- Patient Care Areas – Group 1, 2 or 3
- Other Areas – Group 1, 2 or 3
- Lifts – Group 1 or 2

Rigid and flexible air handling ductwork will be required to comply with fire hazard properties set out in AS 4254 Parts 1 and 2.

Material test data sheets will need to be submitted for further assessment to ensure compliance with the above.

5. Clause C1.14 – Ancillary Elements

An ancillary element (attachment) must not be fixed, installed, or attached to the internal parts or external face of an external wall that is required to be *non-combustible* unless it is one of the following:

- Gutter/downpipe / other plumbing fixture
- A flashing.
- A grate/grille <2m^2 associated with a building service.
- An electrical switch/GPO/cover plate, or the like.
- A light fitting.
- A required sign.
- A combustible non-required sign may be permitted if achieving a Group Number of 1 or 2 and not extending beyond one storey or fire compartment.

  This issue must be carefully noted in relation to any proposed signage structures.
- A combustible awning, sunshade, canopy, blind, or shading hood may be permitted at ground storey or a storey immediately above ground storey if complying as relevant to fire hazard properties and not affecting a required exit.
- A part of a security, intercom, or announcement system.
- Wiring.
- A paint, lacquer, or a similar finish.
- A gasket, caulking, sealant, or adhesive associated with the above ancillary elements.

PART C2 – COMPARTMENTATION AND SEPARATION

6. Clause C2.2 – General Floor Area and Volume Limitations

The maximum size of any fire compartment with a Class 9a cannot exceed 5,000 m² & 30,000 m³.

Note: the size of fire compartments within patient care areas is limited to a maximum of 2,000m^2.

The size of the fire compartments as detailed on the Design Development Architectural Drawings complies with DtS Provisions of the BCA.

Gap between Concrete Slab and Curtain Wall

Based on a typical external wall construction, it is noted that the small gap between created between the slab edge and external wall is difficult to fire seal in accordance with a tested system.

In this instance it is noted that a smoke seal will be provided to the gap between the slab edge and external wall in lieu of a proprietary tested fire seal. The provision of a smoke seal to the gap in lieu of a fire seal is a technical non-compliance with the DtS Provisions of the BCA.

The gap between the slab edge and the curtain wall which is to be smoke sealed in lieu of a proprietary fire seal will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by ARUP in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

7. Clause C2.5 – Class 9a Buildings

Fire & Smoke separation is to be as per BCA specifications C2.5 and C3.4.

Patient care areas also need to be fire compartmented into 2000m^2 fire compartments with fire walls having an FRL of 120/120/120.

Patient care areas are required to be separated from non-patient care areas by fire and smoke rated construction.

Ward and Treatment Areas are required to be designed in accordance with the following table.

Area Use		Max. Compartment Size		
Patient Care Area (max 2,000m^2)	**Ward Area**	Where total floor area is less than 500m^2 :	Where total floor area is greater than 500m^2, but less than 1000m^2 :	Where total floor area is greater than 1000m^2 :
		Separate from other areas with Smoke Walls	Separate with smoke walls into areas less than 500m^2	Separate with smoke walls with an FRL of not less 60/60/60 into areas less than 1000m^2
	Treatment Area	Where total floor area is less than 1000m^2 :	Where total floor area is greater than 1000m^2 :	
		Separate from other areas with Smoke Walls	Separate with smoke walls into areas less than 1000m^2	
Note: Walls identified above which are required to achieve an FRL or be smoke separated must be of non-combustible construction i.e., no timber framed stud walls.				

Table No. 6 – Required fire and smoke compartmentation for patient care areas

Excessive Smoke Compartment Size on Level 02

Having regard to the proposed design, we note the following:

+ The size of smoke compartment 12 is 518m^2 and which exceeds the maximum permitted size of 500m^2 by 18m^2.

The size of the smoke compartment is proposed to be assessed as part of a Fire Engineering Performance Solution to be prepared by WSP in order demonstrate compliance with the nominated Performance Requirements of the BCA.

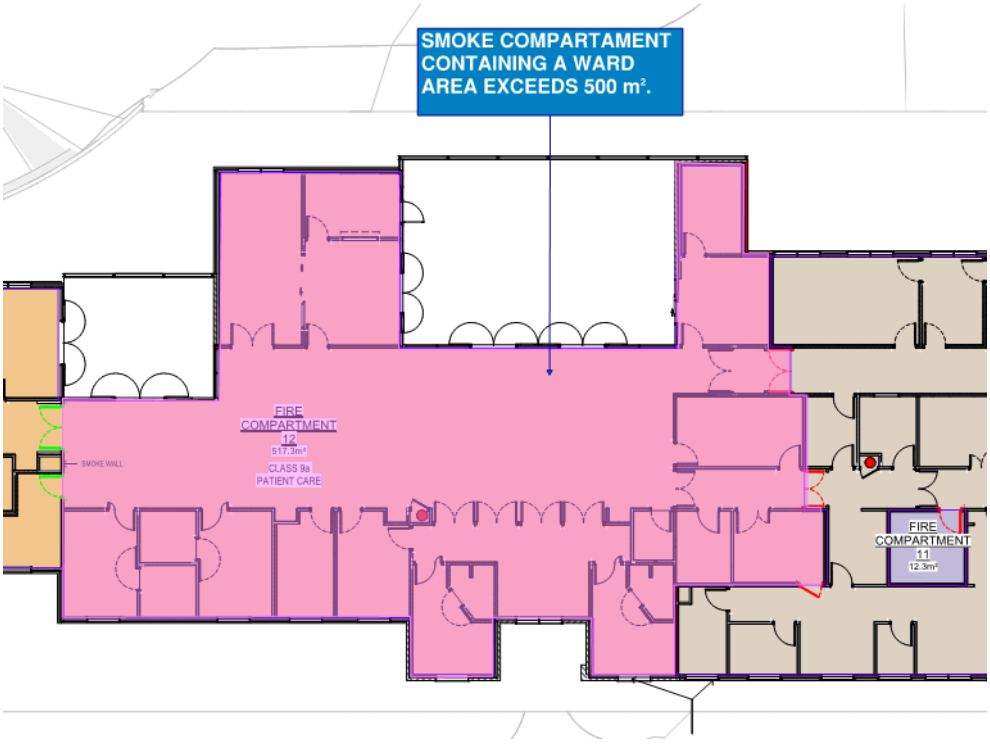


Figure No. 2– Smoke compartment exceeds 500m^2

Provision of Multiple Fire Compartments on Level 01

The current Architectural Design contains numerous fire compartments on the Level 01.

From a compliance standpoint, there is a no requirement for the provision of Fire Compartment 02 (Hot Water Unit unless it contains a boiler in accordance with Clause C2.12), Fire Compartment 05 (Corridor) and Fire Compartment 06 (Loading Dock Lobby).

The non-provision of Fire Compartment 02 & 05 will also result in compliant fire hose reel coverage being provided to these rooms.

8. Clause C2.6 – Vertical Separation of Openings in the External Wall of the Building

Having regard to the fact that the building is proposed to be provided with an Automatic Fire Suppression System installed in accordance with AS 2118.1 – 2017, spandrel separation is not required to be provided between openings in the external wall of the building.

9. Clause C2.7 – Separation by Fire Walls

Fire walls (*including fire rated walls*) must extend from the floor slab to the underside of the floor slab above or where no floor is provided above the roof sheeting, with no penetrations by building elements through the fire wall other than roof battens with a dimension of 75mm x 50mm or sarking.

The fire wall separating the overnight accommodation rooms from the remainder of the Ground Floor is required to have an FRL of not less than 120/120/120 in both directions. Details of the proposed fire wall construction is to be submitted for review.

Verification will be required from the Architect / Structural Engineer / Head Contractor that no proposed building elements have been designed to pass through the fire walls.

Note: -

No building elements penetrating fire walls includes steel brackets supporting electrical cable trays or any other structural elements supporting another building element.

Glazing is not permitted to be located within a fire wall in accordance with the DtS Provisions of the BCA.

10. Clause C2.8 – Separation of Classifications in the Same Storey

Fire Wall Separating Class 3 from Class 9c

The fire wall separating the Class 3 area from the Class 9a area on Level 01 is required to have an FRL of not less than 120/120/120 in both directions.

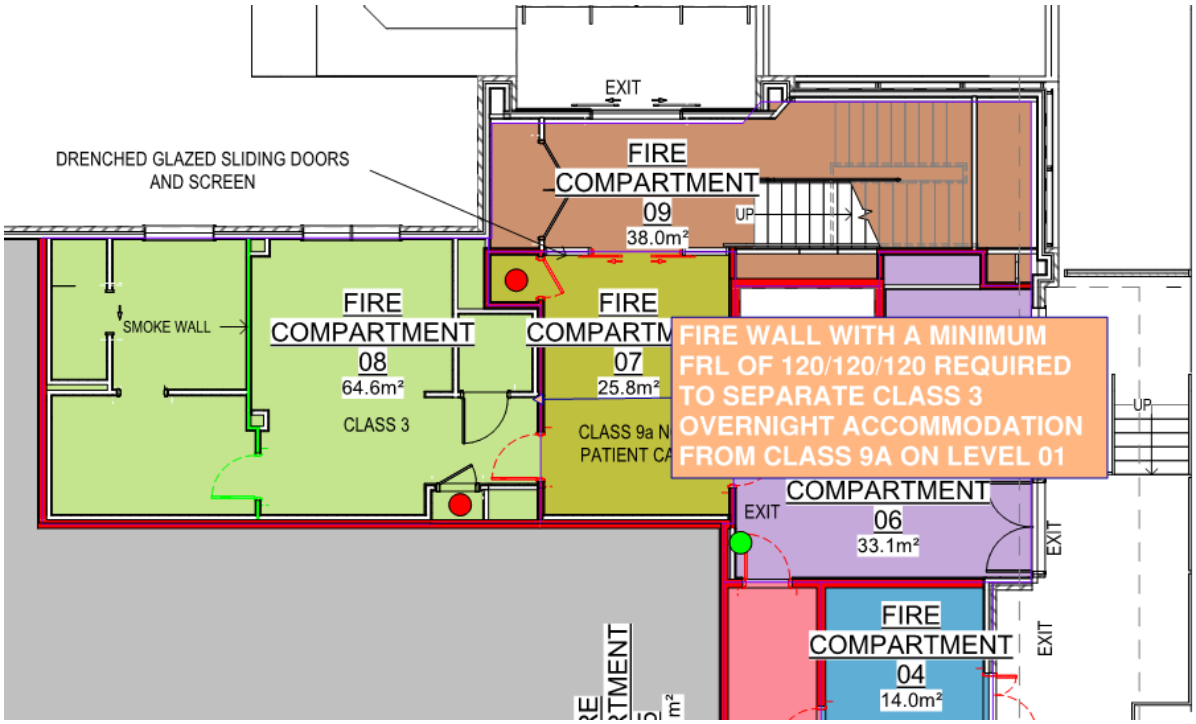


Figure No. 3 – Proposed separation of the Class 3 overnight accommodation area from the remainder of Level 01

11. Clause C2.8 – Separation of Classifications in Different Storeys

Based on the Class 9a classification located on Level 02 and having regard to the requirements of Clause C2.5, the floor separating storeys is required to have a minimum FRL of 120/120/120.

12. Clause C2.10 – Separation of Lift Shafts

The lift shaft is required to have a fire resistance level 120/120/120 (if load bearing) and -/120/120 (if non-load bearing) in accordance with Table 3 of Specification C1.1.

13. Clause C2.11 – Stairways and Lift Shafts in One Shaft

Fire isolated stairways and lifts cannot be located within the same fire isolated shaft.

The Architectural Drawings indicate that the fire isolated stairway and lifts shaft are provided in separated fire rated shafts.

14. Clause C2.12 – Separation of Equipment

Any of the following equipment must be fire rated with a fire resistance level of 120/120/120 and any doorway to have an FRL of not less than --/120/30:

+ Emergency generators used to sustain emergency equipment operating in the emergency mode.
+ Boilers where the water is boiled to greater than 100 degrees Celsius.
+ A battery system installed in the building that has a total voltage of 12 volts or more and a storey capacity of 200 kWh or more.

Hot Water Unit Room on Level 01

Verification is required as to the whether the Hot Water Unit Room on Level 01 contains a boiler as defined by the BCA.

A boiler is defined as: -

A vessel or an arrangement of vessels and interconnecting parts, wherein steam or other vapour is generated, or water or other liquid is heated at a pressure above that of the atmosphere, by the application of fire, the products of combustion, electrical power, or similar high temperature means, and

(a) Includes superheaters, reheaters, economisers, boiler piping, supports, mountings, valves, gauges, fittings, controls, the boiler settings and directly associated equipment; but

(b) Excludes a fully flooded or pressurised system where water or other liquid is heated to a temperature lower than the normal atmospheric boiling temperature of the liquid.

Verification will be required from the Services Consultant as to whether any Hydraulic Boilers are proposed to be located within the Hot Water Unit Room and if so whether they meet the above definition. If Hydraulic Boilers are proposed to be installed, then will be required to be fire separated by construction that achieves a minimum FRL of 120/120/120.

15. C2.13 – Electricity Supply System

Main Switchroom, Generator Rooms etc are to be fire separated from the internal parts of the building with construction achieving an FRL of 120/120/120.

The main switchboard sustaining emergency equipment operating in the emergency mode must be separated from the remainder of the building with construction achieving an FRL of 120/120/120 with any doors to be –/120/30 self-closing fire doors.

The electrical conductors located within a building that supply a main switchboard as detailed within (2) above must have a classification in accordance with AS/NZS 3013 of not less than WS53W (where subject to damage by motor vehicles) or WS52W otherwise. Alternatively, the conductors may be enclosed or otherwise protected with construction having an FRL of not less than 120/120/120.

Where emergency equipment is required within a building all switchboards in the electrical installation that sustain the electrical supply to the emergency equipment will be constructed so that emergency equipment switchgear is separated from non-emergency equipment switchgear by metal partitions designed to minimise the spread of fault from the non-emergency switchgear.

Emergency equipment requiring separation from non-emergency switchgear includes but it not limited to the following:

+ Fire hydrant booster pumps
+ Pumps for automatic sprinklers systems, water spray, chemical fluid suppression systems or the like
+ Pumps for fire hose reels where such pumps and fire hose reels from the sole means of fire protection in the building
+ Air handling systems designed to exhaust and control the spread of fire and smoke
+ Emergency lifts
+ Control and indicating equipment
+ Emergency warning and intercom systems

Any plantrooms housing switchboards for smoke control equipment will be required to be fire separated from the remainder of the building by construction achieving a minimum FRL of 120 mins.

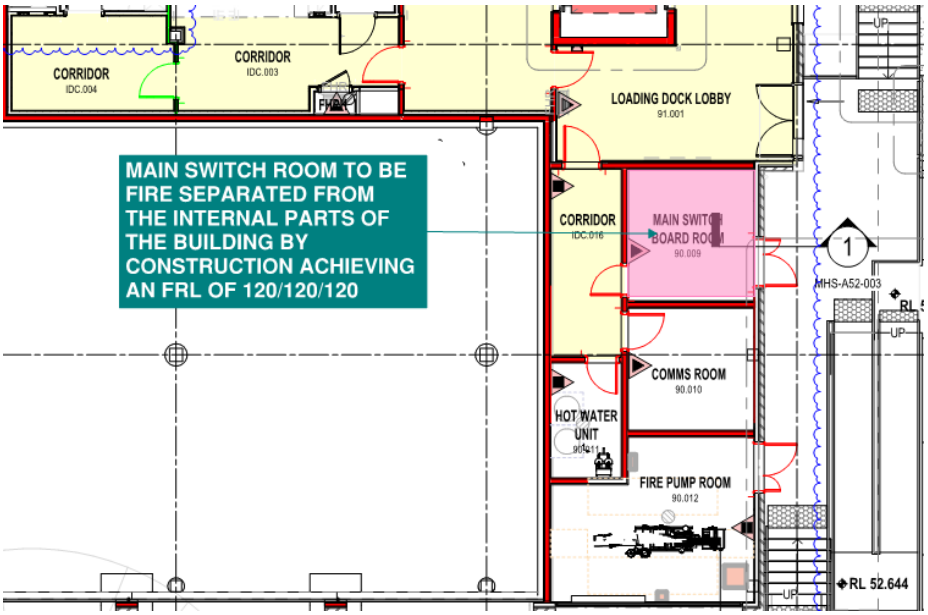


Figure No. 4 – Required separation of Main Switch Room on Level 01

PART C3 – PROTECTION OF OPENINGS

16. Clause C3.2 – Protection of Openings in External Walls

Based on the Design Development Architectural Drawings submitted the building is not situated within 3m of a side or rear allotment boundary line or within 6m of another building on the allotment being the adjoining Adult Mental Health Building, Nepean Executive Building, Sexual Health Building and proposed TAMs Building.

In this instance, there are no openings in the external wall of the building that require protection.

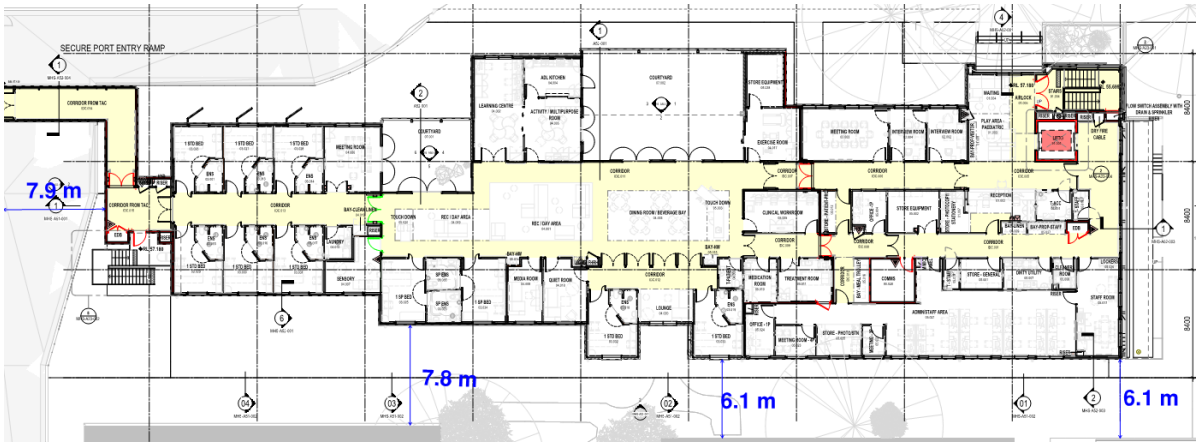


Figure No. 5 – Distance of proposed CAMHS Building from existing Adult Mental Health, Nepean Executive Building, Sexual Health Building, and proposed TAMS Building

17. Clause C3.3 – Separation of External Walls and Openings in Different Fire Compartments

Where an internal fire wall intersects at the junction of an external wall, the external walls of the different compartments and any associated openings that are exposed to one another are required to be protected in accordance with Clause C3.3.

There are a small number of locations throughout the building where exposure occurs between external walls and their associated openings of different fire compartments on Level 02 of the building.

It is proposed to select the external wall of one of the fire compartments where exposure occurs and protect that wall in both directions, and such provide a comparative design to the DtS Provisions of the BCA which require both walls to be rated in one direction.

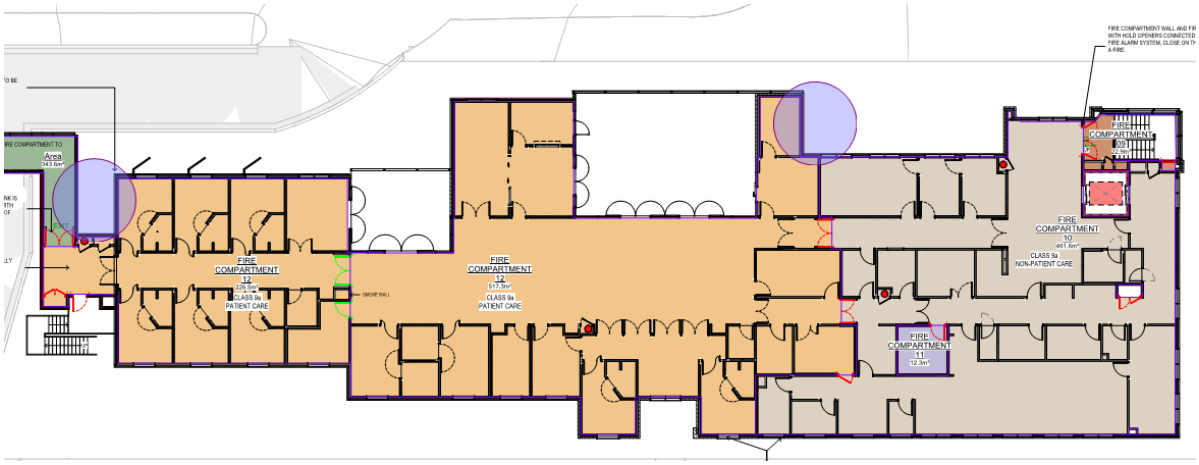


Figure No. 6 – Locations of exposure of external walls of different fire compartments on Level 02

The protection of the external walls and associated openings is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

18. Clause C3.5 – Doorways in Fire Walls

Any doors located within fire walls must be fire rated to achieve the same rating as the fire wall itself i.e., 120 mins.

All fire doors are required to be self-closing or automatic closing. All automatic closing doors are required to close upon activation of the fire alarm system within the building i.e., Automatic Fire Detection & Alarm System and Automatic Fire Suppression System.

Smoke detectors must be installed within 1500 mm of the automatic closing doors (on both sides of the door).

19. Clause C3.7 – Protection of Doorways in Horizontal Exits

All horizontal exits are required to have a FRL of -/120/30.

All horizontal exit doors are required to be self-closing or automatic closing. All automatic closing doors are required to close upon activation of the fire alarm system within the building i.e., Automatic Fire Detection & Alarm System, Automatic Fire Suppression System etc.

Smoke detectors must be installed within 1500 mm of the automatic closing doors (on both sides of the door).

20. Clause C3.8 – Openings in Fire Isolated Exits

Glazed Sliding Door to Fire Isolated Stairway on Level 01

Doorways opening into a fire isolated stairway are required to be protected by -/60/30 fire doors that are self-closing or automatic closing.

The provision of a glazed wall and doorway opening to a fire isolated (separated stairway) is a technical non-compliance with the DTS Provisions of the BCA.

The proposed design consists of a glazed wall and sliding door which is to be protected with internal wall wetting drenchers.

The provision of drencher protected glazing will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.

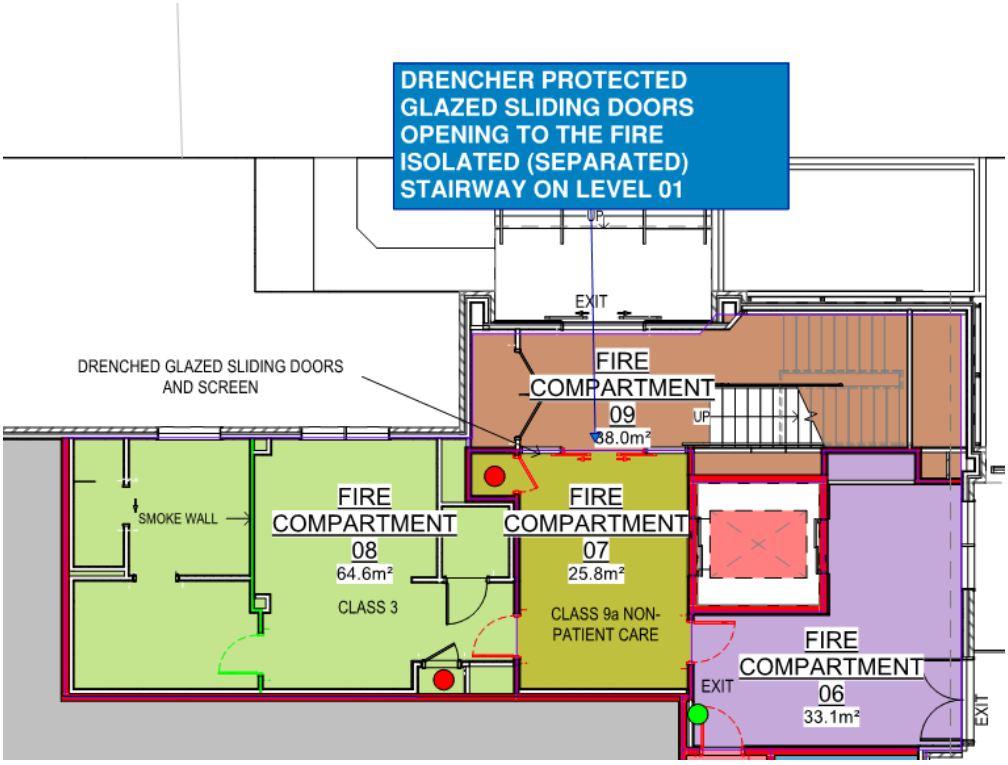


Figure No. 7 – Glazed sliding doors leading from the lobby space to the fire isolated (separated) stairway on Level 01 of the building

21. Clause C3.9 – Service Penetrations in Fire Isolated Exits

Fire isolated exits cannot be penetrated by services other than –

- Electrical wiring permitted by Clause D2.7 (e) to be installed within the exit; or
- Ducting associated with a pressurisation system
- Water supply pipes for services penetrations

The Riser shafts currently documented within the fire isolated (separated) stairway to be fire separated from the stairway (with no access panels provided) by construction which achieves a minimum FRL of 120/90/90 (load-bearing) or -/90/90 (non-loadbearing).

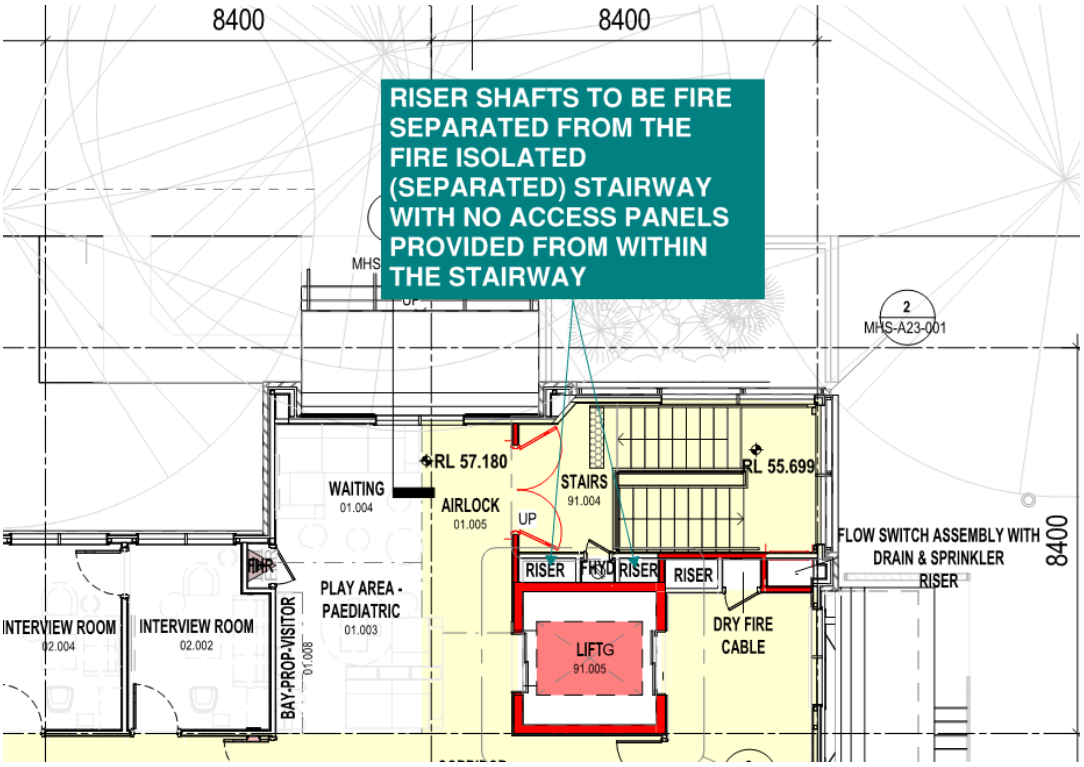


Figure No. 8 – Riser shafts to be fire separated from the fire isolated stairway

22. Clause C3.10 – Openings in Fire Isolated Lift Shafts

The doorways to the lift shafts are required to have a minimum FRL of -/60/-, comply with AS 1735.11 and are set to remain closed except when discharging or receiving passengers, goods, or services.

23. Clause C3.11 – Bounding Construction: Class 2 and 3 Buildings and Class 4 Parts

Separation of Class 3 Carer Bedroom on Level 01

The Carer Bedroom located on Level 01 which is provided for family members staying overnight is classified as Class 3 in accordance with Part A6 of the BCA.

The adjoining lounge area which will be used by family members staying overnight can also be used by other family members visiting patients in the building. In this instance, the lounge area is not directly considered part of the SOU and thus the Carer Bedroom is required to be fire separated from the Lounge area in accordance with Clause C3.11 and Specification C1.1.

In accordance with Clause C3.11 and Specification C1.1, the overnight room constitutes a single sole occupancy unit is required to be fire separated from the Lounge area by construction achieving an FRL of 90/90/90 (load-bearing) or -/60/60 (non-loadbearing).

The Carer Bedroom is proposed to be smoke separated only from the adjoining Lounge Area on Level 01. The smoke separation of the bedroom from the lounge area is proposed to be assessed as part of a Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

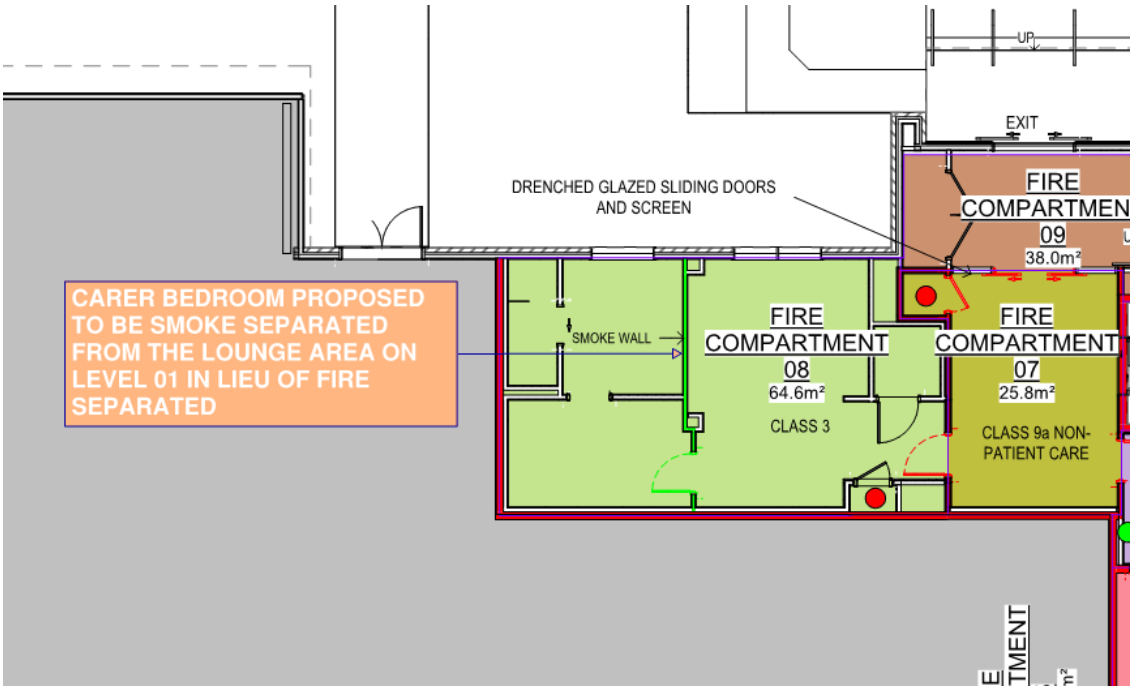


Figure No. 9 – Proposed smoke separation of the Carer Bedroom from the adjoining Lounge area on Level 01.

24. Clause C3.13 – Openings in Shafts

An opening in a wall providing access to a ventilating, pipe, garbage, or other service shaft must be protected by one of the following:

- If it is a sanitary compartment – a door or panel which, together with its frame, is non-combustible or has an FRL of not less than -/30/30; or
- A self-closing -/60/30 fire door or hopper; or
- An access panel having an FRL of not less than -/60/30

25. Clause C3.15 – Openings for Service Installations

Where service installations penetrate the walls or floors required to have an FRL with respect to integrity and insulation they are to be protected by fire seals having an FRL of the building element concerned. Fire seals are required to comply with Specification C3.15. Where the mechanical ventilation system penetrates floors or walls that require an FRL the installation is to comply with AS/NZS 1668.1.

The proposed installation of pipework containing combustible liquids or gas (i.e., natural gas) is prohibited in accordance with Clause C3.15 unless it is a tested system.

Water Filled Pipes Systems Comprised of Metal

In accordance with Clause C3.15, a tested system is not required to comply with the insultation criteria relating to the service subject to the pipe system being constructed of entirely of metal and not having any combustible building elements being located within 100mm for a distance of 2000mm from the penetration and combustible materials not being able to be located within 100mm of service for a distance of 2000mm from the penetration.

Having regard to the requirements of Clause C3.15 which are difficult to achieve in a health care environment due to the number of services especially in corridors, it is understood that is proposed to permit water filled pipes constructed of metal to not comply with the requirements of Clause C3.15 in terms of the 100mm separation for a distance of 2000mm from the penetration.

The proposed design of water filled metal pipes used for fire services, potable water etc with no insultation is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to address compliance with the nominated Performance Requirements of the BCA.

Note 1: -

Where a wall is required to achieve both smoke and fire compartmentation, the penetrations must be protected to accommodate both i.e., combined fire and smoke dampers through all fire walls that bound or separate patient care areas throughout the building.

All fire walls double up as smoke walls when they are within or bound patient care areas and thus must be combined fire and smoke dampers.

The motorised component of the Damper is to be located no more than 600mm from the fire/smoke wall.

Note 2: -

A pipe system comprised entirely of metal that is not normally filled with liquid must not be located within 100mm, for a distance of 2000mm from the penetration of any combustible building element or a position where a combustible material may be located and must be constructed of:

+ *Copper alloy or stainless steel with a wall thickness of at least 1mm; or*

+ *Cast iron or steel (other than stainless steel) with a wall thickness of at least 2mm*

Note 3: -

All pipes normally filled with water cannot be less than 200mm from another service penetration unless protected with a fire wrap installed in accordance with a Tested System approved by a registered Testing Authority.

Note 4: -

A Tested System approved by a registered Testing Authority may be used as an alternative to complying Specification C3.15.

26. Clause C3.16 – Construction Joints

Construction joints, spaces, and the like in and between building elements required to be fire-resisting with respect to integrity and insulation must be protected in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the required FRL.

27. Clause C3.16 – Construction Joints

A column protected by lightweight construction to achieve an FRL which passes through a building element that is required to have an FRL or a resistance to the incipient spread of fire, is required to be installed using a method and materials identical with a protype assembly of the construction which has achieved the required FRL or resistance to the incipient spread of fire.

28. Specification C1.1 – Fire Resisting Construction

The new building elements are required to comply with the requirements of Specification C1.1 for a building of Type B Construction. The following key items of Specification C1.1 are identified:

General Requirements

The following requirements of Specification C1.1 are applicable to the proposed design:

+ Where part of a building required to have an FRL depends on direct vertical or lateral support from another part to maintain its FRL, that supporting part must:
    + Have an FRL not less than the required by other provisions of Specification C1.1; and
    + If located within the same fire compartment as the part its supports have an FRL in respect of structural adequacy the greater of that required –

- For the supporting part itself; and
- For the part is supports

- Be non-combustible –
  - If required by other provisions of Specification C1.1; or
  - If the part is supports is required to be non-combustible

- All internal walls that are required to have a fire rating must extend to the underside of the slab above.
- All loadbearing internal walls must be constructed of concrete or masonry.
- Due to the fact that the building is required to be constructed of Type B Construction, the FRL to the load bearing elements of the external wall applies in both directions.
- Any load bearing structural steel columns installed in the external wall of the building will require an FRL in accordance with the Table 4. This applies to Structural Steel columns located within the external wall assembly that may be supporting any roof etc above.

  Note: Only internal walls and columns located in the storey directly below the roof receive a concession in terms of the omission of FRL's.
- All internal non-loadbearing walls that are required to be fire resisting and lift, ventilating, pipe, garbage, or similar shaft that is not for the discharge of hot products of combustion is required to be constructed of non-combustible construction.
- The floor to the new link to the adjoining Adult Mental Health Building is required to have an FRL of 120/120/120 and building element that provides direct or lateral support to the link bridge is required to be provide with an FRL.

29. Specification C2.5 – Smoke-Proof Walls in Health Care Buildings

Smoke proof walls within all patient care areas (or bounding patient care area) are required to comply with the following:

- Be non-combustible and extend to the underside of –
  - The floor above; or
  - A non-combustible roof covering; or
  - A ceiling having a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes.
- Not incorporate any glazed areas unless the glass is safety glass as defined in AS 1288.
- Only have doorways which are fitted with smoke doors.
- Have all openings around penetrations and the junctions of the smoke-proof wall and the remainder of the building stopped with non-combustible material to prevent the free passage of smoke.
- Incorporate smoke dampers where air-handling ducts penetrate the wall unless the duct forms part of a smoke hazard management system required to continue air movement through the duct during a fire.

Timber Noggins in Smoke Walls

Smoke walls are required to be constructed of non -combustible construction including all elements that make up the smoke wall.

In this instance timber noggings or plywood are not permitted to be installed within the smoke walls install throughout Mental Health. All services, handrails etc will be required to be supported within the smoke wall cavity will be required to be constructed of a non-combustible material.

30. Specification C3.4 – Fire Doors, Smoke Doors, Fire Windows and Shutters

Fire safety doors located in fire and smoke walls are required to swing in the direction of egress.

There are small number of fire safety doors located in fire and smoke walls on Level 01 & 02 which are required to swing in two directions in order for egress to comply from within the subject parts of the building. The subject doorways are detailed in the figures below.

The doorways that swing in one direction only are proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order demonstrate compliance with the nominated Performance Requirements of the BCA.

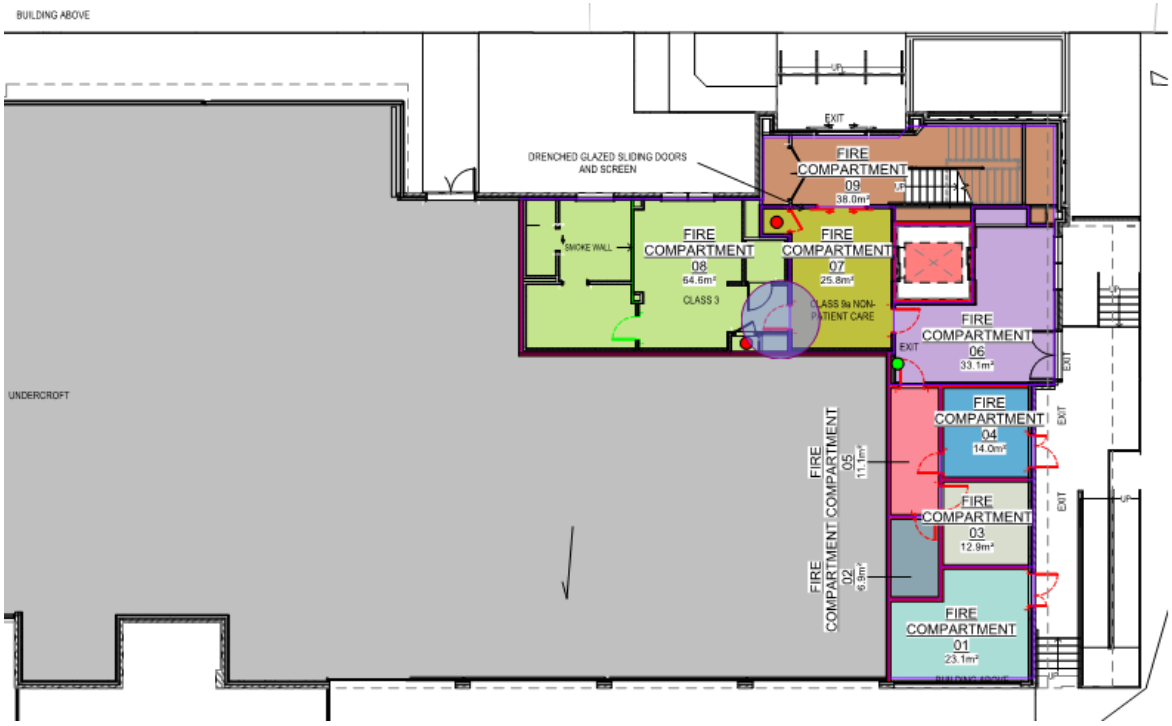


Figure No. 10 – Doorways that are required to swing in both directions on Level 3

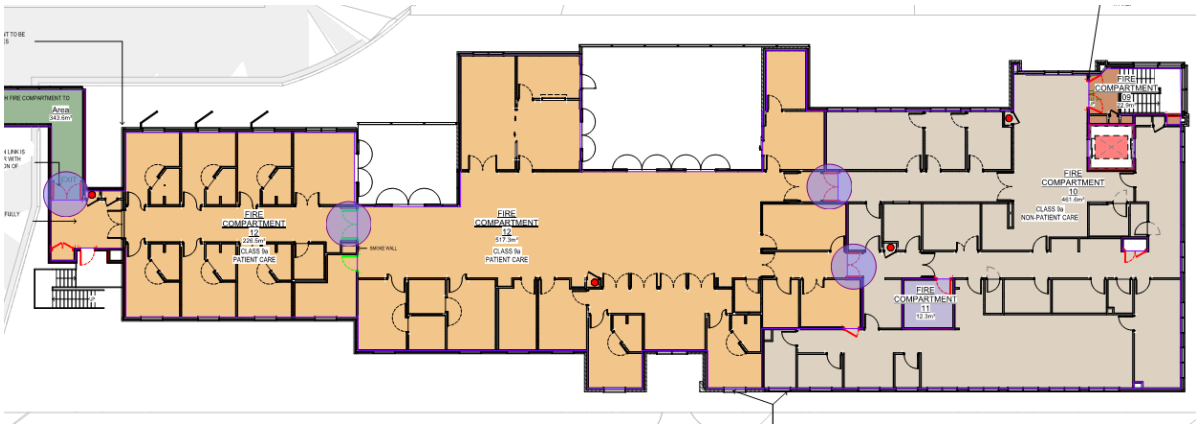


Figure No. 11 – Doorways that are required to swing in both directions on Level 3

SECTION D - ACCESS & EGRESS

PART D1 – PROVISION FOR ESCAPE

31. Clause D1.2 – Number of Exits Required

A minimum of two (2) exits (in addition to any horizontal exit) must be provided from each part of each storey within the building which contains patient care areas.

The minimum number of exits has been provided from Level 02 of the building which contains patient care areas.

32. Clause D1.3 – When Fire-Isolated Stairways and Ramps are required

The stairway located in the North-Eastern part of the building which connects Levels 01 & 02 is required to be a fire isolated exit.

Note: The glazed openings to the stairway on Level 01 in addition to the provision of services within the stairway are proposed to be assessed as Performance Solutions.

The stairway in the South-Western part of the building is proposed to be designed as an external stairway in lieu of a fire isolated stairway. Refer to Clause D1.8.

33. Clause D1.4 – Exit Travel Distances

Egress travel distances from all areas used by patients must be within a maximum distance of 12 m to an exit or to a point of choice of two alternative exits in which case a maximum travel distance of 30 m is permitted to the nearest exit.

Egress from the non-patient care areas is permitted to extend to 20 m to a point of choice and a maximum distance of 40m to an alternative exit.

Egress from the Class 3 accommodation on the Ground Floor is permitted to be up to 20m to the main exit serving Level 01.

Based on the Design Development Architectural Drawings assessed to date, we have undertaken an egress assessment in terms of egress travel distance to an exit and based on our review, we provide the following comments:

Level 01

+ Travel distance from Level 01 complies.

Level 02

+ Travel distance from the Special Bedrooms is up to 34 m to an alternative exit (4 m over the maximum permitted DtS distance).

+ Travel distance from the Learning Centre is up to 34 m to an alternative exit (4 m over the maximum permitted DtS distance).

+ Travel distance from the Kitchen is up to 32 m to an alternative exit (2 m over the maximum permitted DtS distance).

The extended travel distances to an exit will be required to be assessed as part of the Fire Engineering Performance Assessment to be prepared by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

The following figures detail the required exit doors that have been relied upon from each level of the building:

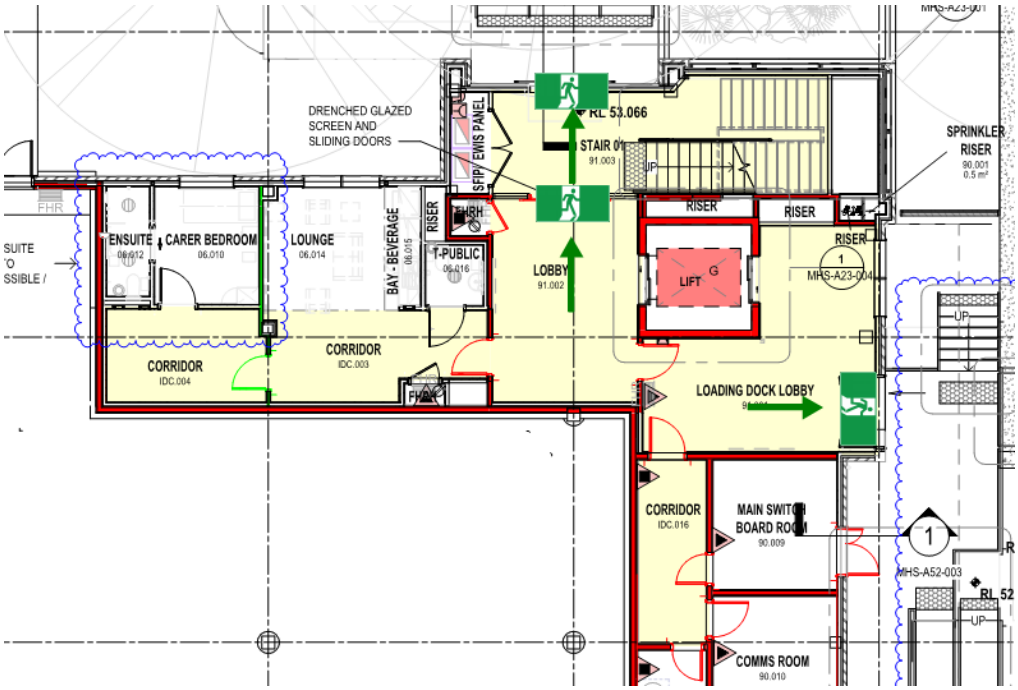


Figure No. 12 – Required exit doors from Level 01

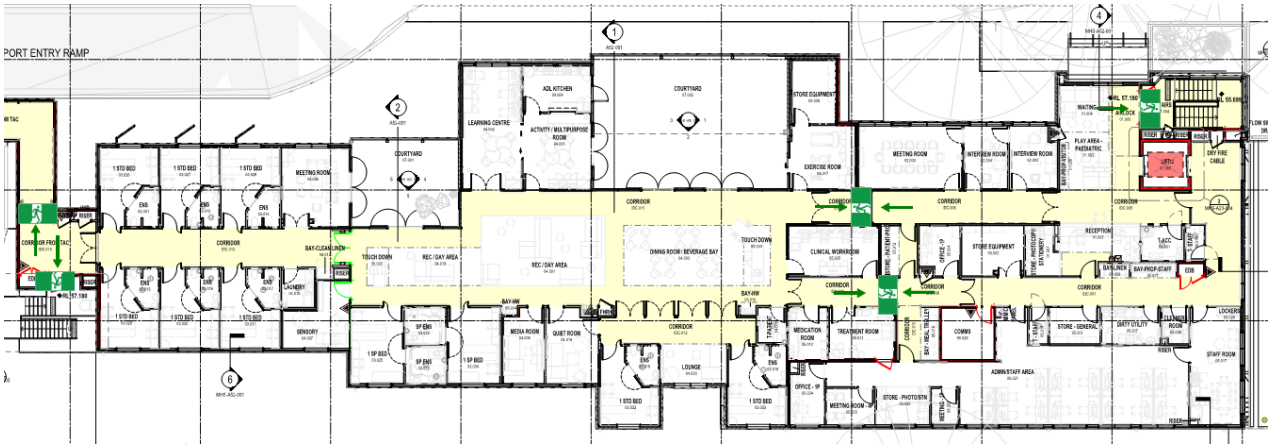


Figure No. 13 – Required exit doors from Level 02

34. Clause D1.5 – Distances Between Alternative Exits

The maximum travel distance between alternative exits serving the patient care areas and overnight accommodation rooms cannot exceed 45 m.

The maximum travel distance between alternative from non-patient care areas is 60 m.

Based on the Design Development Architectural Drawings assessed to date, we have undertaken an egress assessment in terms of egress travel distance between alternative exits and based on our review, we provide the following comments:

+ Travel distance between alternative exits from the patient care area is up to 55 m and 57 m (12m over the maximum permitted DtS distance).

The extended travel distances between alternative exits will be required to be assessed as part of the Fire Engineering Assessment to be prepared by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

35. Clause D1.6 – Dimensions of Exits

The unobstructed height throughout an exit or a path of travel to an exit must not be less than 2 metres, except for doorways which may be reduced to not less than 1980 mm.

In addition, the unobstructed width of any new exit or a path of travel to an exit must not be less than 1 metre except where patients are normally transported in beds within treatment and ward areas in which case a minimum of 1.8m corridor and passageway widths are required.

The unobstructed width of new doors throughout the patient care areas where patients are normally transported in beds are as follows:

a) Doorways leading to or from a corridor with a corridor width of less than 2.2m must not be less than 1200mm, or
b) Doorways leading to or from a corridor with a corridor width greater than 2.2m must not be less than 1070mm.

All other doorways other than the above are to achieve an unobstructed width of not less than 850mm.

36. Clause D1.7 – Travel via Fire Isolated Exits

Upon discharge from the fire isolated stairway on Level 01 occupants are required to turn left and travel via the walkway as the external stairway is not permitted to be relied upon as an external egress path upon discharge a Class 9a health care building.

Upon discharge from a fire isolated stairway, if the path of travel necessitates passing within 6m of any part of the external wall of the same building measured at 90º to the path of travel, then the part of the external wall is required to be protected as follows:

+ Have an FRL of not less than 60/60/60 which is achieved in both directions; and
+ Any openings are protected in accordance with Clause C3.4

The protection is required for a minimum vertical distance of 3m above the path of travel

The path of external travel that an occupant is required to travel upon discharge from the fire isolated stairway is located less than 6m from the external wall of the building as detailed in the figure below.

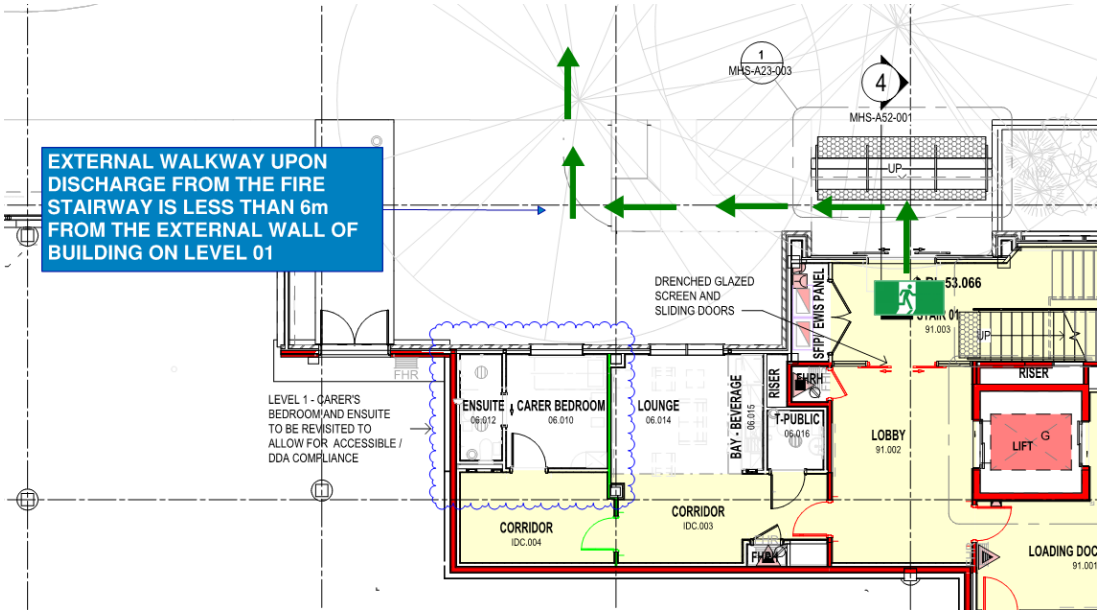


Figure No. 14 – External pathway located within 6m of the external wall and openings to the Class 3 accommodation

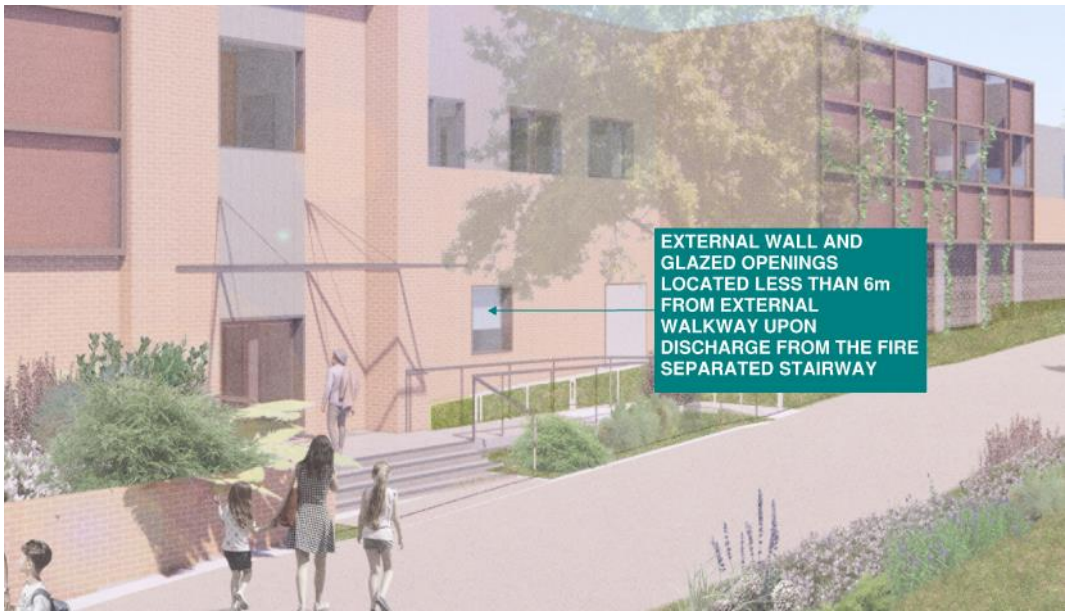


Figure No. 15 – External pathway located within 6m of the external wall and openings to the Class 3 accommodation

The provision of the external pathway and ramp within 6 m of the external wall of the building is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

37. Clause D1.8 – External Stairways or Ramps in lieu of Fire Isolated Stairways

The external stairway provided in lieu of fire isolated stairway will be required to be designed in accordance with the requirements of Clause D1.8. In this instance the following is noted:

- The stairway is to be constructed of materials that are non-combustible throughout.
- The walls that separate the external stairway from the remainder of the building or alternatively shield it from openings in the external wall are required to have an FRL of 60/60/60 (achieved in both directions).
- No openings are permitted to be located within 3 m of the external stairway unless shielded from the stairway by a wall with a minimum FRL of 60/60/60 or it is the doorway leading to the exit in which case it is required to be protected by a self-closing or automatic closing -/60/30 fire door.
- Any openings located within 3m – 6m will be required to be protected in accordance with Part C3 of the BCA unless the external stairway is shielded by a fire rated wall.

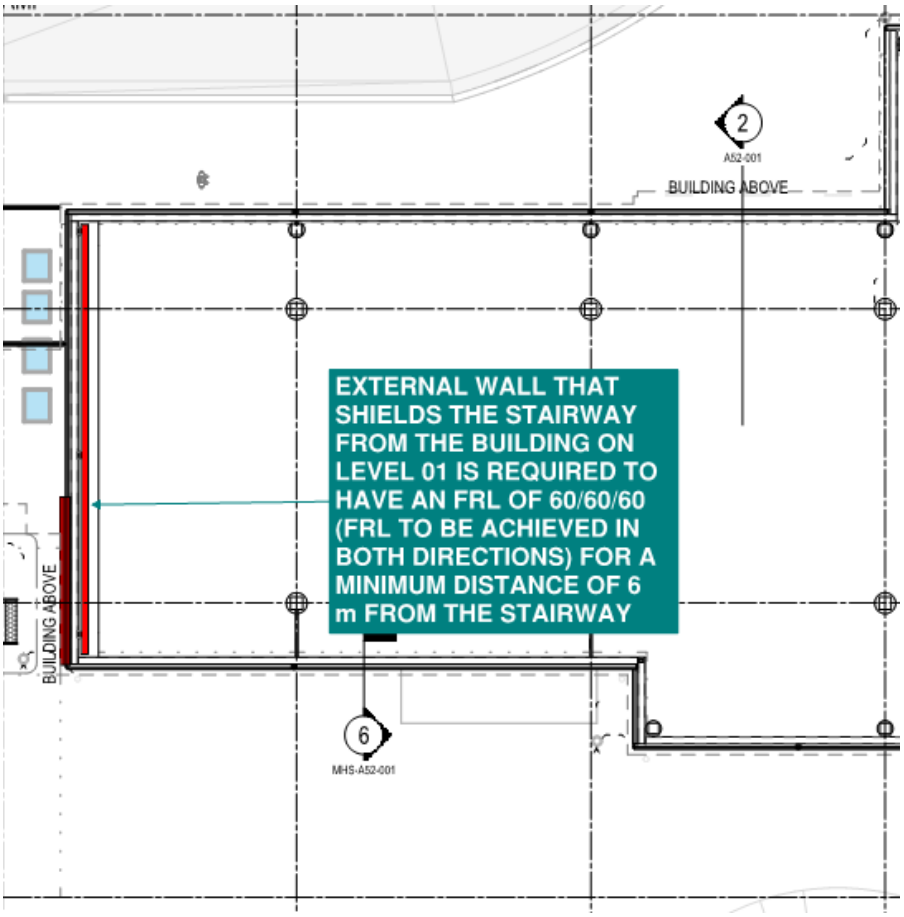


Figure No. 16 – Required protection to the external stair provided in lieu of fire isolated stairway on Level 01

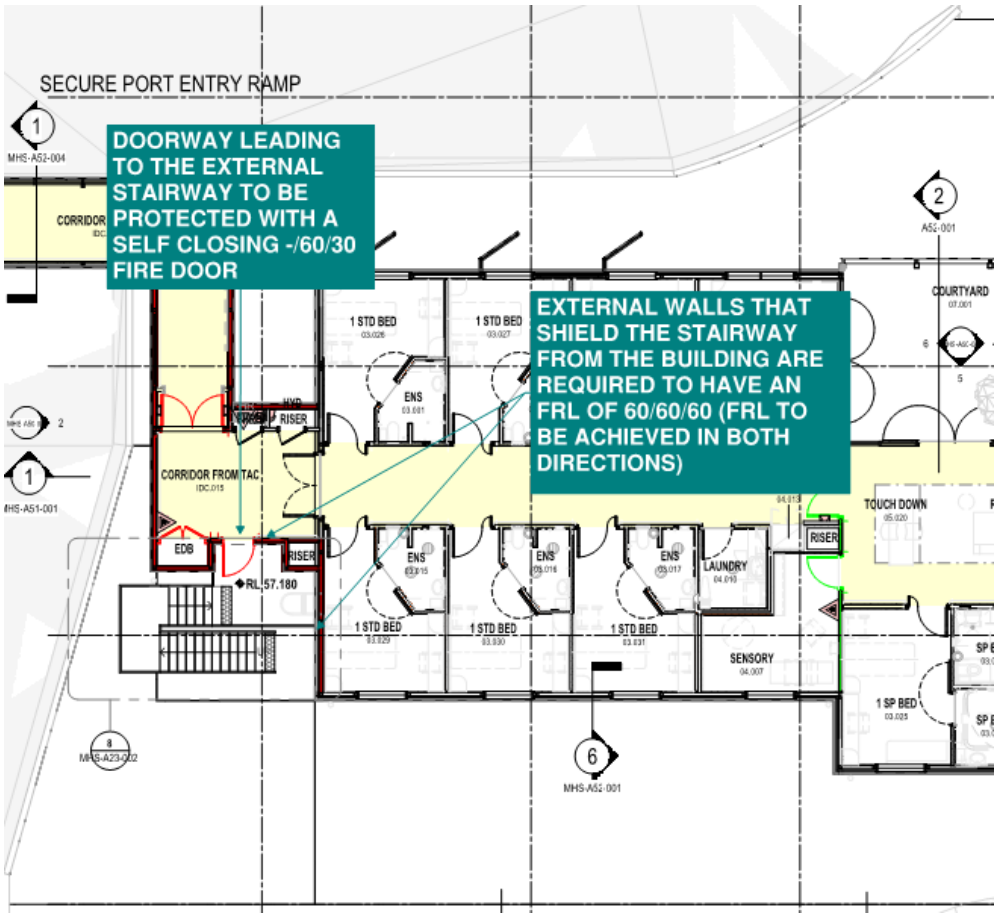


Figure No. 17 – Required protection to the external stair provided in lieu of fire isolated stairway on Level 02

38. Clause D1.10 – Discharge from Exits

In accordance with the DTS provisions of the BCA, the discharge of exits to open space cannot incorporate any steps to connect the discharge point to the adjoining roadway.

The Architectural Drawings indicate that once occupants discharge to open space from the fire isolated stairway on Level 01 there is a walkway that occupants can use to evacuate in lieu of using the stairway at the front of the building.

Verification is required that once occupants discharge from the external stairway, that there are no stairways located in the external path of travel leading from the exit to Derby Street.

The Architectural Drawings are to indicate the external path of travel from the exit to Derby Street.

An exit cannot be blocked at the point of discharge and where necessary suitable barriers are to be installed to prevent vehicles blocking the exit i.e., installation of bollards.

39. Clause D1.11 – Horizontal Exits

In accordance with the BCA, a horizontal exit may be counted as a required exit if the path of travel from a fire compartment leads by one or more horizontal exits directly into another fire compartment which has at least one required exit which is not a horizontal exit.

The Design Development Architectural Drawings indicate that travel via the horizontal exits serving each floor of the building complies with the DTS Provisions of the BCA in that once occupant's discharge through a horizontal exit into an adjoining fire compartment, they have access to an exit that leads directly to open space via a stairway or a stairway or a doorway opening directly to open space.

40. Clause D1.17 – Access to Lift Pits

Access to new lift pits is required to be provided as follows:

+ Where the lift pit depth is not more than 3m, be through the lowest landing doors; or
+ Where the pit depth is more than 3m, be provided through an access doorway complying the following:
  - In lieu of D1.6, the doorway must be level with the pit floor and not be less than 600 mm wide by 1980 mm high clear opening, which may be reduced to 1500 mm where it is necessary to comply with following item.
  - No part of the lift car or platform must encroach on the pit doorway entrance when the car is on a fully compressed buffer.
  - Access to the doorway must be by a stairway complying with AS 1657.
  - In lieu of D2.21, doors fitted to the doorway must be -
    - Of the horizontal sliding or outwards opening hinged type; and
    - Self-closing and self-locking from the outside; and
    - Marked on the landing side with the letters note less than 35 mm:

      'DANGER LIFTWELL – ENTRY OF UNATHORISED PERSONS PROHIBITED - KEEP CLEAR AT ALL TIMES'.

PART D2 – CONSTRUCTION OF EXITS

41. Clause D2.2 – Fire-Isolated Stairways and Ramps

The fire isolated stairway is required to be constructed of non-combustible materials and be designed so that if there is local failure it will not cause structural damage to or impair the fire resistance of the fire isolated shaft.

42. Clause D2.7 – Installations in Exits & Paths of Travel

Any electrical meters, distribution boards or ducts, central communications distribution boards or equipment or electrical motors located within the corridors are to be smoke sealed and enclosed within non-combustible construction with any penetrations smoke sealed.

Note: The smoke sealing is required of any penetrations located between floor and ceiling level.

Gas and other fuel services must not be located within a required exit.

Fire Indicator Panel and EWIS Panel located within

On Level 01 within the building entry which at present also forms part of the fire isolated / separated stairway, the Fire Indicator Panel (FIP) and EWIS Panel are proposed to be located.

The provision of the FIP and EWIS Panel within the fire isolated / separated stairway is contrary to the provisions of the DtS Provisions of the BCA.

The location of the FIP and EWIS Panel within the fire isolated / separated stairway will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with nominated Performance Requirements of the BCA.

43. Clause D2.8 – Enclosure of Space under Stairs and Ramps

A space below a required fire isolated (separated) stairway cannot be enclosed to form a cupboard or other enclosed space within the fire isolated stairway shaft.

In this regard, the space below landing of the fire isolated (separated) stairway within the main entry and cannot be enclosed to form a cupboard or enclosure of any form.

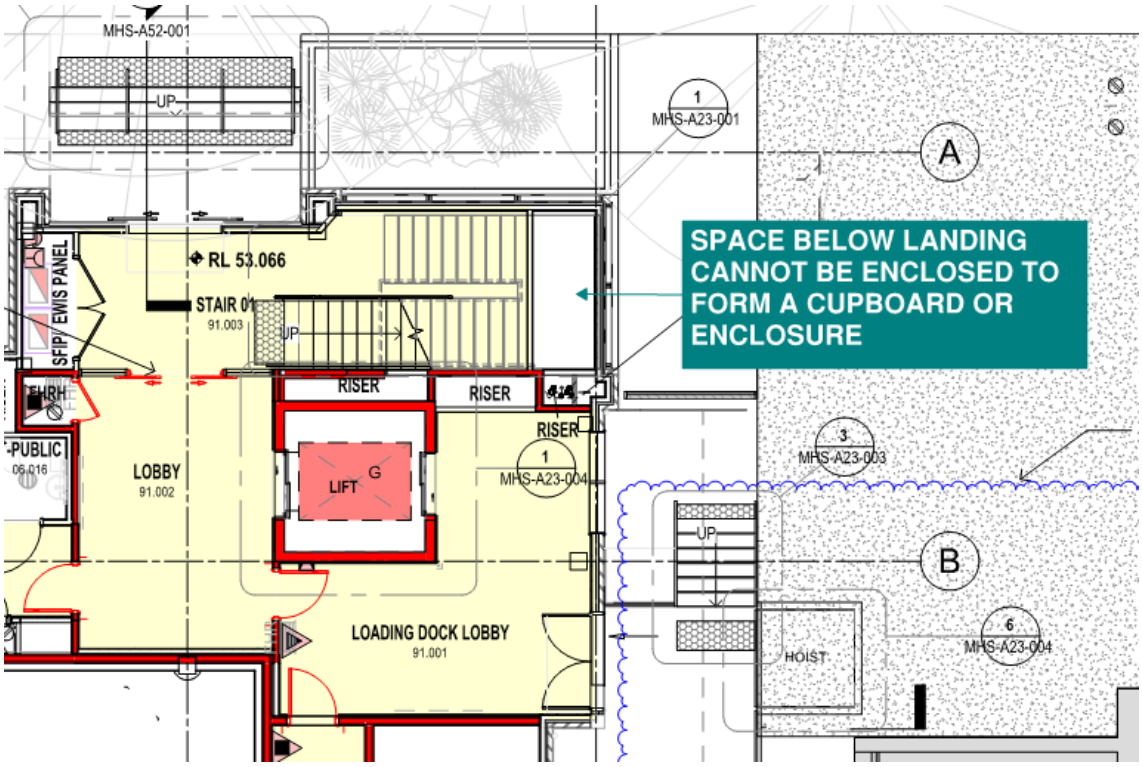


Figure No. 18 – Space below fire isolated (separated) stairway cannot be used to form an enclosure or cupboard

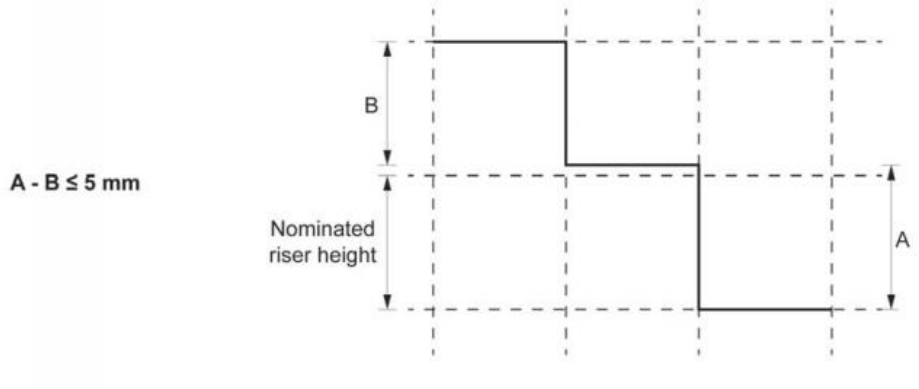
44. Clause D2.13 – Goings & Risers

In relation to the construction of all stairways we note the following:

- Stairway must have not more than 18 and not less than 2 risers in each flight.
- Goings and risers within the stair flights must be constant throughout.
- Goings and risers are to be in accordance with the following dimensions.

Riser and Going Dimensions (mm)			
	Riser (R)	Going (G)	Quantity (2R + G)
Maximum	190	355	700
Minimum	115	250	550

Table No. 7 – Riser and going dimensions for stairways

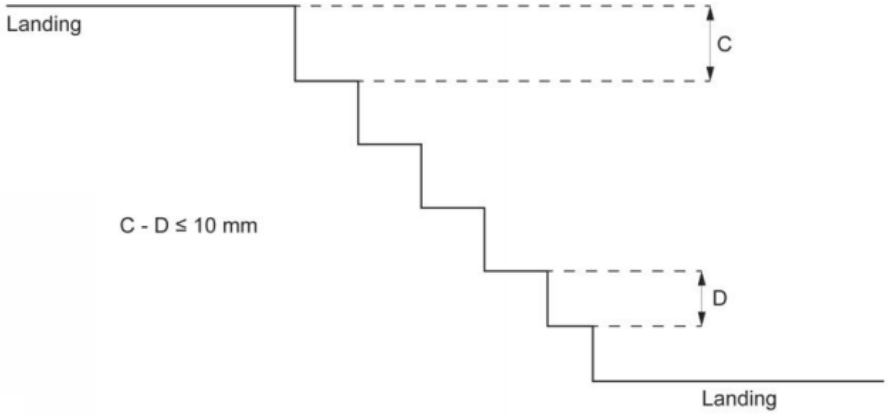


Notes:

1. A = larger riser of two adjacent risers.
2. B = smaller riser of two adjacent risers.
3. This figure only shows deviations in risers, however the same principle can apply for goings.

Figure No. 19: Permitted deviations in adjacent stair risers

Figure D2.13(2) Deviations over a flight



Notes:

1. C = largest riser of the flight.
2. D = smallest riser of the flight.
3. This diagram only shows deviations in risers, however the same principle can apply for goings.

Figure No. 20: Permitted deviations over a stair flight

- The stair treads are required to be provided with the following:
  - Have a surface with a slip resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; or
  - Be provided with a nosing strip with a slip resistance classification not less than that detailed in Table D2.14 when tested in accordance with AS 4586.
- Each stairway is to be provided with a contrast strip to the nosing in accordance with AS1428.1-2009.

45. Clause D2.14 – Landings

The stair landings of the external stairways provided in lieu of fire stairways which serve the Level 1 patient care areas must be designed in accordance with the following:

- The area of any landing must be sufficient to move a stretcher, 2m long and 600mm wide, at a gradient not more than the gradient of the stairs, with at least one end of the stretcher on the landing while changing direction between flights; or
- The stair must have a 180-degree landing, with a clear width of 1600 mm and clear length of 2700 mm.

  Details will be required to be submitted detailing stretcher movement around the landings of the fire isolated stairways.

Furthermore, the stair landings must:

- A surface with a slip resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586; or
- A strip at the edge of the landing with a slip resistance classification not less than that listed in Table D2.14 when tested in accordance with AS 4586, where the edge leads to a flight below.

Table D2.14 Slip Resistance Classification

Application	Surface Conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or landing surface	P3 or R10	P4 or R11
Nosing or landing edge strip	P3	P4

Table No. 8 – Minimum slip resistance ratings required to stairs and ramps

In addition to the slip resistance ratings detailed within the table, the following slip resistance ratings are required throughout the building:

Location	Minimum Slip Resistance
External Car Park	P4 or R11
Loading Dock	P5 or R12
External walkways etc	P4 or R11
Bathrooms and ensuites	P3 or R10
Wards and corridors *Note: Where handwash basins are contained within a corridor, a minimum Slip Rating of P3 or R10 should be maintained for a radius of 2m from the basin.*	P2 or R9
Consultation Areas	P2 or R9
Building Entry (wet area)	P3 or R10

Building Entry (transitional area)	P3 or R10
Building Entry (dry area)	P2 or R9
Lifts	P2 or R9

Table No. 9 – Minimum slip resistance ratings required to specific areas throughout the hospital

46. Clause D2.15 – Thresholds

No steps can be located within the internal or external door thresholds unless the doorway is within a patient care area and the door sill is not more than 25mm above the finished level to which the doorway opens.

In areas other than patient care areas, where there are any steps within door thresholds, a threshold or step ramp is required to be installed in accordance with Clause 10 of AS 1428.1 which requires the following:

- Maximum rise of 35 mm
- Maximum length of 280 mm
- Maximum gradient of 1:8
- Be located within 20 mm of the door leaf it serves

Where the threshold ramp does not abut a wall, the edges of the threshold ramp are required to be tapered or splayed at a minimum of 45º.

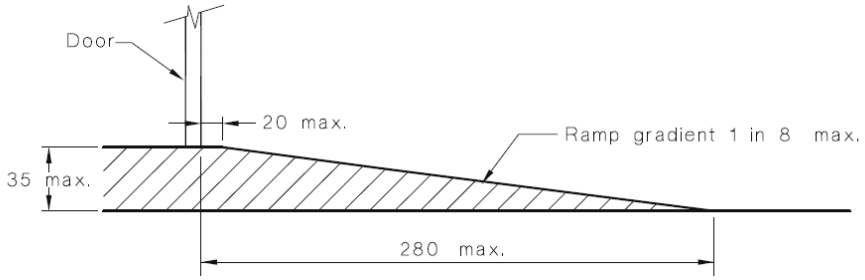


Figure No. 21: Threshold ramp dimensions

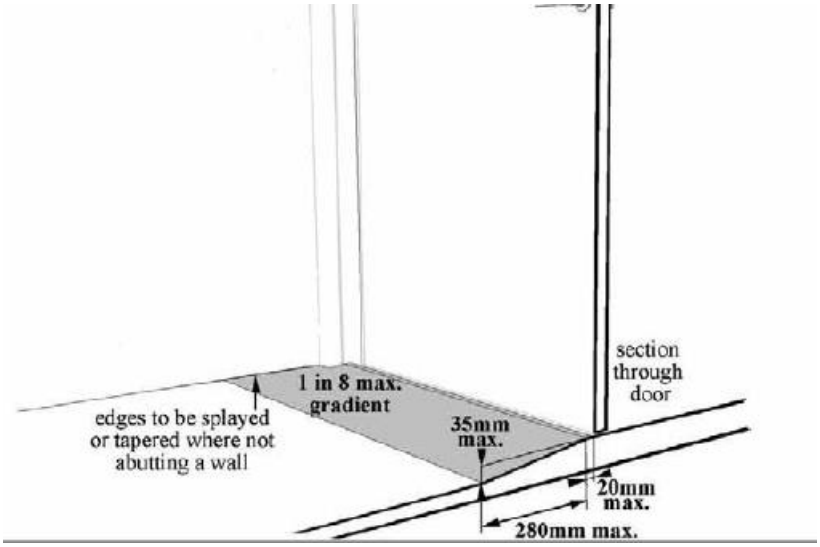


Figure No. 22 – Threshold Ramp

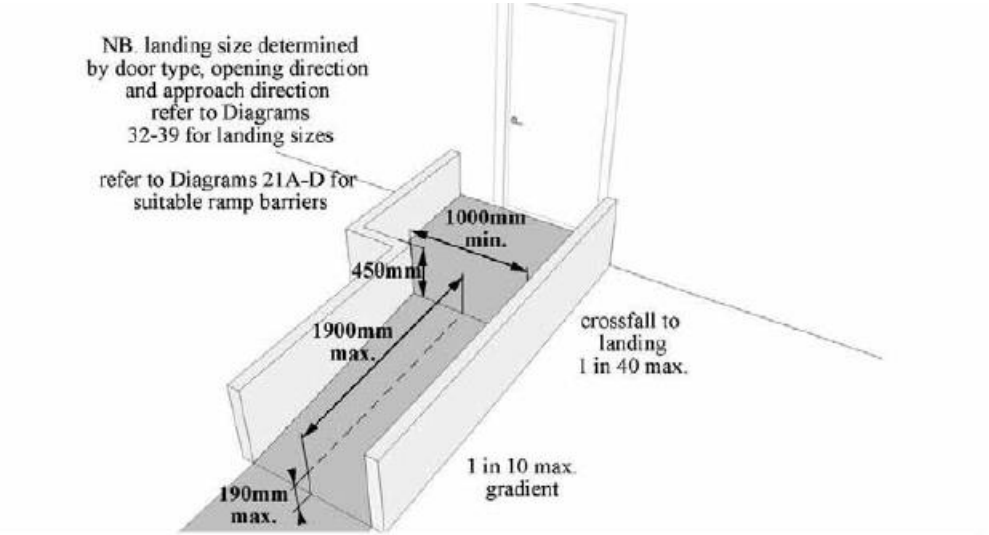


Figure No. 23 - Step Ramp at External Doorway – Front Approach

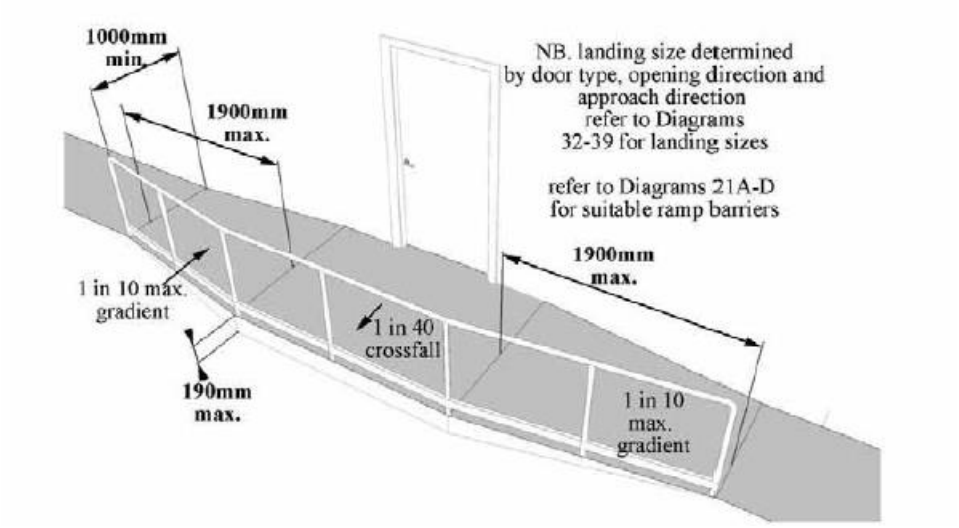


Figure No. 24 – Step Ramp at External Doorway – Side Approach

47. Clause D2.16 – Balustrades or Other Barriers

All balustrades will need to be compliant in terms of a minimum of 1000 mm in height above any fall more than 1 m with no gaps greater than 125-mm. In addition, where the fall exceeds 4-metres the balustrades must not have any climbable elements between 150-mm and 760-mm above the floor. This extends to any

For the external stairway along with the main entry stairway, the balustrades to the stair landings are required to be a minimum height of 1000 mm and 865 mm along the stairway (measured above the nosing line of the stair treads). The openings between balusters cannot exceed 125 mm.

At stair landings, where the inside edge of the landing exceeds 500 mm in length the balustrade must be increased to 1 m in height, with a rail no more than 150 mm above the landing and no gaps greater than 460-mm.

For openable windows where the windowsill height is less than 865-mm and the fall exceeds 1-metre the window must be fixed so as to open no more than 125 mm, or a rail/s will need to be installed to restrict the gap to 125-mm where less than 865-mm above the floor.

All glass balustrades are required to comply with the requirements of AS 1288.

48. Clause D2.17 – Handrails

Handrails are to be provided along at least one side of all corridors in the patient care areas, which are fixed not less than 50 mm from the wall and continuous where practical.

Handrails are required be provided along at least one side of the external stairway provided in lieu of the fire isolated stairway. The handrails are required to be designed and constructed in accordance with Clause 12 of AS 1428.1.

Handrails must be provided along both sides of the fire separated circulation stairway. The handrails are required to be designed and constructed in accordance with Clause 11 and 12 of AS 1428.1 – 2009.

Handrails will be required to be installed to both sides of any pedestrian ramp with a width exceeding 2000 mm.

49. Clause D2.18 – Fixed Platforms, Walkways, Stairways and Ladders

A fixed platform, walkway, stairway or ladder and any going and riser, landing, handrail or barrier attached thereto is permitted to comply with AS 1657 in lieu of Clause D213, D2.14, D2.16 if it only serves:

+ Machinery rooms, boiler houses, lift machine rooms, plant rooms and the like.

50. Clause D2.19 – Doorways & Doors

Sliding Door providing Access to the Fire Isolated Stairway on Level 01

A doorway serving as a required exit or forming part of a required cannot be fitted with a sliding door unless the doorway leads directly to open space.

The sliding door on Level 01 which leads from the public entry lobby to the fire isolated stairway prior to occupants discharging through the final sliding doors is a non-compliance with Clause D2.19 of the BCA as the subject sliding doors does not lead directly to open space but rather to the fire isolated stairway.

The provision of the glazed sliding door proving access to the fire isolated stairway on Level 01 of the building will be required to be assessed as part of the Fire Engineering Performance Solution to be undertaken by Arup in order to demonstrate compliance with the Performance Requirements of the BCA.

Sliding Doors in Patient Care Areas

Sliding doors are not permitted to be located within patient care areas. It is noted that the current Design Development Architectural Drawings do not indicate any sliding doors on Level 02.

If any sliding door is proposed to be located within the patient care areas, it will be required to be assessed as part of the Fire Engineering Performance Solution to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

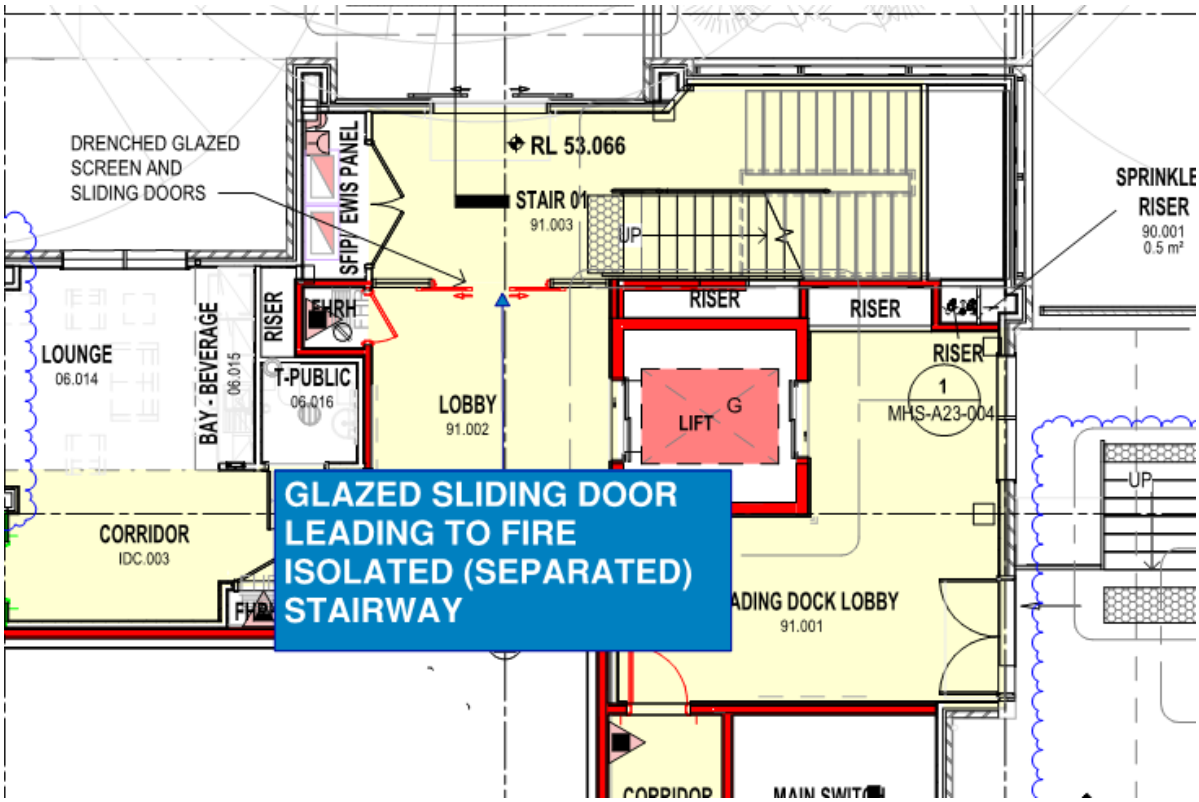


Figure No. 25 – Glazed sliding door on Level 01 which leads to the fire isolated (separated) stairway

51. Clause D2.20 – Swinging Doors

All exit doors or doors forming part of a required exit are required to swing in the direction of egress. This applies to all exit doors leading to the external stairways provided in lieu of fire isolated stairways along with the doorways discharging from the Activity Room and Back of House area on the Ground Floor of the Building.

Swing of Horizontal Exit Doors

All exit doors including horizontal exit doors are required to swing in the direction of egress.

There are fire doors used as horizontal exits on Levels 01 and 02 that are proposed to not swing in the direction of egress in certain instances as identified under Specification C3.4 and as detailed in the below figures.

The swing of the horizontal exit doors against the direction of egress is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

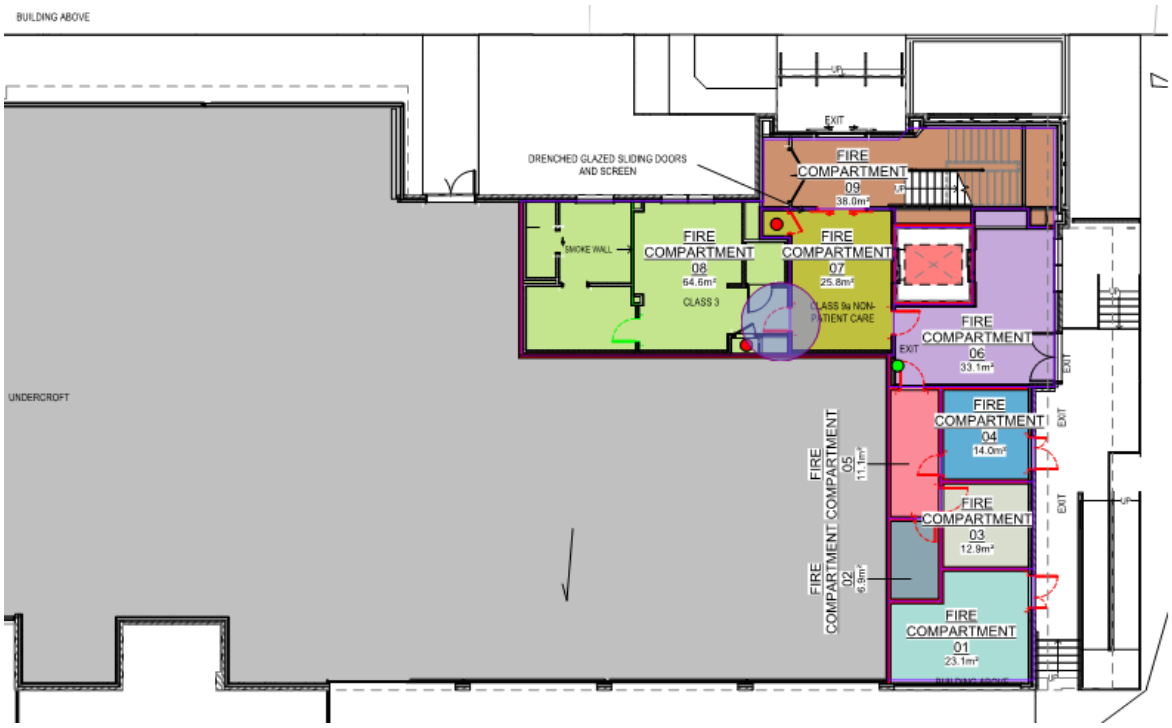


Figure No. 26 – Horizontal exit that swings against the direction of egress on Level 01

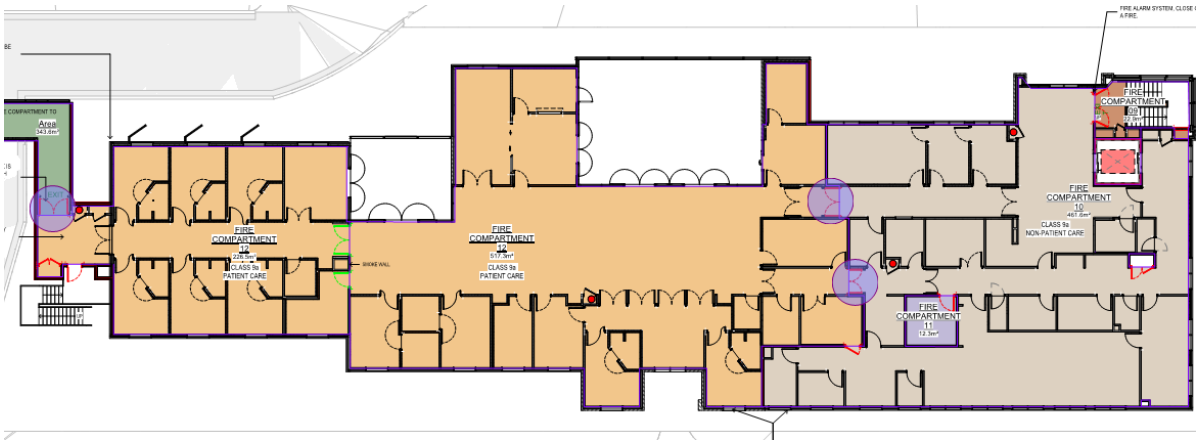


Figure No. 27 – Horizontal exit that swings against the direction of egress on Level 02

52. Clause D2.21 – Operation of Latch

All exit doors and doors in a path of travel are required to be provided with door hardware that is openable by a single-handed downward action without recourse to a key or locking device and meet the following criteria:

+ The door hardware is to be of a design that the hand of a person who cannot grip will not slip from the handle during the operation of the latch: and
+ Have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35mm and not more than 45mm more

The door hardware is to be positioned between 900 – 1100mm from the ground.

Doors providing re-entry to the building from balcony areas etc. must be fitted with key-operated fastenings only, the tongues of which must be locked in the retracted position whenever the building is occupied so that the door can yield to pressure.

Anti-ligature Door Hardware

Due to the nature of the Mental Health Facility, it is noted that door hardware throughout the majority of the facility will be required to be anti-ligature.

The provision of anti-ligature door hardware throughout Mental Health is permitted in accordance with the DtS Provisions of the BCA Subject to the following be implemented:

- The doors can be immediately unlocked –
  - By operating a fail-safe control switch, not contained within a protective enclosure, to actuate a device to unlock the door; or
  - By hand by a person or persons, specifically nominated by the owner, properly instructed as to the duties and responsibilities involved and available at all times when the building is lawfully occupies so that persons in the building or part may immediately escape if there is a fire

The LHD will need to confirm which option will be implemented as part of the use and operation of the facility.

Subject to the LHD confirming an option in accordance with the above, the use of anti-ligature door hardware is permitted in accordance with the DTS Provisions and is not required to be addressed via Performance Solution.

53. Clause D2.23 – Signs on Doors

Doors to the fire isolated stairway must not be locked from inside the stair or if they are proposed to be locked, they must be fitted with a fail-safe device that automatically unlocks the door upon fire trip and comply with one of the following design options:

- On at least one of the storeys, the doors are not able to be locked and a sign is fixed on such doors stating that re-entry is available; or
- An intercommunication system, or an audible or visible alarm system, operated from within the enclosure is provided near the doors on **every level** and a sign is fixed adjacent to such doors explaining its purpose and method of operation.

54. Clause D2.23 – Signs on Doors

All **self-closing** fire and/or smoke doors located within fire and smoke walls throughout the building together with the fire doors providing access to the external stairways are to be provided with signage that states:

FIRE SAFETY DOOR
DO NOT OBSTRUCT
DO NOT KEEP OPEN

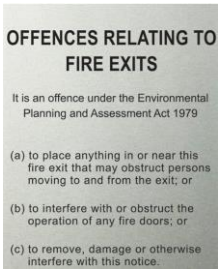
All **automatic closing** fire and/or smoke doors located within fire and smoke walls throughout the building together with automatic closing fire doors leading to the external stairways are to be provided with signage that states:

FIRE SAFETY DOOR
DO NOT OBSTRUCT

The doors discharging from the fire isolated stairways are to be provided with signage as follows (on both sides of the doorways):

FIRE SAFETY DOOR
DO NOT OBSTRUCT

The doors discharging to the external stairways provided in lieu of fire isolated stairways are to be provided with the following additional signage installed on the wall on the latch side of the door.



PART D3 – ACCESS FOR PEOPLE WITH A DISABILITY

55. D3 – Access Requirements for People with Disabilities

Access for persons with disabilities must be provided, at a minimum, to and within all areas normally used by the occupants throughout the building. This includes to and within all beds, throughout all patient care areas, staff areas and communal areas.

The Class 3 overnight room will be required to be fully accessible for a person with a disability including an accessible sanitary facility (ensuite).

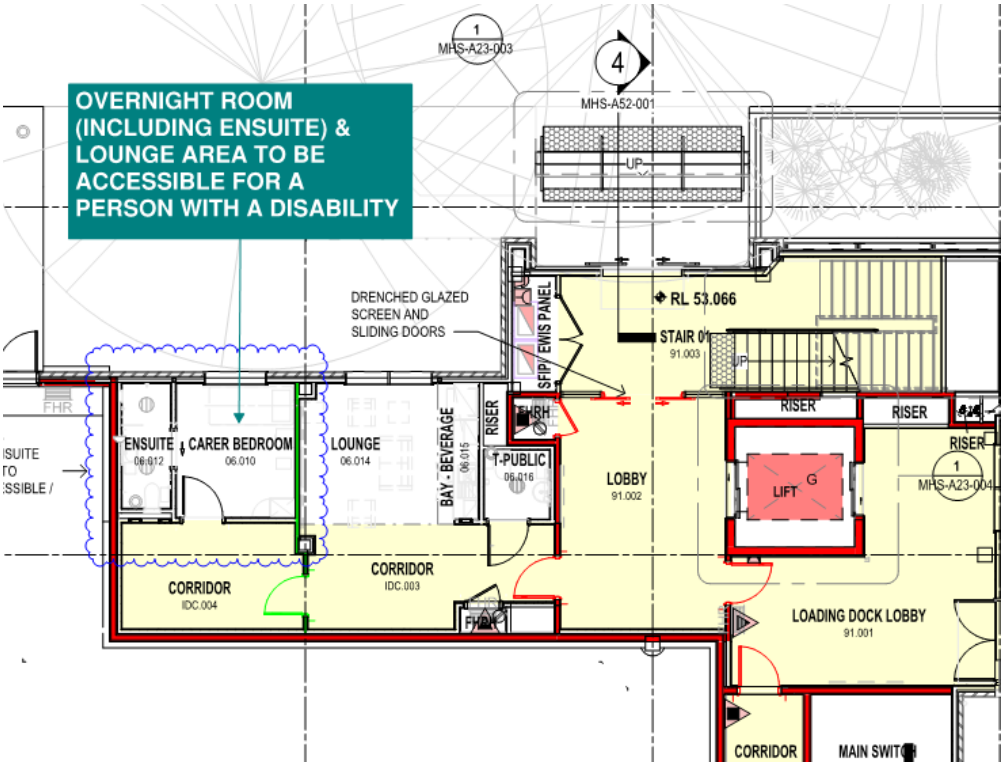


Figure No. 28 – Accessible sole occupancy required to be provided on Level 01

This Report contains high level comments pertaining to access for a person with a disability. A separate and more detailed Report is prepared by iAccess Consultants.

56. Clause D3.2 – Access to Buildings

Access to the building is required as follows:

- An accessible accessway is required to be provided as follows:
  - From the main points of a pedestrian entry at the allotment boundary, and
  - From another accessible building connected by a pedestrian link; and
  - From any required accessible carparking space on the allotment

- In a building required to be accessible, an access is required to be provided throughout the principal pedestrian entrance and –
  - Through not less than 50% of all pedestrian entrances including the principal pedestrian entrance; and
  - In a building with a total floor area of more than 500m2, a pedestrian entrance which is not accessible must not be located more than 50m from an accessible pedestrian entrance.
- An accessible pedestrian entrance with multiple doorways is considered to be one pedestrian where -
  - All doorways serve the same part or parts of the building; and
  - The distance between each doorway is not more than the width of the widest doorway at that pedestrian entrance

Except for pedestrian entrance serving only areas exempted from Clause D3.4 (refer to areas below under Clause D3.4).

- Where a pedestrian entrance required to be accessible has multiple doorways –
  - If the pedestrian entrance consists of not more than 3 doorways, - not less than 1 of those doorways is required to be accessible.
  - If a pedestrian entrance consists of more than 3 doorways, - not less than 50% of those doorways is required to be accessible.
  - From any required accessible carparking space on the allotment
- The minimum unobstructed height of a continuous accessible path of travel is required to be 2000 mm and 1980 mm at doorways.

  Unless otherwise specified (such as at doors, curved ramps and similar), the minimum unobstructed with of a continuous accessible path of travel is required to be 1000 mm and following elements cannot intrude into the minimum width:
  - Fixtures and fittings such as lights, awnings, windows that when open intrude into the circulation space, telephones, skirtings, and similar objects.
  - Essential fixture and fittings such as fire hose reels, fire extinguishers and switchboards.
  - Door handles less than 900 mm above the finished floor

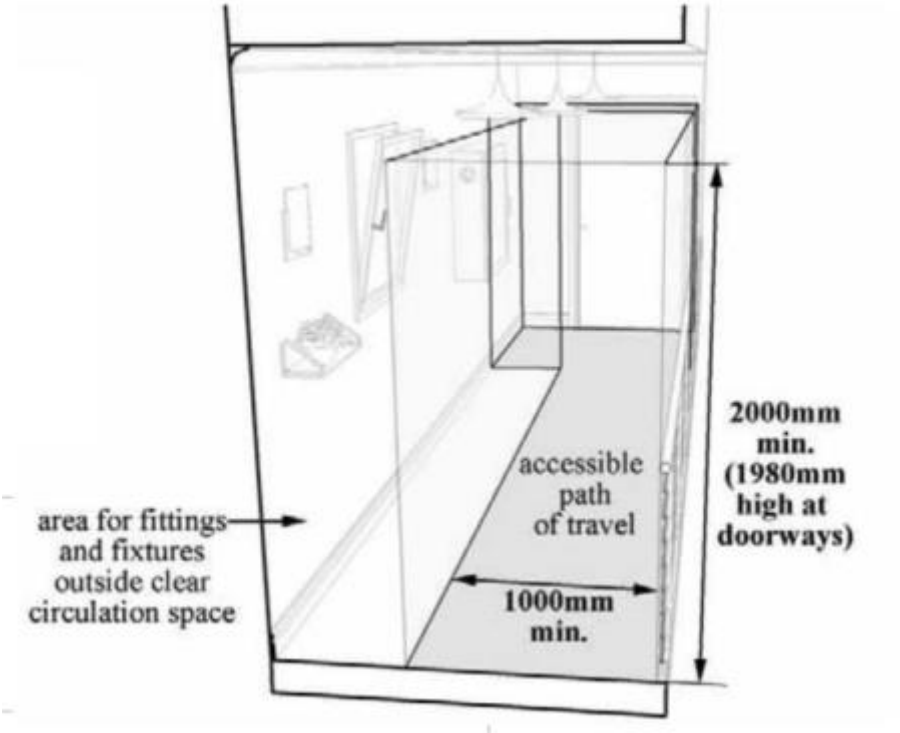


Figure No. 29: Minimum height and width of accessible path of travel

+ The minimum width of an accessible doorway must have a *clear opening* width of not less than 850mm in accordance with AS1428.1. Where double doors are provided, at least one leaf must have a clear unobstructed width of 850mm.

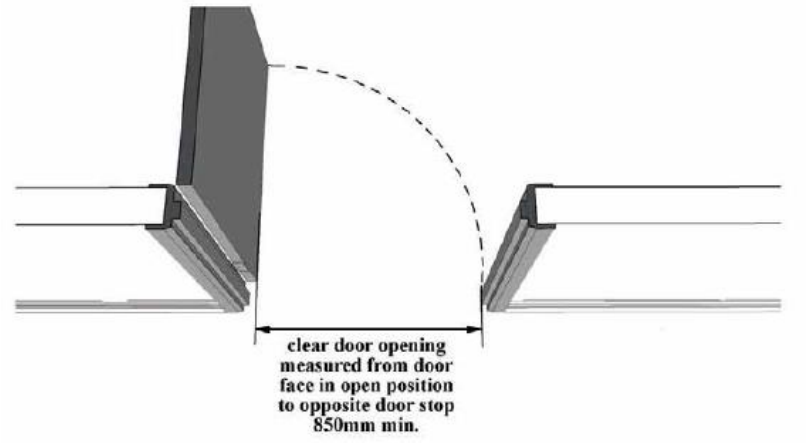


Figure No. 30– Clear Unobstructed Width of Doorway

+ All new doorways shall have a minimum luminance contrast of 30% provided between—

(a) door leaf and door jamb;

(b) door leaf and adjacent wall;

(c) architrave and wall;

(d) door leaf and architrave; or

(e) door jamb and adjacent wall.

The minimum width of the area of luminance contrast shall be 50 mm.

Doorways providing access to rooms that are not required to be accessible, are not required to be provided with a luminance contrast i.e., clean utility rooms, dirty utility rooms, equipment stores etc.

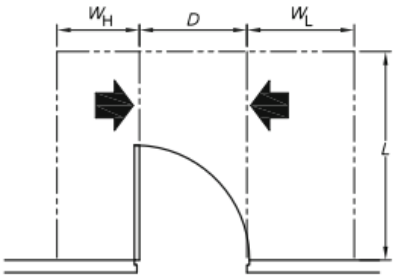
+ Circulation space is required to all doorways throughout the building that are required to be accessible in accordance with Section 13 of AS 1428.1 – 2009 (see diagrams below).

+

Note: Where doorways are provided with one and half leaves, the half leaf is required to permit the required latch side circulation space as required by AS 1428.1 – 2009.

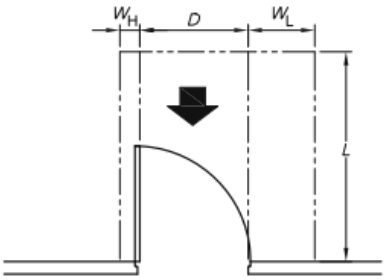
Swing Door Opens Towards User:

Both Sides Approach:



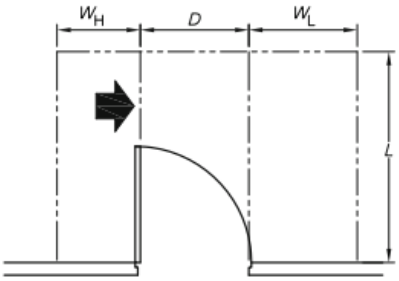
D	L	W_H	W_L
850	1670	660	900
900	1670	610	900
950	1670	560	900
1000	1670	510	900

Front On Approach:



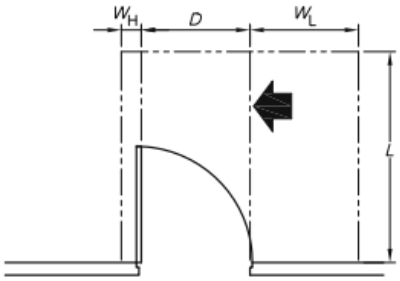
D	L	W_H	W_L
850	1450	110	530
900	1450	110	530
950	1450	110	530
1000	1450	110	530

Hinge Side Approach:



D	L	W_H	W_L
850	1670	660	900
900	1670	610	900
950	1670	560	900
1000	1670	510	900

Latch Side Approach:

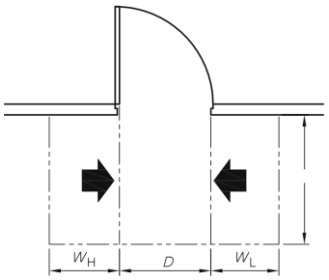


D	L	W_H	W_L
850	1670	110	900
900	1670	110	900
950	1670	110	900
1000	1670	110	900

Figure No. 31 – Circulation Space at Swing Doors – Door Opens Toward User

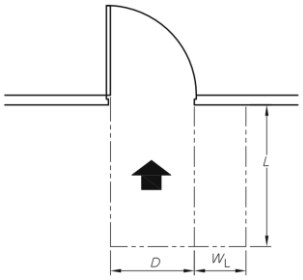
Swing Door Opens Away from User:	
Both Sides Approach:	Front On Approach:
Hinge Side Approach:	Latch Side Approach:

Both Sides Approach:



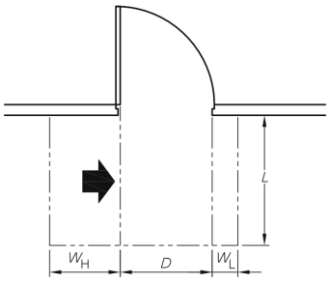
D	L	W_H	W_L
850	1240	560	660
900	1210	510	660
950	1175	460	660
1000	1155	410	660

Front On Approach:



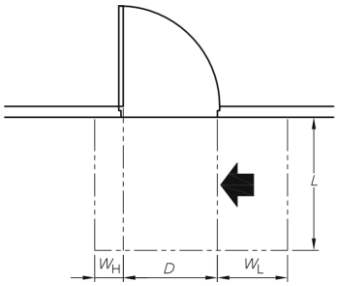
D	L	W_H	W_L
850	1450	0	510
900	1450	0	510
950	1450	0	510
1000	1450	0	510

Hinge Side Approach:



D	L	W_H	W_L
850	1220	560	340
900	1185	510	340
950	1160	460	340
1000	1140	410	340

Latch Side Approach:

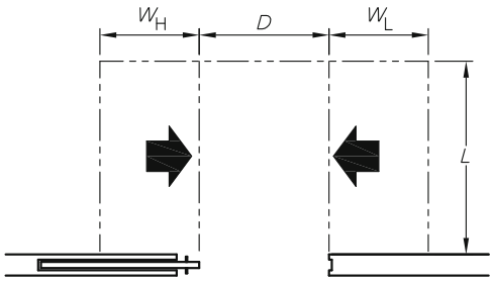


D	L	W_H	W_L
850	1240	240	660
900	1210	190	660
950	1175	140	660
1000	1155	90	660

Figure No. 32 – Circulation Space at Swing Doors – Door Opens away from User

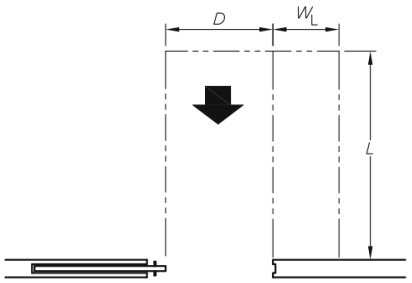
Sliding Doors Recessed in Wall:

Both Sides Approach:



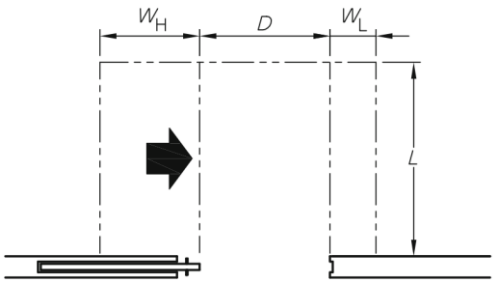
D	L	W_H	W_L
850	1280	660	660
900	1280	610	660
950	1280	560	660
1000	1280	510	660

Front On Approach:



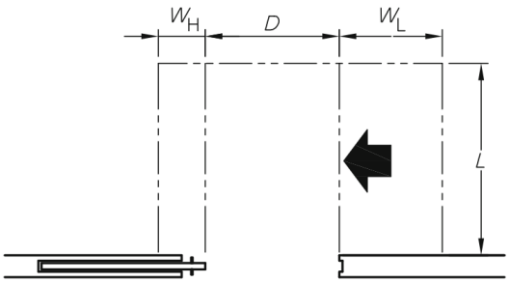
D	L	W_H	W_L
850	1450	0	530
900	1450	0	530
950	1450	0	530
1000	1450	0	530

Slide Side Approach:



D	L	W_H	W_L
850	1280	660	395
900	1280	610	395
950	1280	560	395
1000	1280	510	395

Latch Side Approach:



D	L	W_H	W_L
850	1230	185	660
900	1230	180	660
950	1230	180	660
1000	1230	180	660

Figure No. 33 – Circulation Space at Sliding Doors – Recessed in Wall

Sliding Doors Surface Mounted

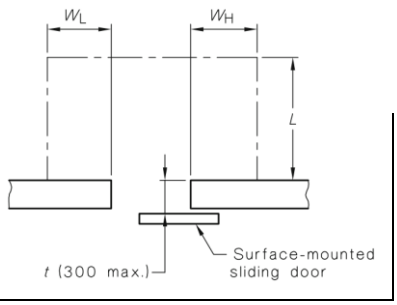
For any side on approach:	Add dimension *t* to W_L and W_H.	
For only a front on approach:	Add dimension *t* to *L*, W_L and W_H.	

Figure No. 34 – Circulation Space at Sliding Doors – Surface Mounted

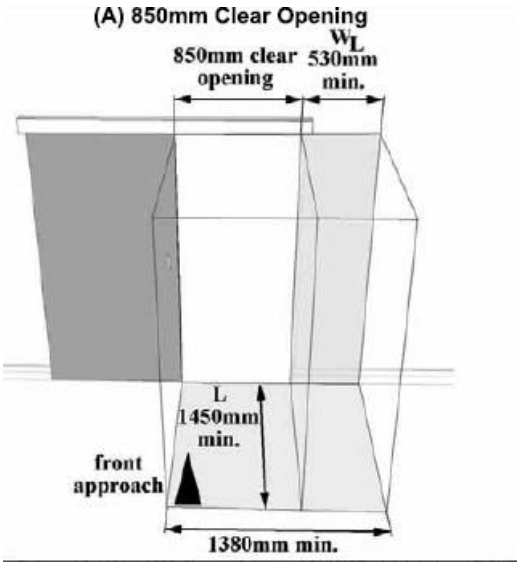


Figure No. 35 – Circulation Space at Swing Doors

57. Clause D3.3 – Parts of Buildings to Be Accessible

In a building required to be accessible –

- Every ramp and stairway, excepts for ramps and stairways in areas exempted from Clause D3.4, are required to comply with –
  - For a ramp, except a fire isolated ramp, Clause 10 of AS 1428.1; and
  - For a stairway, except a fire isolated stairway, Clause 11 of AS 1428.1; and
  - For a fire isolated stairway, Clause 11 (f) and (g) of AS 1428.1.
  - Door handles less than 900 mm above the finished floor
- Every passenger lift is required to be designed in accordance with Clause E3.6
- Accessways throughout the building are required to have –
  - Passes spaces complying with AS 1428.1 at a maximum 20m intervals on those parts of an access where a direct line of sight is not available; and
  - Turning spaces complying with AS 1428.1 –
    - Within 2 m of the end of accessways where it is not possible to continue travelling along the accessway, and
    - At maximum 20 m intervals along the accessway
- All dead-end corridors where a person in a wheelchair is required to make a 90º to 180º turn is required to be not less than 2070mm in the direction of travel and not less than 1540 mm wide.

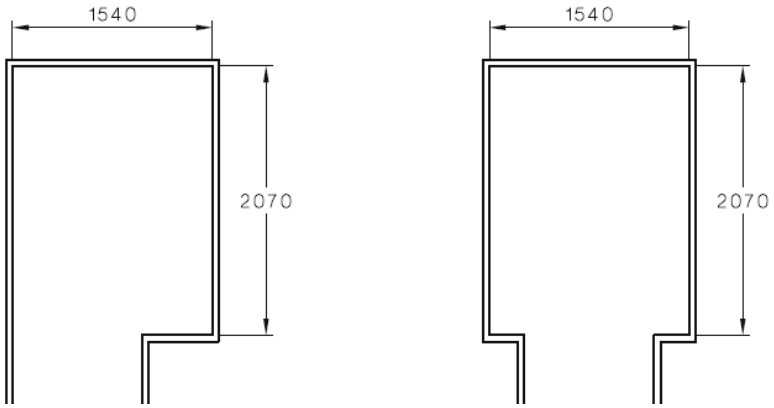


Figure No. 36 – Minimum space required for >90º to 180º turn

Accessible Walkways (AS1428.1 – 2009 Section 10.2):

The requirements for walkways serving the development are as follows:

- Walkways can have a gradient up to 1:20. Anything steeper is a ramp and requires kerbs or kerb rails plus handrails to both sides.
- A walkway with a gradient less than 1 in 33 does not require landings but does require a crossfall of maximum 1 in 40 (maximum cross fall of 1 in 33 if the surface is bitumen).
- Walkways steeper than 1 in 33 do not require a crossfall to the main walkway but do require a crossfall of 1 in 40 to landings

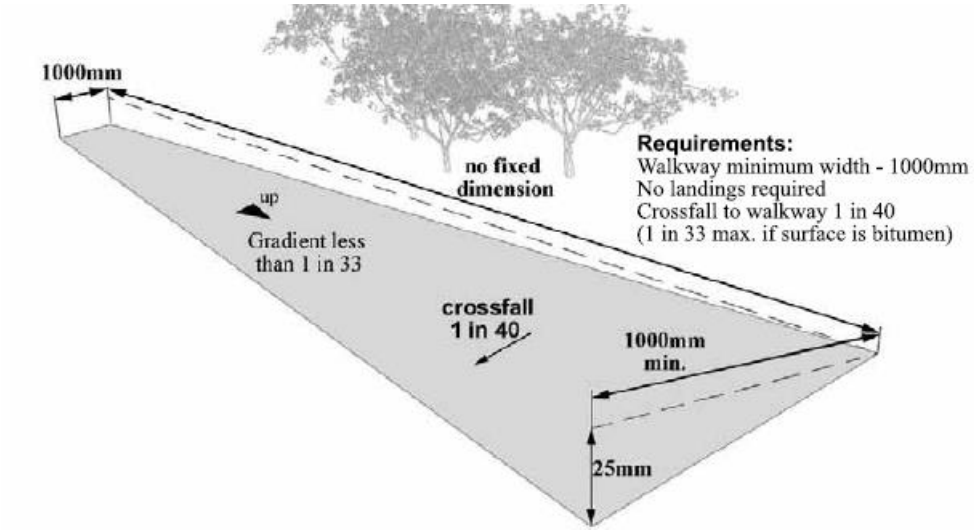


Figure No. 37 - Requirements for a Walkway with a Gradient Less Than 1 in 33

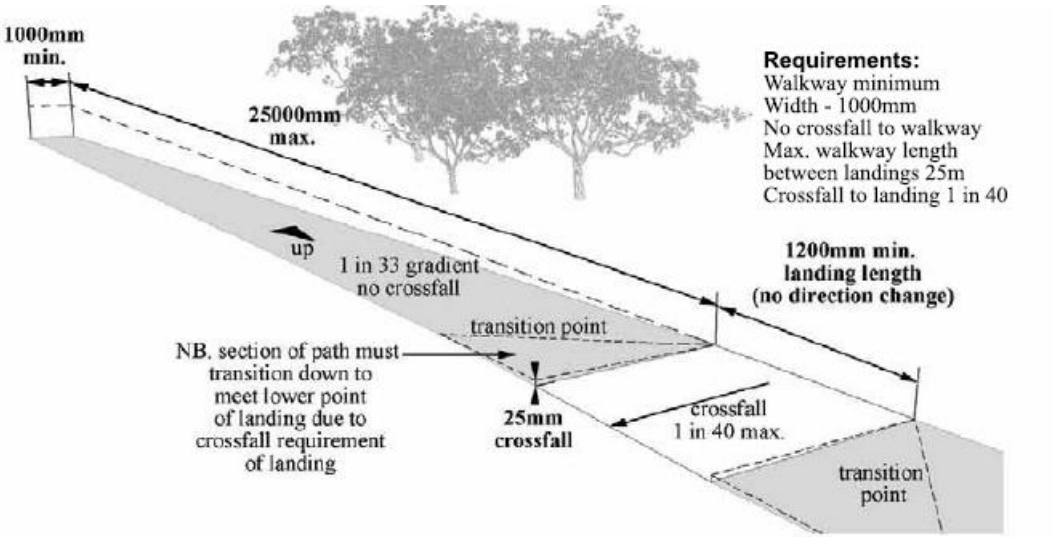


Figure No. 38 - Requirements for a Walkway with a 1 in 33 Gradient

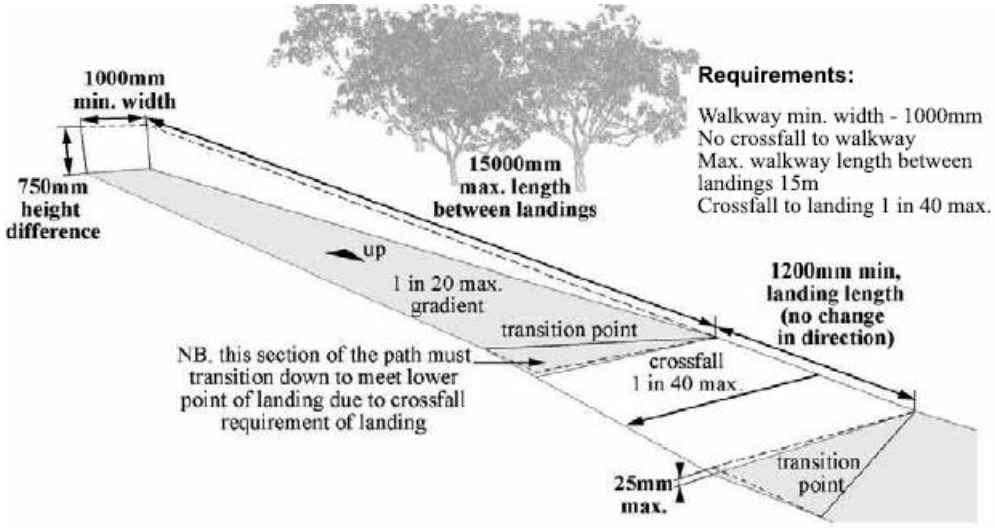


Figure No. 39 - Requirements for a Walkway with a 1 in 20 Gradient

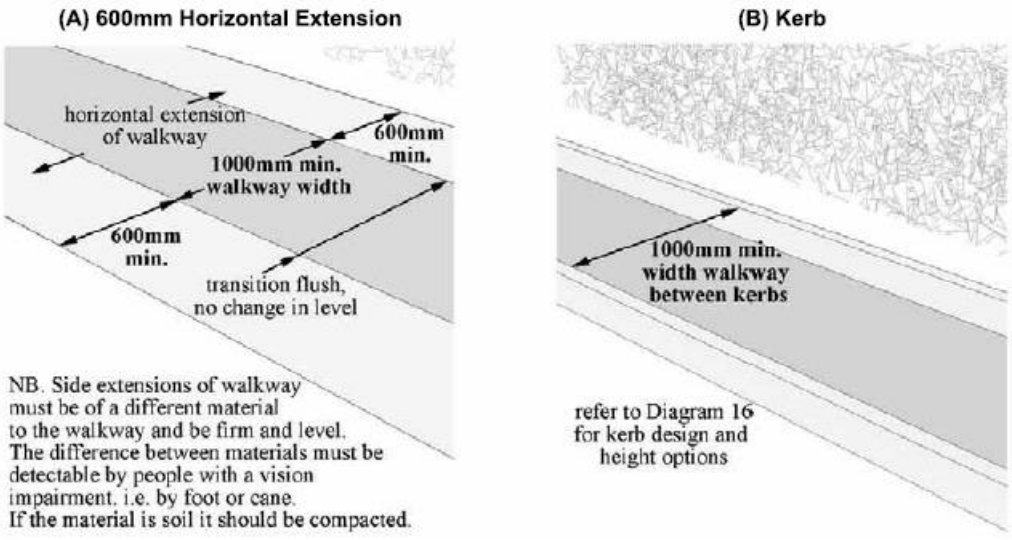


Figure No. 40 - Requirements for Edges of Walkways

Accessible Ramps (AS1428.1-2009 Section 10.3):

Accessible ramps are required to be designed and constructed in accordance with the following:

- The maximum gradient is to be 1:14.
- Landings are to be provided at the top and bottom of the ramp and at intervals not exceeding 9m.

  The landings to the ramps are required to have a minimum width of 1200mm.
- Handrails are to be provided to both sides of the ramp. The handrails are required to be extended 300mm at both the top and bottom of the ramp.
  - The ramps are to be provided with kerb rails that comply with the following:
  - The minimum height above the finished floor shall be 65mm
  - The height of the top of the kerb or kerb rail shall not be within the range of 75mm to 150mm above the finished floor.
  - There cannot be a longitudinal gap or slot greater than 20mm in the kerb or kerb rail within the range 75mm to 150mm above the finished floor.
- Where ramps are constructed with a change in direction, the angle of approach shall create a 90° angle to the line of transition between the ramp surface and the landing surface.

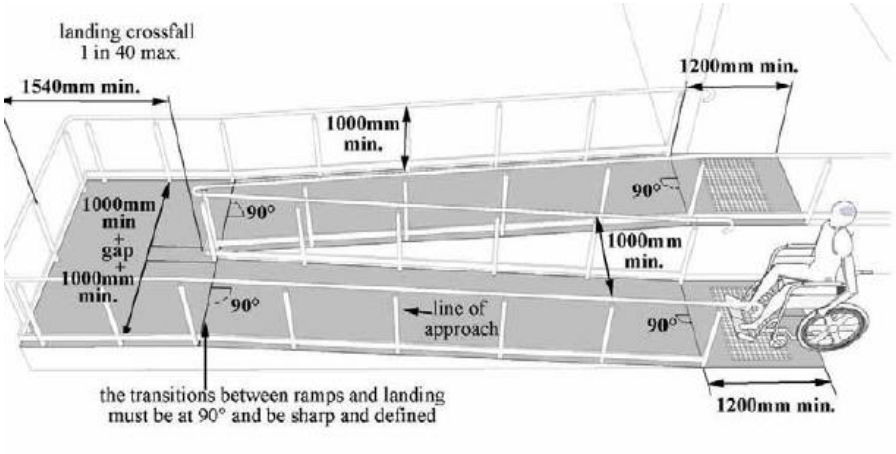


Figure No. 41 – Ramp and Landing with Change in Direction of 180°

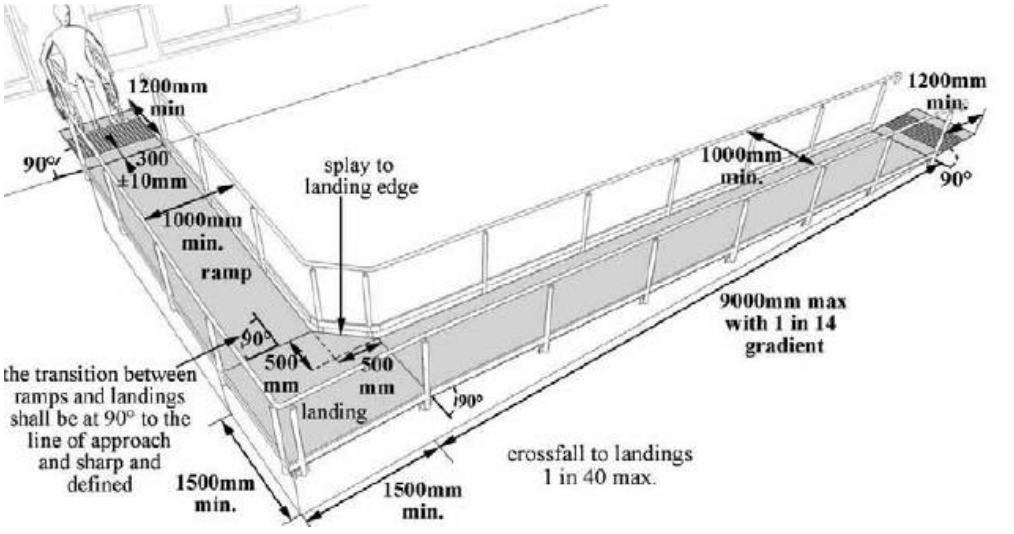


Figure No. 42 – Ramp and Landing with Change of 90°

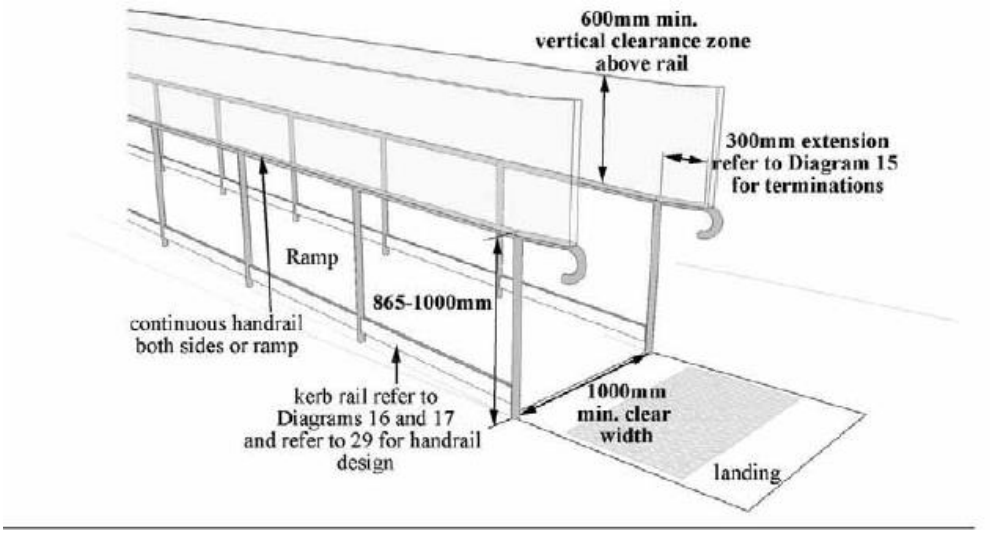


Figure No. 43 – Handrail Extensions at Ramp Ending

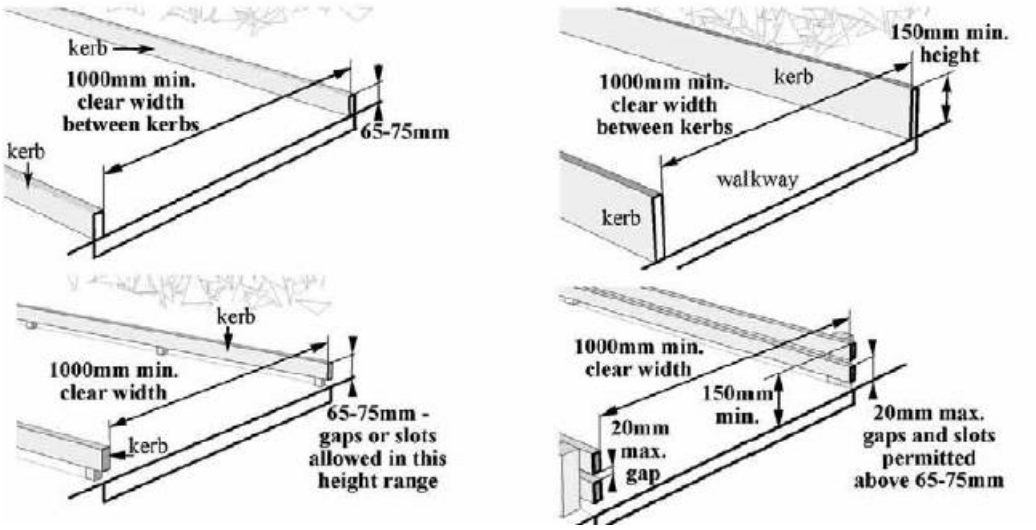


Figure No. 44 – Kerb and Kerb Rail Design Options

Accessible Stairways:

The central circulation stairway is required to be designed in accordance with AS 1428.1. In this instance, the following is required:

- A handrail to each side of stairway.
- Handrails are required to be extended at the top and bottom of the stairway. At the bottom of the stairway, the handrails are required to extend one tread width plus 300mm from the last riser. At the top of the stairway, the handrails are required to extend 300mm from the last riser.
- Solid opaque risers.
- Contrast nosing's to the stair treads.
- The handrails are to have a maximum dimension of 50mm and be spaced a minimum distance of 50mm from the wall.

  Note: -
  Handrails within fire isolated stairways are only required to comply with Clause 12 of AS 1428.1 which regulates the size of the handrails, cross section and distance from adjacent walls surfaces etc. In this

instance the extensions at the top and bottom of the handrails are not required within the fire isolated stairway.

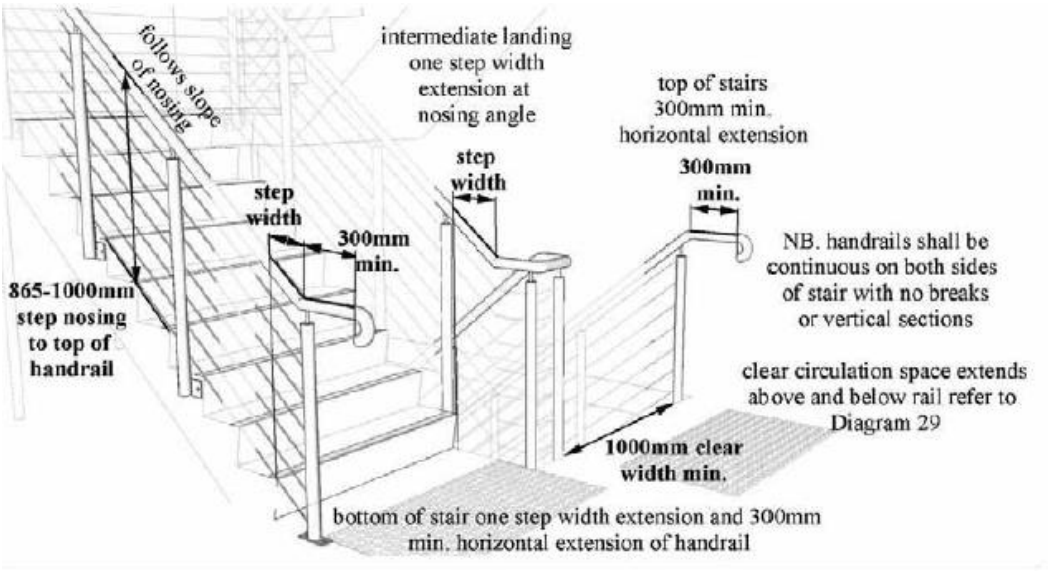


Figure No. 45 – Handrails to Stairways

The below figure detail's locations throughout the building where circulation space requires close attention in order to ensure that compliance is achieved with the requirements of AS 1428.1 – 2009 as the design develops.

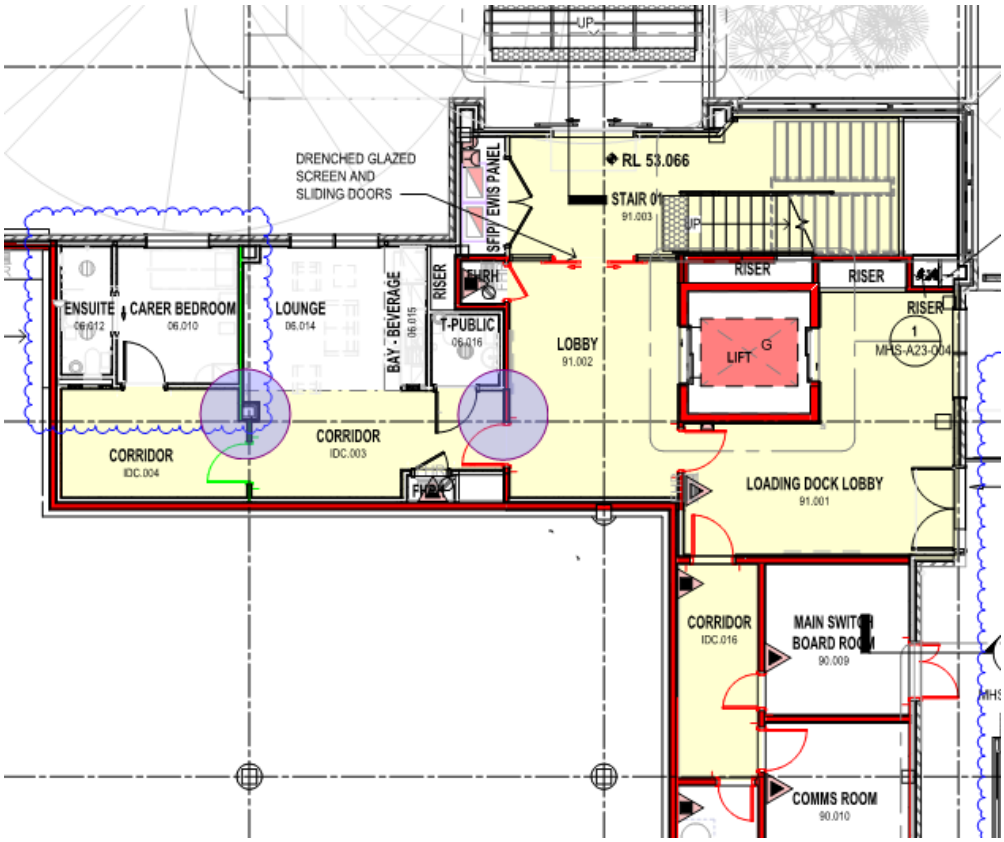


Figure No. 46 – Circulation Space at Swing Doors on Level 01

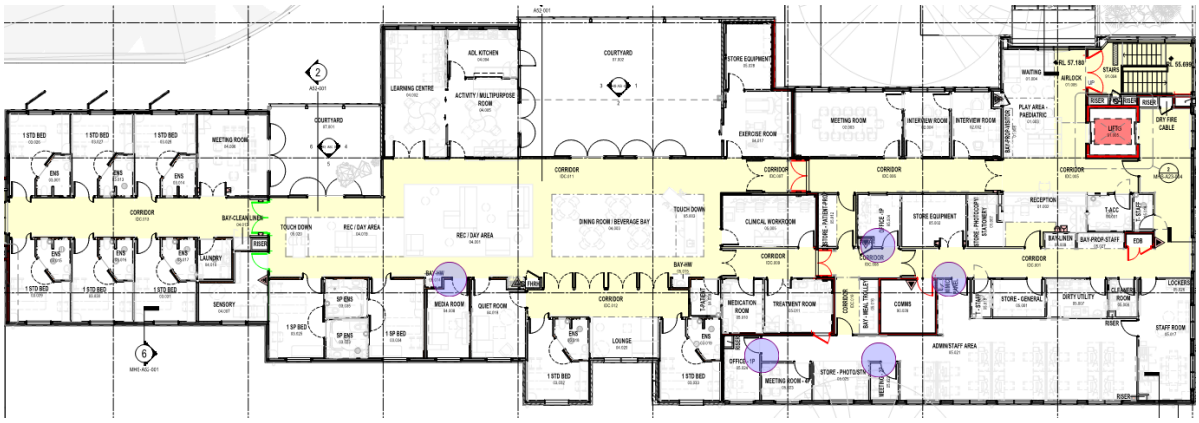


Figure No. 47 – Circulation Space at Swing Doors on Level 02

Access Control

Access control swipe readers are required to be installed between 900 – 1100mm above FFL and not closer than 500mm to an internal corner.

Door release buttons are required to be located between 900 – 1100mm above FFL and closer than 500mm to an internal corner. Door release buttons will need to be large format switches (35mm x 35mm rocker style switches) or a 'mushroom' push button type.

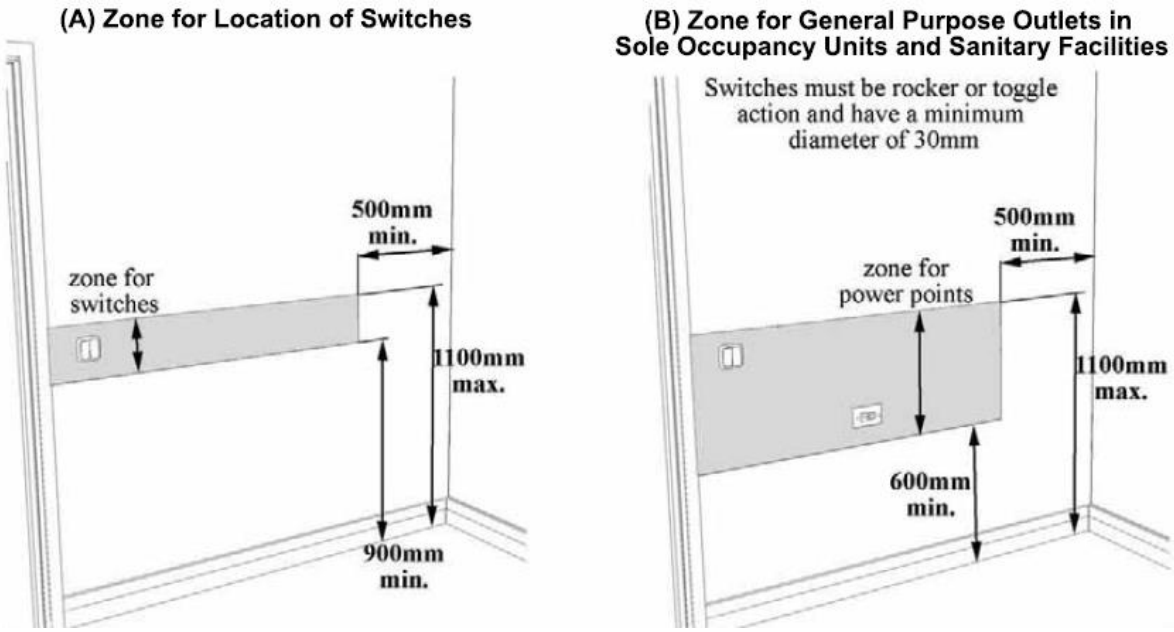


Figure No. 48 – Zones for the location of switches and power outlets

Use of Anti-Ligature Hardware

It is noted anti-ligature hardware will be utilised throughout the patient care area of the building.

The use of anti-ligature fixtures and fittings including door hardware, handrails etc will be required to be assessed as part of a Performance Solution Report to be prepared by the Access Consultant in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

Accessible Counters

The reception counters associated with the entrance to the building is to include a portion of the counter that is accessible to a person with a disability. The height of the counter should be 850mm +/- 20mm.

The knee and foot clearances below the counter or bench are required to be provided in accordance with AS 1428.2 – 1992.

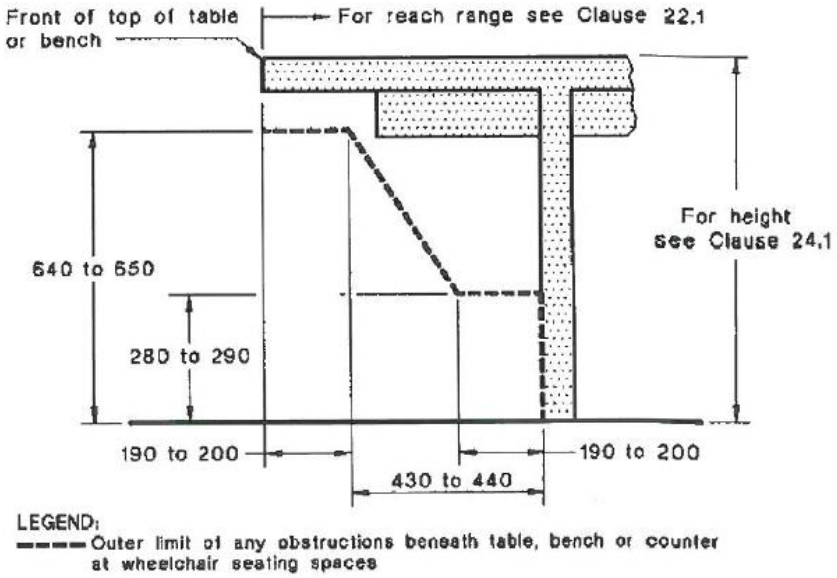


Figure No. 49 – Clearances below an accessible counter or bench

Beverage Bays

Where Beverage Bays are proposed to be installed, they are required to be designed as follows:

- If the beverage bays are located within a room, the circulation space within the room will be required to comply with the provisions of AS 1428.1 – 2009 with a zone of 1500mm x 1500mm provided to ensure that that an occupant can make a 180o turn.
- The distance between the beverage bay counter and any adjacent wall cannot be less than 1540mm.
- Where the beverage bay is located adjacent to a doorway, circulation space around the doorway is required to be provided as detailed above.
- Water zip taps cannot be located closer than 500mm from an internal corner.
- Side reach access to the tap hardware of the beverage bay is permitted. Side reach access is required to be provided in accordance with AS 1428.2 – 1992 as detailed in the below Figure.

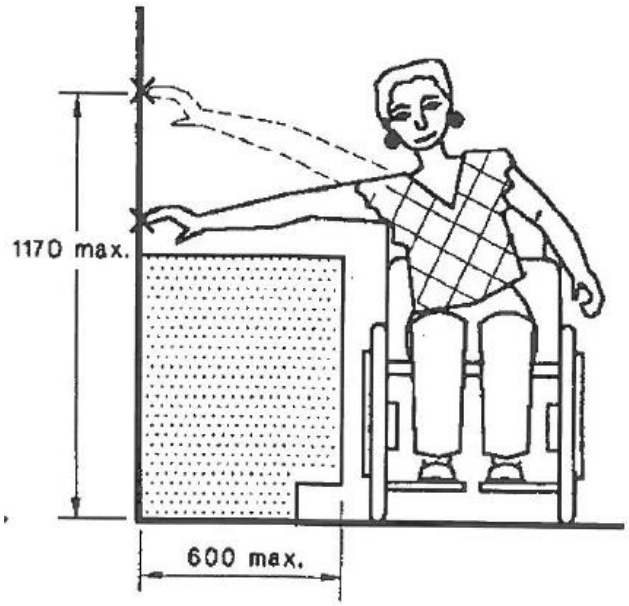


Figure No. 50 – Side reach requirements for a wheelchair user

Carpet

The pile height or pile thickness cannot exceed 11 mm and the carpet backing thickness cannot exceed 4 mm.

Exposed edges of floor covering are required to be fastened to the floor surface and is required to have a trim along the entire length of any exposed edge.

At the leading edges, carpet trims and any soft flexible materials are required to have a vertical face no higher than 3 mm or a rounded bevelled edge no higher than 5mm or above that height a gradient of 1 in 8 up to a total maximum height of 10 mm.

Note: In accordance with Clause D3.3 (h), the dimensions of 10mm, 6mm and 4mm are to be replaced with 11 mm, 4mm and 15 mm respectively.

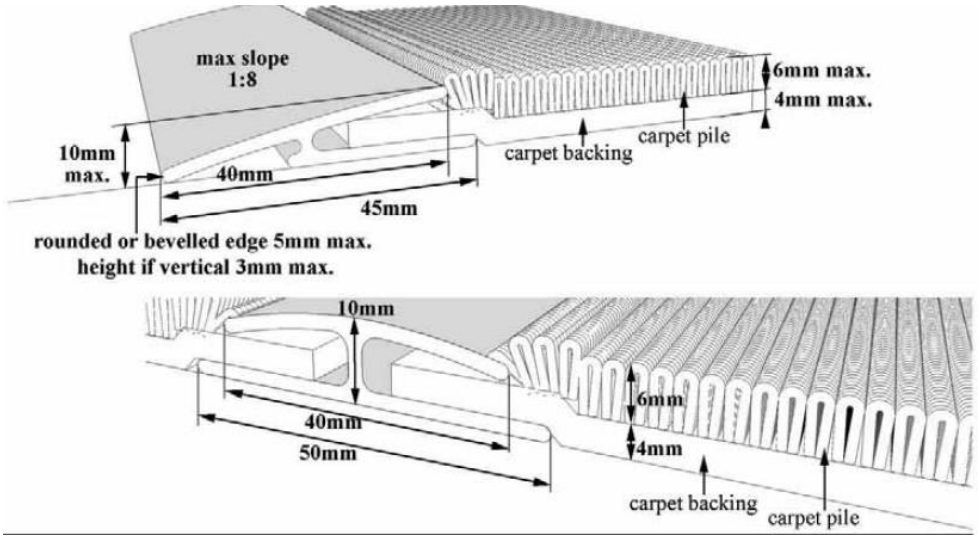


Figure No. 51 – Carpet joints on an accessible path of travel

Recessed Matting

Matting recessed within a continuous accessible path of travel is required to comply with the following:

+ Where of metal and bristle type construction or similar, its surface cannot be more than 3 mm if vertical or 5 mm if rounded or bevelled, above or below the surrounding surface; and
+ Where a mat or carpet type material, it is required to have the fully compressed surface level with or above the surrounding surface with a level difference no greater than 3 mm if vertical or 5 mm if rounded or bevelled.

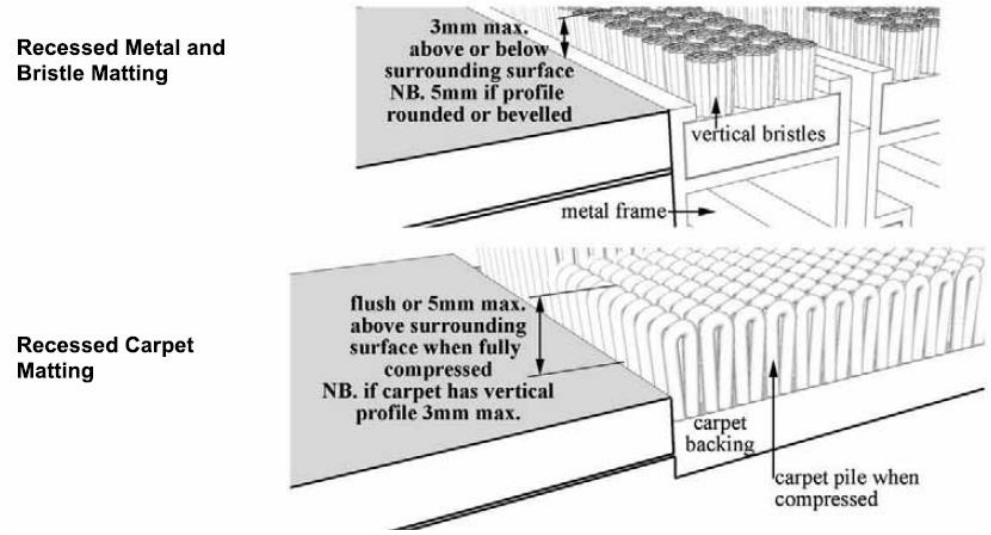


Figure No. 52 – Recessed matting height tolerances

Grates

Grates installed are required to comply with the following:

+ Circular openings cannot be greater than 13 mm in diameter.
+ Slotted openings cannot be greater than 13 mm wide and be orientated so that the long dimension is transverse to the dominant direction of travel.

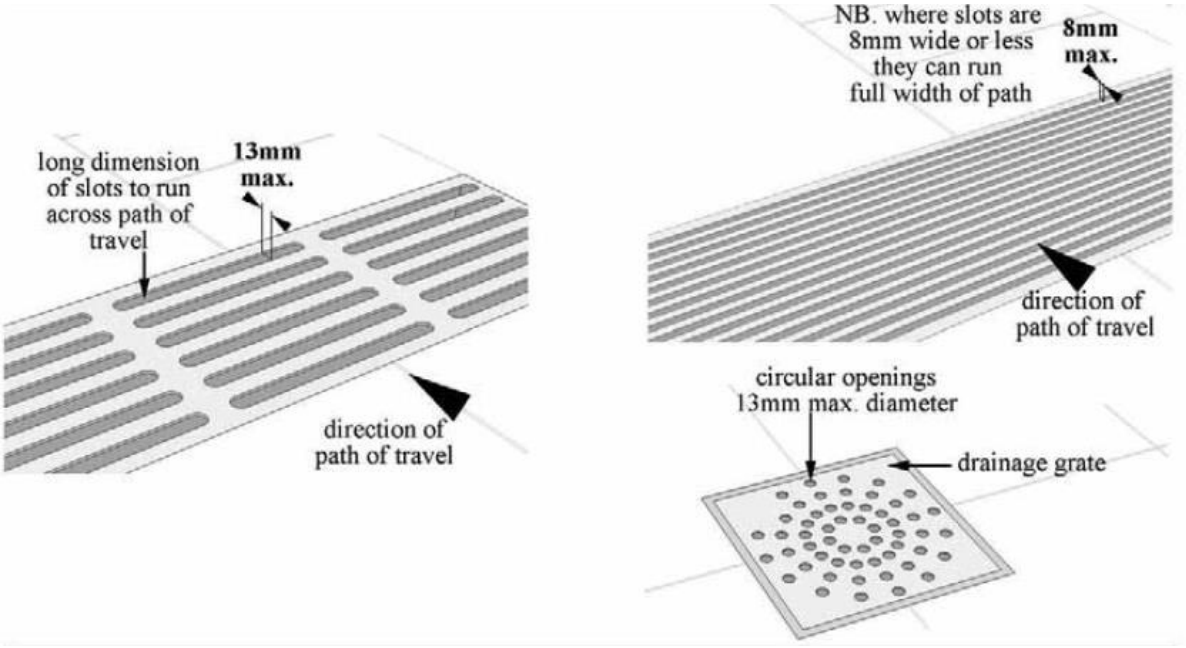


Figure No. 53 – Maximum size of openings in grates

Accessible Fixtures & Fittings:

+ All fixtures, fittings and door hardware are to comply with Section 13.5 & Section 14 of AS1428.1-2009.

  In this instance, toggle style light switches and GPO outlets etc. should be provided within all patient care areas and to all accessible sanitary facilities (unless automatic lighting is provided within the sanitary facility)

+ Braille tactile signage will be required to be installed throughout the building identifying accessible sanitary facilities, exits and lifts in accordance with the DTS Provisions of the BCA and AS 1428.1.

Signage to identify any ambulant or accessible sanitary facility is required to be located on the wall on the latch side of door or on the door itself leading to the sanitary facility.

58. Clause D3.4 – Exemptions

Access need not be provided to:

- An area where access would be inappropriate because of the particular purpose for which the area is used.
- An area that would pose a health or safety risk for people with a disability.
- Any path of travel providing access only to an area exempted by (a) or (b).

Areas / rooms that are not required to be accessible for a person with a disability include the following:

- Dirty Utility Rooms
- Clean Utility Rooms
- Equipment Storerooms
- General Storerooms
- Cleaners Rooms
- Back of House Area containing the Bulk Store, General Waste Room etc
- Plant Rooms
- Main Switch Room, UPS / EDB / Comms Rooms

Written verification will be required to be submitted by the Western Sydney Local Health District verifying that a staff member with a disability will not be required to access the above rooms in their role.

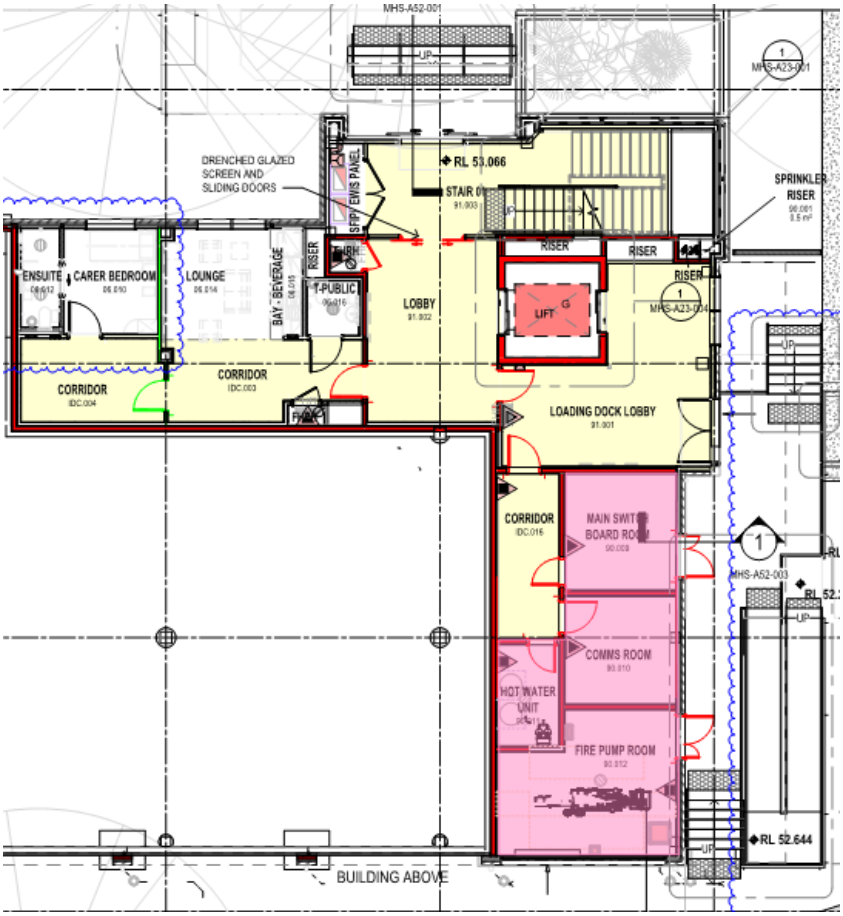


Figure No. 54 – Rooms on Level 01 that are not required to be accessible for a person with a disability

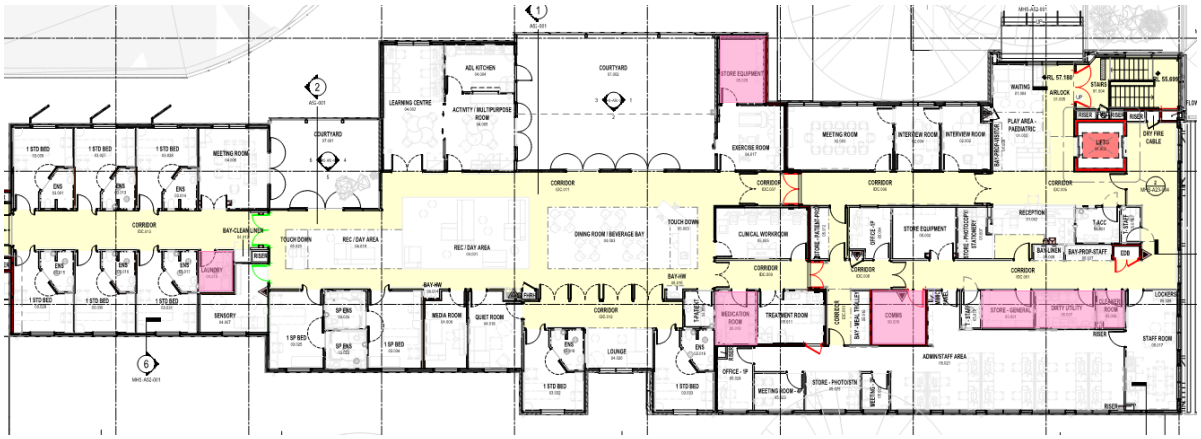


Figure No. 55 – Rooms on Level 02 that are not required to be accessible for a person with a disability

59. Clause D3.5 – Accessible Carparking

Accessible car parking spaces are required to be provided in accordance with Table D3.5

Based on the number of car parking spaces serving the development, a minimum of one (1) accessible car parking space is required to be provided for a person with a disability.

60. Clause D3.6 – Signage

Braille and tactile signage complying the requirements of Specification D3.6 is required to:

+ Incorporate the international symbol of access or deafness, as appropriate, in accordance with AS 1428.1 and identify each -

+ Sanitary facility; and

+ A space with a hearing augmentation system; and

+ Identify each door required by **E4.5** (door to be provided with exit signs) to be provided with an exit sign and state –

  a. ***"Exit"***; *and*
  b. ***"Level"*** *followed by the floor number*

+ Signage including the international symbol for deafness in accordance with AS 1428.1 must be provided within a room containing a hearing augmentation system identifying –

  - The type of hearing augmentation; and
  - The area covered within the room; and
  - If receivers are being used and where the receivers can be obtained

+ Signage in accordance with AS 1428.1 must be provided for accessible unisex sanitary facilities to identify the facility is suitable for left or right-handed use.

+ Signage to identify an ambulant accessible sanitary facility in accordance with AS 1428.1 must be located on the door of the facility.

+ Where a pedestrian entrance is not accessible, directional signage incorporating the international symbol of access, in accordance with AS 1428.1 must be provided to the location of the nearest accessible pedestrian entrance.

+ Where a bank of sanitary facilities is not provided with an accessible unisex sanitary facility, directional signage incorporating the international symbol of access in accordance with AS 1428.1 must be placed

at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex sanitary facility.
Signs identifying a door required by E4.5 to be provided with an exit sign must be located:

i. On the side that faces a person seeking egress; and

ii. On the wall on the latch side of the door with the leading edge of the sign located between 50mm and 300mm from the architrave; and

iii. Where (ii) is not possible, the sign may be placed on the door itself.

The provision of Braille and tactile exit signage with the message, *for example*. *"**Exit - Level 1**"* assists people with vision impairment to orientate themselves in case of an emergency situation and to find an exit and evacuate the area in a safe and equitable manner.

Location of Braille and Tactile Signs

Braille tactile signage including symbols, numbering and lettering is required to be designed in accordance with the following: -

- Braille and tactile components of the sign must be located not less than 1200 - 1600mm above the ground or floor surface.
- Signs with single lines of characters are to have the line of the tactile characters not less than 1250 mm and not more than 1350 mm above the floor or ground surface.
- Signs identifying rooms containing features or facilities listed in D3.6 are required to be located –
  - On the wall on the latch side of the door with the leading edge of the sign located between 50 mm and 300 mm from the architrave; and
  - Where the above is not possible, the sign is permitted to be located on the door itself.
- Signs identifying a door required to by Clause E4.5 to be provided with an exit must be located –
  - On the side that faces a person seeking egress; and
  - On the wall on the latch side of the door with the leading edge of the sign located between 50 mm and 300 mm from the architrave; and

The Braille & tactile egress signage is to be located adjacent or on (see above) each door that: -

- Provides direct egress into a fire isolated stairway
- Provides direct discharge from the storey into a passageway or lobby (airlock) associated with the fire isolated stairway
- Provide direct discharge from a fire isolated stairway to open space (discharge door)
- Horizontal exit doors providing egress into an adjoining fire compartment
- Provides direct egress to a roadway or open space

The below signage is an example of what will be required: -

Signage Specification: -

- Tactile characters must be raised or embossed to a height of not less than 1 mm and not more than 1.5 mm.
- Title case must be used for all tactile characters, and
  - Upper case tactile characters must have a height of not less than 15 mm and not more than 55 mm, except that the upper-case tactile characters on a sign identifying a door required by Clause E4.5 to be provided with an exit sign must have of not less 20 mm and not more than 55 mm; and
  - Lower case tactile characters must have a minimum height of 50% of the related uppercase characters.
- Tactile characters, symbols, and the like, must have rounded edges.
- The entire sign, including any frame, must have all edges rounded.
- The background, negative space or fill of signs must be of matt or low sheen finish.
- The characters, symbols, logos and other features on signs must be matt or low sheen finish.
- The minimum letter spacing of tactile characters on signs must be 2 mm.
- The minimum word spacing of tactile characters on sigs must 10 mm.
- The thickness of letter strokes must not be less than 2 mm and not more than 7mm.
- Tactile text must be left justified, except that single words may be centre justified.
- Tactile text must be Aerial typeface

61. Clause D3.7 – Hearing Augmentation

Hearing Augmentation

A hearing augmentation system will be required to be installed to all rooms / areas where a built-in amplification system is installed.

A built-in amplification system is a system where either speakers are installed within a room or a wall mounted monitor has built in speakers. Such installations are typically found in meeting rooms, training rooms, and waiting areas.

Where the wall mounted screen is not capable of broadcasting sound and any audio is provided way of speakers attached to a laptop or that are portable, the hearing augmentation provisions will not need to be applied.

If a hearing augmentation system is:

- An induction loop, it must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system; or
- A system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers must not be less than -
  - If the room or space accommodates up to 500 persons, 1 receiver for every 25 persons or part thereof, or 2 receivers, whichever is the greater; and
  - If the room or space accommodates more than 500 persons but not more than 1000 persons, 20 receivers plus 1 receiver for every 33 persons or part thereof in excess of 500 persons.

62. Clause D3.8 – Tactile Indicators

The DTS Provisions of the BCA grant a concession for the provision of tactile ground surface indicators to stairways and ramps within a Class 9a building.

In this instance tactile ground surface indicators are not required to be installed to internal stairways, however all external stairways and ramps providing access to and from the building are required to be provided with tactile ground surface indicators.

63. Clause D3.11 – Ramps

On an accessway –

- A series of connected ramps must not have a combined vertical rise of more than 3.6 m; and
- A landing for a step ramp must not overlap a landing for another step ramp or ramp.

The Architectural Drawings indicate that there are no pedestrian ramps that have a vertical rise greater than 3.6m.

64. Clause D3.12 – Glazing on An Accessway

On an accessway where there is no rail, handrail or transom provided to glazed walls and doors which may be mistaken as an opening must be clearly line marked in accordance with the following:

- Must be clearly marked for the full width of the glazed element,
- Must be a solid and non-transparent contrasting line,
- The contrasting line must have a minimum of 30% luminance contrast when viewed against the floor surface or surfaces within 2m of the glazing of the opposite side.
- Must be not less than 75mm in width,
- The lower edge of the contrasting line must be located between 900mm and 1000mm above the finished floor level

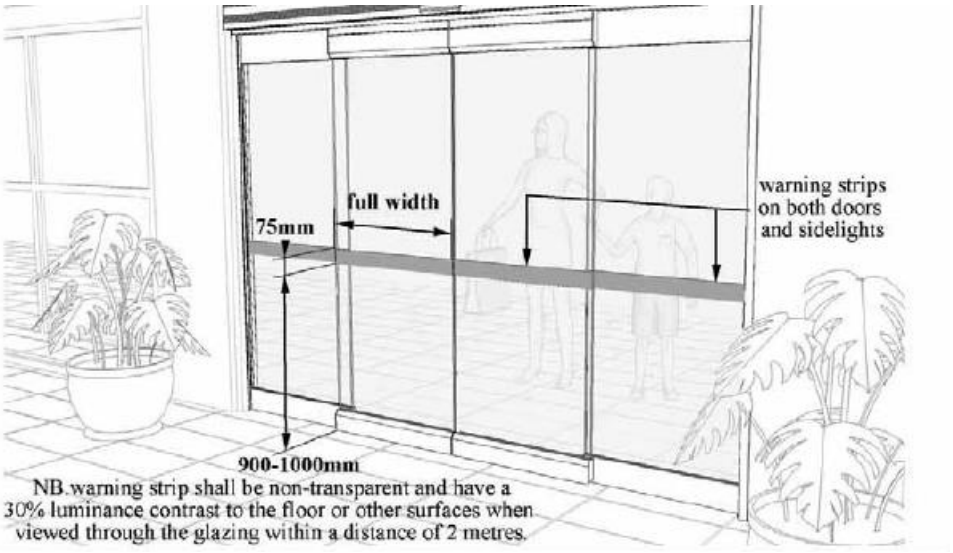


Figure No. 56 – Warning Strips to Full Height Glazing

SECTION E – SERVICES AND EQUIPMENT

PART E1 – FIRE FIGHTING EQUIPMENT

65. Part E1 – E4 – Essential Fire Safety Measures

The following essential fire safety measures are required to be installed within the building based on the proposed design.

Essential Fire and Other Safety Measures	Standard of Performance
Access Panels, Doors & Hoppers	BCA Clause C3.13 AS 1530.4 - 2014
Alarm Signalling Equipment	AS1670.3 – 2004
Automatic Fail-Safe Devices	BCA Clause D2.21
Automatic Fire Detection & Alarm System	BCA Spec. E2.2a AS 1670.1 - 2018.
Automatic Fire Suppression System	BCA Spec. E1.5 AS2118.1 - 2017
Emergency Lifts	BCA Clause E3.4 AS 1735.2 - 2001
Emergency Lighting	BCA Clause E4.4 AS/NZS 2293.1 - 2018
Emergency Evacuation Plan	AS 3745 - 2002
Emergency Warning & Intercommunication System	BCA Clause E4.9 AS 1670.1 - 2018
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 AS/NZS 2293.1 – 2018
Fire Dampers	BCA Clause C3.15 AS/NZS 1668.1 - 2015 AS 1682.1 & 2 – 2015
Fire Doors	BCA Clause C2.12, C2.13, C3.5, C3.7, C3.8 AS 1905.1 – 2015
Fire Hose Reels	BCA Clause E1.4 AS 2441 – 2005
Fire Hydrant Systems	Clause E1.3 AS 2419.1 - 2005

Essential Fire and Other Safety Measures	Standard of Performance
Fire Seals	BCA Clause C3.15 AS 1530.4 – 2014 AS 4072.1 – 2005
Fire Walls	BCA Spec. C1.1
Lightweight Construction	BCA Clause C1.8 & AS 1530.4 – 2014
Manual Call Points	BCA Section E
Mechanical Air Handling Systems (automatic shutdown)	BCA Clause E2.2 AS/NZS 1668.1 - 2015 AS 1668.2 – 2012
Paths of Travel	EP & A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Smoke Dampers	AS/NZS 1668.1 – 2015 AS 1682.1 & 2 – 2015
Smoke Doors	BCA Spec. C3.4 & C2.5
Smoke Seals	BCA Spec C3.4
Smoke Walls	BCA Spec. C2.5
Warning & Operational signs	Section 183 of the EP & A Regulations 2000 BCA Clause D2.23, E3.3 AS 1905.1 – 2015

Table No. 10 – Required essential fire safety measures

66. Clause E1.3 – Fire Hydrants

Fire Hydrants

Fire hydrant coverage is required to be provided to serve the building in accordance with AS 2419.1 – 2005.

System Performance

Based on the fact that the building contains 2 storeys and no fire compartment exceeding 1000 m^2, the maximum number of fire hydrants that are required to flow simultaneously is 1 in accordance with Table 2.1 of AS 2419.1 – 2005.

Hydrant Locations

It is noted that internal fire hydrants are proposed to be provided throughout the building.

Internal hydrants are required to be located as follows:

+ Within the fire isolated stairway; and

- Within 4 m of the external stairway provided in lieu of the fire isolated stairway; and
- Within 4 m of the horizontal exits

A minimum of one fire hydrant is required to serve each fire compartment unless covered by a fire hydrant within a fire isolated stairway or an external hydrant.

On Level 01, a fire hydrant is required to be located within the fire isolated (separated) stairway as detailed in the figure below.

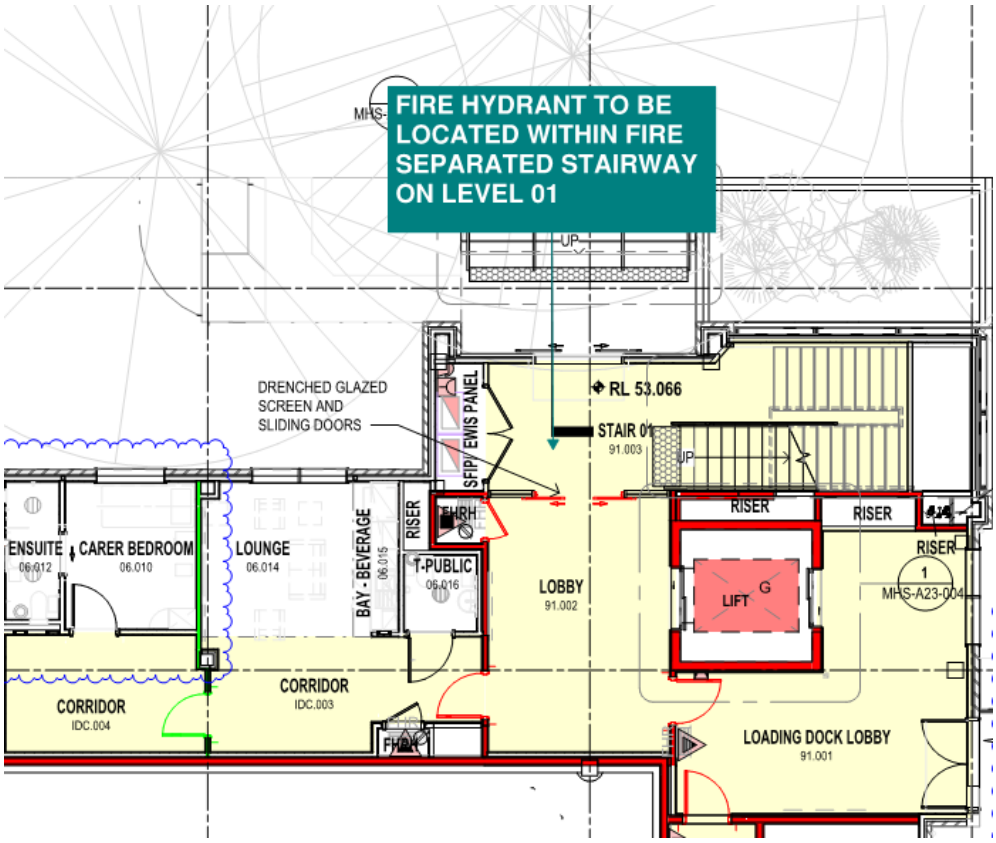


Figure No. 57 – Fire hydrant to be located within the fire isolated stairway on Level 01

Hydrants in Cupboards within the Fire Isolated Stairway

If fire hydrants are enclosed within cupboards within the fire isolated (separated) stairway, they are to be enclosed in construction which is non-combustible including the doorway accessing the cupboard.

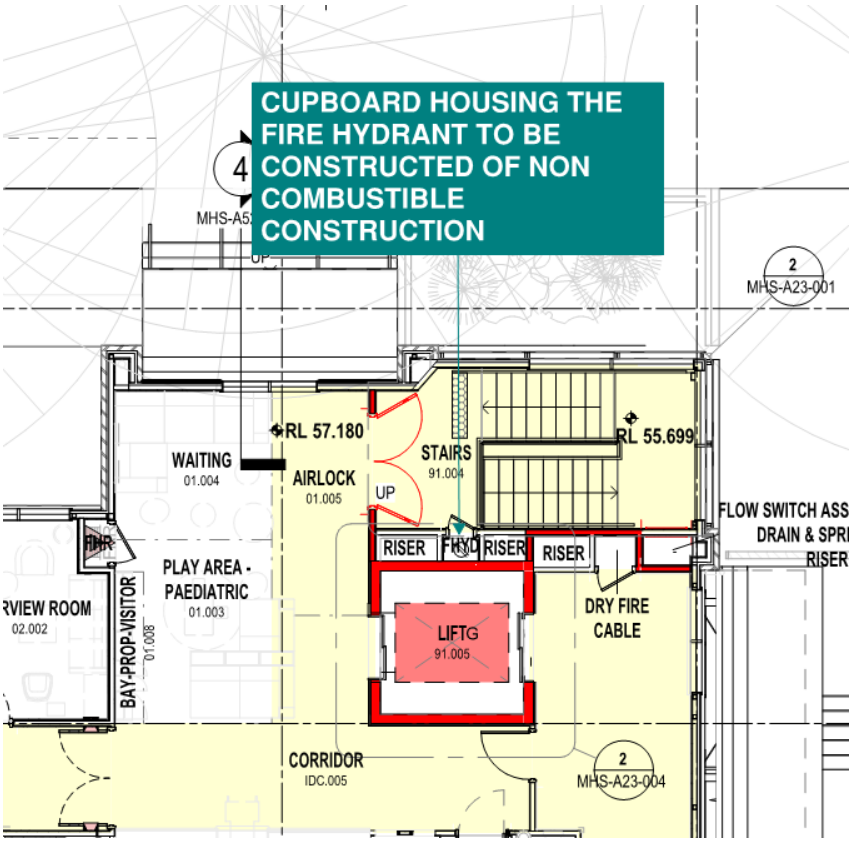


Figure No. 58 – Fire hydrant housed within cupboard on Level 02 of the fire isolated (separated) stairway

Fire Hydrant Booster

A fire hydrant booster is required to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access.

It is noted that the existing fire hydrant booster that will be relied upon for the proposed building will not be located within site of the main entrance of the building.

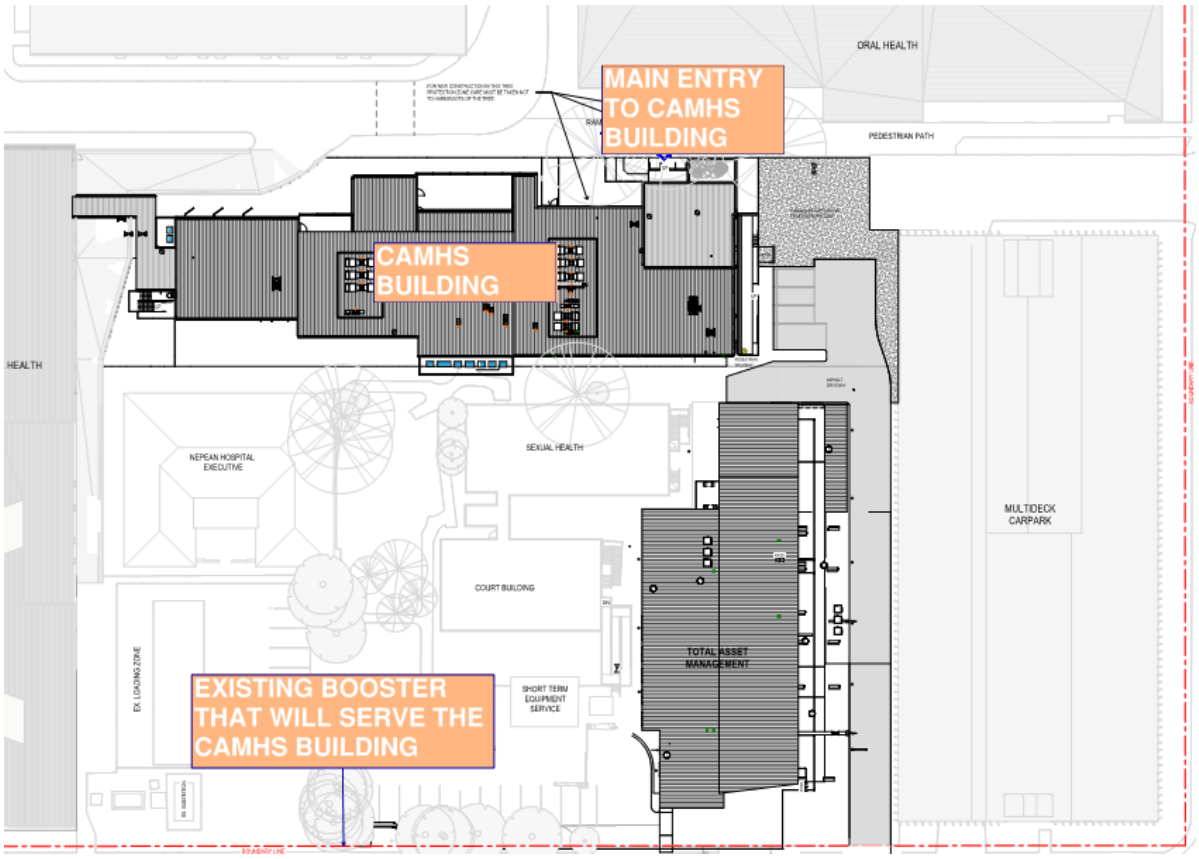


Figure No. 59 – Location of existing hydrant booster in proximity to the main entry to CAMHS Building

The location of the existing booster in relation to the main entrance of the building will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.

Fire Hydrant Pump Room

In accordance with AS 2419.1 – 2005, an internal fire hydrant pump room is required to be located so that the doorway opening to the pump room leads directly to a road or open or alternatively to a fire isolated exit via an airlock.

The Fire Hydrant Pump Room provided on Level 01 is noted as having direct access to open space with the doorway opening to open space.

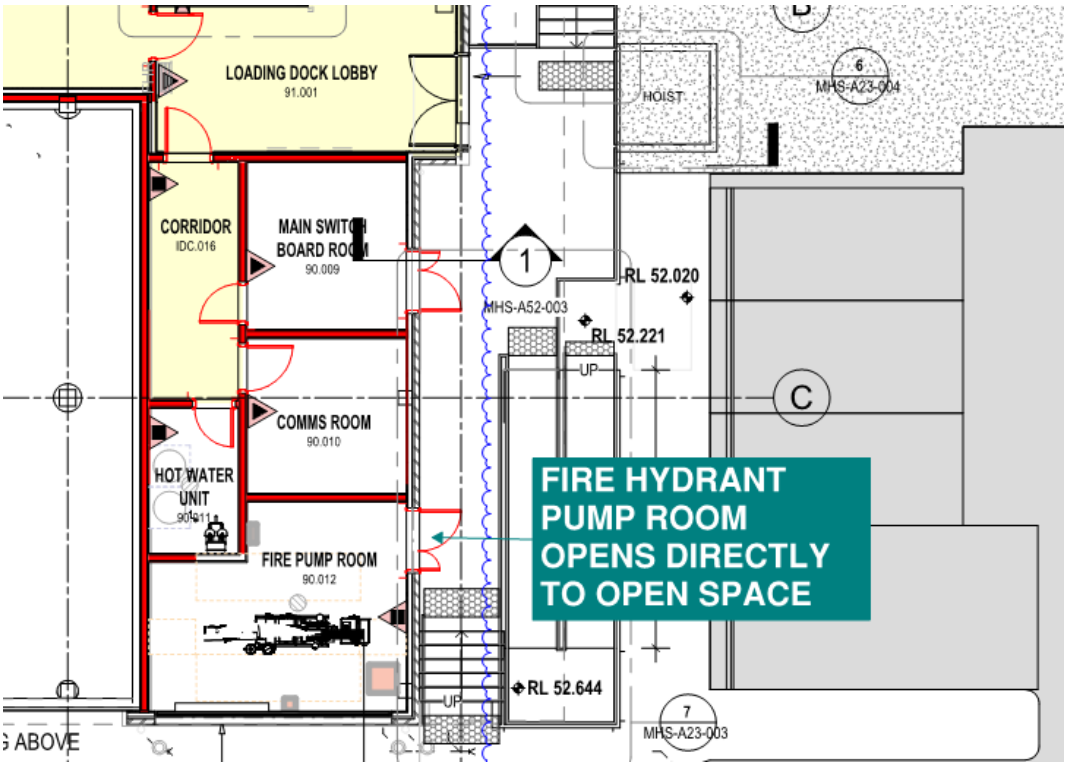


Figure No. 60 – Fire hydrant pump room on Level 01 opening directly to open space

Access to Locked Cupboard Doors Housing Fire Hydrants

Doors providing access to cupboards housing internal fire hydrants are required to permit free access at all times for FRNSW personnel in accordance with AS 2419.1.

It is noted that cupboards containing internal fire hydrants are proposed to be secured locked having regard to the mental health nature of the patients within the building.

The secure cupboards housing the internal fire hydrants will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.

67. Clause E1.4 – Hose Reels

Fire Hydrants

Fire hose reels are required to be installed throughout the building in accordance with AS 2441 – 2005.

Location

Internal fire hose reels are required to be located as follows:

- Within 4 m of the fire isolated stairway; and
- Within 4 m of the external stairway provided in lieu of the fire isolated stairway; and
- Within 4 m of the horizontal exits or adjacent to an internal fire hydrant depending on coverage

Fire hose reels are not permitted to be pass through fire safety doors separating fire and smoke compartments.

Access to Locked Cupboard Doors housing FHR's

Doors providing access to cupboards housing internal hose reels are required to permit free access at all times for occupants of the building unless the enclosures are constructed in accordance with Clause 10.4.4 of AS 2441 – 2005.

It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the patients of the building.

The secure cupboards housing the internal fire hose reels will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.

Doors to Cupboards Housing FHR's

Doors to cupboards housing fire hose reels and fire hydrants are to be designed in such a manner that when they are open, they do not impede on the path of travel leading to an exit. In this instance, doors to cupboards will be required to swing 180º open against the wall face or in some instances, two smaller doors may need to be provided to cupboards so as not to impede the width of exits. Special attention is required to cupboards located directly adjacent to fire safety doors throughout the building.

Omission of Fire Hose Reel Coverage to Fire Separated Comms Rooms

The Comms Room on Levels 01 & 02 which is proposed to be fire separated from the remainder of the storey will not be provided with compliant fire hose reel coverage due to the fact that the fire hose is not permitted to pass through the fire door in order to achieve fire hose reel coverage.

The omission of fire hose reel coverage to the fire separated room will be required to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

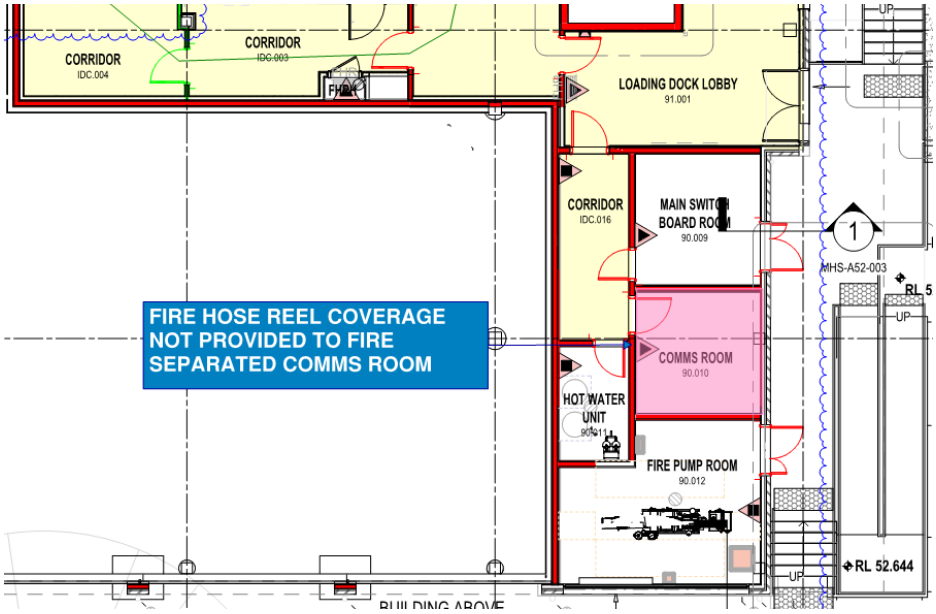


Figure No. 61 – Fire separated comms room not provided with compliant fire hose reel coverage

As detailed under Clause C2.5, there is no requirement for the Loading Dock Lobby, Corridor and Hot Water Unit Room (unless it meets the definition of a Boiler) to be fire separated from the remainder of the building. The non-fire separation of these rooms will ensure that compliant fire hose reel coverage complies.

Verification is required that the fire hose reel coverage is provided to the fire pump room by running the fire hose reel from the loading dock lobby externally to serve the pump room.

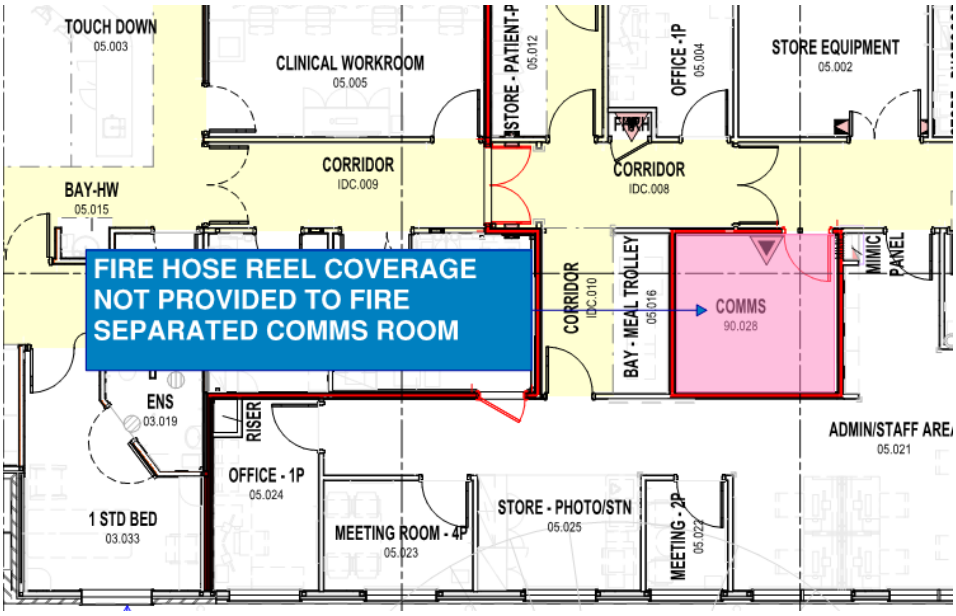


Figure No. 62 – Fire separated comms room not provided with compliant fire hose reel coverage

68. Clause E1.5 – Sprinklers

Automatic Fire Suppression System

It is noted that an Automatic Fire Suppression System is proposed to be installed throughout the proposed CAMHS building in accordance with AS 2118.1 – 2017.

The proposed linkway connecting the proposed CAMHS building to the adjoining Adult Mental Health Building is proposed to form an extension of the existing building and is proposed not to be sprinkler protected.

The wall separating sprinkler protected and non-sprinkler protected areas will be required to have a minimum FRL of 120 mins as detailed in figure below.

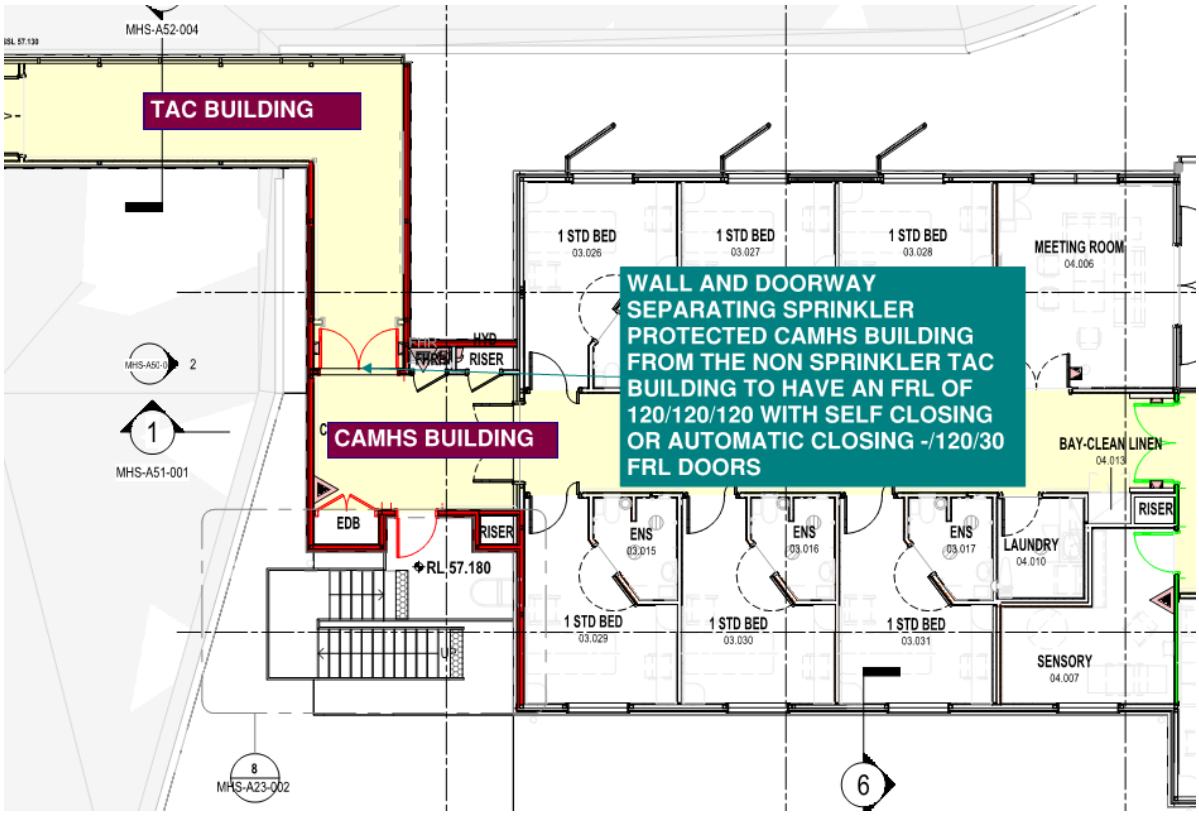


Figure No. 63 – Separation of sprinkler v non-sprinkler protected parts of the building

Location of Sprinklers

The sprinkler system will be required to all external canopies, covered walkways, balconies etc. in accordance with AS 2118.1 – 2017.

The sprinkler system is required to be installed to all lift shafts and riser shafts throughout the building in accordance with AS 2118.1 - 2017.

The sprinkler system will be required to be installed to all EDB cupboards, Fire Services cupboards, Services cupboards etc throughout the building in accordance with AS 2118.1 – 2017.

The sprinkler system will be required to be installed to all Comms Rooms, DAS Rooms etc in accordance with AS 21118.1 – 2017.

The sprinkler system will be required to be installed throughout the ceiling voids.

Where full height curtains are proposed to be installed within treatment areas, ward areas etc, they will be required to be reviewed by the Fire Services Consultant to determine the impact on Sprinkler coverage. If sprinkler coverage is proposed to be impeded, the curtains will be required to contain an open mesh for at least 500mm from the top of the curtain.

Omission of Sprinklers to Rooms provided with High Voltage Equipment

In accordance with Clause 3.1.3 of AS 2118.1 – 2017, sprinklers are permitted to be omitted from high voltage, normally unoccupied areas such as rooms used for no purposes other than to contain transformers, electrical switch, or control gear (non-oil filled), which are bounded by walls which achieved a minimum FRL of 120/120/120 and are provided with a smoke detection and alarm system installed within the room in accordance with AS 1670.1 - 2018.

Omission of Sprinklers to Rooms provided with Low Voltage Equipment

As detailed above, Clause 3.1.3 of AS 2118.1 – 2017 only permits sprinklers to be omitted from rooms containing high voltage equipment.

It is noted that at the request of HI / LHD sprinklers are proposed to be omitted from rooms containing low voltage electrical equipment including Comms Rooms.

The omission of sprinklers from rooms containing low voltage equipment is proposed to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.

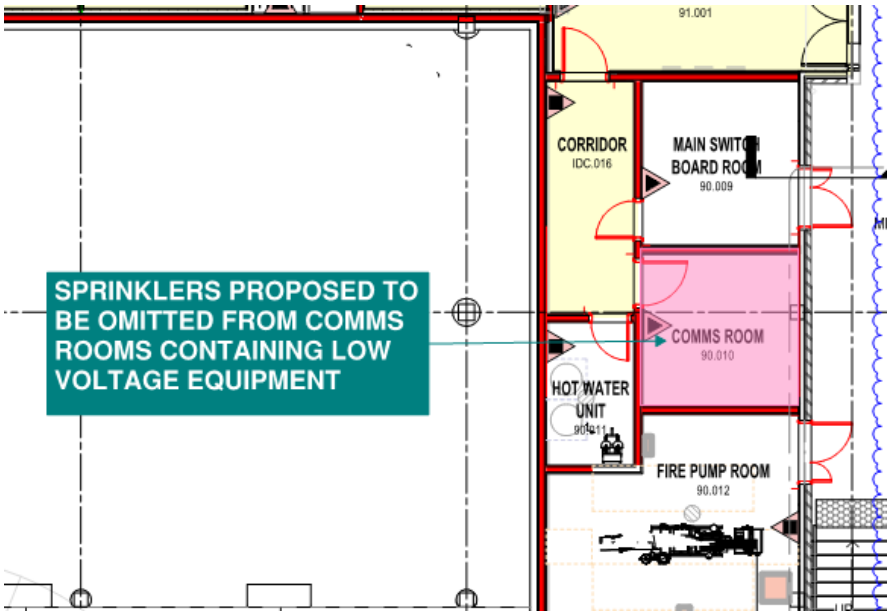


Figure No. 64 – Comms Room containing low voltage equipment on Level 01 proposed to have sprinklers omitted from the room

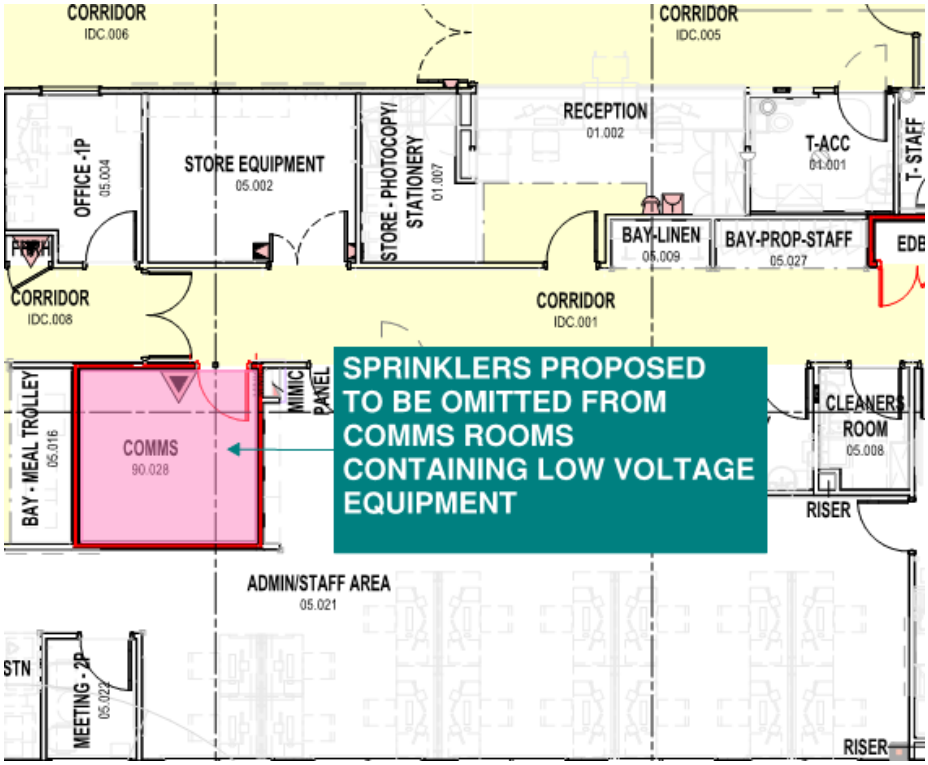


Figure No. 65 – Comms Room containing low voltage equipment on Level 02 proposed to have sprinklers omitted from the room

Fire Sprinkler Booster

A fire sprinkler booster is required to be located in a manner where it is within sight of the main entrance of the building and adjoins a primary vehicular entrance and is situated within 8m of a hardstand access to permit Brigade access.

It is noted that the existing fire hydrant booster that will be relied upon for the proposed building will not be located within site of the main entrance of the building.

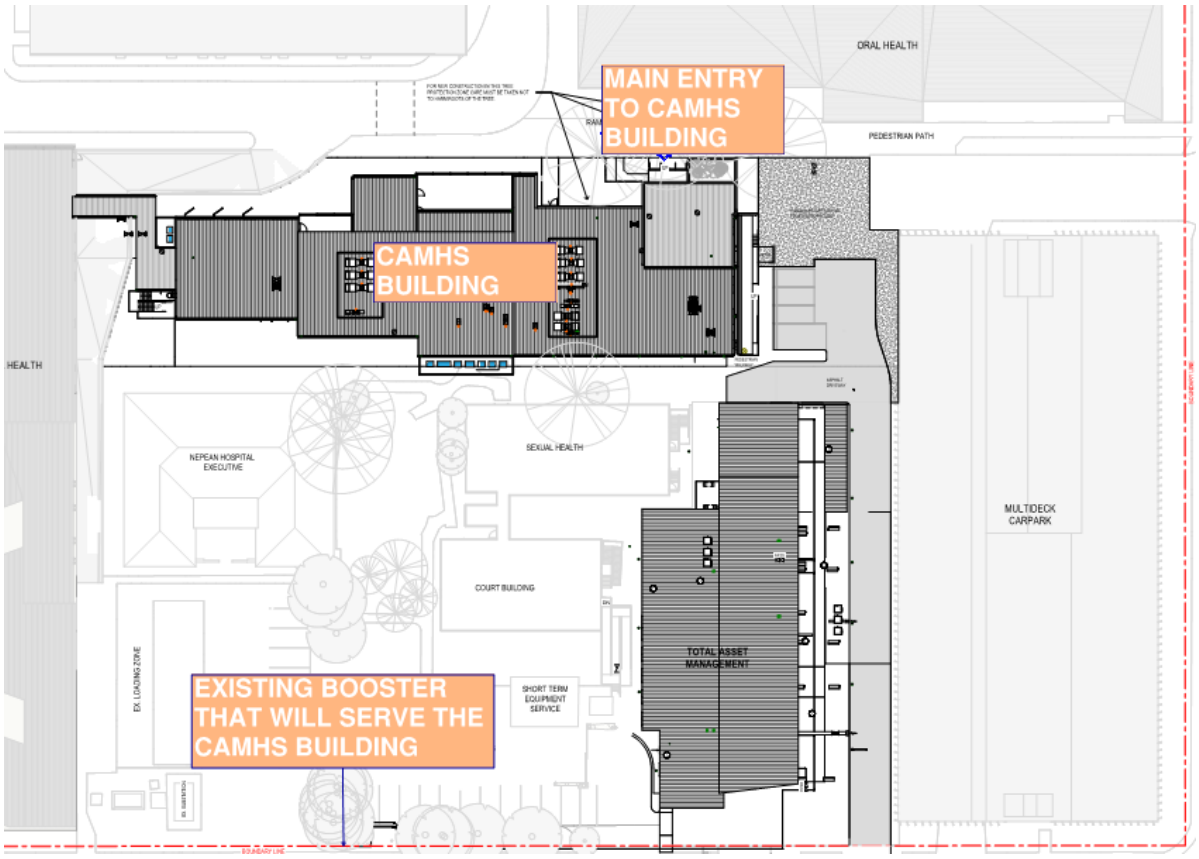


Figure No. 66 – Location of existing sprinkler booster in proximity to the main entry to CAMHS Building

The location of the existing booster in relation to the main entrance of the building will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to demonstrate compliance with the nominated Performance Requirements of the BCA.

Sprinkler Alarm Valves

The sprinkler alarm valves are to be secured and located in a room with direct access to a road or open space.

Verification is required that the sprinkler alarm valves will be located within the Fire Hydrant Pump Room which has direct egress to open space.

Sprinkler Protection to Cupboards and Wardrobes, Showers and Toilet Cubicles

In accordance with Clause 5.9.17 of AS 2118.1 – 2017 sprinklers are not required to be installed within built-in service cupboards, cupboards or wardrobes, or showers and toilet cubicles in protected bathrooms for Light Hazard or Ordinary Hazard provided:

+ The floor area does not exceed 2.5 m^2;
+ The walls and ceilings are lined or backed with non-combustible materials;
+ Are not used for the storage or flammable liquids;

- Sprinklers in the adjoining area are positioned so they cover the unprotected area. Note – Obstructions caused by lintels or bulkheads are not considered for the purpose of this clause.

In this instance the EDB Cupboards installed throughout building are not required to be provided with sprinklers on the basis that compliance with Clause 5.9.17 of AS 2118.1 – 2017 (Amendment No. 2).

69. Clause E1.6 – Portable Fire Extinguishers

Portable fire extinguishers are to be installed in accordance with clause E1.6 and AS 2444. This includes the provision of Class Type A & E Class Portable Fire Extinguishers throughout each floor. In accordance with Clause E1.6, Type E Extinguishers are permitted to be installed nurse and staff stations.

Powder fire extinguishers are not permitted to be installed in areas containing patient care areas throughout the building.

Portable Fire Extinguisher to Overnight Accommodation Rooms

An ABE type fire extinguisher with a minimum size of 2.5kg is required to be located within 10 m of the entry doors serving the Class 3 Carer Bedroom on Level 01.

Access to Locked Cupboard Doors housing Portable Fire Extinguishers

Doors providing access to cupboards housing internal hose reels are required to permit free access at all times for occupants of the building, unless the enclosures are constructed in accordance with Clause 3.6 of AS 2444 – 2001

It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the patients of the building.

The secure cupboards housing the internal fire hose reels will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.

PART E2 – SMOKE HAZARD MANAGEMENT

70. Clause E2.2 – Smoke Hazard Management

In terms of the requirements for smoke hazard management throughout the building, the following key items are noted:

Automatic Fire Detection & Alarm System

An Automatic Fire Detection & Alarm System is required to be installed throughout the building in accordance with AS 1670.1 - 2018. Photoelectric type smoke detectors are required to be installed in patient care areas and in paths of travel to exits from patient care areas.

Smoke detectors may be omitted from rooms that are considered a spurious alarm environment i.e., Dirty Utility Rooms, Clean Utility Room with slop hoppers, sterilizers etc. on the basis that the room is provided with a sprinkler system.

Manual Call Points

Manual call points are required to be installed in evacuation routes so that no point on a floor is more than 30m from a manual call point.

Access to Locked Cupboard Doors housing Manual Call Points

It is noted that cupboards containing internal fire hose reels are proposed to be secured locked having regard to the mental health nature of the development.

The secure cupboards housing the internal fire hydrants will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.

Clearance around Manual Call Points installed in Cupboards

As detailed above, manual call points are proposed to be installed in secure cupboards throughout the building having regard to the mental health nature of the building.

Manual call points are required to achieve a minimum clearance of 300 mm around them and a clear distance of 600 mm in front in accordance with AS 1670.1 – 2018.

When manual call points are installed in cupboards, the minimum required clearance around the manual call points cannot be achieved.

The clearance around the manual call points will be required to be addressed as part of the Fire Engineering Assessment to be undertaken by Arup to determine compliance with the nominated Performance Requirements of the BCA.

Key elements of AS 1670.1 which require close attention are as follows:

- Where a sole occupancy unit i.e., bedroom consists of one main room and water closet/shower/bathroom (which is not used for other purposes i.e., laundry), it may be protected by one smoke detector located in the main room provided that the total area of the whole unit is less than 50 m^2 i.e., when less than 50 m^2, the water closet/shower/bathroom is not required to be protected.
- 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 is to be treated as a room and is required to be protected.
- Where full height curtains are proposed to be installed within treatment areas, ward areas etc, they must be of open mesh material for at least 300 mm to permit smoke to pass through, otherwise the curtains will be considered a wall and smoke detectors will have to be installed either side of the curtains.
- A clear space of at least 30 0mm radius, to a depth of 600 mm is required to be maintained from the smoke detector.
- Detectors are required to be located a minimum distance of 900 mm from supply air fans or ceiling fans.
- Detectors are required in all sanitary facilities with a floor area greater than 3.5 m^2.
- Any cupboard with a floor area >3m^3 is required to be protected.
- All electrical cupboards, comms cupboards etc. irrespective of the size are required to be protected.
- Detectors are required to be installed to the void spaces/under croft areas on Levels 1 & 2 where access to the space is provided.
- Detectors are to be installed to the lift shafts, service shafts etc as required by AS 1670.1 – 2018.

Mechanical Air Handling Systems

The mechanical air-handling system systems (other than non-ducted systems with a capacity not more than 1000 litres/second, systems serving critical treatment areas and miscellaneous exhaust air system installed in accordance with Sections 5 and 6 of AS/NZS 1668.1) must shut down automatically on the activation of the Automatic Fire Detection & Alarm System and Automatic Fire Suppression System.

PART E3 – LIFT INSTALLATIONS

71. Clause E3.2 – Stretcher Facility in Lifts

A stretcher facility is required to be provided in the Emergency Lift serving the building.

A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space of not less than 600 mm x 2000mm long x 1400mm high above floor level.

72. Clause E3.3- Warning Against Use of Lifts in Fire

Signage stating "DO NOT USE LIFT IF THERE IS A FIRE" is to be provided near the lift call buttons in letters not less than 10-mm in height.

73. Clause E3.4 – Emergency Lifts

The lift provided is required to be an Emergency Lift due to the fact that occupants on Level 02 do not have direct egress to a road or open space.

The Emergency Lift is required to be separated from the remainder of the building by construction achieving an FRL of 120/120/120.

74. Clause E3.6 – Passenger Lifts

The passenger lift is required to be designed and installed in accordance with the requirements of Clause E3.6 and specifically Table E3.6b.

75. Clause E3.7 – Fire Service Controls

In terms of the Fire Service Controls the following is required to be provided:

- A fire service recall control switch complying with Clause E3.9 for:
  - A group of lifts; or
  - A single lift not in a group that serves the storey
- A lift care fire service drive control switch complying with Clause E3.10 for every lift.

76. Clause E3.9 – Fire Services Recall Operation Switch

Each group of lifts must be provided with one fire service recall control switch required by Clause E3.7 that activates the fire service recall operation in accordance with Clause E3.9.

PART E4 – VISIBILITY IN AN EMERGENCY, EXIT SIGNS AND WARNING SYSTEMS

77. Clause E4.2 – Emergency Lighting

Emergency Lighting is required to be installed throughout the building in accordance with AS 2293.1 -2018 in the following locations:

- Within the fire isolated stairway;
- External stairway provided in lieu of fire isolated stairway;
- In every passageway, corridor, hallway, or the like that is part of the path of travel to an exit;
- In every passageway, corridor, hallway, or the like serving a treatment area or a ward area;
- In every room having a floor area of more than 120 m^2 in a patient care area;
- All covered balconies, walkways etc. that a person is required to egress under; and
- Within the Fire Hydrant Pump Room.

78. Clause E4.5 – Exit Signs

Exit signs are to be installed throughout the building in accordance with AS 2293.1 -2018 in the following locations:

- Doors providing direct egress from a storey to the fire isolated stairway and external stairway provided in lieu of a fire isolated stairway;
- Doors providing direct egress from a storey to open space;
- Fire Safety Doors (i.e., fire/smoke doors) separating compartments;
- Doors leading from balcony areas, courtyards etc. back into the building; and
- Above doorways in a path of travel where the location of the exit is not clear.
-

79. Clause E4.6 – Directional Exit Signs

Directional exit signs are to be installed throughout the building where the exits are not readily apparent to occupants in accordance with AS 2293.1 -2018.

80. Clause E4.9 – Sound System and Intercom System for Emergency Purposes

An Emergency Warning & Intercom System (EWIS) is required to be installed throughout the entire building in accordance with AS 1670.4 – 2018.

It is noted that all external areas from which an occupant is required to re-enter the building (e.g., courtyards, balconies, terraces etc.) are also required to be provided with compliant EWIS speakers to ensure that occupants in external areas are aware of the activation of the fire alarm system.

Rationalisation of EWIS Speakers

It is proposed to omit EWIS speakers from patient bedrooms and other sensitive environments where the activation of the speaker within the room may cause trauma to the patient.

The rationalisation of EWIS system from within the patient bedrooms will be required to be to be assessed as part of the Fire Engineering Assessment to be undertaken by Arup in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

SECTION F – HEALTH & AMENITY

PART F1 – DAMP AND WEATHERPROOFING

81. Clause F1.0 – Deemed to Satisfy Provisions

Performance Requirement FP1.4 relating to the prevention of water through the external is required to be demonstrated as being complied. There is no specific DtS Clause for this Performance Requirement in respect of external walls.

In this instance a Performance Solution Report is required to be prepared to demonstrate that the external wall and roof weatherproofing system meets Performance Requirement FP1.4 and will prevent the penetration of water through the external walls.

82. Clause F1.4 – External above Ground Membranes

All waterproofing membranes to external areas are to be designed and constructed in accordance with AS 4654 Parts 1 & 2. Particular attention is required to doorways leading to external areas where there is a level threshold.

This is not just a waterproofing issue but also an architectural design issue where grated drains may be required to be installed in front of the door where a step down is not provided.

83. Clause F1.5 – Roof Coverings

A roof is required to covered with –

+ Concrete roofing tiles complying with AS 2049 and fixed in accordance with AS 2050; or
+ Terracotta roofing tiles complying with AS 2049 and fixed in accordance with AS 2050; or
+ Cellulose cement corrugated sheeting complying with AS/NZS 2908.1 and installed in accordance with AS/NZS 1562.2; or
+ Metal sheet roofing complying with AS 1562.1; or
+ Plastic sheet roofing designed and installed in accordance with AS/NZS 4256.1, AS/NZS 4256.2, AS/NZS 4256.3, AS/NZS 4256.5 and AS/NZS 1562.3; or
+ Terracotta, fibre-cement and timber slates and shingles design and installed in accordance with AS 4597.

84. Clause F1.6 – Sarking

Sarking-type material used for weatherproofing of roofs and walls is required to comply with AS/NZS 4200.1 and AS 4200.2.

85. Clause F1.7 – Waterproofing of Wet Areas

Building elements in the bathroom or shower room, a slop hopper or sink compartment, a laundry or sanitary compartment is required:

+ Be water resistant or waterproof in accordance with Table F1.7; and
+ Be constructed in accordance with AS 3740

86. Clause F1.9 – Damp-Proofing

Moisture from the ground must be prevented from reaching –

+ The walls above the damp-proof course; and
+ The underside of a suspended floor construction of a material other than timber, and the supporting beams or girders.

Where a damp-proof course is provided, it is required to consist of:

+ A material that complies with AS/NZS 2904; or
+ Impervious sheet material in accordance with AS 3660.1.

PART F2 – SANITARY AND OTHER FACILITIES

87. Clause F2.3 – Facilities in Class 3 to 9 Buildings

The Class 9a facility is required to have:

+ Kitchen facilities
+ Laundry facilities
+ A shower for each 8 patients or part thereof
+ One island-type plunge bath in each storey containing Ward Areas

Required Sanitary Facilities

+ BCA2016 Part F requires sanitary facilities with the Class 9a facilities as follows:-

(a) Facilities for Staff:-

Toilet facilities for staff are to be provided in accordance with the following:-

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Male Employees	1-20	1	1	0	1-30	1
			11-25	1		
	>20	Add 1 per 20	26-50	2	>30	Add 1 per 30
			>50	Add 1 per 50		
Female Employees	1-15	1	N/A		1-30	1
	> 15	Add 1 per 15			> 30	Add 1 per 30

Table No. 11 – Sanitary facilities required for staff members

(b) Facilities for Patients:

User Group	Closet Pans		Urinals		Washbasins	
	Design Occupancy	Number	Design Occupancy	Number	Design Occupancy	Number
Male Patients	1-16	1			1-8	1
	> 16	Add 1 per 16			>8	Add 1 per 8
Female Patients	1-16	1			1-8	1
	> 16	Add 1 per 16			> 8	Add 1 per 8

Table No. 12 – Sanitary facilities required for patients

The number of sanitary facilities provided for both staff and patients is compliant with the DTS Provisions of the BCA based on anticipated staffing numbers.

Verification is required from the LHD as to maximum staffing number expected to be within the building at one any one time.

Provision of Unisex Sanitary Compartments containing Water Closets

Sanitary compartments containing water closets are required to be provided separately for males and females.

The provision of unisex sanitary compartments containing water closets in lieu of separate facilities for males and females throughout the building will be required to be assessed as part of a Performance Solution in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

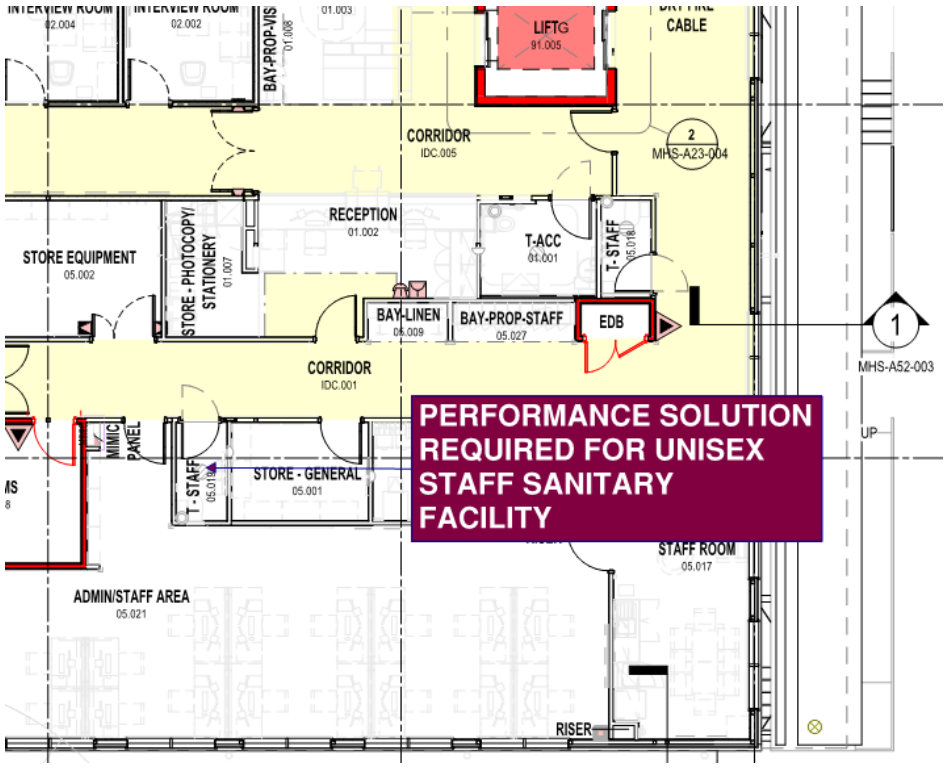


Figure No. 67 – Unisex sanitary facility provided for staff on Level 02

88. Clause F2.4 – Accessible Sanitary Facilities

Facilities for a person with a disability will be required to be throughout the building.

In this instance the following sanitary facilities are required to be provided:

Level 1

+ One (1) accessible sanitary facility associated with the accessible sole occupancy unit
+ Once (1) accessible sanitary facility associated with lounge area for use by visiting family members of patients

Level 2

+ One (1) unisex accessible sanitary facility for staff
+ One (1) unisex ambulant sanitary facility for staff
+ One (1) unisex accessible sanitary facility for patients

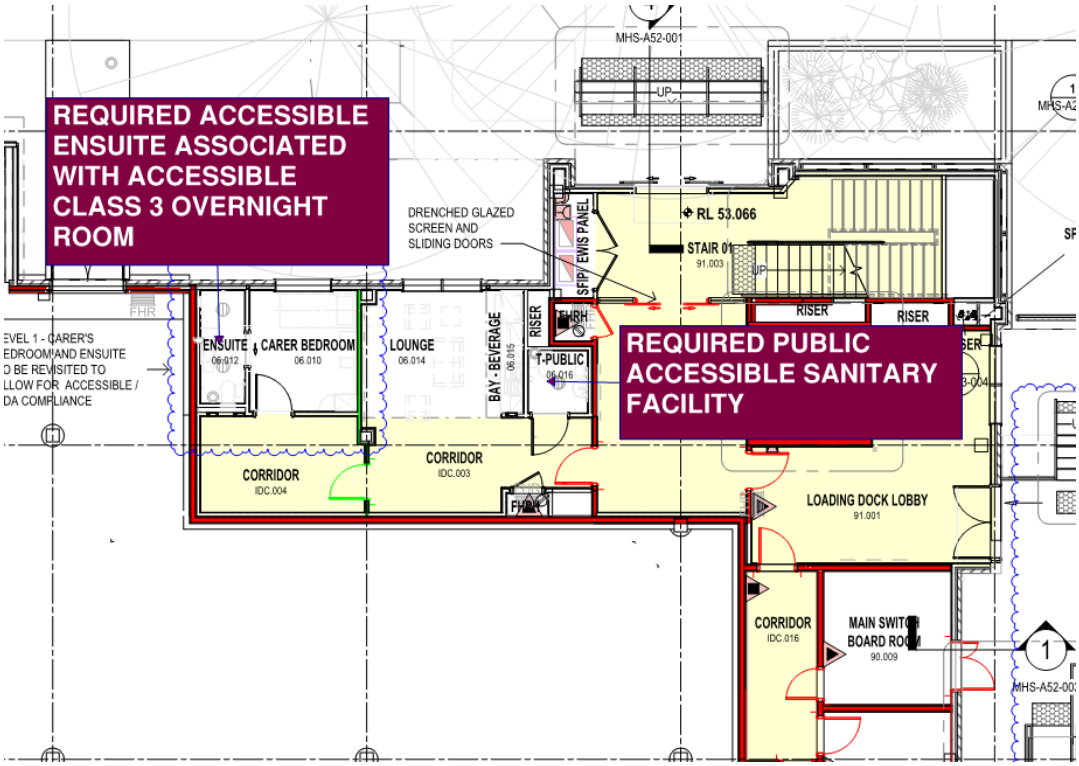


Figure No. 68 – Required sanitary facilities for a person with a disability on Level 01

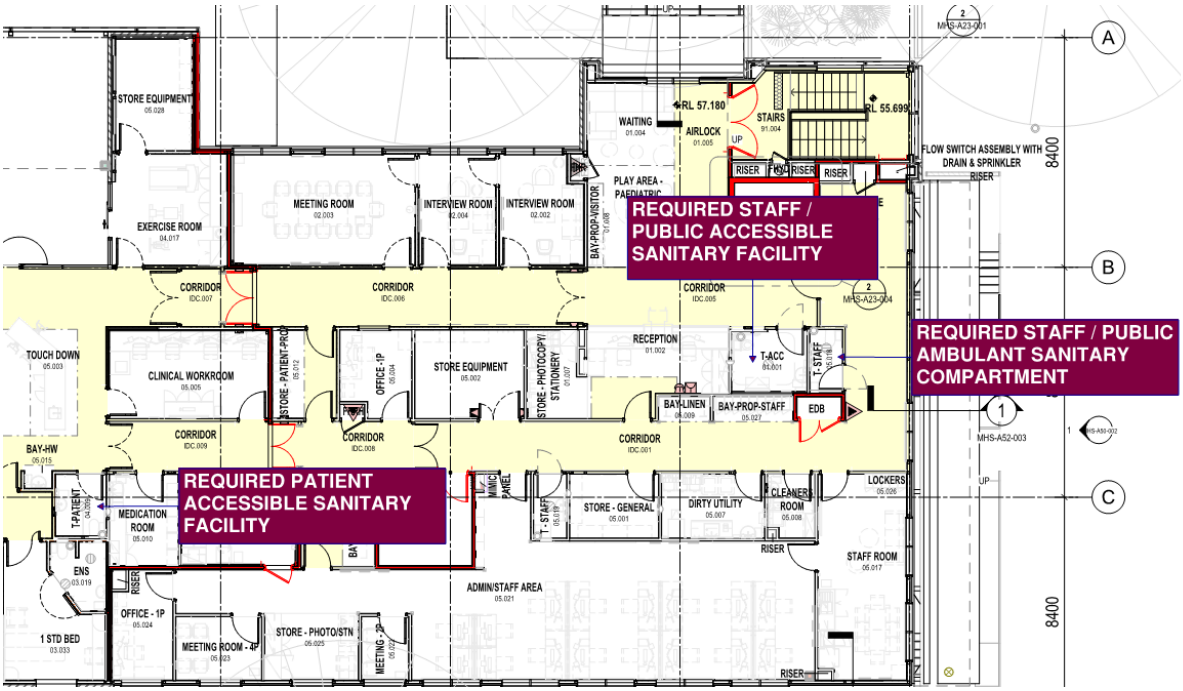


Figure No. 69 – Required sanitary facilities for a person with a disability on Level 02

Provision of Unisex Ambulant Sanitary Compartments

Ambulant sanitary compartments for a person with a disability are required to be provided separately for males and females.

The provision of unisex ambulant sanitary compartments will be required to be assessed as part of a Performance Solution to be prepared by the appointed Access Consultant as only unisex accessible sanitary facilities are technically permitted by the DtS Provisions of the BCA to be used by both male and females.

Use of Anti-Ligature Hardware to Accessible Sanitary Facilities and Ambulant Sanitary Compartments

It is noted anti-ligature hardware will be utilised in sanitary facilities for a person with a disability.

The use of anti-ligature fixtures and fittings within the sanitary facilities for a person with a disability will be required to be assessed as part of a Performance Solution Report to be prepared by the Access Consultant in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

Accessible Sanitary Facilities

The unisex accessible sanitary facility to be provided is required to be designed spatially in accordance with the following figures:

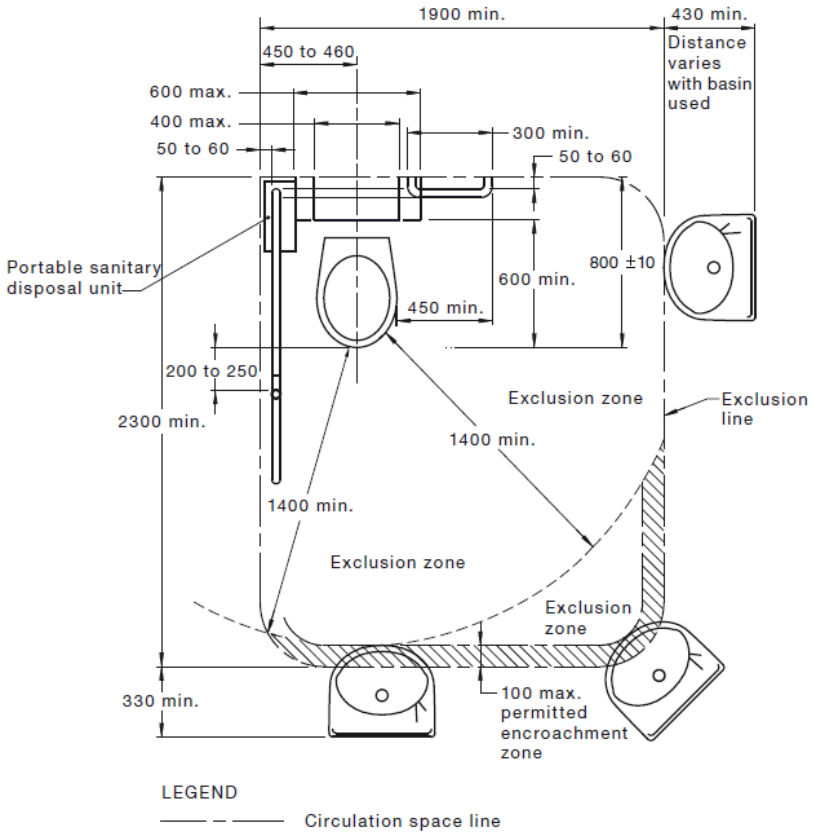


Figure No. 70: Circulation space required within the accessible sanitary facility

Clearances around the water closet are to be in accordance with the figure below:

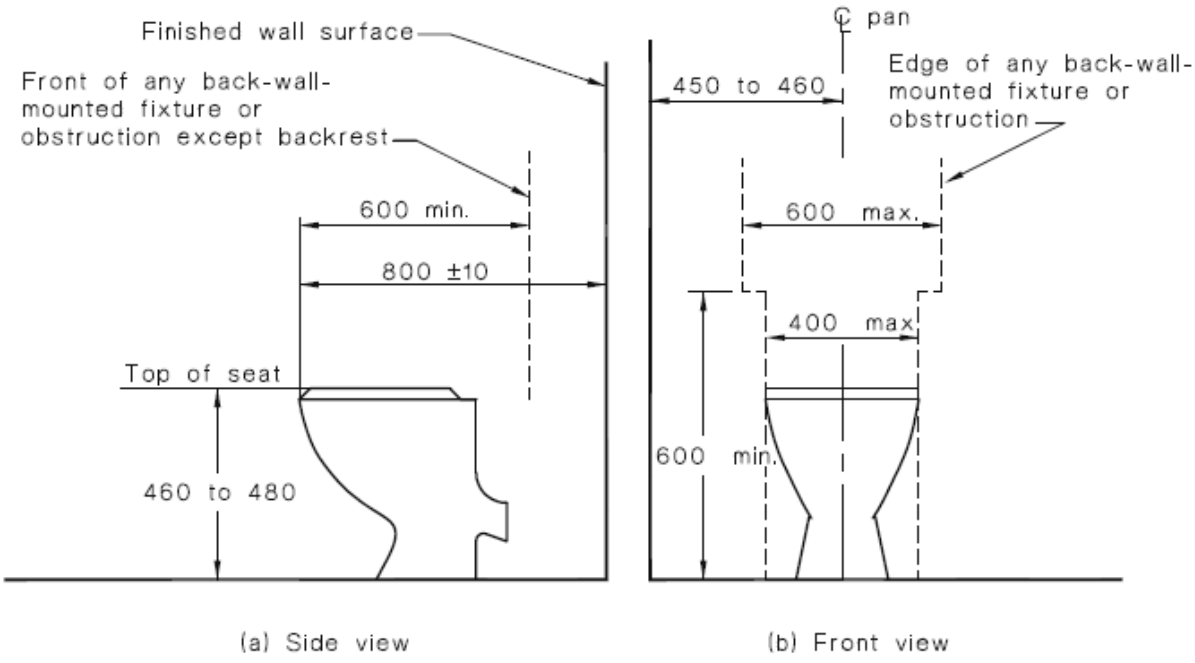


Figure No. 71: Required clearances around the water closet

Basins are permitted to encroach within the circulation space of doorways as detailed within the following Figure:

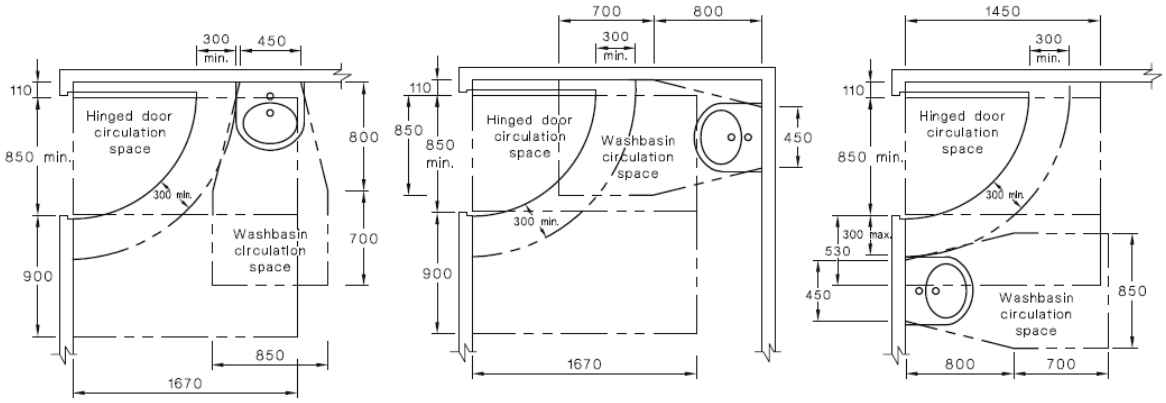


Figure No. 72: Allowable encroachment of a washbasin into the hinged door circulation space

The following specific items are required to be installed within the unisex accessible sanitary facility:

- Rocker action and toggle switches are required to be installed which have a minimum dimension of 30 mm x 30 mm. Push-pad switches are to have a minimum dimension of 25mm in diameter.

- General purpose outlets are to be located between 600 mm to 1100 mm above FFL and not less than 500 mm from any internal corner.

- The outlet for the toilet paper dispenser is to be located in accordance with the following figure. The toilet paper cannot encroach upon the clearance space required around the grabrail.

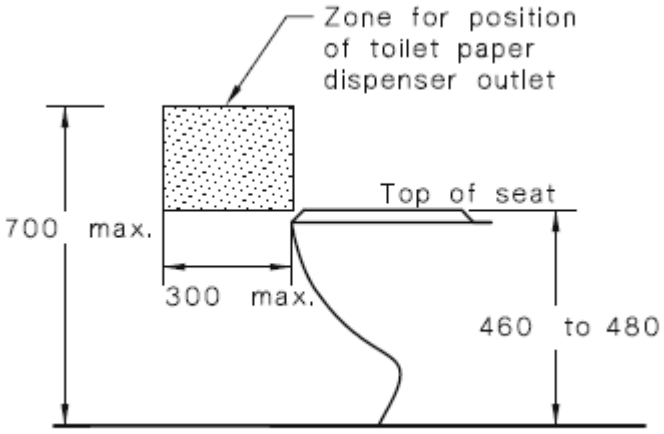


Figure No. 73: Required zone for toilet paper dispenser

Shelf space is required to be provided adjacent to the washbasin in accordance with the one of the following:

- As a vanity top at a height of 800 mm to 830 mm and a minimum width of 120 mm and a depth of 300 mm to 400 mm without encroaching into any circulation space.

- As a separate fixture –

  - Within any circulation space at a height of 900 mm to 1000mm with a width of 120 mm to 150 mm and length of 300 mm to 400 mmm; and

- External to all circulation spaces at a height of 790 mm to 1000 mm with a minimum width of 120 mm and a minimum length of 400 mm.

- Where provided, Soap dispensers, towel dispensers, hand dryers and similar fittings are required to be operable by one hand and are to be installed with the height of their operative component or outlet not less than 900 mm and not more than 1100 mm above FFL and no closer than 500 mm from an internal corner.

- A coat hook is to be provided at a height between 1200 mm to 1350 mm above FFL and not less than 500 mm from an internal corner.

Ambulant Sanitary Compartments

The ambulant sanitary compartments are required to be designed spatially in accordance with the following Figures:

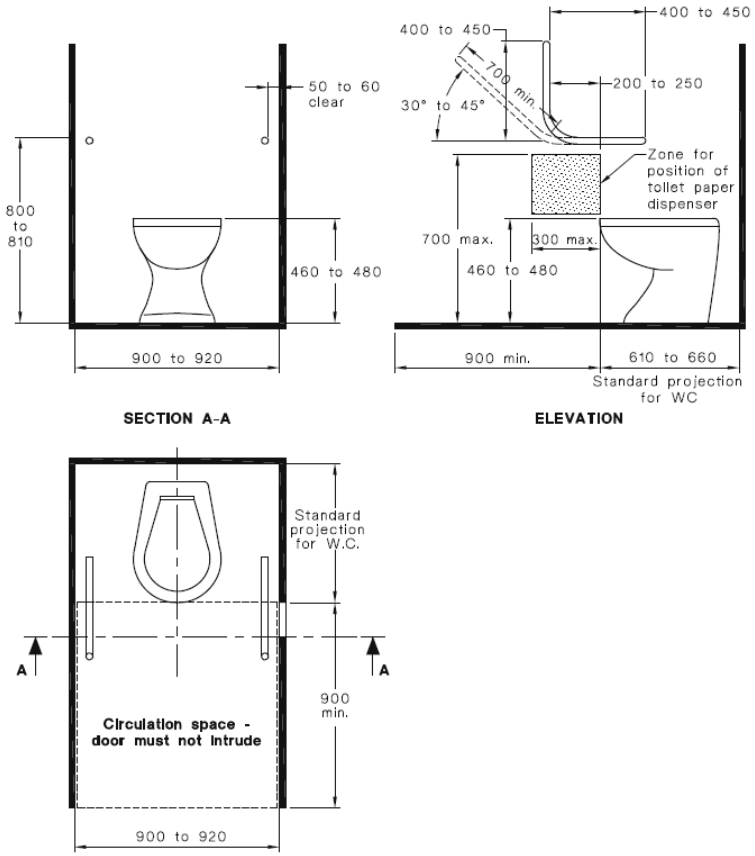


Figure No. 74: Layout requirements for ambulant sanitary compartments

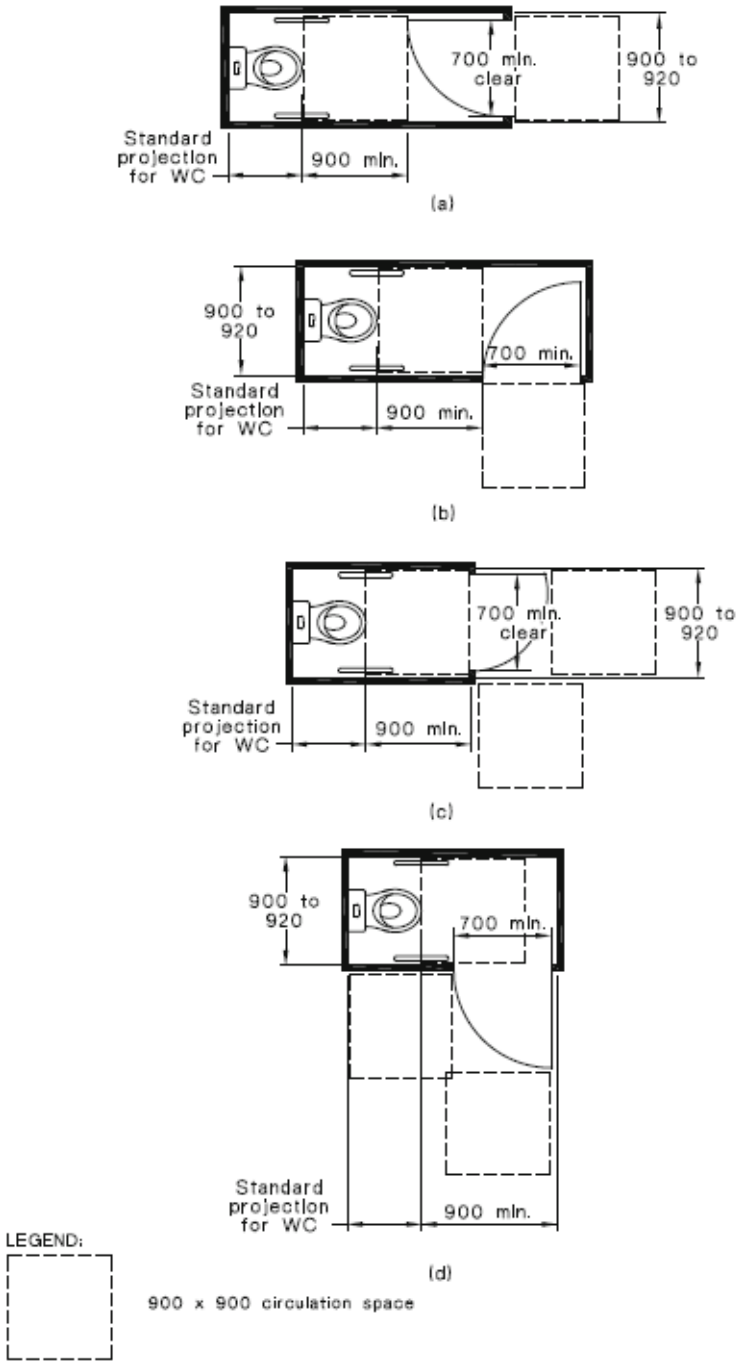


Figure No. 75: Options for doorways leading to ambulant sanitary compartments

89. Clause F2.5 – Construction of Sanitary Compartments

The door to a fully enclosed sanitary compartment is required to: -

- Open outwards; or
- Slide; or
- Be readily removable from the outside of the sanitary compartment i.e., removable hinges

Unless there is a clear space of at least 1.2m measured in accordance with the below figure, between the closet pan within the sanitary compartment and the doorway.

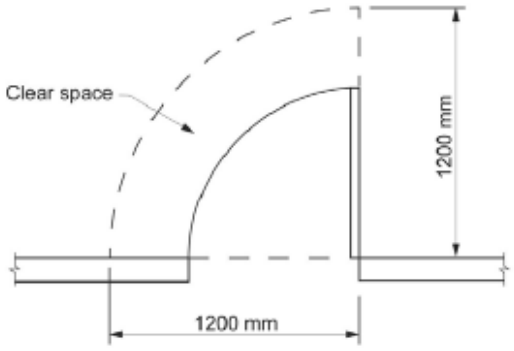


Figure No. 76: Minimum distance required between doorway and pan in a fully enclosed sanitary compartment

90. Clause F2.8 – Waste Management

In class 9a areas at least one slop hopper or other device must be provided on any storey containing ward areas or bedrooms and must have a flushing apparatus, tap and grating.

PART F3 – ROOM HEIGHTS

91. Clause F3.1 – Height of Rooms

The floor to ceiling heights throughout shall comply with the following:

- in a patient care area, treatment room, clinic, waiting room, dining room, activity room, passageway, corridor, or the like – 2400mm; and
  - Bathroom, shower room, sanitary compartment, airlock, tea preparation room, pantry, storeroom, or the like must achieve a minimum height of 2100 mm.
  - Exits – 2000 mm;
  - Staff Office & Meeting Rooms – 2400 mm;
  - Consultation Rooms – 2400 mm; and
  - Main Switch Room and Pump Room – 2100 mm

PART F4 – LIGHT AND VENTILATION

92. Clause F4.1 – Provision of Natural Light

Natural light is required to all bedrooms within ward areas of the Class 9a on Level 02 that are used for sleeping purposes. In this instance all of the bedrooms within the ward areas will be required to be provided with natural light. The Design Development Architectural Drawings indicate compliance in this instance.

The Class 3 Carer Bedroom on Level 01 is required to be provided with natural light. The Design Development Architectural Drawings indicate compliance in this instance.

Figure No. 77 – Window providing natural light to the overnight Carer Bedroom on Level 01

93. Clause F4.2 – Methods and Extent of Natural Light

Where natural light is required, it must be provided by windows or glazed doors that have an aggregate light transmitting area of not less than 10% of the floor area of the room that it serves.

Verification will be required that each of the bedrooms are served by windows with an aggregate light transmitting area of not less than 10% of the floor area.

The Architectural Drawings indicate that windows are provided to all bedrooms within the ward area on Level 1.

94. Clause F4.4 – Artificial Lighting

Artificial lighting is required to be designed in accordance with AS 1680.0 - 2009.

Artificial lighting is required to be provided to all stairways, passageways, and ramps.

If natural light of a standard equivalent to that required by Clause F4.2 is not available, and the periods of occupant or use of the room or space will create undue hazard to occupants seeking egress in an emergency then artificial lighting is required to be provided to all rooms that are frequently occupied, all spaces required to be accessible, all corridors, lobbies, internal stairways, other circulation spaces and paths of egress.

95. Clause F4.5 – Ventilation of Rooms

Mechanical Ventilation and Air Conditioning will be required to all areas not naturally ventilated in accordance with the DTS Provisions of the BCA and AS 1668.2 - 2012.

SECTION G – ANCILLARY PROVISIONS

96. Part G6 – Occupiable Outdoor Area

The external courtyards on Level 02 are by definition occupiable outdoor areas and thus the relevant provisions of Part G6 of the BCA are required to be complied with.

The below figure detail typical occupiable outdoor spaces throughout the building.

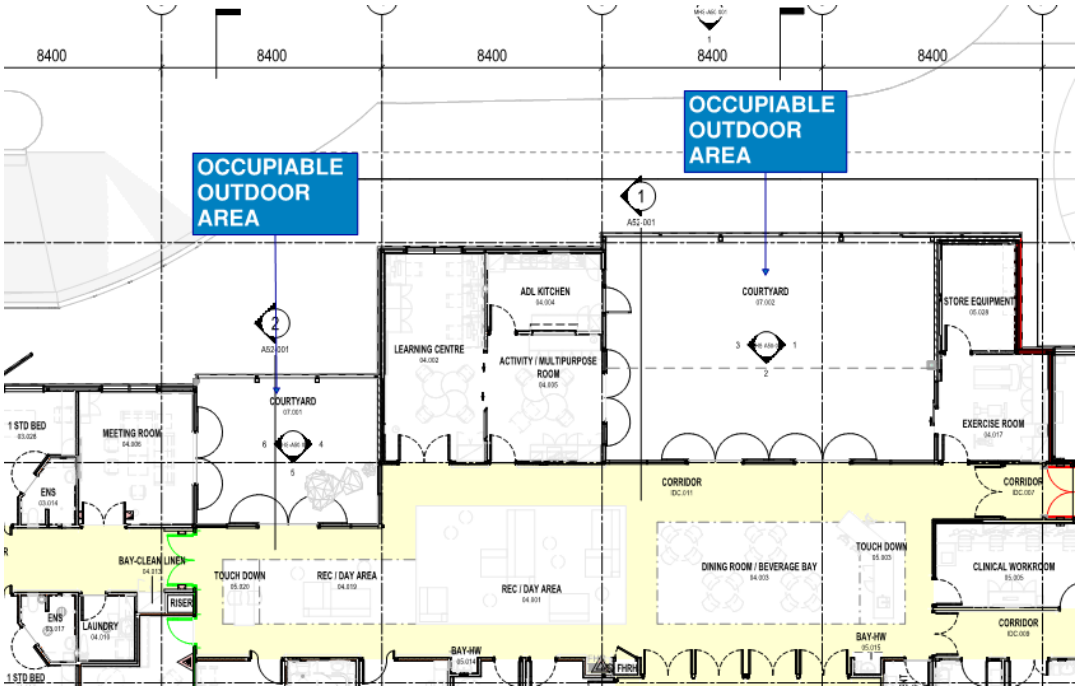


Figure No. 78 – Occupiable outdoor areas on Level 02

97. Clause G6.2 – Fire Hazard Properties

Any lining, material or assembly in an occupiable outdoor area is required to comply with the requirements of Specification C1.10 as if it were an internal lining.

Note: The following fire hazard properties of a lining, material or assembly in an occupiable outdoor area are not required to comply with Specification C1.10:

- *Average specific extinction area*
- *Smoke Developed Index*
- *Smoke Development rate*
- *Smoke Growth Rate Index*

98. Clause G6.6 – Fire Fighting Equipment

Fire hydrant and fire hose reel coverage will be required to be provided to all occupiable outdoor areas.

99. Clause G6.8 – Visibility in an Emergency, Exit Signs and Warning Systems

The outdoor occupiable areas are required to be provided with Exit Signage above the doors leading from the external areas back into the building.

As noted under Clause E4.9 above, the EWIS speakers are required to be extended to all outdoor areas.

SECTION J – ENERGY EFFICIENCY

100. Parts J1 – J8

The energy efficiency provisions of Section J are applicable to the proposed building.

In this regard Parts J1 - Building Fabric, J2, Part J3 - Building Sealing, Part J5 - Air Conditioning and Mechanical Ventilation, Part J6 - Artificial Lighting and Power, and Part J7 - Hot water supply & Part J8 – Access for Maintenance is required to be provided.

If the proposed design will not comply with the DtS provisions of the BCA, then a JV3 Assessment will be required to be undertaken to demonstrate compliance with the Performance Requirements of the BCA.

E. CONCLUSION

This report contains a BCA2019 and Access to Premises Standards 2010 assessment of the reference Design Development Architectural Drawings for the proposed Child & Adolescent Mental Health Services Building at Nepean Hospital.

Arising from our assessment we are satisfied that the new works can satisfy the requirements of the BCA2019 and the Access to Premises Standards 2010 if the works are designed and constructed in accordance with the requirements of this BCA Report and the subsequent Fire Engineering Assessment undertaken by Fire Safety Engineer and Performance Solution prepared by the appointed Access Consultant.