



BUILDING CODE OF AUSTRALIA REPORT

**One Sydney Harbour
Residential Building R4A**

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Date	Rev No	No. of pages	Issue	Checked By	Approved By	Date Approved
03.12.14	A	18	Draft for Project Approval	Brigitte Thearle		12.12.14
10.02.15	B	18	Revised Draft for Project Approval	Brigitte Thearle		19.02.15
20.04.15	C	19	Final for Project Approval	Brigitte Thearle		24.04.15
29.06.15	D	19	Revised Final for Project Approval	Brigitte Thearle		09.07.15
10.05.16	E	41	Clause by Clause Assessment	Aaron Celarc	Seb Howe	16.05.16

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Renzo Piano Building Workshop (refer appendix A) for compliance with the Building Code of Australia 2015.

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Construction Certificate will need to include verification from a suitably accredited fire engineer: -

DTS Clause	Description of Non-Compliance	Performance Requirement
C1.1, C2.7, C2.8, Spec C1.1	Reduction of fire rating in ground floor retail to 2 hours in lieu of 3 hours. This includes the following: - Fire separation between the retail and residential portions on the ground floor. - Fire separation between the retail ground floor and the residential storeys above.	CP1, CP2
C1.1, C2.7, C3.2, C3.4	Separation between Buildings R4A and R4B is proposed to be assessed on a performance basis. The buildings are considered as united buildings due to large colonnade/awning linking them at ground floor and the link bridge linking them at Podium Level 2.	CP2, CP8
C1.1, Spec C1.1	Reduction of structural adequacy to 60 minutes in lieu of 90 minutes for floor slabs in wet areas.	CP1, CP2
C1.1, Spec C1.1	The slab to the link bridge and supporting structure between R4A and R4B at Podium Level 2 is not proposed to provided with the required FRL.	CP1, CP2
C1.1, Spec C1.1	Fire separation between storeys is not proposed to extend to the outer skin of the double façade.	CP2
D1.4	Extended travel distances as follows: Podium - Travel distance to a point of choice of up to 30m in lieu of 20m in lift lobby and pool areas 50m to a point of choice in lieu of 20m from open deck Podium 2 & 57m to an exit 80m between exits in lieu of 45m from substation Podium 1 Plant Areas - Travel distance to a point of choice of up to 30m in lieu of 20m Roof Level 66m to an exit in lieu of 20m at roof level.	DP4, EP2.2

D1.5	Distance between alternative exits up to 80m in lieu of 60m on plant room level	DP4, EP2.2
D1.7	Fire isolated stairway opens directly onto the MSR room in Lieu of having an air lock.	DP5,
D2.20	The exit doors from the retail tenancies on the ground floor are proposed to swing against the direction of egress.	DP2, DP4
E1.3	The hydrant booster assembly is not within sight of the main building entry.	EP1.3
E1.3	The fire rated protection around the booster assembly does not extend 2m on each side of and 3m above the upper hose connections in accordance with AS 2419.1-2005.	EP1.3
E1.3	The external fire hydrants are located less than 10m from the building and are not provided with fire rated protection extending 2m each side and 3m above the upper hose connections in accordance with AS2419.1-2005.	EP1.3
E1.8	The fire control room is located within the basement and does not have an entry directly off the main entrance. Access to the fire control room involves a change in level to a road or open space in excess of 300 – approximately 3m.	EP1.6
E4.9	The sound system and intercom system for emergency purposes does not comply as the speech intelligibility (STI) requirement of 0.5 is not achieved in the bathrooms and balconies of the sole occupancy units and the plant rooms throughout the building.	EP4.3
E1.5	The proposed sprinkler system will include the following: - Propriety FM approved type B monitoring switches are proposed to be used on isolation valves instead of type A switches retrofitted to the valve. - High pressure valves manufactured by Victaulic not covered under AS 4118.6-1995 are to be utilised on the combined sprinkler / hydrant system. - Use of 15mm (K-factor 8) sprinklers instead of 10mm (K-factor 5.6) sprinklers for residential common lobbies and concealed space protection. - Shower cubicles are not proposed to be provided with sprinkler coverage. - Sprinklers are not proposed to the underside of the link bridge positioned over the canopy linking buildings R4A and R4B - Sprinklers are not proposed to selected awnings eg swimming pool.	EP1.4
E2.2	Zone smoke control is not proposed within the ground floor retail areas.	EP2.2

E4.9	The sound systems and intercom systems for emergency purposes do not comply as the speech intelligibility (STI) requirement of ≥ 0.5 is not achieved in the bathrooms and balconies of the sole-occupancy units and the plant rooms.	EP4.3
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The fire engineered solution relating to EP1.3, EP1.6 and EP2.2 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Based on the abovementioned items being addressed as an alternate solution by a suitably qualified fire engineer, the project is capable of achieving compliance with the Building Code of Australia, including the provisions relating to access for people with disabilities.

The documentation will need further detailing such as door hardware, specifications, service design, as outlined in Appendix D of this report.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

Assessed By

Seb Howe

1.0 Introduction

This report supports a State Significant Development Application (SSD 6964) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Development Application (DA) seeks approval for construction of a residential flat building (known as Residential Building R4A) and associated works at Barangaroo South as described in the Overview of Proposed Development section of this report.

1.1 Overview of Proposed Development

The Residential Building R4A DA seeks approval for the construction and use of a 72 storey residential flat building comprising 327 apartments, ground floor retail, the allocation of car parking, services, plant and storage within the Stage 1B Basement (subject of a separate concurrent DA), and the construction of ancillary landscaping and temporary public domain.

Approval for the construction of Residential Building R4A's core and associated plant and services within the basement is being sought as part of the concurrent Stage 1B Basement DA and do not form part of this DA.

1.2 Site Location

Barangaroo is located on the north western edge of the Sydney Central Business District, bounded by Sydney Harbour to the west and north, the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and bounded to the south by a range of new development dominated by large CBD commercial tenants.

The Barangaroo site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South.

The R4A DA Site area is located within Barangaroo South as shown in Figure 1. The DA Site is located on land generally known and identified in the approved Concept Plan as Block 4A.

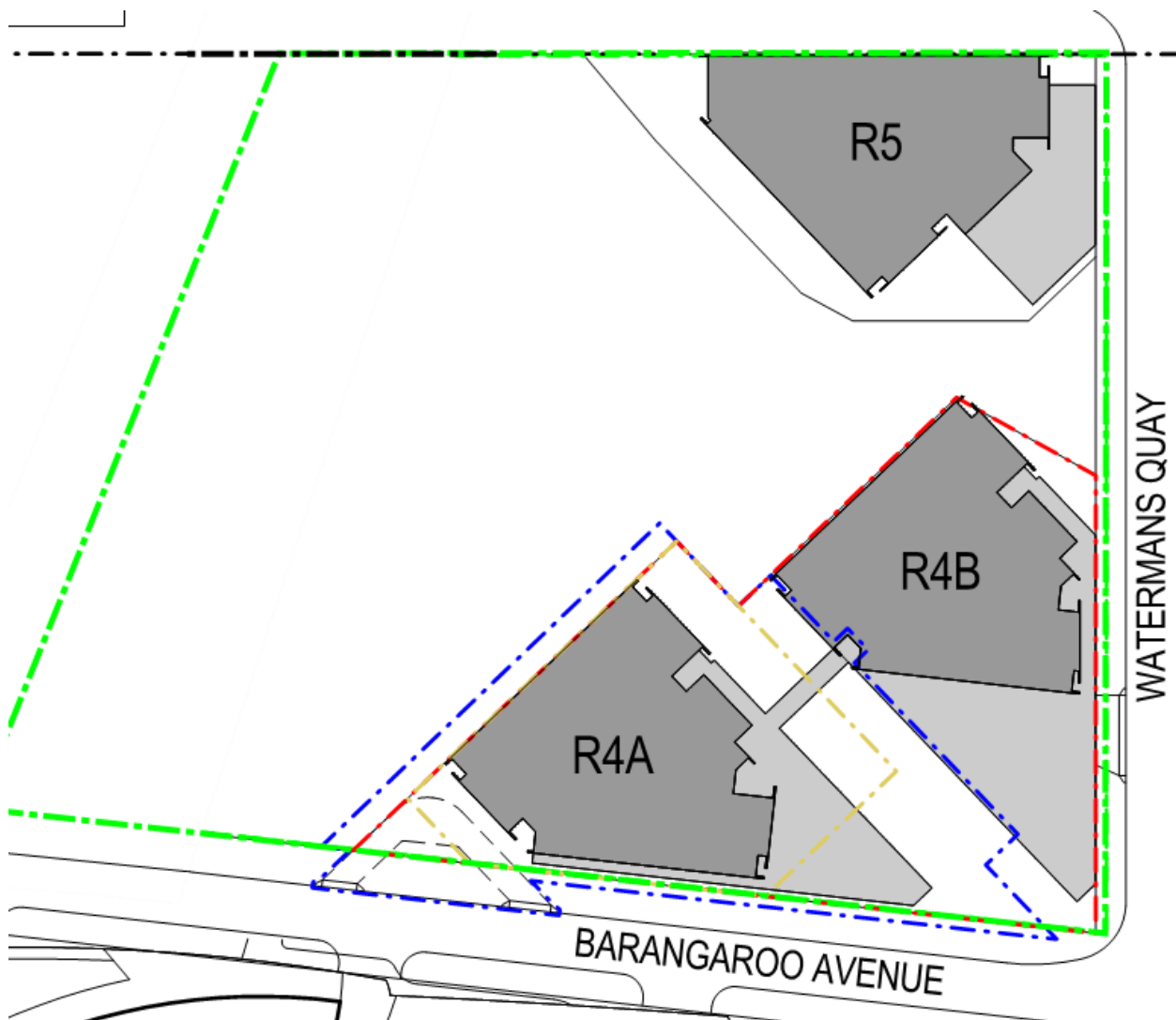


Figure 1: R4A Residential Building Development Application Aerial Site Location Plan

1.3 Current Legislation

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is the version that is in place at the time of the application to the Certifying authority for the Construction Certificate.

2.0 Building Assessment Data

Summary of Construction Determination: -

Building R4A	
Classification	2, 6, 9b
Number of Storeys Contained	77
Rise In Storeys	72
Type of Construction	A
Effective Height (m)	>50m

Building R4A and the proposed basement, Buildings R4B and R5 are considered one building under the deemed to satisfy provisions of the BCA. It is proposed to assess Building R4A as a separate building to the basement and Buildings R4B and R5. This will be documented as part of the fire engineering and is similar to the strategy adopted for Barangaroo South.

3.0 Structural Provisions

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided.

4.0 Fire Resistance

The buildings should be constructed generally in accordance with Table 3 of Specification C1.1 of the Building Code of Australia 2015. The building is required to be Type A Construction.

The building has been assessed on the basis of the following fire separation/ compartmentation within the development:

- Bounding construction to the sole occupancy units of 90 minutes;
- Separation between the basement and the residential/ retail portions of 120 minutes;
- Fire compartmentation of the building at each floor level;
- Fire separation between the retail and the remainder of the building by 180 minutes; and
- Fire separation between 2 and the remainder of the building by 120 minutes.

Fire resistance levels (FRLs) for building structural members are as follows:

- Retail Portions 180 minutes
- Gym/Pool portions 120 minutes
- Residential levels 90 minutes

The following reductions in FRL's are proposed. These items are to be assessed as part of the alternate solution to BCA Performance Requirements CP1 and CP2:

- Reduction of fire rating to ground floor retail to 2 hours in lieu of 3 hours. This includes the following:
 - Fire separation between the retail and residential portions on the ground floor.
 - Fire separation between the retail ground floor and the residential storeys above.
- Reduction of structural adequacy to 60 minutes in lieu of 90 minutes for floor slabs in wet areas.

4.1 Protection of Openings

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

1. Any external opening within 3m of the fire source feature protected by -/60/- fire rated construction, or externally located wall wetting sprinklers, or an alternate solution be provided to verify CP2 of the BCA.
2. Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving the FRL applicable to the classification (refer above).
3. Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving the FRL applicable to the classification (refer above); (or 120/120/120 where it is a room such as a substation). This applies to doors serving as horizontal exits.
4. Self-closing -/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).
5. -/60/- fire doors to openings in fire isolated lift shafts that comply with AS 1735.11 and are set to remain closed except when discharging or receiving passengers, goods or vehicles

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

Where non-compliances with the above occur, these will be addressed on a performance basis to BCA Performance Requirements CP2 and CP8.

Fire source feature is defined as;

- (a) *The far boundary of a road, river, lake or the like adjoining an allotment,*
- (b) *The side or rear boundary of the allotment,*
- (c) *The external wall of another building on the allotment which is not a class 10 building.*

4.2 Public Corridors: Class 2 and 3 Buildings

Public corridors exceeding 40m in length to be divided into intervals of not more than 40m by smoke proof walls.

4.3 Passive Fire Protection

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Lift motor rooms;
- Emergency power supply;
- Emergency generators;

- Electricity supply;
- Boilers or batteries;
- Hydrant Pump rooms; and
- Sprinkler Pump Rooms.

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

4.4 Fire Hazard Properties

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to specification C1.10 of the Building Code of Australia.

5.0 Egress

The egress provisions from the proposed building are provided by:

- Fire isolated stairways; and
- External perimeter doorways.

Other detailing issues that will need to be addressed include:

- Door hardware;
- Exit door operation;
- Stair construction;
- Handrail and balustrade construction;
- Details of separation of rising & descending stairs;
- Discharge from the Fire Isolated Exits; and
- Details of the egress provisions to the road.

5.1 Exit Travel Distances

Based on the locations of the proposed exits, the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would generally be satisfied for the buildings.

The travel distances to exits should not exceed the following under the deemed to satisfy provisions:

Retail, Gym/Pool Portions:

- 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- Exits shall be located to not be more than 60m apart and not closer than 9m.

Residential Portions:

- 6m from an exit or from a point of choice;
- 20m from a single exit at the level of egress to a road or open space; and
- Alternate exits not more than 45m apart.

The following areas exceed the maximum allowable travel distance:

Podium

- Travel distance to a point of choice of up to 30m in lieu of 20m.

Plant Areas

- Travel distance to a point of choice of up to 30m in lieu of 20m.

Distance between alternative exits

- Distance between alternative exits up to 80m in lieu of 60m on plant room level

These items are to be assessed as part of the alternate solution to BCA Performance Requirements DP4 and EP2.2.

5.2 Dimensions of Exits

Minimum dimensions of 1000mm in width and 2000mm height to be provided within exits, with the paths of travel to exits also requiring a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657 in which case a 600mm clear width is required).

Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e minimum 870 mm doors).

5.3 Fire Isolated Exits

Each fire-isolated stairway or fire-isolated ramp must provide independent egress from each storey served and discharge directly, or by way of its own fire-isolated passageway to:

- A road or open space; or
- To a point within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter; and from which an unimpeded path of travel, not further than 20 m, is available to a road or open space; or
- Into a covered area that adjoins a road or open space, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m and provides an unimpeded path of travel from the point of discharge to the road or open space of not more than 6 m.

Where a path of travel from the point of discharge of a fire-isolated exit necessitates passing within 6m of any part of an external wall of the same building, measured horizontally at right angles to the path of travel, that part of the wall must have an FRL of not less than 60/60/60 and any openings protected internally in accordance with C3.4, for a distance of 3 m above or below, as appropriate, the level of the path of travel, or for the height of the wall, whichever is the lesser.

Exits are currently shown to discharge to the road.

5.4 Balustrading and Handrail

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

Where it is possible to fall more than 4m to the finished floor below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing.

Any windows with a sill height of less than 1.7m in bedrooms or 865mm in all other cases with a fall of more than 2m for windows, 4m for all other cases, openings are to be restricted or a protective barrier that does not allow a 125mm sphere to pass through.

Handrails should generally be provided at a minimum height of 865mm alongside of all ramps and stairs.

The main public stairs and ramps should be designed in accordance with the requirements of AS1428.1 for persons with disabilities. This requires a handrail on each side of the stair and ramp and for the handrail to extend approximately 550mm – 600mm past the last tread / end of ramp.

6.0 Access for Persons with a Disability

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2015. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

The design would generally comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

Where the main public entrance is via a ramp, tactile indicators shall be provided in accordance with AS 1428.4 at the top and bottom. Parking shall be provided for people with disabilities in accordance with Clause D3.5 of the BCA. Facilities services and features of the building accessible to people with disabilities shall be identified by signage complying with Clause D3.6 of the BCA.

General

Access to be provided to and within the building pursuant to AS1428.1-2009 as follows:

- Via the principle public entry and at least 50% of all other entrances;
- From designated car parking spaces for the use of occupants with a disability;
- From another accessible building connected by a pedestrian link; and
- All areas used by the public.

Note that entrances that are not accessible are to be located within 50m of an entrance that is accessible.

Class 2 Residential

All common areas including entrance lobbies, pools, lounge areas etc. are required to be accessible and comply with the requirements of AS 1428.1-2009. While no Sole Occupancy Units

are required to be accessible under the provisions of the BCA, access is to be provided to each Sole Occupancy Unit. This includes the circulation space requirements compliant with AS 1428.1-2009 to the outside of the door and sufficient space to do a 180 degree turn at the end of a dead end corridor.

Note all garbage chutes, mail areas etc. are required to be accessible.

Class 6 & 9b Retail, Food & Beverage, Terraces, Gaming & Function

Access is required to and within the retail, food and beverage tenancies to all areas that are normally used by the occupants. This includes level access to terraces.

7.0 Fire Services & Equipment

The following fire services will need to be provided throughout the building:

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999, AS 2118.6-1995 throughout the building;
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005;
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005;
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001;
- Sound System & Intercom System for Emergency Purposes in accordance with AS 1670.4-2004. The sound systems and intercom systems for emergency purposes do not comply as the speech intelligibility (STI) requirement of ≥ 0.5 is not achieved in the bathrooms and balconies of the sole-occupancy units and the plant rooms. This is to be assessed as part of the alternate solution to BCA Performance Requirement EP4.3; and
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1-2005.

A Fire Control Room shall be provided in accordance with Clause E1.8 of the BCA. The fire control room is located within the basement and does not have an entry directly off the main entrance. This is to be assessed as part of the alternate solution to BCA Performance Requirement EP1.6.

7.1 Fire Hydrants

A system of Fire Hydrants is required to be provided to BCA Clause E1.3 and AS 2419.1-2005. We will reply upon design certification from a Hydraulic Consultant at the Construction Certificate stage.

A booster assembly is required to be provided as part of the fire hydrant requirements. The booster is required to be located attached to the building at the main entry. If remote from the building, it is to be located at the main vehicle entry and within sight of the main entry of the building, within 20m of a hardstand area.

Fire hydrants are to be provided within fire isolated stairs/within 4.0m of required exits.

The following deviations are proposed to be assessed as part of the alternate solution to BCA Performance Requirement EP1.3:

- The hydrant booster assembly is not within sight of the main building entry; and

- The fire rated protection around the booster assembly does not extend 2m on each side of and 3m above the upper hose connections in accordance with AS 2419.1-2005.

7.2 Fire Hose Reels

A Fire Hose Reel System is required except to the Class 2 portions to BCA Clause E1.4 and AS2441.

Hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length.

Please note that fire hose reel coverage cannot pass through fire or smoke doors.

7.3 Automatic Sprinkler Protection

An Automatic Fire Suppression System is required throughout the building to Specification E1.5 and AS2118.1-1999.

An occupant warning system that is triggered upon activation of the sprinkler system should be provided in accordance with BCA Specification E1.5.

7.4 Portable Fire Extinguishers

Portable fire extinguishers are required to be installed in accordance with Table E1.6 of the BCA and AS 2444-2001. In addition, extinguishers are to be provided to the class 2 portions of the building in accordance with the below:

- an ABE type fire extinguisher is to be installed with a minimum size of 2.5 kg; and
- extinguishers are to be distributed outside a sole-occupancy unit
 - (a) to serve only the storey at which they are located; and
 - (b) so that the travel distance from the entrance doorway of any sole-occupancy unit to the nearest fire extinguisher is not more than 10 m.

8.0 Ventilation and Smoke Hazard Management

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Zone Smoke Control to the non-residential portions in accordance with the requirements of AS/NZS 1668.1-1998. Zone smoke control is not proposed within the podium areas. This is to be assessed as part of the alternate solution to BCA Performance Requirement EP2.2.
- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-1998;
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2004 to common areas and AS 3786-1993
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-1998

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within the fire control room. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 of the Building Code of Australia and AS 1668 and AS/NZS 3666.1.

9.0 Lift Services

The passenger lifts to be installed are to be: -

- fitted with warning signs, fire service controls in accordance with Clauses E3.3, E3.7, E3.9 and E3.10 of the BCA;
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600mm wide, 2000mm long and 1400mm high;
- At least two emergency lifts with stretcher facilities in accordance with part E3.4 of the BCA. The two emergency lifts shall be located in separate shafts. These lifts are to serve all storeys that are served by passenger lifts;
- Be provided with the following: -
 - A handrail in accordance with AS 1735.12;
 - Minimum internal floor dimensions as specified in Table E3.6b of the BCA i.e. 1,400mm x 1,600mm;
 - Minimum clear door opening complying with AS 1735.12;
 - Passenger protection system complying with AS 1735.12;
 - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12;
 - Lighting in accordance with AS 1735.12;
 - Automatic audible information within the lift car to identify the level each time the car stops; and
 - Audible and visual indication at each lift landing to indicate the arrival of the lift car.

10.0 Sanitary Facilities

The sanitary & other facilities within the development would generally consist of: -

Class 2 (Residential) Portions:

Each sole occupancy unit is provided with:

- A kitchen sink and facilities for preparation and cooking of food; and
- A bath or shower; and
- A closet pan and wash basin; and
- Clothes washing facilities (tub and space for washing machine); and
- Clothes drying facilities (either 7.5m of clothes line or space for a dryer).

A closet pan and washbasin is to be provided that is not accessible through a sole occupancy unit.

Class 6 & 9b Portions:

Sanitary facilities to these portions will be provided in accordance with the requirements of the BCA for their respective areas.

Please note the Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009. Where one accessible facility is provided on a storey, one may be deducted from the total required for the storey, not the total for each type of classification on the storey.

An accessible sanitary facility compliant with AS 1428.1-2009 is required to be provided to all levels that are required to be accessible and contain sanitary facilities. In addition, an ambulant facility for each sex that is compliant with AS 1428.1-2009 is also required to be provided at each bank of sanitary facilities that contain an accessible facility. Where multiple banks of sanitary

facilities are provided to a storey, an accessible facility is required to be provided to at least 50% of the banks on that floor.

11.0 Sound Transmission & Insulation

The sound transmission and insulation requirements for the Class 2 and 3 portions shall be provided in accordance with Part F5 of the BCA 2014 for the following elements:

- A floor separating sole-occupancy units or a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification:
 - $R_w + C_{tr}$ (airborne) not less than 50; and
 - $L_{n,w} + C_I$ (impact) not more than 62
- A wall separating sole-occupancy units
 - $R_w + C_{tr}$ (airborne) not less than 50.
- A wall separating a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification
 - R_w (airborne) not less than 50.
- A wall separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining unit; or a sole-occupancy unit from a plant room or lift shaft.
 - R_w (airborne) not less than 50; and
 - Discontinuous Construction
- A door assembly separating a sole-occupancy unit from a stairway, public corridor, public lobby or the like,
 - R_w not less than 30.
- All walls required to have a impact sound insulation rating are of discontinuous construction

12.0 Energy Efficiency

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
 - Building Fabric
 - Glazing
 - Building Sealing
 - Air Conditioning & Ventilation Systems
 - Artificial Lighting & Power
 - Hot Water Supply
2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

Appendix A - Design Documentation

The following documentation was used in the assessment and preparation of this report: -

Drawing No.	Title
AD2000000/3	R4A GROUND FLOOR PLAN
AD2005000/3	R4A PODIUM 0 FLOOR PLAN
AD2010000/3	R4A PODIUM 1 FLOOR PLAN
AD2020000/3	R4A PODIUM 2 FLOOR PLAN
AD3040000/5	R4A LEVEL 4 – 19 HIGH FLOOR PLAN
AD3200000/5	R4A LEVEL 20 PLANT ROOM FLOOR PLAN
AD7033304/5	R4A PREMIUM LEVEL 33 – 44 – APARTMENT 04 FLOOR PLAN & RCP
AD3520000/5	R4A LEVEL 52 PLANT ROOM FLOOR PLAN
AD3530000/5	R4A LEVEL 53 – 60 LUXURY FLOOR PLAN
AD3680000/4	R4A LEVEL 68 PENTHOUSE FLOOR PLAN
AD3690000/4	R4A LEVEL 69 PENTHOUSE FLOOR PLAN
AD3700000/4	R4A LEVEL 70 ROOF FLOOR PLAN
BR4A_ASD_PA1_0002/16	R4A SITE PLAN
BR4A_ASD_PA1_4001/16	R4A ELEVATION NORTH-EAST (PARK)
BR4A_ASD_PA1_4002/16	R4A ELEVATION WEST (BARANGAROO AVE)
BR4A_ASD_PA1_4003/16	R4A ELEVATION SOUTH-EAST (LIFT LOBBY)
BR4A_ASD_PA1_4004/16	R4A ELEVATION SOUTH (WATERMANS QUAY)
BR4A_ASD_PA1_5001/16	R4A OVERALL SECTION AA
BR4A_ASD_PA1_5002/16	R4A OVERALL SECTION BB

Appendix B - Draft Fire Safety Schedule

Essential Fire Safety Measures	Standard of Performance
1. Access Panels, Doors and Hoppers	BCA Clause C3.13
2. Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
3. Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2004
4. Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.6 – 1995 (Combined sprinkler & hydrant)
5. Building Occupant Warning System activated by the Sprinkler System	BCA Spec. E1.5 & AS 1670 – 2004
6. Emergency Lifts	BCA Clause E3.4 & AS 1735.2 – 2001
7. Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
8. EWIS	BCA Clause E4.9 & AS 1670.4 - 2004
9. Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
10. Exit Signs (non-illuminated)	BCA Clause E4.7
11. Fire Control Room	BCA Spec. E1.8
12. Fire Dampers	BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990
13. Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2005
14. Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
15. Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
16. Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
17. Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
18. Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
19. Paths of Travel	EP&A Reg 2000 Clause 186
20. Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
21. Pressurising Systems	BCA Clause E2.2 & AS/NZS 1668.1 – 1998
22. Self-Closing Fire Hoppers	BCA Clause C3.13 & AS 1530.4 – 1997
23. Smoke and Heat Vents	BCA Spec. E2.2c & AS 2665 – 2001
24. Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 1998
25. Smoke and/or Heat Alarm System	BCA Spec. E2.2a & AS 3786 – 1993
26. Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause D2.23, E3.3

Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2015:

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	Class of building — FRL: (in minutes)			
<i>Structural adequacy/Integrity/Insulation</i>	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated therein) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is—				
<i>For loadbearing parts—</i>				
less than 1.5 m	90/ 90/ 90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/ 60/ 60	120/ 90/ 90	180/180/120	240/240/180
3 m or more	90/ 60/ 30	120/ 60/ 30	180/120/ 90	240/180/ 90
<i>For non-loadbearing parts—</i>				
less than 1.5 m	—/ 90/ 90	—/120/120	—/180/180	—/240/240
1.5 to less than 3 m	—/ 60/ 60	—/ 90/ 90	—/180/120	—/240/180
3 m or more	—/—/—	—/—/—	—/—/—	—/—/—
EXTERNAL COLUMN not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> to which it is exposed is—				
less than 3 m	90/—/—	120/—/—	180/—/—	240/—/—
3 m or more	—/—/—	—/—/—	—/—/—	—/—/—
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
<i>Fire-resisting lift and stair shafts—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Non-loadbearing</i>	—/ 90/ 90	—/120/120	—/120/120	—/120/120
<i>Bounding public corridors, public lobbies and the like—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
<i>Between or bounding sole-occupancy units—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
<i>Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
<i>Non-loadbearing</i>	—/ 90/ 90	—/ 90/ 90	—/120/120	—/120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—				
	90/—/—	120/—/—	180/—/—	240/—/—
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

Appendix D - BCA Clause by Clause Assessment

Clause	Description	Comment	Status
PART C – FIRE RESISTANCE			
C1.1	Type of construction required	The project is required to be of Type A Construction. Refer Appendix D for required FRLs. The rationalisation of these FRLs is to be assessed by a suitably qualified person to BCA Performance Requirement CP1. Reduction of fire rating is proposed in ground floor and podium level 1 retail to 2 hours. This includes the following areas: - Fire separation between the retail and residential portions and podium level 1 - Fire separation between the retail areas and the residential storeys above. The required fire rated floors and walls bounding the SOU's do not extend to the outer skin of the double façade. it is proposed to reduce the slab thickness in the wet areas, therefore reducing the structural adequacy to 60mins in lieu of 90mins	Complies
C1.5	Two storey Class 2 or 3 buildings	<i>Two storey may be Type C depending on exits.</i>	Not Applicable
C1.7	Open spectator stands and indoor sports stadiums	May be Type C depending on design.	Not Applicable
C1.8	Lightweight construction	Lightweight construction may be used in a wall system to achieve an FRL in accordance with Specification C1.8	To be specified
C1.10	Fire Properties	Hazard Lining, materials and assemblies must comply with Spec C1.10 for:- - Floor Linings - Wall lining and ceiling linings - Air handling ductwork - Lift cars - Attachments to floors, ceilings, internal walls and internal linings of external walls Does not apply to plaster, concrete, ceramic tile (etc)	To be specified
C1.11	Performance of external walls in fire	<i>Panel walls in buildings up to 2 storeys</i>	Not Applicable
C2.2	General floor area and volume limitations	Clause does not apply to a carpark provided with a sprinkler system or class 2 portions.	Not Applicable
C2.3 & 2.4	Large isolated buildings (Perimeter Vehicular Access)	Building is not considered large isolated as it has no class 9a portions	Not Applicable

BCA ASSESSMENT REPORT
One Sydney Harbour
Residential Building R4A

Clause	Description	Comment	Status
(Category 2)			
C2.5	Class 9a buildings	Building has no class 9a portions	Not Applicable
C2.6	Vertical separation of openings in external walls	Building is proposed to be sprinkler protected throughout.	Not Applicable
C2.7	Separation by fire walls	Reduction of fire rating is proposed in ground floor and podium level 1 retail to 2 hours. This includes the following areas: - Fire separation between the retail and residential portions and podium level 1 - Fire separation between the retail areas and the residential storeys above. - Separation between Buildings R4A and R4B is proposed to be assessed on a performance basis.	To be specified as part of Alternate Solution report
C2.8	Separation of classifications in the same storey	Reduction of fire rating is proposed in ground floor and podium level 1 retail to 2 hours. This includes the following areas: - Fire separation between the retail and residential portions and podium level 1 - Fire separation between the retail areas and the residential storeys above.	To be specified as part of Alternate Solution report
C2.9	Separation of classifications in different storeys	Reduction of fire rating is proposed in ground floor and podium level 1 retail to 2 hours. This includes the following areas: - Fire separation between the retail and residential portions and podium level 1 - Fire separation between the retail areas and the residential storeys above.	To be specified as part of Alternate Solution report
C2.10	Separation of lift shafts	Lifts to building to be enclosed by a shaft with an FRL of 90/90/90 to residential portions and 120/120/120 to carpark portions	Complies
C2.11	Stairways and lifts in one shaft	Stairways and lifts that are required to be located in fire resisting shafts are not proposed to be located within the same shaft. stairways and lifts proposed to be in separate shafts	not applicable
C2.12	Separation of equipment	Emergency generators sustaining equipment operating in emergency mode lift motors and control rooms, central smoke control plant are to be separated from the remainder of the building by construction having an FRL of the building by construction having an FRL of not less than 120/120/120. These services are not to be located in the same enclosure. Doors to enclosures are to be - /60/60 self-closing fire doors.	separation of the boiler room and sole occupancy units is required to have an FRL of 120/120/120
C2.13	Electricity supply	Electricity substation and main switchboard are	To be specified

Clause	Description	Comment	Status
	system	to be located in separate enclosures and separated from the rest of the building. The enclosures are to have an FRL of 120/120/120 with doorways protected by - /60/30 self-closing fire doors.	
C2.14	Public corridors in Class 2 and 3 buildings	Corridors to be limited to 40 m compartments. No corridors proposed exceed 40m in length.	Complies
C3.2	Protection of openings in external walls.	Openings in an external wall that is required to have an FRL must, if the distance between the opening and the fire-source feature to which it is exposed is less than— i. 3 m from a side or rear boundary of the allotment; or ii. 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or iii. 6 m from another building on the allotment that is not Class 10, be protected in accordance with C3.4 and if wall-wetting sprinklers are used, they are located externally. ▪ Separation between Buildings R4A and R4B is proposed to be assessed on a performance basis.	To be specified as part of Alternate Solution report
C3.3	Separation of external walls and openings in different fire compartments	Does not apply to openings in different sole occupancy units/lobbys etc. within the same fire compartment.	Not Applicable
C3.4	Acceptable methods of protection	Openings that require protection are to be protected by • Doorways -Internal or external wall-wetting sprinklers used with doors that are self-closing or automatic closing; or -Automatic or self-closing – /60/30 fire doors • Windows -Internal or external wall-wetting sprinklers used with windows that are automatic closing or permanently fixed closed; or - /60/ - fire windows that are automatic closing or permanently fixed in the close position ; or - /60/ - automatic closing fire shutters. • Other openings -Excluding voids, internal or external wall-wetting sprinklers; or -Construction having an FRL of not less than - /60/ -	To be specified, To be specified as part of Alternate Solution report

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One Sydney Harbour
Residential Building R4A

Clause	Description	Comment	Status
		Separation between Buildings R4A and R4B is proposed to be assessed on a performance basis.	
C3.5	Doorways in fire walls	No horizontal exits proposed.	Not Applicable
C3.6	Sliding fire doors	No sliding fire doors proposed.	Not Applicable
C3.7	Protection of doorways in horizontal exits	No horizontal exits proposed.	To be specified
C3.8	Openings in fire-isolated exits	Doorways leading into the isolated exits and do not open to road or open space are to be - /60/30 fire doors that are self-closing or automatic closing where the doors are automatic closing, they are to close on activation of fire smoke detection and alarm system and sprinkler system. Detectors to activate automatic closing function are to be located within 1.5m of the approach side of the door. No windows proposed to fire isolated stairs.	To be specified
C3.9	Service penetrations in fire-isolated exits	Fire isolated exits must not be penetrated by any services except: - Electrical wiring that is associated with the lighting detection or pressurisation of the exit, security or surveillance of the exit, an intercommunication system or the monitoring of hydrant or sprinkler isolating valves; - Water supply pipes for fire services; - Ducting that does not open into any other part of the building and, where it passes through another part of the building, as an FRL of not less than – /120/60. All other services are to be separated out from the fire stair by construction achieving an FRL of 120/120/120.	To be specified
C3.10	Openings in fire isolated lift shafts	All lift shafts are required to be fire isolated except Lift 4 as it does not serve more than three storeys. Doorways in a fire isolated lift shaft 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. Lift indicator panels in the wall of a fire-isolated lift shaft must be backed by construction having an FRL of not less than –/60/60 if it exceeds 35,000mm² in area.	To be specified
C3.11	Bounding construction: Class 2, 3 and 4 buildings	Bounding construction with the FRL required by Spec C1.1 (90/90/90 for loadbearing elements, - /60/60 for non-loadbearing elements) is to be provided around all sole occupancy units. Doorways to the sole occupancy units are to be protected by a self-closing fire door achieving an FRL of -/60/30. Where a lobby is provided separating two	please refer to the marked up compartmentation plans which outlines areas that do not have the required FRLs.

Clause	Description	Comment	Status
		apartments, those apartments are considered as separate sole occupancy units with compliant bounding construction between them.	
C3.12	Openings in floors and ceilings for services	Where a service passes through a floor that is required to have an FRL with respect to integrity and insulation, or a ceiling required to have a resistance to the incipient spread of fire, the service must be installed in a shaft complying with Specification C1.1, or in accordance with C3.15. Penetrations are to be sealed with a tested system, with the installation on site matching exactly the prototype tested. Please provide a copy of the test reports for the systems used. Where a service passes through a floor which is required to be protected by a fire-protective covering, the penetration must not reduce the fire performance of the covering.	Complies, as per fire separation legend
C3.13	Openings in shafts	An opening in a wall which provides access to a ventilating, pipe, garbage or other service shaft must be protected by a self-closing –/60/30 fire door or hopper, an access panel having an FRL of not less than –/60/30, or, if it is in 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, if the shaft is a garbage shaft, a door or hopper of non-combustible construction.	To be specified
PART D - ACCESS AND EGRESS			
D1.2	Number of exits required	Two exits required and provided from each storey except for roof which is not considered a storey and is provided with one exit.	Complies
D1.3	When fire-isolated exits are required	All exits are required to be fire isolated as they connect more than 2 storeys below ground and three storeys above ground, with the exception of the stairs that connect the mail room to level 1. Fire stairs are to be separated from the remainder of the building by construction achieving the following FRL's: - Residential: 90/90/90 - Carpark: 120/120/120	Complies
D1.4	Exit travel distances	Extended travel distances as follows: Podium - Travel distance to a point of choice of up to 30m in lieu of 20m Plant Areas - Travel distance to a point of choice of up to 30m in lieu of 20m	Does Not Comply, addresses as part of the Alternate Solution Report
D1.5	Distance between alternative exits	Distance between alternative exits up to 80m in lieu of 60m on plant room level	Does Not Comply, addresses as part of the Alternate Solution Report
D1.6	Dimensions of exits	Each exit is to have a minimum clear width of	Complies

Clause	Description	Comment	Status
	and paths of travel to exits	1,000mm. Clear width at doorways is to be a minimum of 750mm (clear of door leaf). Exit is to have an unobstructed clear height of 2m (1.8m at doorways).	
D1.7	Travel via fire-isolated exits	Each <u>fire-isolated stairway</u> or <u>fire-isolated ramp</u> must provide independent egress from each <u>storey</u> served and discharge directly, or by way of its own <u>fire-isolated passageway</u> to: - A road or <u>open space</u>; or - To a point within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter; and from which an unimpeded path of travel, not further than 20 m, is available to a road or <u>open space</u>; or - Into a covered area that adjoins a road or <u>open space</u>, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout, including the perimeter openings, of not less than 3 m and provides an unimpeded path of travel from the point of discharge to the road or <u>open space</u> of not more than 6 m. Fire isolated stairway opens directly onto the MSR room in Lieu of having an air lock.	Does Not Comply, addresses as part of the Alternate Solution Report
D1.8	External stairways or ramps in lieu of fire-isolated exits	No external stairways or ramps proposed in lieu of fire isolated exits.	Not Applicable
D1.9	Travel by non-fire-isolated stairways or ramps	travel distance via non fire isolated stairs does not exceed 80m	Complies
D1.10	Discharge from exits	Exits Not obstructed	Complies
D1.11	Horizontal exits	No Horizontal exits proposed	Not Applicable
D1.12	Non-required stairways, ramps or escalators	Internal retail stairs connect two storeys in a sprinkler protected building	Complies
D1.16	Plant rooms and lift motor rooms: Concession	A ladder may be used in lieu of a stairway to provide egress from a plant room with a floor area of not more than 100 m², or all but one point of egress from a plant room or a lift machine room with a floor area of not more than 200 m². The ladder may form part of an exit provided that in the case of a fire-isolated stairway it is contained within the shaft, or may discharge within a storey in which case it must be considered as forming part of the path of travel.	To be specified

Clause	Description	Comment	Status
		The ladder must comply with AS 1657 for a plant room and AS 1735.2 for a lift machine room.	
D2.2	Fire-isolated stairways and ramps	A stairway or ramp (including any landings) that is required to be within a fire-resisting shaft must be constructed of non-combustible materials and so that if there is local failure it will not cause structural damage to, or impair the fire-resistance of, the shaft	Complies
D2.3	Non-fire-isolated stairways and ramps	Required stairs and ramps (including landings and any supporting building elements) which are not required to be within a fire-resisting shaft, must be constructed according to Clause D2.2, or of reinforced or prestressed concrete, steel in no part less than 6 mm thick, or timber that has a finished thickness of not less than 44 mm, has an average density of not less than 800 kg/m ³ at a moisture content of 12%; and has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue.	To be specified
D2.4	Separation of rising and descending stair flights	Fire isolated stairways that serve levels both above and below ground are to be separated so that there is no direct connection between a flight rising from a storey below the lowest level of access to a road or open space and a flight descending from a storey above that level. The separation that separates or is common to the rising and descending flights must be non-combustible and smoke proof in accordance with Clause 2 of Specification C2.5. The stairs rising from the basement and the stairs descending from the tower above are separated and discharge separately into the fire isolated passage leading to road or open space.	Complies
D2.5	Open access ramps and balconies	No open access ramps or balconies proposed as part of smoke hazard management.	Not Applicable
D2.6	Smoke lobbies	No smoke lobbies currently proposed as part of smoke hazard management strategy.	Not Applicable
D2.7	Installations in exits and paths of travel	Access to service shafts and services other than to fire-fighting or detection equipment must not be provided from a fire-isolated stairway, fire-isolated passageway or fire-isolated ramp. An opening to any chute or duct intended to convey hot products of combustion from a boiler, incinerator, fireplace or the like, must not be located in any part of a required exit or any corridor, hallway, lobby or the like leading to a required exit. Gas or other fuel services must not be installed	Complies

Clause	Description	Comment	Status
		in a required exit. Services or equipment comprising of electricity meters, distribution boards or ducts, central telecommunications distribution boards or equipment, electrical motors or other motors serving equipment in the building may be installed in a required exit, except for fire-isolated exits or in any corridor, hallway, lobby or the like leading to a required exit if the services or equipment are enclosed by non-combustible construction or a fire-protective covering with doorways or openings suitably sealed against smoke spreading from the enclosure. Electrical wiring may be installed in a fire-isolated exit if the wiring is associated with a lighting, detection, or pressurisation system serving the exit, a security, surveillance or management system serving the exit, an intercommunication system or an audible or visual alarm system in accordance with D2.22 or the monitoring of hydrant or sprinkler isolating valves.	
D2.8	Enclosure of space under stairs and ramps	Space under stairways not proposed to be enclosed by cupboard or the like. Note the area under fire isolated stairways is not permitted to be enclosed to form a cupboard or the like within the same shaft.	To be specified
D2.9	Width of stairways	1m clear width provided	Complies
D2.10	Pedestrian ramps	A fire-isolated ramp may be substituted for a fire-isolated stairway if the construction enclosing the ramp and the width and ceiling height comply with the requirements for a fire-isolated stairway. The floor surface of a ramp must have a non-slip finish. No fire isolated ramps currently proposed.	Not Applicable
D2.11	Fire-isolated passageways	The enclosing construction of a fire-isolated passageway must have an FRL when tested for a fire outside the passageway in another part of the building of, if the passageway discharges from a fire-isolated stairway or ramp, not less than that required for the stairway or ramp shaft (ie.e 120/120/120 to carpark and 90/90/90 to residential portions); or, in any other case — not less than 60/60/60. The top construction of a fire-isolated passageway need not have an FRL if the walls of the fire-isolated passageway extend to the underside of a non-combustible roof covering, or a ceiling having a resistance to the incipient spread of fire of not less than 60 minutes separating the roof space or ceiling space in all areas surrounding the passageway within the	To be specified

Clause	Description	Comment	Status
		fire compartment To be specified	
D2.12	Roof as open space	Roof not proposed to be considered as open space	Not Applicable
D2.13	Treads and risers	A stairway must have not more than 18 nor less than 2 risers in each flight and risers are not to have any openings that would allow a 125 mm sphere to pass through between the treads. In the case of a required stairway, no winders are to be provided in lieu of a landing. Min (mm) Max (mm) Going (G) 250 355 Riser (R) 115 190 2R+G 550 700	To be specified
D2.14	Landings	In a stairway landings having a maximum gradient of 1:50 may be used in any building to limit the number of risers in each flight and each landing must be not less than 750 mm long, and where this involves a change in direction, the length is measured 500 mm from the inside edge of the landing Landings are to have a non-slip finish throughout or an adequate non-skid strip near the edge of the landing where it leads to a flight below	To be specified
D2.15	Thresholds	The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the doorway opens to a road or open space, external stair landing or external balcony, and the door sill is not more than 190 mm above the finished surface of the ground, balcony, or the like, to which the doorway opens.	To be specified
D2.16	Balustrades or other barriers	A continuous balustrade or other barrier must be provided to an area not bounded by a wall if its level above the surface beneath, is more than 4 m where it is possible for a person to fall through an openable window; or 1 m in any other case. For a balustrade or other barrier in fire-isolated stairways, fire-isolated ramps and other areas used primarily for emergency purposes, the space between balusters or the width of any opening (including any openable window or panel) must not be more than 300 mm or, where rails are used, a rail must be provided at a height of not more than 150 mm above the nosings of the stair treads or the floor of the landing, balcony or the like and the space	To be specified

Clause	Description	Comment	Status
		between rails must not be more than 460 mm. Openings in any other balustrade must be constructed in accordance with the following must not permit a 125 mm sphere to pass through it and for stairs the space is measured above the nosings. For floors more than 4 m above the surface beneath, any horizontal or near horizontal elements between 150 mm and 760 mm above the floor must not facilitate climbing. The height of a balustrade must be 865 mm above the nosings of the stair treads or the floor of a ramp or other path of travel with a gradient not less than 1:20. The height must be not less than 1 m above the floor of any access path, balcony, landing or the like where the path of travel has a gradient less than 1:20, 865 mm above the floor of a landing to a stair or ramp where the balustrade or other barrier is provided along the inside edge of the landing and does not exceed a length of 500 mm or 865 mm above the floor beneath an openable window. A transition zone may be incorporated where the balustrade or other barrier height changes from 865 mm on the stair flight or ramp to 1 m at the landing	
D2.17	Handrails	Handrails must be located along at least one side of the ramp or flight or along each side if the total width of the stairway or ramp is 2 m or more and not more than 2 m apart in the case of intermediate handrails. Note that AS 1428.1 requires general access stairs to be provided with handrails on both sides of the stair. The handrail is to be fixed at a height of not less than 865 mm measured above the nosings of stair treads and the floor surface of the ramp, landing, or the like; and be continuous between stair flight landings and have no obstruction on or above them that will tend to break a hand-hold. Handrails required to assist people with disabilities must be provided in accordance with D3.3.	To be specified
D2.18	Fixed platforms, walkways, stairways and ladders	A fixed platform, walkway, stairway, ladder and any going and riser, landing, handrail, balustrade or other barrier attached thereto may comply with AS 1657 in lieu of D2.13, D2.14, D2.16 and D2.17 if it only serves machinery rooms, boiler houses, lift-machine rooms, plant-rooms, and the like.	To be specified
D2.19	Doorways and doors	A doorway serving as a required exit or forming part of a required exit must not be fitted with a revolving door, a roller shutter, tilt-up door or a sliding door unless the sliding	Complies, hardware and operation to be specified

Clause	Description	Comment	Status
		door leads directly to a road or open space and the door is able to be opened manually under a force of not more than 110 N. If fitted with a door which is power-operated, it must be able to be opened manually under a force of not more than 110 N if there is a malfunction or failure of the power source; and if it leads directly to a road or open space it must open automatically if there is a power failure to the door or on the activation of a fire or smoke alarm anywhere in the fire compartment served by the door. All egress doors currently shown to be swinging doors.	
D2.20	Swinging doors	The exit doors from the retail tenancies on the ground floor are proposed to swing against the direction of egress	Does Not Comply, to be addressed in the FER
D2.21	Operation of latch	A door in a required exit, forming part of a required exit or in the path of travel to a required exit must be readily openable without a key from the side of a person seeking egress, by a single hand downward action or pushing action on a single device which is located between 900 mm and 1.1 m from the floor, except if it serves a door within a sole occupancy unit, sanitary compartment, or the like.	To be specified
D2.22	Re-entry from fire-isolated exits	Doors of a fire-isolated exit must not be locked from the inside as the building has an effective height of more than 25m. This requirement does not apply to a door fitted with a fail-safe device that automatically unlocks the door upon the activation of a fire alarm and if, on at least every fourth storey, 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, audible or visual alarm system, operated from within the enclosure is provided near the doors and a sign is fixed adjacent to such doors explaining its purpose and method of operation.	To be specified
NSW D2.101	Doors in path of travel in a place of public entertainment	No entertainment venues proposed.	Not Applicable
D2.23	Signs on doors	A sign, to alert persons that the operation of certain doors must not be impaired, must be installed where it can readily be seen on, or adjacent to, a required fire door providing direct access to a fire-isolated exit or a required smoke door. The sign is to be located on the side of the door that faces a person seeking egress and, if the door is fitted with a device for holding it in the open position, on either the wall adjacent	To be specified

Clause	Description	Comment	Status
		to the doorway or both sides of the door; and for a fire door forming part of a horizontal exit, a smoke door that swings in both directions or a door leading from a fire isolated exit to a road or open space on each side of the door. The must be in capital letters not less than 20 mm high in a colour contrasting with the background and state: - for an automatic door held open by an automatic hold-open device: “ FIRE SAFETY DOOR—DO NOT OBSTRUCT ”; or - for a self-closing door: “ FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN ”; or - for a door discharging from a fire-isolated exit: “FIRE SAFETY DOOR—DO NOT OBSTRUCT”	
D3.1	General building access requirements	Access is required to be provided to the retail/commercial portions of the building to all areas usually used by the occupants. Access is required to be provided to at least one level on which sole occupancy units are located. Access is required to and within carpark portions that contain accessible carparking.	To be specified
D3.2	Access to the buildings	Access provided to all levels by lift.	Complies
D3.3	Parts of buildings to be accessible	Access ramps and lifts have been provided to access all areas in accordance with AS1428.1.	Complies
D3.4	Exemptions	The following areas are not required to be accessible: - 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. (c) Any path of travel providing access only to an area exempted by (a) or (b).	Note
D3.5	Accessible Carparking	Confirm required amount as per the DA, basement works are a separate job	To be specified
D3.6	Signage	Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access or deafness, as appropriate, in accordance with AS 1428.1-2009 must identify each sanitary facility in the retail/commercial portions Signage in accordance with AS 1428.1-2009 must be provided for accessible unisex sanitary facilities to identify if the facility is suitable for left or right handed use and	To be specified

Clause	Description	Comment	Status
		signage to identify an ambulant accessible sanitary facility in accordance with AS 1428.1-2009 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 1428.1-2009 must be provided to direct a person 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 1428.1-2009 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.	
D3.7	Hearing augmentation	No class 9b portions or rooms provided with inbuilt amplification other than for emergency purposes are proposed.	Not Applicable
D3.8	Tactile indicators	For a building required to be accessible, tactile ground surface indicators must be provided to warn people with a vision impairment that they are approaching a public stairway or ramp other than a step ramp and kerb ramp. Tactile ground surface indicators must be Type B indicators in accordance with AS 1428.4. Tactile indicators are not required to fire stairs unless used for general access as well. Where gradients are shallower than 1:20, tactile indicators are not required to be provided.	To be specified

PART E - SERVICES AND EQUIPMENT

E1.3	Fire hydrants (Category 2)	Fire Hydrants required to be provided throughout the development in accordance with Clause E1.3 of the BCA and AS 2419.1-2005. Where internal fire hydrants are provided, they must serve only the storey on which they are located and be located within fire stairs. Location of any supplementary hydrants to be included in Fire Engineering Report. Where the water supply system is taken from a static source, suitable connections and vehicular access must be provided to permit fire brigade personnel to draw water from that source and a fire-service booster connection must be provided adjacent to allow boosting of the system. The hydrant booster facing Hickson road is not within sight of the main building entry.	Does not comply to be addressed in the FER
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Clause	Description	Comment	Status
		The Booster assembly is not provided with radiant heat protection in accordance with AS2419.1-2005 the external fire hydrants are located less than 10m from the building and are not provided with fire protection of 2m either side and 3m above the hydrant.	
E1.4	Fire hose reels	Fire hose reel system to be provided to the Basement to AS2441-2005.	To be specified
E1.5	Sprinklers (Category 2)	An automatic fire suppression system compliant with BCA Spec E1.5 and AS 2118.1-1999 is to be installed throughout the building. The proposed sprinkler system will include the following: · Proprietary FM approved type B monitoring switches are proposed to be used on isolation valves instead of type A switches retrofitted to the valve. · High pressure valves manufactured by Victaulic not covered under AS 4118.1.6-1995 are to be utilised on the high pressure stage of the combined sprinkler / hydrant system. · Use of 15mm (K-factor 8) sprinklers instead of 10mm (K-factor 5.6) sprinklers for residential common lobbies and concealed space protection. · Shower cubicles are not proposed to be provided with sprinkler coverage.	To be specified
E1.6	Portable fire extinguishers	Portable fire extinguishers are to be provided as required to BCA Table E1.6 to AS 2444-2001.	To be specified
E1.8	Fire control centres/rooms (Category 2)	The fire control room is located within the basement level B0 and involves a change in level to a road or open space in excess of 300mm – approximately 3m	Does Not Comply. To be addressed in the FER
E1.9	Fire precautions during construction	Not less than one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each storey adjacent to each required exit or temporary stairway or exit; and, after the building has reached an effective height of 12 m, the required fire hydrants and fire hose reels must be operational in at least every storey that is covered by the roof or the floor structure	Note

Clause	Description	Comment	Status
		above, except the 2 uppermost storeys and any required booster connections must be installed.	
E1.10	Provision for special hazards	No special hazards identified	Not Applicable
E2.2	Smoke hazard management (Category 2)	The following smoke hazard management systems are required throughout the building: Throughout: - Automatic Air Pressurisation to all fire isolated exits to AS/NZS 1668.1-1998 - Automatic Fire Suppression System (Sprinklers) to AS 2118.1-1999 Carpark Portions: - Mechanical ventilation system in accordance with AS 1668.2 must comply with clause 5.5 of AS/NZS 1668.1 except that fans with metal blades suitable for operation at normal temperature may be used and the electrical power and control cabling need not be fire rated. Residential Portions: - Smoke detection and alarm system complying with AS 3786 to be provided within each sole occupancy unit. Smoke detection and alarm system complying with AS 1670.1 to be provided to the public areas in residential portions of the building	To be specified
E3.2 to E3.7	Lifts (Category 2)	Lifts to have dimensions that cater for a stretcher facility (i.e. 600mm wide x 2,000mm long x 1,400mm high). A sign warning against use of lifts in a fire is to be displayed near every call button that reads 'Do not use lifts if there is a fire', with signs in capital letters having the lettering a minimum of 10mm in height and lower case letters with a minimum height of 8mm. Sign is to be incised, inlaid or embossed letters on a metal, wood, plastic or similar plate securely and permanently attached to the wall. At least two emergency lifts are to be provided serving all levels of both towers (i.e. four emergency lifts are required). The emergency lifts are to be separated from the remainder of the building by construction achieving an FRL of not less than 120/120/120 and comply with either AS 1735.2 or Appendix A of AS 1735.1. As the building has an effective height of more than 75m, the emergency lifts are to have a rating of at least 600kg.	To be specified
E4.2 to 4.4	Emergency lighting requirements	Emergency lighting is to be provided throughout the building (except in sole occupancy units). The system of emergency lighting is to comply with AS 2293.1-2005.	To be specified
E4.5 to 4.8	Exit signs	An exit sign must be clearly visible to persons approaching the exit, and must be installed on,	To be specified

Clause	Description	Comment	Status
		above or adjacent to each door to a fire isolated exit or door leading to road or open space. If the exit is not readily apparent to the occupants then exit signs must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a required exit. Note this does not apply to doors from sole occupancy units. An illuminated exit sign is not required to the exit door if a sign which is clearly and legibly labelled on the side of the person seeking egress with the word "EXIT" in capital letters 25 mm high in a colour contrasting with that of the background. Note illuminated directional exit signs are still required. The system of exit signs is to comply with AS 2293.1-2005.	
E4.9	Emergency warning and intercommunication systems	A Sound System and Intercom System for Emergency Purposes complying with AS 1670.4 is to be provided throughout the building. The sound system and intercom system for emergency purposes does not comply as the speech intelligibility (STI) requirement of ≥ 0.5 is not achieved in the bathrooms and balconies of the SOU's and the plant rooms throughout the building.	Does Not Comply, to be addressed in the FER.
PART F - HEALTH AND AMENITY			
F1.5	Roof coverings	All roof coverings to comply with the requirements of Clause F1.5 of the BCA.	To be specified
F1.6	Sarking	All sarking materials to be provided in accordance with AS/NZS 4200 Parts 1 & 2.	To be specified
F1.7	Water proofing of wet areas in buildings	Waterproofing to be provided where applicable in accordance with Clause F1.7 of the BCA, and installed in accordance with AS3740.	To be specified
F1.9	Damp-proofing	Damp-proofing to be provided where applicable, in accordance with Clause F1.9 of the BCA.	To be specified
F1.10	Damp-proofing of floors on the ground	Damp-proofing of floors on ground to be provided where applicable, in accordance with Clause F1.10 of the BCA.	To be specified
F1.11	Provision of floor wastes	The floor of each bathroom and laundry located at any level above a sole-occupancy unit or public space must be graded to permit drainage to a floor waste.	To be specified
F1.12	Sub-floor ventilation	Where applicable, sub-floor ventilation to be provided in accordance with the requirements of Clause F1.12 of the BCA.	To be specified
F2.1	Facilities in residential buildings	Each sole occupancy unit is provided with: A kitchen sink and facilities for	To be specified

Clause	Description	Comment	Status
		- preparation and cooking of food; and - A bath or shower; and - A closet pan and wash basin; and - Clothes washing facilities (tub and space for washing machine); and - Clothes drying facilities (either 7.5m of clothes line or space for a dryer). A closet pan and washbasin is provided at Level 1 in the building managers office that is not accessible through a sole occupancy unit.	
F2.3	Facilities in Class 3 to 9 buildings	Facilities are to be provided for staff to the retail/ commercial portions at the rate of 1 WC per 20 male occupants, 1 WC per 15 female occupants and 1 basin per 30 occupants. Urinals are to be provided at the rate of 2 for the first 50 male occupants, and 1 per 50 male occupants above 50. Note unisex accessible facilities may be counted as one WC and one wash basin for each sex. Please confirm if the commercial/retail spaces are anticipated to be used as office space to enable more accurate assessment. Patron facilities will be required where these spaces will be used as café/restaurant space.	Not Applicable
F2.4	Facilities for people with disabilities	A unisex accessible sanitary facility complying with AS 1428.1-2009 is required to be provided to at least 50% of the banks of sanitary facilities provided to the retail/commercial portions. Note that 1 or more sanitary facilities is considered to be a bank. At each bank where a unisex accessible sanitary facility is provided, an ambulant facility for each sex, compliant with AS 1428.1-2009 is to be provide for each sex.	Not Applicable
F2.5	Construction of sanitary compartments	Doors to bathroom facilities all open inwards. These doors are to be readily removable from the outside of the sanitary compartment unless there is a clear space of 1.2m between the door and the WC, measured radially from the hinges of the door to the sanitary compartment.	To be specified
F2.8	Slop-hoppers	Building is not class 9a or 9c	Not Applicable
F3.1	Height or rooms and other spaces	Rooms to achieve the following heights throughout: In sole occupancy units: Kitchen, laundry, or the like	To be specified

Clause	Description	Comment	Status
		2.1m ▪ Corridor, passageway or the like 2.1m ▪ <u>Habitable room</u> excluding a kitchen 2.4m Carparking area 2.1m Retail/Commercial 2.4m Above a stairway, ramp, landing or the like 2m (measured vertically above the nosing line of stairway treads or the floor surface of the ramp, landing or the like)	
F4.1 to 4.3	Provision of natural light	Natural lighting to be provided to all habitable rooms in the residential portions of the development. Please confirm 10% of the floor area of each habitable room has been provided with windows.	To be specified
F4.4	Artificial lighting (AS 1680)	Artificial lighting complying with AS 1680 is to be provided to all rooms where natural lighting is not provided.	To be specified
F4.5 to 4.7	Ventilation of rooms	A habitable room is to be provided with either natural ventilation or mechanical ventilation complying with AS1668.2 & AS 3666. Please confirm 5% of the floor area of each habitable room has been provided with windows.	To be specified
F4.8 & 9	Restriction of position of water closets and urinals / Airlocks	Bathroom facilities do not open directly to a kitchen or pantry.	Complies
F4.11	Car park ventilation	The carpark is to be provided with either a mechanical ventilation system that complies with AS 1668.2 or an adequate system of permanent natural ventilation.	To be specified
F4.12	Kitchen local exhaust ventilation	No commercial kitchen proposed.	Not Applicable
F5.2 to F5.7	Sound transmission and insulation	The construction is to achieve the following ratings: A floor separating sole-occupancy units or a sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification: ▪ $R_w + C_{tr}$ (airborne) not less than 50 ▪ $L_{n,w+CI}$ (impact) not more than 62 A wall separating sole-occupancy units: ▪ $R_w + C_{tr}$ (airborne) not less than 50, A wall separating a sole-occupancy unit	To be specified

Clause	Description	Comment	Status
		from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification: - Rw (airborne) not less than 50, A wall separating a bathroom, sanitary compartment, laundry or kitchen in one sole-occupancy unit from a habitable room (other than a kitchen) in an adjoining unit; or a sole-occupancy unit from a plant room or lift shaft: - Rw (airborne) not less than 50 - Discontinuous Construction A door assembly separating a sole-occupancy unit from a stairway, public corridor, public lobby or the like: - Rw not less than 30 All walls required to have an impact sound insulation rating are to be of discontinuous construction.	
PART G - ANCILLARY PROVISIONS			
G1.1	Swimming pools	Penthouse swimming pool must have suitable barriers to restrict access by young children to the immediate pool surrounds in accordance with AS1926 Parts 1 and 2	Not Applicable
G1.2	Refrigerated chambers, strong-rooms and vaults	No refrigerated chambers, strong rooms or vaults proposed.	Not Applicable
NSW G1.10 1	Provision for window cleaning	The windows are to be able to be cleaned either wholly from within the building or provision is to be made for the cleaning of the windows by a method complying with the Occupational Health and Safety Act 2000 and regulations made under that Act.	To be specified
G2.2	Installation of domestic oil-fired or solid-fuel appliances and pressure equipment	No domestic oil-fired or solid-fuel appliances and pressure equipment proposed	Not Applicable
G2.3	Open fireplaces	No open fireplaces proposed	Not Applicable
G2.4	Incinerator rooms	No incinerator rooms proposed	Not Applicable
G3.2 to G3.8	Atrium construction	No atrium proposed.	Not Applicable
G4.2 to G4.9	Construction in alpine areas	Site not located in alpine area	Not Applicable
G5.1 & 2	Construction in bush fire zones	Site not located in bushfire area	Not Applicable
PART H - SPECIAL USE BUILDINGS			
H1.2 to H1.7	Theatres, stages and public halls	No theatres, stages or public halls proposed	Not Applicable
NSW	Places of public	No places of public entertainment proposed	Not Applicable

Clause	Description	Comment	Status
Part H101	entertainment		
NSW Part H102	Temporary structures	Proposal is not a temporary structure	Not Applicable
NSW Part H103	Drive-in theatres	Proposal is not a drive-in theatre	Not Applicable

SECTION J – ENERGY EFFICIENCY

J1.1 and 1.2	Insulation		Insulation to be provided to the retail/commercial portions of the building and the carpark where conditioned to comply with BCA Part J1.	To be specified
J2	Glazing		Glazing to be provided to the retail/commercial portions of the building and the carpark where conditioned to comply with BCA Part J2.	To be specified
J3	Building Sealing		Building sealing to be provided to the retail/commercial portions of the building and the carpark where conditioned to comply with BCA Part J3.	To be specified
J5	Air Conditioning Ventilation Systems	&	Mechanical air handling systems to the retail/commercial portions of the building and the carpark where conditioned are to comply with BCA Part J5.	To be specified
J6	Artificial Power	Lighting &	Artificial lighting to the carpark, retail/commercial portions is to not exceed the following power densities: Carpark: 6W/m ² Carpark entry zone (first 20m of travel): 25W/m ² Retail: 22W/m ² Café/Restaurant: 18W/m ² Common space (including in Class 2 portions): 8W/m ² Entry lobby: 15W/m ²	To be specified
J7	Hot Water Supply		Hot water supply to carpark (if any) and retail/commercial to comply with AS/NZS 3500.4	To be specified
J8	Access for Maintenance		Access for maintenance is to be provided to all equipment throughout except within Sole Occupancy Units.	To be specified

