BLACKETT MAGUIRE+ GOLDSMITH

The National Construction Code Volume One

Schematic Design Report for SSDA Submission

The Children's Hospital at Westmead Redevelopment

Multi Storey Car Park

NSW GOVERNMENT Health Infrastructure

Revision 2

Date: 22 January 2021

Project No.: 190461

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REVISION STATUS				
REVISION	**DATE**	**STATUS**	**PREPARED BY**	**REVIEWED BY**
0	03.12.2020	Schematic Design Report	Adam Durnford	David Blackett
1	20.01.2021	Schematic Design Report for SSDA Submission	Adam Durnford	David Blackett
2	22.01.2021	Schematic Design Report for SSDA Submission	Adam Durnford	David Blackett

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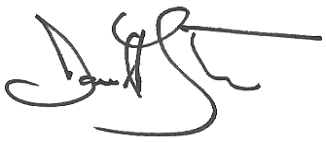

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A. INTRODUCTION

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 including access for a person with a disability of the proposed Multi Storey Car Park to be constructed as part of the New Children's Hospital Westmead Redevelopment.

The new Multi Storey Car Park containing 1003 car parking spaces is required to replace the P17 staff car park which will be demolished to make way for the new Paediatric Services Building. The location selected is the site of the Lodge, north east of the existing Children's Hospital, between it and the new Ronald McDonald House.

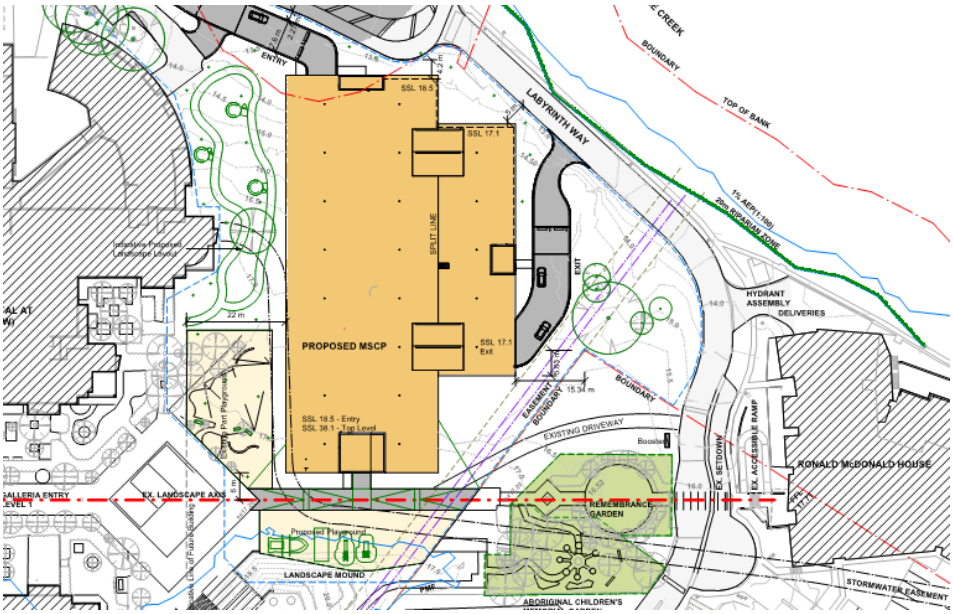

Figure No. 1 – Location of proposed multi storey car park at Westmead Hospital

A.2 AIM

The aim of this report is to:

- Undertake an assessment of the proposed Multi Storey Car Park 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.
- Identify non-compliances that will be required to be assessed as part of the proposed Fire Engineering Assessment to be prepared by the appointed Fire Safety Engineer.
- Review the design documentation against the Access to Premises Standards 2010.
- Identify non-compliances that will be required to be assesses as part of any proposed Access Performance Solution to be prepared by the Access Consultant.
- Identify a list of essential fire safety measures that are required to be installed within the building.

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.
- Schematic Architectural Drawing Nos. CHW-AR-DG-MCP-DA000 (D), DA003 (C), DA004 (C), DA005 (C), DA006 (C), DA008 (C), DA009 (C), DA010 (C), DA011 (C), DA012 (C), DA031 (E), DA032 (E), DA038 (D), DA040 (F), DA041 (E), DA050 (F) & DA051 (F), DA060 (B), DA095 (B), DA096 (B), DA097 (B), DA092 (B) & DA098 (B) prepared by Billard Leece Partnership Pty Ltd.

A.5 REGULATORY FRAMEWORK

Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

A.6 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.7 TERMINOLOGY

Accessible

Means having features to enable use by people with a disability.

Accessway

Means a continuous accessible path of travel (as defined by AS 1428.1) to, into or within a building.

Carpark

Means a building that is used for the parking of motor vehicles but is neither a private garage nor used for the servicing of vehicles, other than washing, cleaning or polishing.

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).

Exit

Means

a) Any, or any combination of the following if they provide egress to a road or open space:

i) An internal or external stairway.
ii) A ramp.
iii) A fire-isolated passageway.
iv) A doorway opening to a road or open space

b) A horizontal exit or a fire isolated passageway leading to a horizontal exit

Fire Isolated Stairway

Means a stairway within a fire resisting shaft and includes the floor and roof or top enclosing structure.

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 Resisting

For the purposes of Volume One, applied to a building element, means having an FRL appropriate for that element.

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.

Flight

Means that part of a stair that has a continuous series of risers, including risers of winders, not interrupted by a landing or floor.

Landing

Means an area at the top or bottom of a flight or between two flights.

Loadbearing

Means intended to resist vertical forces additional to those due to its weight.

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.

Non-combustible

Means

a) Applied to a material – not deemed combustible as determined by AS 1530.1 – Combustibility Tests for Materials; and
b) Applied to construction or part of a building – constructed wholly of materials that are not deemed combustible

Occupation Certificate

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

Open Deck Car Park

Means a carpark in which all parts of the parking storeys are cross-ventilated by permanent unobstructed openings in not fewer than 2 opposite or approximately opposite sides, and –

a) Each side that provides ventilation in not less than 1/6 of the area of any other side; and
b) The openings are not less than ½ of the wall area of the side concerned.

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.

Outdoor air

Means air outside the building

Primary Building Element

For the purposes of Volume One, means a member of a building designed specifically to take part of the loads specified in B1.2 and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of action as a brace to those members.

Performance Solution

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

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).

Self-closing

For the purpose of Volume One, applied to a door, means equipped with a device which returns the door to the fully closed position immediately after each opening.

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.

Storey

Means a space within a building which is situated between one floor level and the floor level next above, or if there is no floor above, the ceiling or roof above, but not –

a) A space that contains only –

i) A lift shaft, stairway or meter room; or
ii) A bathroom, shower room, laundry, water closet, or other sanitary compartment; or
iii) Accommodation intended for not more than 3 vehicles; or
iv) A combination of the above; or

b) A mezzanine

B. BUILDING CHARACTERISTICS

B.1 BUILDING CLASSIFICATION

The following table presents a summary of relevant building classification items of the Multi Storey Car Park to be constructed as part of the Children's Hospital Westmead Redevelopment.

+ **BCA Classification:**	Class 7a (Open Deck Car Park)
+ **Storeys Contained**	Eight (8)
+ **Rise in Storeys:**	Eight (8)
+ **Effective Height:**	> 12m & < 25m i.e. 22.83m
+ **Type of Construction:**	Type A Construction
+ **Sprinkler System Installed Throughout**	No – Not required to be installed in accordance with Table E1.5 as the building is assessed as an Open Deck Car Park
+ **Importance Level**	Importance Level 2 as determined by the Structural Engineer.
+ **Climate Zone:**	Energy Efficiency Zone 6
+ **Maximum Floor Area:**	N/A for an Open Deck Car Park
+ **Maximum Volume:**	N/A for an Open Deck Car Park

Table No. 1 – Summary of building classification items

C. SUMMARY OF KEY COMPLIANCE ISSUES

Based on the Schematic Architectural Drawings prepared by Billard Leece Partnership, the following is a summary of the key compliance issues identified.

C.1 SUMMARY OF KEY COMPLIANCES ISSUES:

No.	BCA Clause	Description
1.	Part A1.0	To comply with the definition of an open deck carpark, the following criteria must be achieved: All parts of the parking storeys are to be cross ventilated by permanent unobstructed openings in not fewer than 2 opposite or approximately opposite sides; and a) Each side that provides ventilation is not less than 1/6 of the areas of any other side; and b) The openings are not less than ½ of the wall area of the side concerned Based on the Schematic Design Architectural Drawings submitted, the proposed façade is capable of complying with the open deck car park provisions.
2.	B1.2	The new Multi Storey Car Park will be required to be designed and constructed in accordance with the requirements of Importance Level 3. The Structural Engineer will be required to confirm that the car park structure has been designed in accordance with Importance Level 3.
3.	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. *Cell Powered Louvred Facade* In addition to the above it is noted that Integrated PV Cell Louvres are proposed to be installed on the building facades. The provision of cell powered louvres on the building façade may represent compliance issues with Clause C1.9 of the BCA in terms of combustibility and will be required to be reviewed extensively by BM+G and the appointed Fire Safety Engineer to determine compliance. Any non-compliance with Clause C1.9 would be required to be assessed as a Performance Solution (if deemed appropriate) with subsequent approval to be obtained by FRNSW.
4.	C2.13	The Main Switch Room located on Level P1 is required to be fire separated from the internal parts of the building by construction achieving a minimum FRL of 120/120/120 (load bearing) or -/120/120 (non-loadbearing).
5.	D1.4	Based on the Schematic Design 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:

No.	BCA Clause	Description
		+ Travel distance from Level P1 is up 52m to an alternative exit (12m over the maximum permitted DtS distance). + Travel distance from the Typical Parking Level is Level P1 is up 52m to an alternative exit (12m over the maximum permitted DtS distance). The extended travel distance to an alternative exit will be required to be assessed as part of the Fire Engineering Performance Solution to be prepared by the appointed Fire Safety Engineer in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
6.	D1.5	Based on the Schematic Design 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 between alternative exits from Level P1 is up 93m (33m over the maximum permitted DtS distance). + Travel distance between alternative exits from Level P1 is up 95m (35m over the maximum permitted DtS distance). The extended travel between alternative exits will be required to be assessed as part of the Fire Engineering Performance Solution to be prepared by the appointed Fire Safety Engineer in order to demonstrate compliance with the nominated Performance Requirements of the BCA.
7.	D1.7	*Discharge from Fire Stair 3* Upon discharge from Fire Stair 3, occupants are immediately exposed to the external wall of the Main Switch Room. In this instance the external wall of the Main Switch Room is required to have a minimum FRL of 60/60/60 (achieved in both directions). Once occupants discharge from Fire Stair 3, verification is required that a path of travel (trafficable) leads direct to Redbank Road without having to pass within 6m (measured perpendicular to the path of travel) of the vehicular entry to the car park. *Discharge from Fire Stair 1* It is noted that Fire Stair 1 discharges into a covered area within the Lift Lobby on Level P1 which adjoins open space. A fire isolated stairway is permitted to discharge into a covered area that adjoins a road or open space on the basis that the area is open for at least 1/3 of its perimeter and has an unobstructed height throughout including perimeter openings of not less than 3m and provides an unimpeded path of travel from the point of discharge to open space of not more than 6m. If compliance cannot be achieved with the minimum clear height of the covered area including the perimeter openings, it is recommended that the discharge door be reconfigured to discharge directly to open space from Stair 1.

No.	BCA Clause	Description
8.	D2.10	In order for egress travel distance to comply and for occupants to have the choice of alternative exits form the car parking storeys, the vehicular ramps between car park levels must have a gradient not exceeding 1:8
9.	Part D3	Access for a person with a disability will be required to be provided throughout Level P1 of car park where the accessible car parking spaces are provided. Access will then be required to be provided Level P1 via the lift lobby and then a series of walkway and accessible ramps (if required) to the adjoining buildings on the Hospital Campus including the existing Children's Hospital and Galleria. The number of accessible car parking spaces on Level P1 is considered satisfactory in ensuring compliance with the requirements of Table D3.5.
10.	E1.3	Fire hydrant coverage is required to be provided to serve the building in accordance with AS 2419.1 – 2005. *System Performance* In accordance with Table 2.1 of AS 2419.1 - 2005 for a non-sprinkler protected building with a floor area exceeding 10,000m^2, a minimum of 3 hydrants are required to flow simultaneously plus one additional hydrant for each 5,000m^2 or part thereof. In this instance and based on the total floor area of the building which exceeds 30,000m2 it is considered highly unlikely that compliance with Table 2.1 of AS 2419.1 - 2005 can be achieved in terms of the minimum number of hydrants that are required to discharge simultaneous. The design of the hydrant systems which will be unable to comply with the requirements of Section 2 of AS 2419.1 – 2005 will be required to be assessed as part of a Fire Engineering Performance Solution to be prepared by the appointed Fire Safety Engineer in order 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 current Architectural Design indicates compliance in this instance. Furthermore, and due to the fact that the building is not required to be provided with an Automatic Fire Suppression System, the internal fire hydrant pump room is required to be separated from the remainder of the building by construction achieving a minimum FRL of 120 mins. *Fire Hydrant Booster* In accordance with AS 2419.1 – 2005 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.

No.	BCA Clause	Description
		In this instance, verification is required that the location of the of the fire hydrant booster on Labyrinth Way is the intended location for the booster that will serve the Multi Storey Car Park.
11.	E1.4	Fire hose reels are required to be installed throughout the building areas in accordance with AS 2441 – 2005.
12.	E1.5	Based on the fact that the building is less than 25m in effective height and the building is an open deck car park, an Automatic Fire Suppression System is not required to be installed throughout the building.
13.	F4.11	In accordance with Clause F4.11 of the BCA, if the car park is an open deck car park, then it is not a requirement of the DtS Provisions of the BCA for the car park to be provided with a system of mechanical ventilation in accordance with AS 1668.2 or natural ventilation in accordance with Section 4 of AS 1668.4. Notwithstanding the minimum requirements of the BCA, the fact that open deck car parks are significantly larger these days (together with the fact that the BCA does not regulate the size of an open deck car park), there is a need to ensure that the build-up of motor vehicle exhaust will not affect the amenity of the users of the car park having regard to the its size which may impact on its ability to readily remove exhaust in an effective manner. It is for this reason that the consultant team need to be satisfied that the car park design will permit the adequate removal of exhaust and if this cannot be achieved without the installation of a mechanical car park exhaust system, then such a system should be installed.
14.	Section J	The energy efficiency provisions of Section J are applicable to the proposed building and as such, a report will be required to be submitted prior to issue of the S109R Approval which details how compliance is being achieved. In this regard Parts 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.

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.	D1.4	DP4, EP2.2	Extended travel distance to an alternative exit from each storey of the car park
2.	D1.5	DP4, EP2.2	Extended travel distances between alternative exits from each storey of the car park
3.	E1.3	EP1.3	Required number of hydrants to flow simultaneously based on the total floor of the car park

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

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 Multi Storey Car Park.

SECTION A – GOVERNING REQUIREMENTS

To comply with the definition of an open deck carpark, the following criteria must be achieved:

All parts of the parking storeys are to be cross ventilated by permanent unobstructed openings in not fewer than 2 opposite or approximately opposite sides; and

a) Each side that provides ventilation is not less than 1/6 of the areas of any other side; and

b) The openings are not less than ½ of the wall area of the side concerned

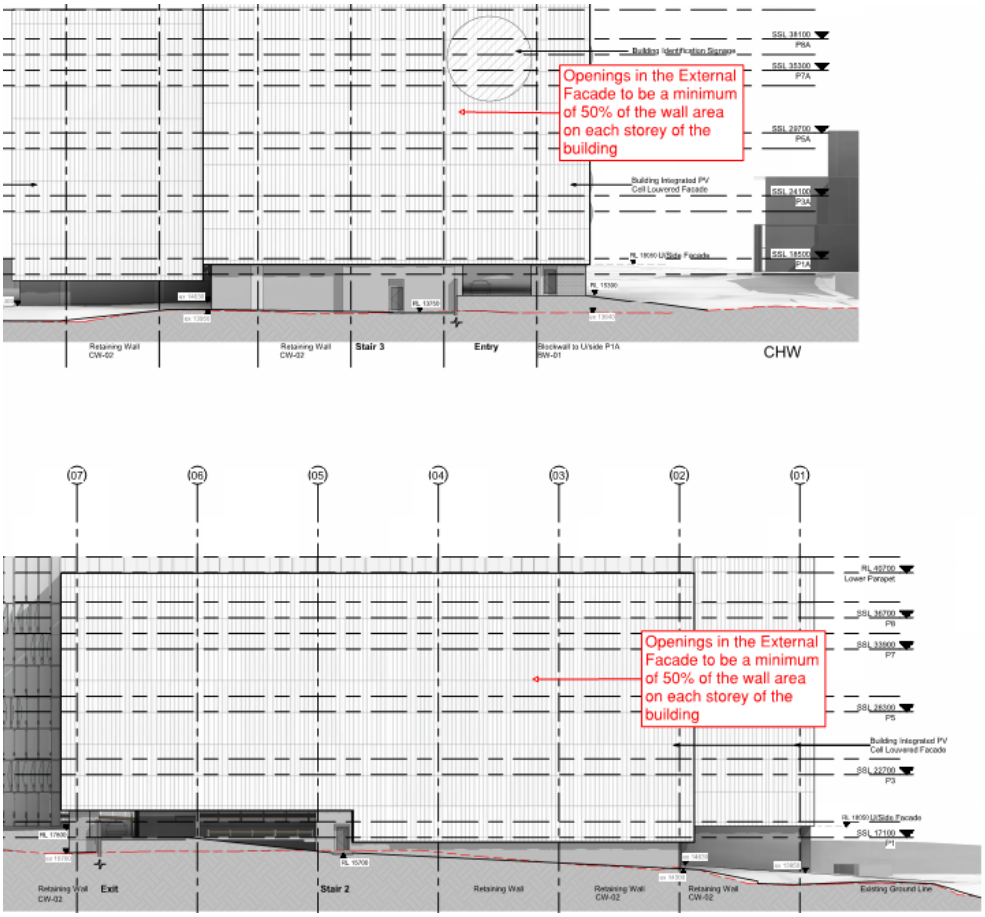


Figure No. 2 – Northern and Eastern façades of the Multi Storey Car Park required to have openings on each storey with a minimum of 50% of the wall area

Based on the Schematic Design Architectural Drawings submitted, the proposed façade is capable of complying with the open deck car park provisions.

SECTION B - STRUCTURE

1. Part B1 – Structural Provisions

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.

The new Multi Storey Car Park will be required to be designed and constructed in accordance with the requirements of Importance Level 2 as determined by the appointed Structural Engineer for the project. The Structural Engineer will be required to confirm that the car park structure has been designed in accordance with Importance Level 2.

SECTION C – FIRE RESISTANCE

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 3 of Specification C1.1 for Type Construction (refer to table below).

TYPE A CONSTRUCTION	
BUILDING ELEMENT	**Class 7a**
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	120/120/120
1.5m to less than 3m	120/90/90
3m or more	120/60/30
For *non-load bearing* parts-	
less than 1.5m	-/120/120
1.5m to less than 3m	-/90/90
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 3m	120/-/-
3m or more	-/-/-
COMMON WALLS & FIRE WALLS	120/120/120

INTERNAL WALLS Fire Resisting lift and stair shafts – Loadbearing Non-loadbearing Ventilating, pipe, garbage, and the like shafts not used for the discharge of hot products of combustion – *Loadbearing* *Non-loadbearing*	 120/120/120 -/120/120 120/90/90 -/90/90
OTHER LOADBEARING INTERNAL WALLS & COLUMNS	120/-/-
FLOORS	120/120/120

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

3. Clause C1.9 – Non Combustible Building Elements

Aluminium Panels

In a building required to be constructed of Type A Construction, external walls and all components incorporated in them including façade covering, framing, sarking and insulation etc are required to be constructed of non-combustible construction.

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 form of Aluminium Composite Panel can be installed on the external façade of the building.

Cell Powered Louvred Facade

In addition to the above it is noted that Integrated PV Cell Louvres are proposed to be installed on the building facades. The provision of cell powered louvres on the building façade may represent compliance issues with Clause C1.9 of the BCA in terms of combustibility and will be required to be reviewed extensively by BM+G and the appointed Fire Safety Engineer to determine compliance. Any non-compliance with Clause C1.9 would be required to be assessed as a Performance Solution (if deemed appropriate) with subsequent approval to be obtained by FRNSW.

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

- Fire Isolated Exits – not less than 2.2 kW/m²
- Other Areas – 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
- Other Areas – Group 1, 2 or 3

5. **Clause C2.2 – General Floor Area and Volume Limitations**

The maximum floor and volume limitations of Clause C2.2 are not applicable to an open deck car park.

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

An open deck car park is granted a concession from having to the comply with the spandrel separation requirements between vertical openings in the external wall of a building for Type A Construction.

In this instance there is no requirement for spandrel separation to be achieved between openings in the external wall.

7. **Clause C2.10 – Separation of Lift Shafts**

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

8. **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.

9. **C2.13 – Electricity Supply System**

The Main Switch Room located on Level P1 is required to be fire separated from the internal parts of the building by construction achieving a minimum FRL of 120/120/120 (load bearing) or -/120/120 (non-loadbearing).

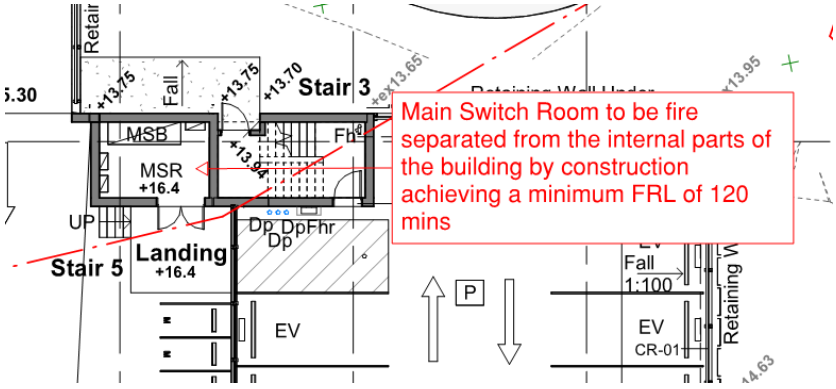


Diagram No. 3 – Required separation of internal main switch room

10. **Clause C3.2 – Protection of Openings in External Walls**

Based on the 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.

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

11. **Clause C3.8 – Openings in Fire Isolated Exits**

The doors discharging into the fire isolated stairways are required to be protected by self-closing fire doors with a minimum FRL of -/60/30.

12. **Clause C3.9 – Service Penetrations in Fire Isolated Exits**

No service penetrations can penetrate the fire isolated stairways other than electrical wiring for lighting, security or essential services and water supply pipes for the fire hydrant system.

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

The entrance doorways to the lift shafts must be protected by -/60/- fire doors that comply with AS 1735.11 and are set to remain closed except when discharging or receiving passengers, goods or vehicles.

A lift call panel, indicator panel or other panel in the wall of a fire isolated shaft must be backed by construction having an FRL of not less than -/60/60 if it exceeds 35 000mm^2 in area.

14. 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, 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 etc is proposed to be assessed as part of a Performance Solution to be addressed by the appointed Fire Safety Engineer 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.

15. 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.

16. 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 A Construction. The following key items of Specification C1.1 are identified:

General Requirements

The following key items of Specification C1.1 are identified:

+ 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 A Construction, the FRL to the external walls applies in both directions i.e. FRL must be achieved from both sides of the external wall.
+ The external walls and façade are required to be non-combustible (this includes any insulation used in the external wall)
+ 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.
+ All fire rated shafts i.e. fire isolated stairways and lift shafts must be enclosed at the top and bottom by a construction having an FRL of not less than 60/60/60.

SECTION D - ACCESS & EGRESS

17. Clause D1.2 – Number of Exits Required

The minimum number of exits has been provided from each level of the building with three (2) alternative exits being available to building occupants.

18. Clause D1.4 – Exit Travel Distances

Egress travel distance from all parts of the car parking storeys is permitted to extend up to 20m to a point of choice and a maximum distance of 40m to an alternative exit.

Based on the Schematic Design 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 Level P1 is up 52m to an alternative exit (12m over the maximum permitted DtS distance).
+ Travel distance from the Typical Parking Level is Level P1 is up 52m to an alternative exit (12m over the maximum permitted DtS distance).

The extended travel distance to an alternative exit will be required to be assessed as part of the Fire Engineering Performance Solution to be prepared by the appointed Fire Safety Engineer 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:

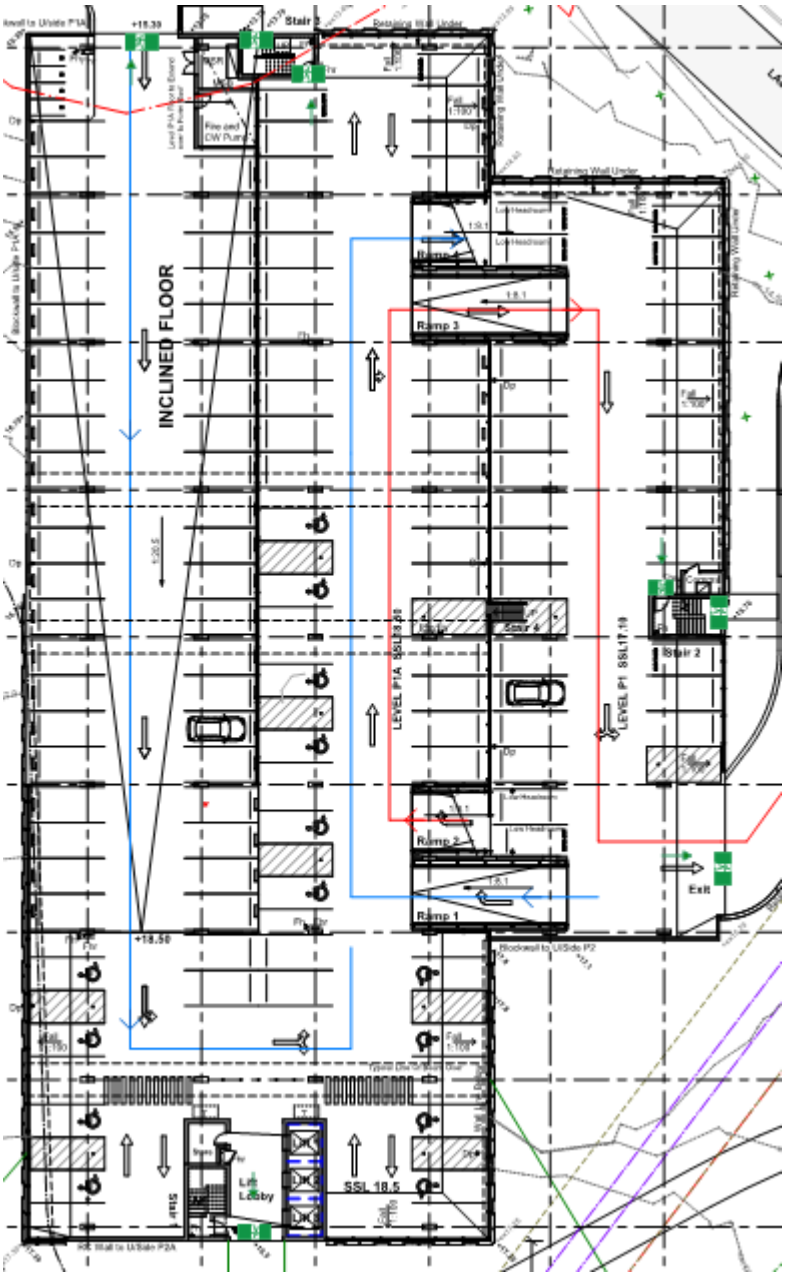


Figure No. 4 – Required exit doors from Level P1

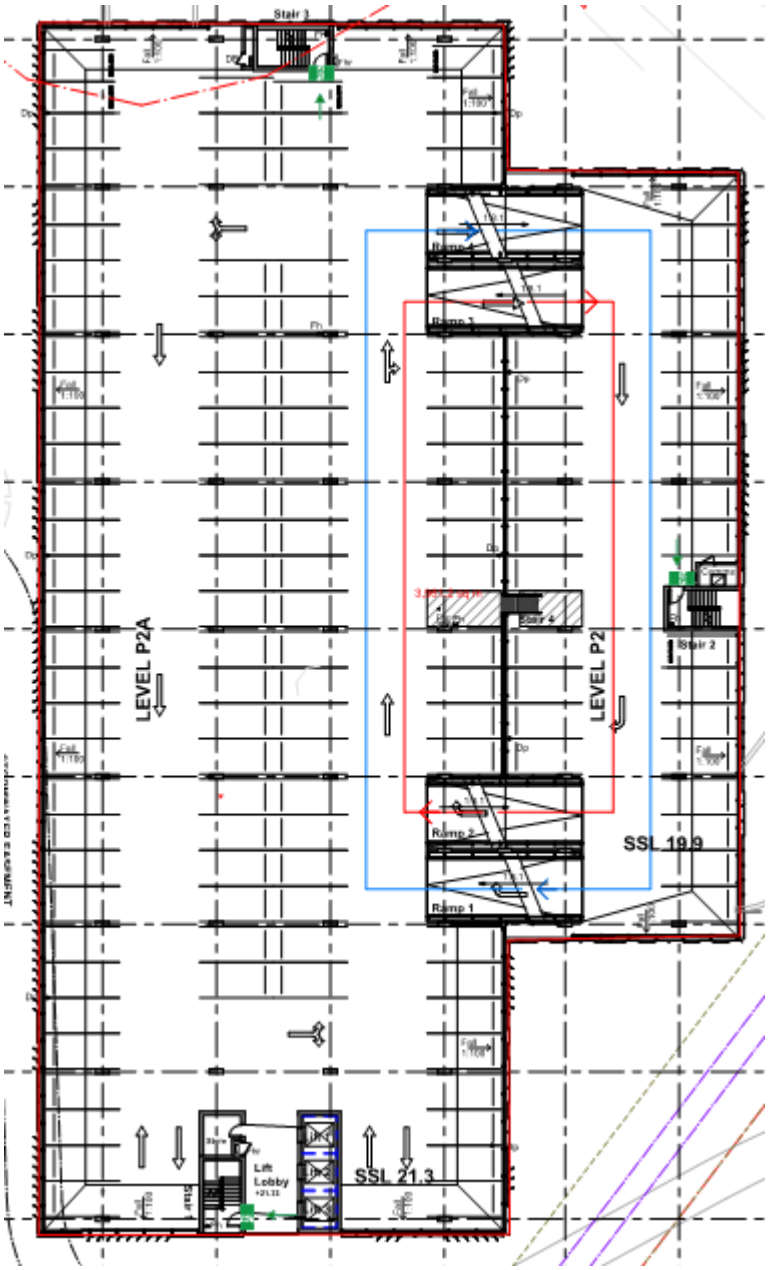


Figure No. 5 – Required exit doors from Typical Parking Level

19. Clause D1.5 – Distances Between Alternative Exits

The maximum travel distance between alternative exits serving each storey of the car park is 60m.

Based on the Schematic Design 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 between alternative exits from Level P1 is up 93m (33m over the maximum permitted DtS distance).

+ Travel distance between alternative exits from Level P1 is up 95m (35m over the maximum permitted DtS distance).

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

Based on the Schematic Design Architectural Drawings assessed to date, we have undertaken an egress assessment in terms of egress travel distance between alternative exits and egress travel distance complies.

20. 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 1980mm.

The minimum unobstructed width of all doorways throughout the building is required to be a minimum of 850mm clear.

In addition, the unobstructed width of any new exit or a path of travel to an exit must not be less than 1 metre. In this instance specific attention is required to the paths of travel that lead to the fire isolated stairways where it adjoins a car parking space. In this instance, there must be a minimum clear unobstructed width of 1000mm that is provided to the path of travel between car parking spaces and adjoining walls and any built structures such as columns or services such as fire hose reels etc.

Refer to the Figure below for a typical location where a clear unobstructed width of 1000mm is required to be maintained between car parking spaces and a fire isolated stairway.

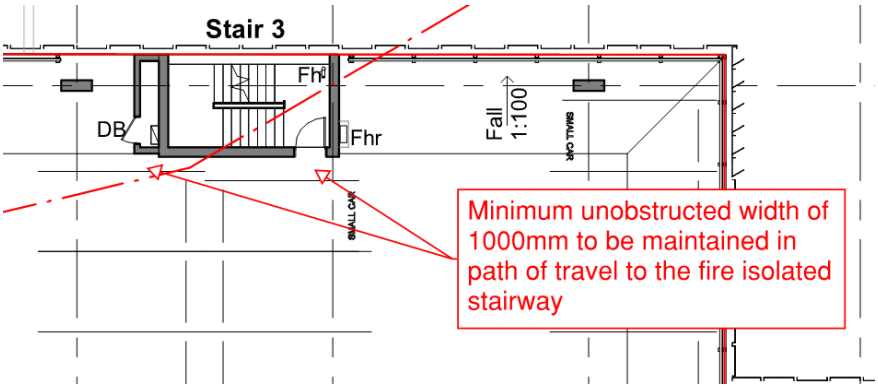


Figure No. 6 – Path of travel leading to exits to have a clear unobstructed width of 1000mm

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

Discharge from Fire Stair 3

Upon discharge from Fire Stair 3, occupants are immediately exposed to the external wall of the Main Switch Room. In this instance the external wall of the Main Switch Room is required to have a minimum FRL of 60/60/60 (achieved in both directions).

Once occupants discharge from Fire Stair 3, verification is required that a path of travel (trafficable) leads direct to Redbank Road without having to pass within 6m (measured perpendicular to the path of travel) of the vehicular entry to the car park.

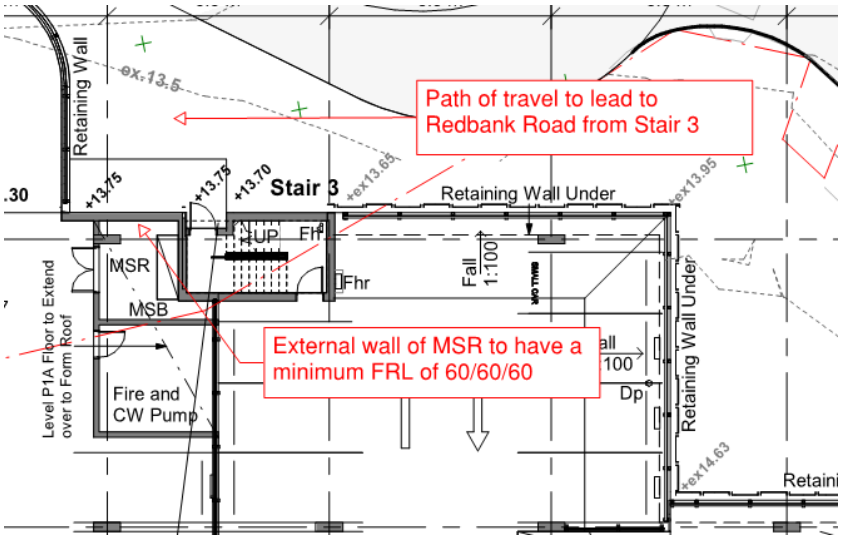


Figure No. 7 – Discharge from Fire Stair 3

Discharge from Fire Stair 1

It is noted that Fire Stair 1 discharges into a covered area within the Lift Lobby on Level P1 which adjoins open space.

A fire isolated stairway is permitted to discharge into a covered area that adjoins a road or open space on the basis that the area is open for at least 1/3 of its perimeter and has an unobstructed height throughout including perimeter openings of not less than 3m and provides an unimpeded path of travel from the point of discharge to open space of not more than 6m.

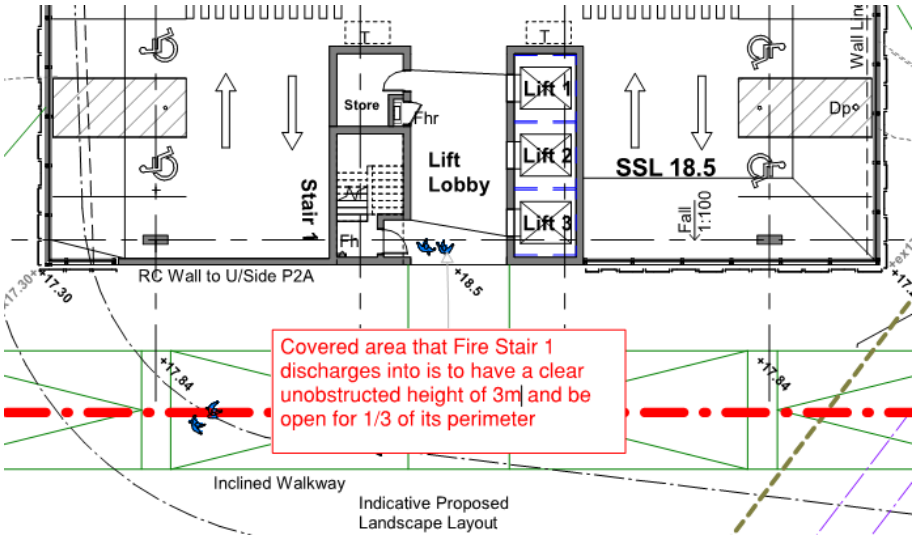


Figure No. 8 – Discharge from Fire Stair 1 into a covered area adjoining open space

If compliance cannot be achieved with the minimum clear height of the covered area including the perimeter openings, it is recommended that the discharge door be reconfigured to discharge directly to open space from Stair 1.

22. Clause D1.10 – Discharge from Exits

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.

23. Clause D1.12 – Non-Required, Stairways, Ramps or Escalators

The non-required non-fire isolated stairway (stair 4) located on Grid 05 is permitted to be connect all storeys of the car park and remain non-fire separated from the rest of the building as it is not relied upon as a required exit from the building.

24. Clause D2.2 – Fire Isolated Stairways

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

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

No access is permitted to service shafts within the fire isolated stairways.

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.

26. Clause D2.10 – Pedestrian Ramps

In order for egress travel distance to comply and for occupants to have the choice of alternative exits form the car parking storeys, the vehicular ramps between car park levels must have a gradient not exceeding 1:8.

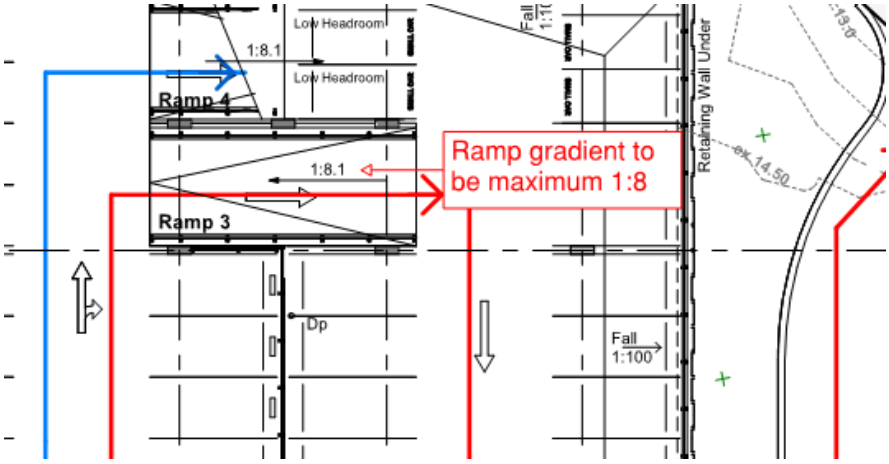


Figure No. 9– Vehicular ramps used as paths of travel to alternative exits to have a maximum gradient of 1:8

27. 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

- 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.

28. Clause D2.14 – Landings

The stair landings of the fire isolated stairways must have a slip resistance of classification in accordance with the following table.

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
Undercover Car Parking Areas	P3 or R10
External Car Parking Areas	P5 or R12
External walkways	P4 or R11
Building Entry (wet area)	P3 or R10
Building Entry (transitional area)	P3 or R10
Lifts	P2 or R9

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

29. Clause D2.15 – Thresholds

No steps can be located within the internal or external door thresholds. Where there are any steps within external door thresholds, a threshold or step ramp is required to be installed in accordance with Clause 10 of AS 1428.1.

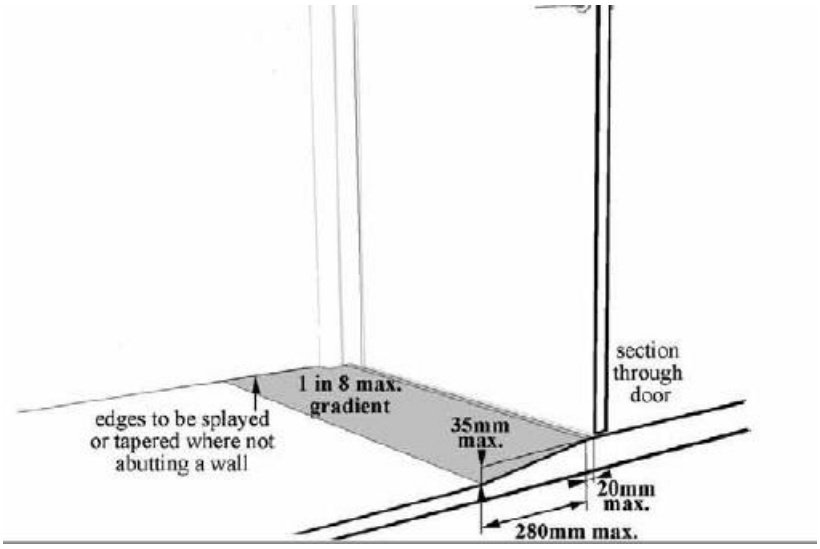


Figure No. 10 – Threshold Ramp

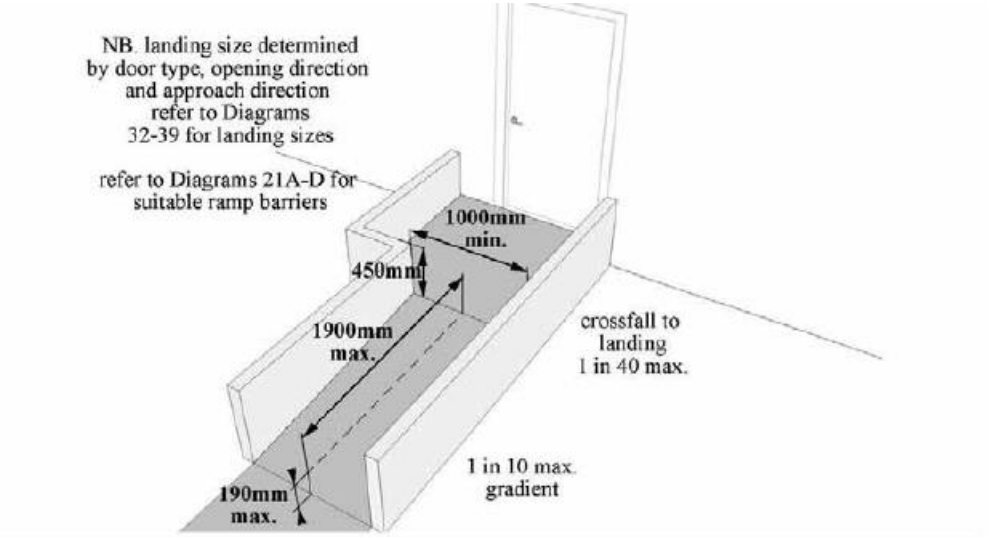


Figure No. 11 - Step Ramp at External Doorway – Front Approach

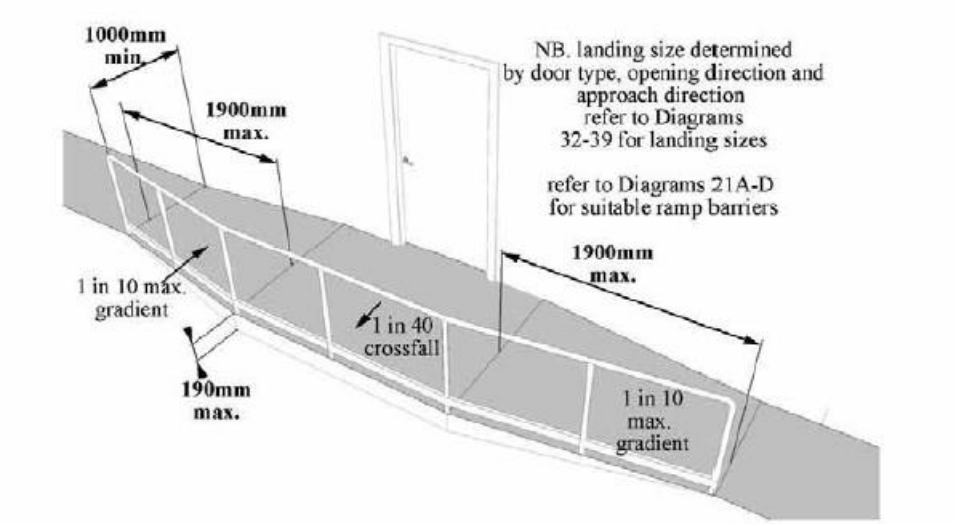


Figure No. 12 – Step Ramp at External Doorway – Side Approach

30. Clause D2.16 – Balustrades or Other Barriers

General Requirements

All balustrades are required to be constructed to a minimum height of 1000 mm where the level below is greater than 1000mm to all landings, between car parking levels, walkways etc.

Note: Verification is required as to the proposed barrier between car parking levels where the change in level exceeds more than 1000mm.

Where the level below exceeds 4000mm the balustrades must not have any climbable elements between 150mm and 760mm above the floor.

Note: Verification is required as to the proposed barrier construction to the roof top level of the car park.

All balustrades are required to comply with the structural loading requirements of AS 1170.1.

Perforated Metal Façade Panels

Where the external façade will be used as the barrier to prevent a person falling, it will be required to be certified as complying with the structural loading requirements of AS 1170.1 and comply with the requirements of the BCA in that for the first 1000mm, no openings in the balustrade can exceed 125mmm.

Fire Isolated Stairways

Within the fire isolated stairways where the fall exceeds 1000mm, the balustrading must be a minimum of 865-mm above the nosing of the tread with a rail no more than 150-mm above the nosing of the tread and no gaps between rails greater than 460-mm.

Within the fire isolated stairways, at stair landings, where the landing exceeds 500-mm in length the balustrade must be increased to 1m in height, with a rail no more than 150-mm above the landing and no gaps greater than 460-mm.

Non-Fire Isolated Stairways

For all non-fire isolated stairways i.e. Stair 6, the openings between balusters cannot exceed 125mm.

31. Clause D2.17 – Handrails

Handrails are required be provided along at least one side of the fire isolated stairways. 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 non-required non-fire isolated stairway i.e. Stair 4 between car parking levels. 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 the pedestrian / vehicular ramps due to the width exceeding 2m and the ramps being used for egress to the alternative exits.

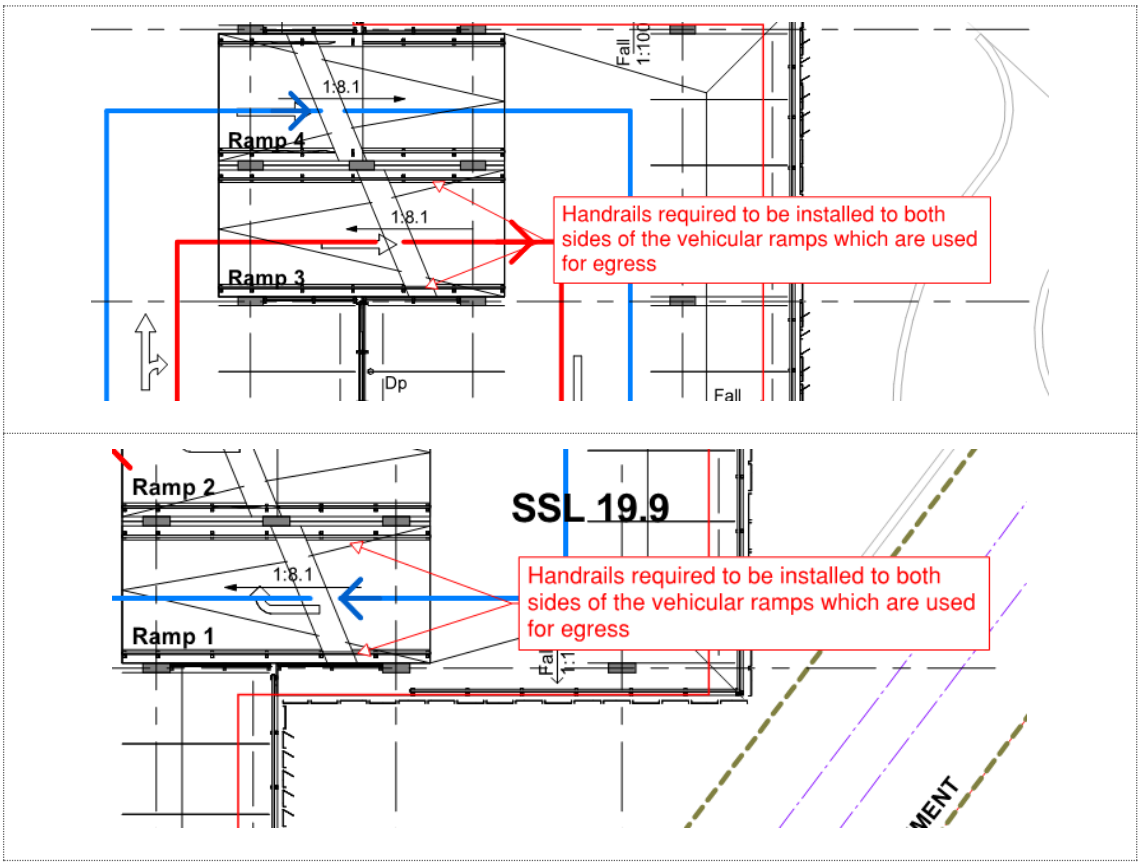


Figure No. 13 – Step Ramp at External Doorway – Side Approach

32. 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.

33. Clause D2.20 – Swinging Doors

All swinging doors in a required exit or forming part of a required exit must swing in the direction of egress.

It is noted that the swing of the doors as indicated on the current Schematic Deign Architectural Drawings comply.

34. 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.

35. Clause D2.23 – Signs on Doors

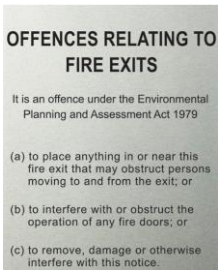
All **self-closing** fire doors providing access to the fire isolated stairways are to be provided with signage that states:

FIRE SAFETY DOOR
DO NOT OBSTRUCT
DO NOT KEEP OPEN

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 fire isolated stairways are to be provided with the following additional signage installed on the wall on the latch side of the door.



The DtS Provisions requires Braille signage for egress systems from the building. In this instance the following is required to be provided: -

+ 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*

  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.

Signage Specification: -

The signage is to be: -

+ Located between 1200-1600mm above FFL
+ Signs with single lines of characters are to have the line of the tactile characters between 1250mm-1350mm above FFL
+ Signage tactile characters must be raised or embossed to a height between 1mm-1.5mm
+ Upper case letter to be between 20mm-55mm

Signage is to be contrasting & is to comply with BCA Specification E3.6.

Signage Locations:

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

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

36. D3 – Access Requirements for People with Disabilities

The proposed Multi Storey Car Park will comply with BCA Part D3 and the Access to Premises Standards 2010 in terms of access and facilities for people with disabilities.

This will in essence ensure the design satisfies the requirements of the DDA.

Access for persons with disability is required to be provided to and within any level containing accessible car parking spaces. In this instance, it is noted that the accessible car parking spaces are located on Level P1. On this basis, access for a person with a disability is required to and within the entirety of Level P1.

Access need not be provided to:

(a) An area where access would be inappropriate because of the particular purpose for which the area is used.

(b) An area that would pose a health or safety risk for people with a disability.

(c) Any path of travel providing access only to an area exempted by (a) or (b).

BCA2019 Part D3.2 – Access to Buildings & D3.3 – Parts of Buildings to be Accessible

- Access must be provided from Level P1 of the car park via the lift lobby to the walkways which are to have a maximum gradient of 1:20 or via accessible ramps with a maximum gradient of 1:14 which will then lead to the existing Children's Hospital and Galleria.
- 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.

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

The requirements for walkways that connect the Multi Storey Car Park to the adjoining buildings is 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

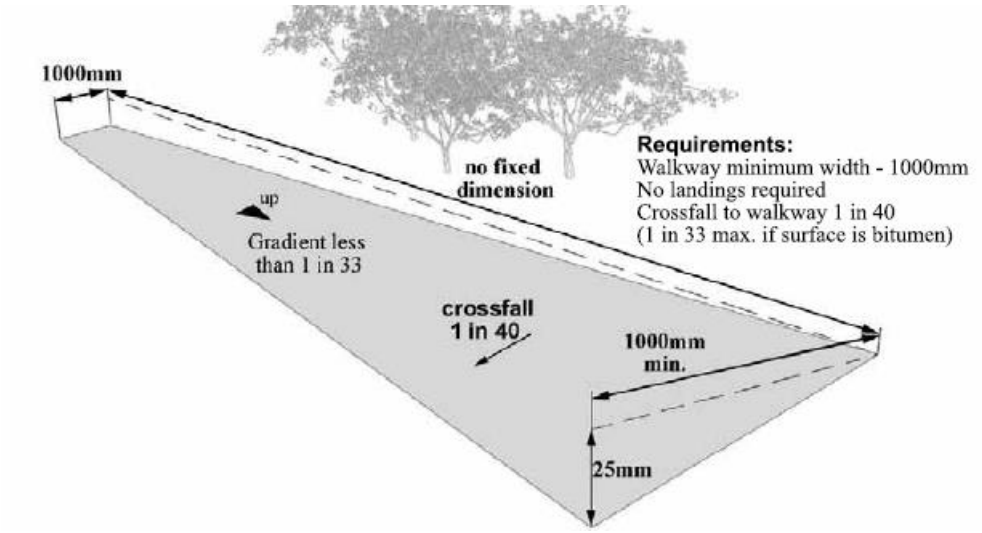


Figure No. 14 - Requirements for a Walkway with a Gradient Less Than 1 in 33

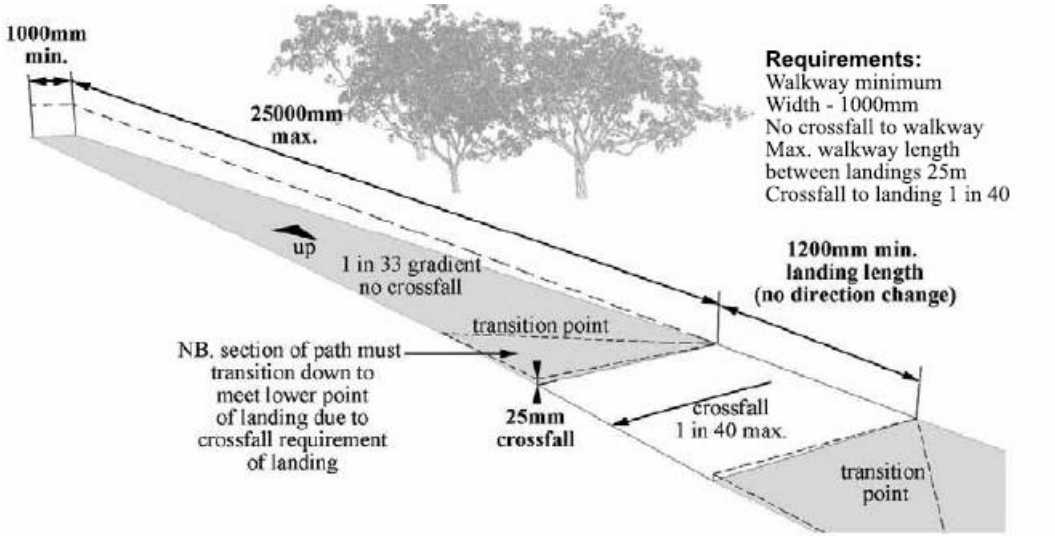


Figure No. 15 - Requirements for a Walkway with a 1 in 33 Gradient

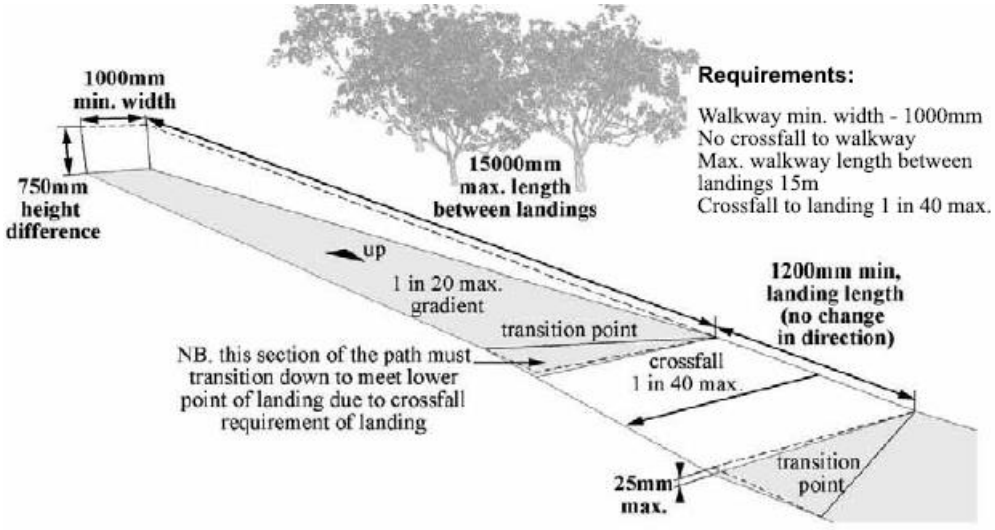


Figure No. 16 - Requirements for a Walkway with a 1 in 20 Gradient

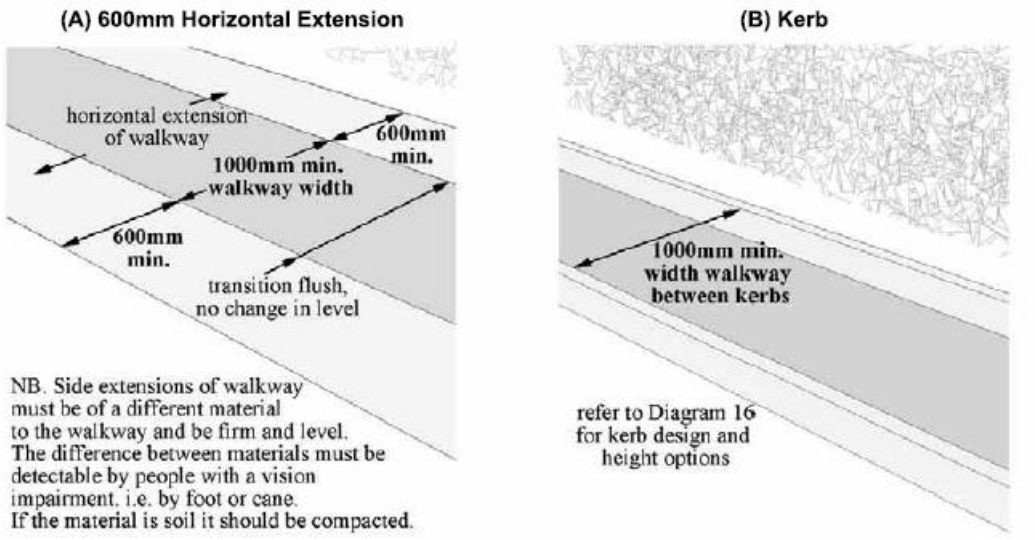


Figure No. 17 - Requirements for Edges of Walkways

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

Accessible ramps that are located within the external path of travel connecting the Multi Storey Car Park to the existing adjoining buildings 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.
- Tactile surface indicators are required to be installed at the top and bottom of the ramp in accordance with AS 1428.4. Tactile ground surface indicators are not required to be installed on the mid landings of the ramp where the handrails are continuous around the landing.

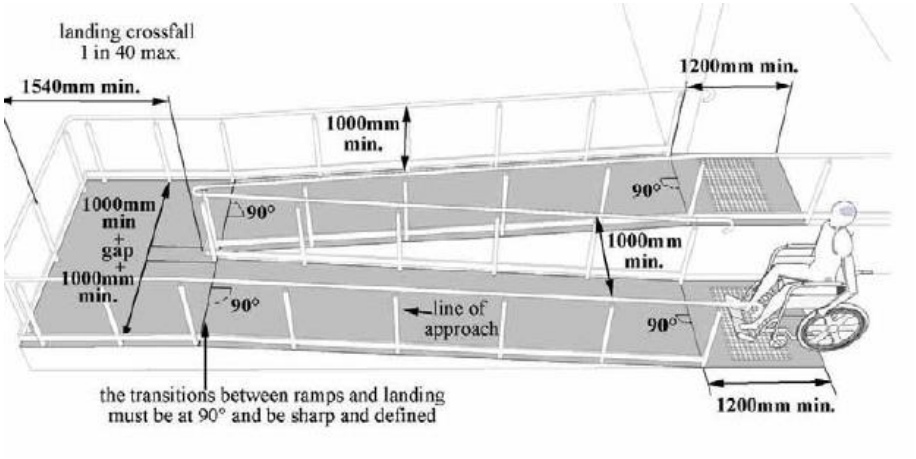


Figure No. 18 – Ramp and Landing with Change in Direction of 180°

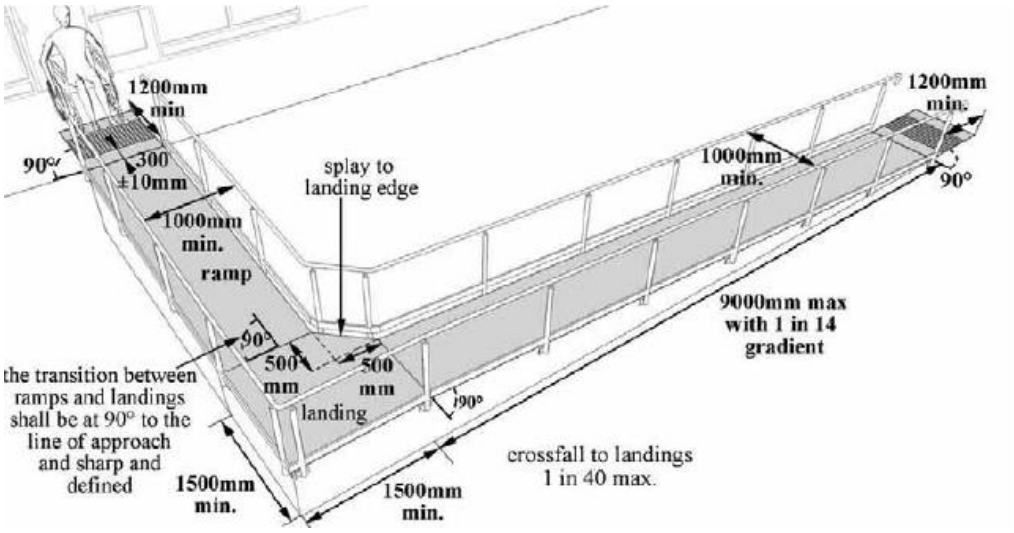


Figure No. 19 – Ramp and Landing with Change of 90°

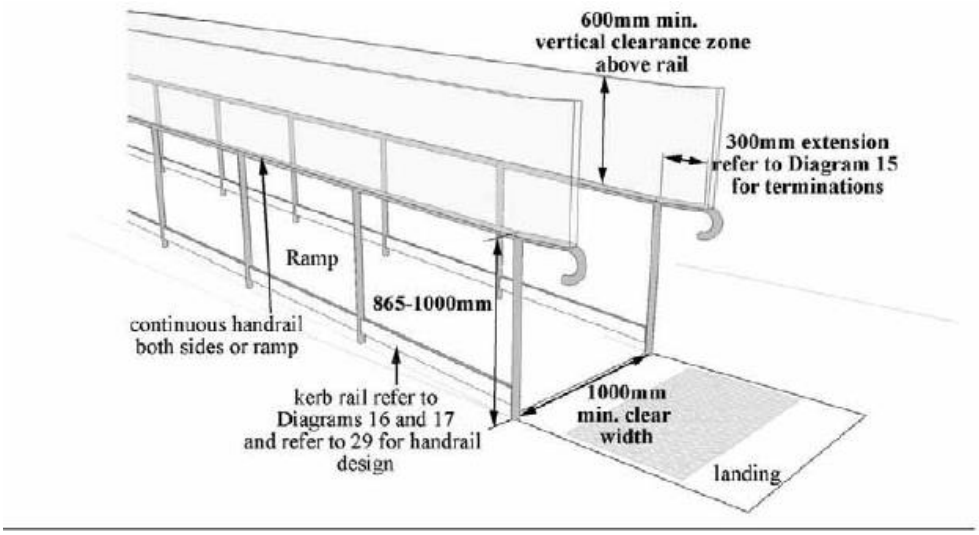


Figure No. 20 – Handrail Extensions at Ramp Ending

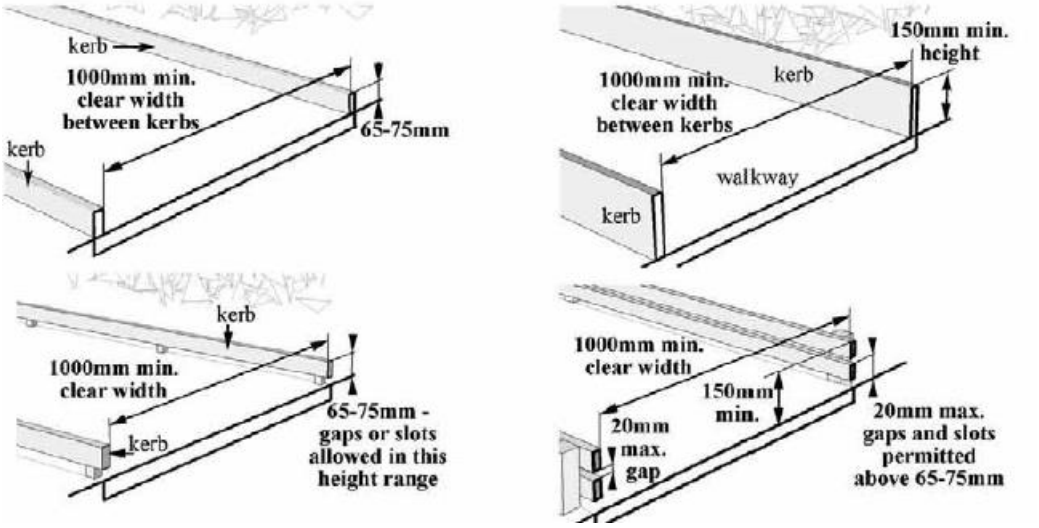


Figure No. 21 – Kerb and Kerb Rail Design Options

Accessible Stairways:

The central circulation stairway (stair 4) is required to be designed in accordance with AS 1428.1. In this instance, the following is required:

- A handrail is required to be installed 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 are to be provided to the stair treads which achieve a minimum colour contrast luminance of 30% to the background (tread).
- The handrails are to have a maximum dimension of 50mm and be spaced a minimum distance of 50mm from the wall.
- Tactile ground surface indicators are required to be installed at the top and bottom of the stairways in accordance with AS 1428.4. In this instance the tactile ground surface indicators are to be positioned 300mm form the last tread and extend for a minimum distance of 600mm – 800mm.

  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.

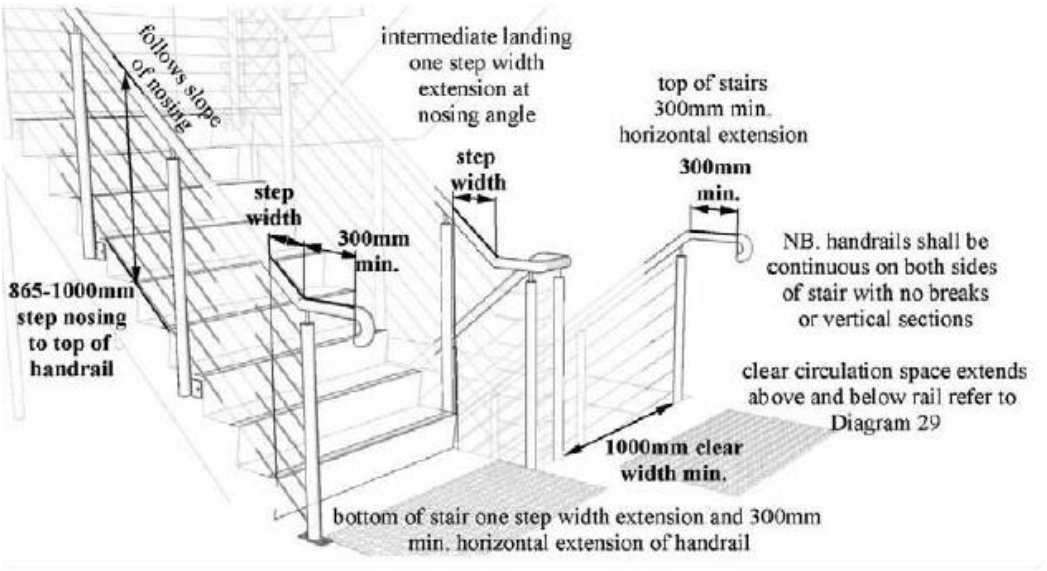


Figure No. 22 – Handrails to Stairways

Access Control

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

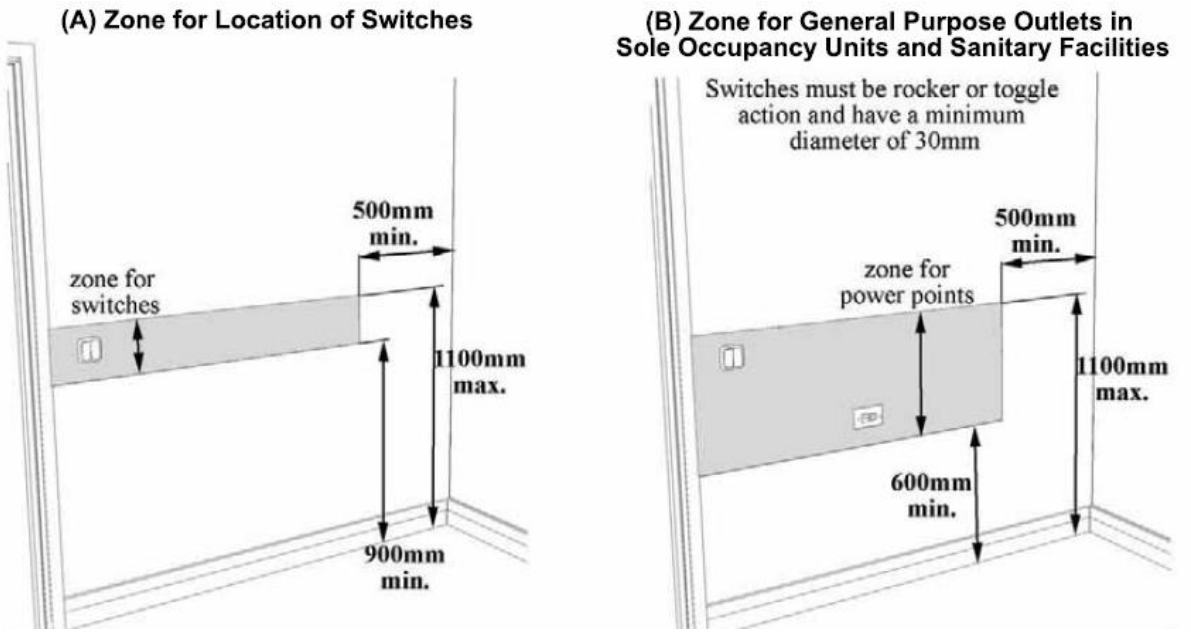


Figure No. 23 – Zones for the location of switches and power outlets

Accessible Fixtures & Fittings:

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

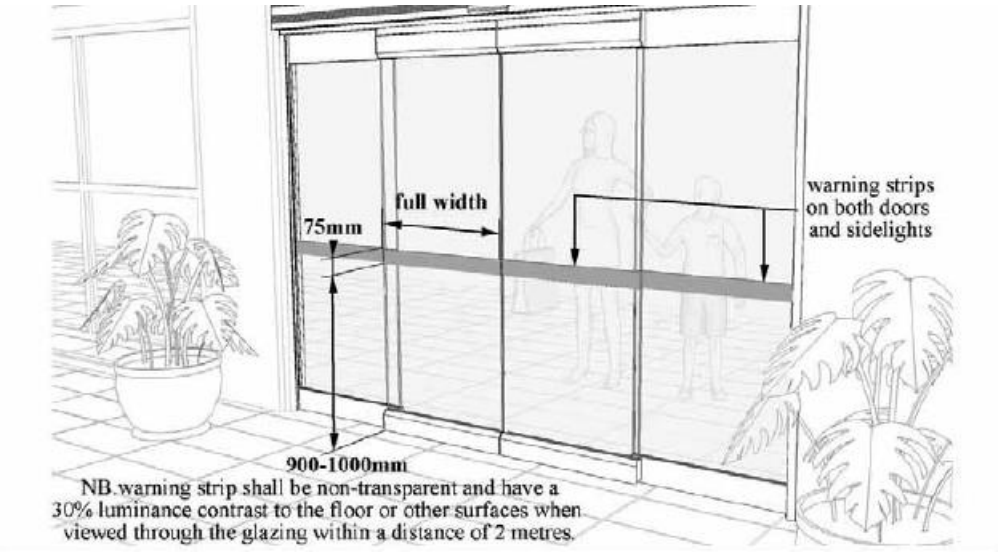


Figure No. 24– Warning Strips to Full Height Glazing

Accessible Car Parking Spaces

The Architectural Drawings indicate the provision of 14 accessible car parking spaces which are located on Level P1. Based on 1029 car parking spaces provided the provision of fourteen (14) accessible car parking spaces is considered to be satisfactory in ensuring compliance with Clause D3.5 of the BCA.

SECTION E – SERVICES AND EQUIPMENT

37. Part E1 – E4 – Essential Fire Safety Measures

The following essential fire safety measures are required to be installed within the building based on the Architectural Drawings reviewed to date.

Essential Fire and Other Safety Measures	Standard of Performance
Emergency Lighting	BCA Clause E4.4 AS/NZS 2293.1 - 2018
Emergency Evacuation Plan	AS 3745 - 2002
Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 AS/NZS 2293.1 – 2018
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

Essential Fire and Other Safety Measures	Standard of Performance
Fire Hydrant Systems	Clause E1.3 AS 2419.1 - 2005
Fire Seals	BCA Clause C3.15 AS 1530.4 – 2014 AS 4072.1 – 2005
Paths of Travel	EP & A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
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

38. Clause E1.3 – Fire Hydrants

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

System Performance

Table 2.1 of AS 2419.1 – 2005 specifies the minimum number of fire hydrants that are required to discharge simultaneously according the building classification and floor area.

In accordance with Table 2.1 for a non-sprinkler protected building with a floor area exceeding 10,000m^2, a minimum of 3 hydrants are required to flow simultaneously plus one additional hydrant for each 5,000m^2 or part thereof.

In this instance and based on the total floor area of the building which exceeds 30,000m^2 it is considered highly unlikely that compliance with Table 2.1 of AS 2419.1 - 2005 can be achieved in terms of the minimum number of hydrants that are required to discharge simultaneous.

The design of the hydrant systems which will be unable to comply with the requirements of Section 2 of AS 2419.1 – 2005 will be required to be assessed as part of a Fire Engineering Performance Solution to be prepared by the appointed Fire Safety Engineer in order to demonstrate compliance with the nominated Performance Requirements of the BCA.

Hydrant Locations

A fire hydrant system is required to be installed to provide coverage to all parts of the Multi Storey Car Park in accordance with AS 2419.1 – 2005.

Internal Hydrants are to be located within each of the fire isolated stairways at each storey of the building.

Having regard to the size of each storey, additional fire hydrants will be required to be located within the confines of each storey in order to achieve compliant coverage to each storey.

In this instance careful design consideration needs to be given to ensure that there is a clear space of 1000mm in front of fire hydrant to permit access by FRNSW. Where fire hydrants adjoin car parking spaces, bollards may need to be installed to ensure that access to fire hydrants are not blocked by motor vehicles.

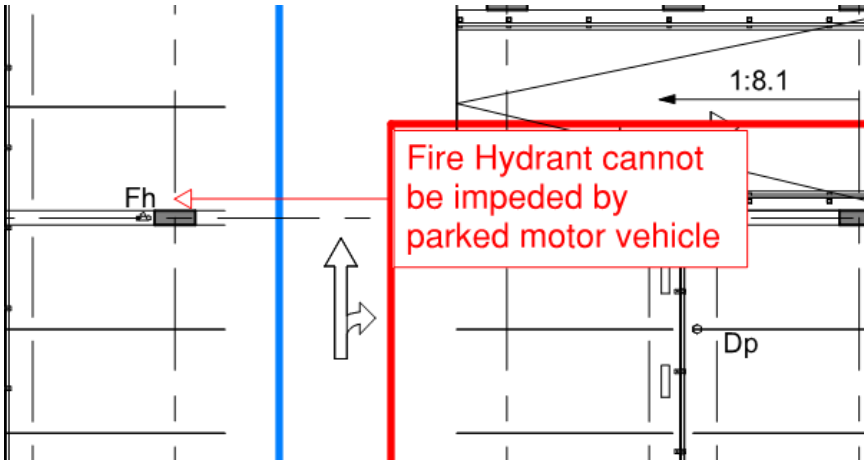


Figure No. 25 – Internal on floor fire hydrants to have unimpeded access can cannot be block by parked moto vehicles

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 current Architectural Design indicates compliance in this instance.

Furthermore, and due to the fact that the building is not required to be provided with an Automatic Fire Suppression System, the internal fire hydrant pump room is required to be separated from the remainder of the building by construction achieving a minimum FRL of 120 mins.

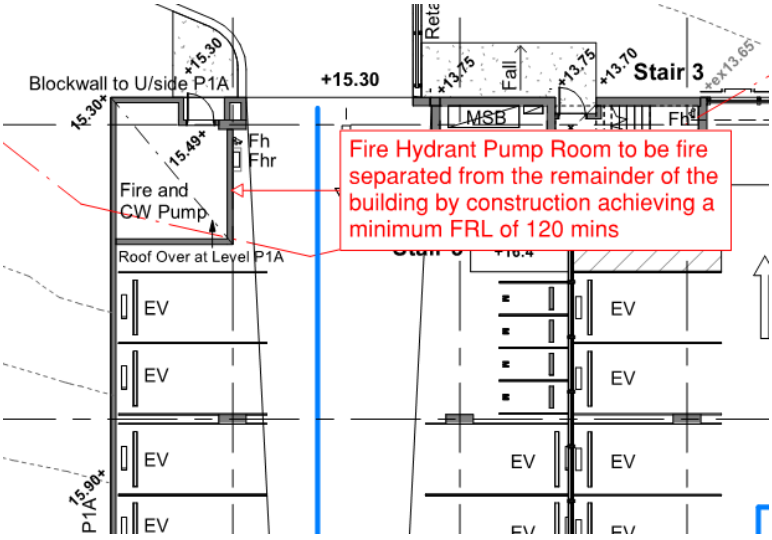


Figure No. 26 – Internal fire hydrant pump room located on Level P1

Fire Hydrant Booster

In accordance with AS 2419.1 – 2005 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.

In this instance, the fire hydrant booster will be required to be designed in accordance with the requirements of AS 2419.1 – 2005. Any deviation from the requirements of AS 2419.1 – 2005 will be required to be assessed as part of a Fire Engineering Performance Solution that will be required to be approved by FRNSW.

39. **Clause E1.4 – Hose Reels**

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

Location

Fire hose reels are required to be located within 4m of an exit or adjacent to an internal fire hydrant (other than fire hydrants located within a fire isolated stairway).

Having regard to the size of each storey, additional fire hose reels will be required to be located within the confines of each storey adjacent to an internal fire hydrant in order to achieve compliant coverage to each storey.

In this instance careful design consideration needs to be given to ensure that there is a clear space directly in front of the fire hose reels to ensure their use in the event of an emergency. Where fire hose reels adjoin car parking spaces, bollards may need to be installed to ensure that access to fire hose reels are not blocked by motor vehicles.

40. **Clause E1.5 – Sprinklers**

Based on the fact that the building is less than 25m in effective height and the building is an open deck car park, an Automatic Fire Suppression System is not required to be installed throughout the building.

41. **Clause E1.6 – Portable Fire Extinguishers**

Portable fire extinguishers are to be installed in accordance with clause E1.6 and AS 2444 - 2001.

42. **Clause E3.2 – Stretcher Facility in Lifts**

A stretcher facility is required to be provided in at least one of the passenger lifts which serves each storey of 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.

43. **Clause E3.6 – Passenger Lifts**

The passenger lifts are required to be designed and installed in accordance with the requirements of Clause E3.6.

44. **Clause E3.9 - Fire Service Controls**

A fire service recall control switch complying with Clause E3.9 is required to be provided to the group of lifts and a lift car fire service drive control switch complying with Clause E3.10 is required to be provided for every lift.

45. **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:

+ On each storey of the fire isolated exits; and
+ Throughout each storey of the car park

46. **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 stairways;
+ Doors providing access from the fire isolated stairways to open space;
+ Within the lift lobby directing occupants to open space;
+ Above the vehicular entry point which is to be used for occupant egress; and
+ Throughout the car parking storeys directing occupants to the alternative exits.

The following figure details indicative exit sign locations from the typical car park storey.

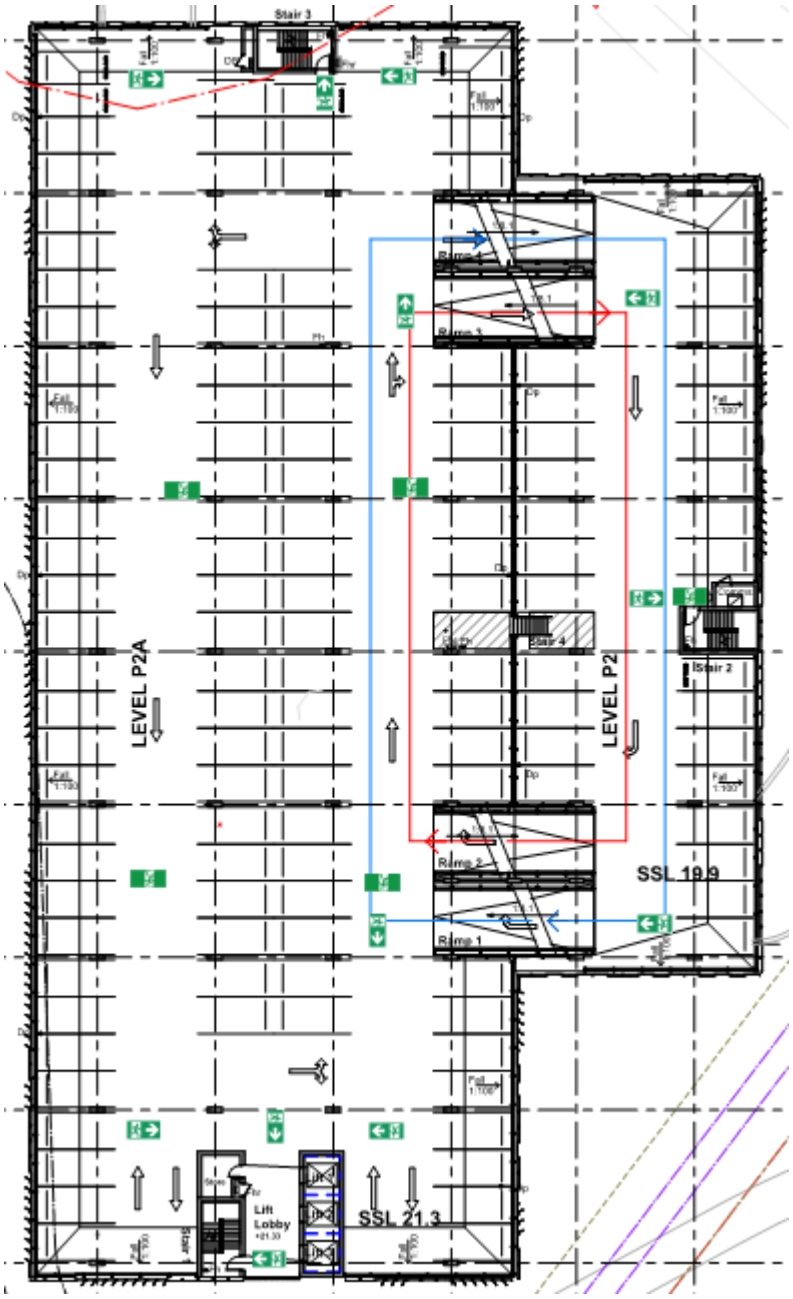


Figure No. 28 – Indicative exit sign locations on a typical car park storey

47. 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 -2005.

Refer to diagrams above under Clause E4.5 for indicative location of directional exit signs.

Note: Additional exit signage may be required or alternatively the size of the exit signs will be required to be increased in order for compliance to be achieved with the requirements of AS 2293.1 – 2005.

SECTION F – HEALTH & AMENITY

48. Clause F1.0 – Deemed to Satisfy Provisions

Performance Requirement FP1.4 is not required to be complied with for an open deck car park due to the fact that there are no external walls to the building to prevent the ingress of water.

In this instance there is no requirement for the preparation of a Performance Solution

49. Clause F3.1 – Height of Rooms

The floor to ceiling heights throughout the building are required to comply with the following:

- Car parking areas – 2100mm;
    - Accessible Car Parking Spaces – 2500mm;
    - Path of vehicular travel from the car park entrance to each accessible car parking spaces – 2200mm;
- Lobby Areas – 2100mm;
- Stairways, Landings; and
- Plant areas – 2100m.

50. Clause F4.4 – Artificial Lighting

Artificial lighting is required to be provided throughout each car parking storey in accordance with AS 1680.0 - 2009.

51. Clause F4.11 – Car Parks

In accordance with Clause F4.11 of the BCA, if the car park is an open deck car park, then it is not a requirement of the DtS Provisions of the BCA for the car park to be provided with a system of mechanical ventilation in accordance with AS 1668.2 or natural ventilation in accordance with Section 4 of AS 1668.4.

Notwithstanding the minimum requirements of the BCA, the fact that open deck car parks are significantly larger these days (together with the fact that the BCA does not regulate the size of an open deck car park), there is a need to ensure that the build-up of motor vehicle exhaust will not affect the amenity of the users of the car park having regard to the its size which may impact on its ability to readily remove exhaust in an effective manner.

It is for this reason that the consultant team need to be satisfied that the car park design will permit the adequate removal of exhaust and if this cannot be achieved without the installation of a mechanical car park exhaust system, then such a system should be installed.

SECTION J – ENERGY EFFICIENCY

52. Parts J1 – J8

The energy efficiency provisions of Section J are applicable to the proposed building and as such design verification will be required to be submitted prior to issue of the s6.28 which details how compliance is being achieved.

In this regard Part J6 - Artificial Lighting and Power and Part J8 – Access for Maintenance is required to be provided.

E. CONCLUSION

This report contains a BCA2019 and Access to Premises Standards 2010 assessment of the referenced Schematic Design Architectural Drawings for the proposed Multi Storey Car Park to be constructed as part of the Children's Hospital Westmead Redevelopment.

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 the appointed Fire Safety Engineer.