



A Bureau Veritas Group Company

# Regulatory Compliance Report

Mosman High School Upgrade  
745 Military Road, Mosman

Prepared for:	Multiplex
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## 1. Executive Summary

### Development Overview

The project is led by School Infrastructure NSW (SINSW) and comprises a new four (4) storey building and associated landscaping works. The new building includes additional general learning spaces, canteen, library, staff rooms, administration areas, and arts and sports facilities. For SSDA, the schematic design proposal for the new building and associated landscaping works of selected areas of the existing school facilities are the subject of this report.

Development consent is sought for the following works: -

- Demolition of Building B, Building C and part Building E;
- Removal of existing sports court and surrounding retaining walls and nominated trees;
- Construction of a new part 3/ part 4 storey building plus lift overrun and net enclosure to rooftop multi-court (Building G) on the corner of Military Road and Belmont Road providing:
  - administration and staff facilities;
  - multipurpose gym/hall;
  - library;
  - canteen facilities;
  - general and senior learning units;
  - science learning unit;
  - health / PE and performing arts unit; and
  - learning and admin support unit.
- Associated landscaping works including new outdoor play areas, a rooftop play space and rooftop multi-purpose court; and
- Relocation of the main pedestrian entrance from Military Road to Belmont Road.

A detailed project description is provided within the Environmental Impact Statement for the project.

The site is located on 745 Military Road, Mosman, NSW, on coastal land in the centre of the business and shopping district of Mosman, within the Mosman Council Local Government Area (LGA). The campus is bound by Belmont Rd (North), Military Rd (East), Avenue Rd (South) and Gladstone Ave (West). The immediate surrounding environment of the site is majority residential with Balmoral to the East, Cremorne to the West, Clifton Gardens to the South and Georges Heights to the Southeast. The site possesses notable surrounding views accessible from the site, including coastline views to the East, providing a contact with nature; with the Balmoral coast only 5 km from the site.

### Compliance Summary

As Registered Certifiers we have reviewed the architectural design documents prepared by Woods Bagot (refer appendix A) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 Amendment 1 (BCA).

This report has been prepared to assess the project against the Building Code of Australia to enable issuance of construction approvals. Further assessment of the design will be undertaken as the design develops to ensure compliance is achieved prior to approval being issued.

### Deviations from the Deemed-to-Satisfy Provisions

The assessment of the design documentation has revealed that the following areas deviate from the deemed-to-satisfy provisions of the BCA. These items are to be addressed to ensure compliance is achieved, either through design amendment to achieve compliance with the deemed-to-satisfy provisions, or through a performance solution demonstrating compliance with the Performance Requirements of the BCA:

No.	Description	DTS Clause	Performance Requirements
<b>Fire Safety Items</b>			

No.	Description	DTS Clause	Performance Requirements
1	<b>Reduction of Fire Resistance Levels</b> It is proposed to reduce the FRL to the Roof, Steel Beam and columns within the development. In addition, rationalisation of FRLs within the development from 120 minutes to 60 minutes.	C1.1 and Spec C1.1	CP1 and CP2
2	<b>Extended Travel Distances</b> Travel Distances are proposed to extend to be in excess of DtS provisions, including up to 30m to a point of choice, in lieu of 20m.	D1.4, D1.5	DP4, EP2.2
3	<b>Discharge from Fire Isolated Exits</b> The discharge of fire stairs involves travelling within 6m of the building. This performance solution is proposed to rationalise the degrees of Fire Resistance and protection of openings to the building as a result.	D1.7	DP5, DP4 and EP2.2
4	<b>Protection of Openings in Fire Isolated stairs</b> Due to the nature of the openings in the fire stairs within the development, the glazed openings to be assessed from a performance based approach to determine the degree of protection.	C3.8, C3.4	CP1 and CP2, EP2.2
5	<b>Spandrel Construction</b> A performance based approach is to be developed the design of the spandrels providing vertical fire protection between compartments in lieu of DtS design and construction.	C2.6	CP1 and CP2
6	<b>Omission of Class 9b Areas</b> A Performance Solution is to be developed for the omission of Fire hose reel in the Class 9b areas of the building and the provision of portable fire extinguishers to supplement.	E1.4	EP1.1, EP1.2
7	<b>Location of the Hydrant Booster</b> The hydrant Booster is proposed to be located out of sight of the main entry to the building.	E1.3	EP1.3
8	<b>Rationalisation of Smoke Control – School Hall</b> The Stage within the school hall is proposed to be in excess of 50sqm, as such the method of smoke control is proposed to be performance based on lieu of the provision of smoke exhaust as nominated under the DtS Provisions of the BCA.	E2.2	EP2.2
<b>Miscellaneous Items</b>			
9	<b>Weatherproofing of External Walls</b> As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement FP1.4.	-	FP1.4

The feasibility and any additional requirements that will apply as a result of the performance solution will need to be confirmed by the professional preparing the performance solution. Any performance solution will need to be prepared by a suitably qualified/accredited professional.

Refer to part 7 of this report for further details regarding the required services.

Any fire engineered solution relating to category 2 Fire Safety Matters items will be approved after consultation with the NSW Fire Brigade as part of the Crown Certificate process.

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

## 2. Introduction

Development consent is sought for the following works: -

- Demolition of Building B, Building C and part Building E.
- Removal of existing sports court and surrounding retaining walls and nominated trees.
- Construction of a new part three (3) / part four (4) storey school building (Building G) plus rooftop
- fencing on the corner of Military Road and Belmont Road providing: -
  - Administration and staff facilities.
  - Multipurpose gym/hall.
  - Library.
  - Canteen facilities.
  - General and senior learning units.
  - Science learning unit.
  - Health / PE and performing arts unit.
  - Learning and admin support unit.
- Associated landscaping works including new outdoor play areas, a rooftop play space and rooftop basketball court.
- Reinstatement of staff carparking.

A detailed project description is provided within the Environmental Impact Statement for the project.

This report is based upon the review of the design documentation listed in Appendix A of this Report

The report is intended as an overview of the relevant provisions of the Building Code of Australia for assistance only. Detailed drawings and associated review will still be required as the final design is developed.

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 version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2019 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

## 3. Compliance with the Building Code of Australia

The Building Code of Australia is a performance based document, whereby compliance is achieved by complying with the Governing Requirements and the Performance Requirements.

Performance Requirements are satisfied by one of the following:

- 1) A Performance Solution
- 2) A Deemed-to-Satisfy Solution
- 3) A combination of (1) and (2)

## 4. Documentation of Performance Solutions

A Performance Solution must demonstrate compliance with all relevant Performance Requirements, or the solution must be at least equivalent to the Deemed-to-Satisfy provisions.

Compliance with the Performance Requirements is to be demonstrated through one or a combination of the following:

- a) Evidence of suitability in accordance with Part A5 of the BCA that shows the use of a material, product, plumbing and drainage product, form of construction or design meets the relevant Performance Requirements.
- b) A Verification Method including the following:

- i. The Verification Methods provided in the NCC.
- ii. Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements
- c) Expert Judgement
- d) Comparison with the Deemed-to-Satisfy Provisions

## 5. Preliminaries

### 5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Building 1
Classification	9b, 5
Number of Storeys	4
Rise In Storeys	5
Type of Construction	Type A
Effective Height (m)	<25m

*Note: The effective height of the project includes all stories included in the rise in stories of the project.*

Summary of the floor areas and relevant populations where applicable: -

Part of Project	BCA Classification	Approx. Floor Area (m <sup>2</sup> )	Assumed Population
Ground Floor	9b / 5	2340	1573
Level 01	9b	1795	402
Level 02	9b / 5	1780	759
Level 03	9b / 5	2214	1001
Level 04	9b	1010	337
<b>Total</b>		9139	4072

Notes:

- The above populations have been based on floor areas and calculations in accordance with Table D1.13 of the BCA.

#### Occupiable Outdoor Areas

BCA 2019 introduced specific provisions regarding occupiable outdoor areas. These provisions outline requirements with regards to fire ratings, egress provisions and coverage from essential services and are contained in this report.

An occupiable outdoor area is defined in the BCA as follows:

*'a space on a roof, balcony or similar part of a building:*

- a) That is open to the sky; and*
- b) To which access is provided, other than access only for maintenance; and*
- c) That is not open space or directly connected with open space'*

Outdoor Learning and Rooftop play areas are considered outdoor occupiable space for BCA compliance.

## 6. Structure

### 6.1. Structural Provisions (BCA B1):

New structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2011 and AS 1170.4-2007.

Depending on the importance level of the building as determined by AS/NZS 1170.0-2002, the non structural elements of the building, including partitions (and non-structural fire walls), ceilings, services and racking/shelving may be required to comply with the seismic restraint requirements of AS 1170.4-2007. Where this is required, certification will be required confirming that the design of the seismic restraints comply with AS 1170.4-2002. This may be provided by a specialist seismic consultant or by the architect and services design engineers.

It is noted that BCA 2019 introduced a new Verification Method, BV2, which is a pathway available to verify compliance with BCA Performance Requirement BP1.1(a)(iii).

Glazing is to comply with AS1288-2006, and AS2047-2014.

## 7. Fire Protection

### 7.1. Fire Compartmentation (BCA C1.1)

The BCA stipulates three levels of fire resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C2.2.

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type A Construction, in accordance with Table 3 of Specification C1.1 of the Building Code of Australia 2019 Amendment 1.

The maximum floor area and volume limitations of a fire compartment as nominated in the deemed to satisfy provisions are as follows:

Classification		Type of Construction		
		A	B	C
5, 9b or 9c aged care building	max floor area—	8 000 m <sup>2</sup>	5 500 m <sup>2</sup>	3 000 m <sup>2</sup>
	max volume—	48 000 m <sup>3</sup>	33 000 m <sup>3</sup>	18 000 m <sup>3</sup>

The maximum fire compartment size in the building (being the gymnasium) as an approximate volume of 11,000 m<sup>3</sup>, being within the maximum compartment size under the BCA. Ongoing assessment of Fire Compartmentation drawings is to be undertaken as the design develops.

### 7.2. Fire Resistance (BCA C1.1)

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type A Construction, Please refer to Appendix C which outlines the required fire rating to be achieved by the development.

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;
- Sprinkler Pump Rooms;
- Fire Control Room

The above areas are to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

Please note that with regards to fire separation, the provisions and required FRL's that apply to the building also apply to an occupiable outdoor space associated with the building.

### **7.3. Fire Hazard Properties (BCA C1.10 and BCA C1.9)**

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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.

Rigid and flexible air handling ductwork must comply with AS4254 Parts 1 & 2 2012.

Floor linings and floor coverings used in lift cars must have a critical radiant flux not less than 2.2, and wall and ceiling linings must be a Material Group No. 1 or 2.

#### External Wall Cladding

Since the building is of Type A construction, the following components are required to be completely non-combustible:

- External walls, including façade coverings, framing, insulation;
- Flooring and framing of lift pits;
- Non-loadbearing internal walls required to have an FRL;
- All non-loadbearing shafts;
- All loadbearing internal walls and loadbearing fire walls, including those that are part of loadbearing shafts.

Please provide product specifications and test reports to AS 1530.1-1994 for all materials to demonstrate compliance

For materials and assemblies that are required to be non-combustible, the material or system must be not deemed combustible when tested in accordance with AS 1530.1-1994.

#### Combustible Materials

The following materials, though combustible or containing combustible fibres, may be used wherever a non-combustible material is required:

- a) Plasterboard.
- b) Perforated gypsum lath with a normal paper finish.
- c) Fibrous-plaster sheet.
- d) Fibre-reinforced cement sheeting.
- e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.
- f) Sarking type materials that do not exceed 1mm in thickness and have a Flammability Index not greater than 5.
- g) Bonded laminated materials where -
  - (i) each laminate is non-combustible; and
  - (ii) each adhesive layer does not exceed 1 mm in thickness; and
  - (iii) the total thickness of the adhesive layers does not exceed 2 mm; and

- (iv) the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole does not exceed 0 and 3 respectively.

It is recommended that once material selections are made, copies of the fire test certificates/reports be provided for review and approval.

Any Aluminium Composite Panels must be labelled in accordance with SA TS 5344.

The BCA does nominate that ancillary elements may not be fixed to an external wall that is required to be non-combustible unless they comprise of the following:

- a) An ancillary element that is non-combustible.
- b) A gutter, downpipe or other plumbing fixture or fitting.
- c) A flashing.
- d) A grate or grille not more than 2 m<sup>2</sup> in area associated with a building service.
- e) An electrical switch, socket-outlet, cover plate or the like.
- f) A light fitting.
- g) A required sign.
- h) A sign other than one provided under (a) or (g) that—
  - i) achieves a group number of 1 or 2; and
  - ii) does not extend beyond one storey; and
  - iii) does not extend beyond one fire compartment; and
  - iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.

Please provide fire hazard properties reports for any proposed signs and confirm their extent i.e. not spanning more than one storey or fire compartment:

#### **7.4. Vertical Separation of openings in external walls (BCA C2.6)**

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A building of Type A construction must be provided with spandrel separation between openings on different storeys unless the building is protected with a sprinkler system throughout in accordance with Specification E1.5.

For the purposes of C2.6, window or other opening means that part of the external wall of a building that does not have an FRL of 60/60/60 or greater.

Spandrels are required in accordance with BCA Clause C2.6, which stipulates a 900mm high spandrel; with 600mm of this spandrel being above the finished floor level. Alternatively, an 1100mm horizontal slab may be utilized. The spandrel material is required to be non-combustible and to achieve an FRL of 60/60/60.

It is noted that any penetrations in the spandrel construction e.g. for drainage, overflow etc. are to be protected.

Detailed elevations will be required to enable a full check and assessment to be undertaken of the spandrels proposed.

It noted that the design of spandrel protection is proposed to deviate from the DtS provisions of the BCA and as such, is proposed to be verified through the development of a performance solution.

#### **7.5. Protection of Openings in External Walls (BCA C3.2 / C3.3 / C3.4)**

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The prescriptive provisions of the BCA stipulate that any external opening within 3m of the boundary, within 6m of the far boundary of a road, river, lake or the like that adjoins the allotment, or within 6m of another building on the allotment requires protection by -/60/- fire rated construction, or externally located wall wetting sprinklers.

Where a building is separated into fire compartments, the distance between parts of external walls and openings within them must be not less than the table below unless those parts of each external wall has an FRL not less than 60/60/60 and openings are protected.

#### **7.6. Protection of Openings fire rated building elements (BCA C3.5 and BCA C3.10)**

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

- a) 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 an FRL the same as the FRL of the floor it is passing through;
- b) 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 an FRL the same as the FRL of the floor it is passing through; (or 120/120/120 where it is a room such as a substation);
- c) 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).

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.

As the design develops, details will need to be included in relation to sealing of penetrations / construction of fire rated shafts.

## 8. Access and Egress

### 8.1. Provision for Escape (BCA D1)

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The egress provisions for the proposed building are provided by the following:

- External Doors
- Fire Isolated Stairs

The egress provisions that apply to the building also apply to any occupiable outdoor areas.

Detailing issues that will need to be addressed as the design develops include:

- Door Hardware
- Exit Door Operation
- Stair Construction
- Handrail and Balustrade construction
- Discharge from Fire Isolated Exits
- Details of the egress provisions to the Road.
- Door swings

### 8.2. Travel via Fire Isolated Exits (BCA D1.7)

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The proposed exits are required to be fire isolated.

The BCA requires each fire isolated stairway to 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 in a storey 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 an unimpeded path of travel not more than 20m to a road or open space; or
- 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 of not less than 3m, and provides an unimpeded path of travel to a road or open space of not less than 6m.

Additionally, where the path of travel from the point of discharge requires occupants to pass within 6m of any part of the external wall of the same building (measured horizontally), that external wall must have a 60/60/60 FRL and have any openings protected internally for a distance of 3m above or below the path of travel.

A Performance solution is to be development for the discharge of the central fire stair to rationalise the degree of fire resistance and protection of openings required under this clause.

### 8.3. Exit Travel Distances (BCA D1.4)

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The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would be satisfied.

The travel distances to exits should not exceed:

**Class 5 to 9**

- no point on the floor must be more than 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

The extended travel distances and distance between the exit stairs will need to be addressed to comply with the requirements of the deemed to satisfy provisions noted above or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2.

It has been identified that travel distances are up to 30m to a point of choice in lieu of 20m and are to be addressed through the development of a Fire Engineered Solution.

#### 8.4. Dimensions of Exits (BCA D1.6)

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657-2018 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 920 mm doors).

#### 8.5. Balustrades and Handrails (BCA D2.16 / BCA D2.17 / D2.24)

##### Generally

Balustrading to a minimum height of 1000mm with a maximum opening of 124mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm, or where it is possible to fall through an openable window located more than 4m above the surface beneath.

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor.

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

The public stairs and ramps located along an accessible path of travel 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.

In addition to the above, handrails are required to both sides of all stairs with a width of 2m or more.

#### 8.6. Slip Resistance

The adoption of BCA 2014 introduced a requirement for slip resistance of stairway treads and ramp surfaces. The requirements are as follows:

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
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## 9. Services and Equipment

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures. A draft essential fire safety schedule can be found in Appendix B.

It is noted that the provisions below also apply to occupiable outdoor areas.

### 9.1. Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005.

Pressure and flow information will be required to confirm the required pressures and flow to the system, depending on the type of hydrant to be utilized;

The fire services/hydraulic engineer is to confirm the required flow rates for the development.

The building is required to be provided with a booster assembly 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, the booster is to be located at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

### 9.2. Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005.

Fire hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length and 4m of water spray. Where required, additional fire hose reels shall be located internally as required to provide coverage. These hose reels are to be located adjacent to internal hydrants.

Fire hose reel cupboards must not contain any other services such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress unless a performance solution is developed under BCA Performance Requirement EP1.1

Fire Hose reel are not to extend through Fire and Smoke Walls.

### 9.3. Fire Extinguishers (BCA E1.6)

The provision of portable fire extinguishers is required to BCA Clause E1.6 and AS2444 – 2001.

Table E.6 details when portable fire extinguishers are required:

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	<ul style="list-style-type: none"> <li>a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1)</li> <li>b) To cover Class F fire risks involving cooking oils and fats in kitchens.</li> <li>c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles).</li> <li>d) To cover Class A fire risks in normally occupied fire compartments less than 500m<sup>2</sup> not provided with fire hose reels (excluding open deck carparks).</li> <li>e) To cover Class A fire risks in classrooms and associated schools not provided with fire hose reels.</li> </ul>

Occupancy Class	Risk Class (as defined in AS 2444)
	f) To cover Class A fire risks associated with Class 2 or 3 building or class 4 part of building.

Fire extinguishers are to be located in accordance with AS 2444 - 2001, often collocated with fire hydrants and/or fire hose reels.

#### 9.4. Smoke Hazard Management (BCA E2.2)

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

- Zone Smoke Control in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1 ;
- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1;
- (School Hall): Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2018;

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.

#### 9.5. Lift Services (BCA E3.4 and BCA E3.6)

The passenger lifts to be installed are to be:-

- Fitted with warning signs, fire service controls in accordance with Clauses E3.3, Figure 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;
- Be provided with the following in order to satisfy accessibility requirements:
  - A handrail in accordance with AS1735.12-1999,
  - Minimum internal floor dimensions of 1400 x 1600mm for lifts which travel more than 12m, or 1100 x 1400mm for lifts which travel not more than 12m,
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter or across the door opening between 50mm and 1550mm above floor level,
  - Have a set of buttons for operating the lift located at heights above level complying with AS1735.12 - 1999
  - For lifts serving more than 2 levels, automatic audible information within the lift car identifying the level each time the car stops, and audible and visual indication at each lift landing to indicate the arrival of a car

#### 9.6. Exit Signs and Emergency Lighting (BCA E4.2 and BCA E4.5)

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with BCA Part E4 and AS/NZS 2293.1-2018, including the potential use of photo luminescent exit signs.

Details are required to be provided for review.

#### 9.7. Sound Systems and Intercom Systems for Emergency Purposes (BCA E4.9)

A Sound System and Intercom System is required in accordance with AS1670.4-2018 and BCA Clause E4.9



Details are to be provided for our review.

#### **9.8. Fire Precautions During Construction (BCA E1.9)**

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After the building has reached an effective height of 12m, the following fire services are required to be operational:

- Required fire hydrants and fire hose reels on every storey covered by the roof/floor structure (except the 2 uppermost storeys); and
- Booster connections installed.

Due to the height of the building this will need to be considered and implemented during construction.

## 10. Health and Amenity

### 10.1. Sanitary Facilities (BCA F2.2 and BCA F2.3)

#### *Schools / Education*

Separate sanitary facilities are required to be provided for male & female staff and for male & female students; this also includes the provision of a unisex disabled facility for both staff and students separately.

Detailed designs will need to be developed as to the layout, dimensions, etc of the sanitary facilities.

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.

#### *Bathroom Construction*

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges.

### 10.2. Floor Wastes

Floor wastes to be provided within bathrooms and laundries where located above another sole occupancy unit. The floor shall be sloped towards these wastes.

Floor wastes are required to be provided where wall hung urinals are provided and the floor shall be sloped towards these wastes.

### 10.3. Light and Ventilation (BCA Part F4)

Natural Ventilation is required to be provided to rooms at a rate of 5% of the floor area in openings. Alternatively, mechanical ventilation is required in accordance with AS1668.2-2012

Artificial lighting complying with AS/NZS1680.0-2009 is to be incorporated with the final detailed design to be developed to confirm this.

These provisions also apply to areas considered as occupiable outdoor areas such as the outdoor learning spaces.

### 10.4. Waterproofing (BCA FP1.4)

Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.

As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows:

*A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause—*

- a) unhealthy or dangerous conditions, or loss of amenity for occupants; and*
- b) undue dampness or deterioration of building elements.*

#### External above Ground Membranes

All external above ground areas (roof slabs, balconies etc.) shall be protected by a waterproofing system in accordance with AS4654 Parts 1 and 2 – 2012.

For external balconies the waterproofing membrane must have a vertical upward termination height in accordance with the table below dependant on the wind class of the site. The wind class is determined by the structural engineer.

Wind Class Regions A & B	Wind Class Regions C & D	Ultimate Limit State Wind Speed	Termination Height (mm)
N1	-	34	40
N2	-	40	50
N3	C1	50	70
N4	C2	61	100
N5	C3	74	150
N6	C4	86	180

#### Wet Areas

Internal wet areas throughout the development (e.g. bathrooms, laundries) shall be waterproofed in accordance with AS3740 - 2010 requirements.

Further review will be undertaken as the design develops with respect to the specification of waterproofing membrane, provision of water-stops at doorways etc.

## 11. Energy Efficiency

### 11.1. SECTION J (JP1 Energy Use)

Efficient energy use must be achieved appropriate to the function and use of the building, level of human comfort, solar radiation, energy source of the services and sealing of the building envelope. To achieve this JV1, JV2, JV3 and JV4 verification methods have been introduced as options available to achieve compliance.

It is noted that a deemed to satisfy pathway is also available.

The proposed site will be located in a climate zone 5.

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

#### Verification Methods

The Verification Methods available to demonstrate compliance with the BCA on a performance basis are as follows:

##### JV1 NABERS Energy for Offices

- To achieve compliance with JP1 a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement and comply with ANSI/ASHRAI Standard 140.
- To achieve the energy model for (JP1 (i)) solar radiation the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
  - Tenant supplementary heating; and
  - Cooling systems; and
  - External lighting; and
  - Car park services.
  - A thermal comfort level between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of annual hours of operation.
- The building also needs to comply with additional requirements of Spec JVa.

##### JV2 Green Star

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
  - The building complies with simulation requirements and is registered for a Green Star – Design & As-Built rating; and
  - The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and
  - In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieved across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and
  - The building complies with the additional requirements of Specification JVa.

##### JV3 Verification Using a Reference Building

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:

- It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when the proposed building is modeled with the proposed services and the proposed building is modelled with the same services as the reference building. The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
- The building achieves the additional requirements in Specification JV4; and
- The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and use on site and another process such as reclaimed energy used on site.

#### JV4 Building Envelope Sealing

- Compliance with sealing of the building against air leakage is verified when the envelope is sealed at an air permeability rate tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than –
  - For a class 2 building or a class 4 part of a building, 10m<sup>3</sup>/hr.m<sup>2</sup> at 50 Pa reference pressure; or
  - For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m<sup>3</sup>/hr.m<sup>2</sup> at 50 Pa reference pressure; or
  - For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m<sup>3</sup>/hr.m<sup>2</sup> at 50 Pa reference pressure.
- Part J3 and performance solution that uses one of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieved can also be used as verification methods.

## 12. Access for People with Disabilities

The development is required to comply with the accessibility provisions contained within:

- The Building Code of Australia 2019 Amendment 1;
- Disability (Access to Premises – Buildings) Standards 2010;
- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

**Note:** With the introduction of the Commonwealth *Disability Discrimination Act (DDA)* in 1992 (enacted in 1993), all organisations have a responsibility to provide equitable and dignified access to goods, services and premises used by occupants. Organisations and individuals since its introduction, are required to work to the objects of the Act which are to eliminate, as far as possible, discrimination against persons on the ground of disability in the **areas of work, accommodation, education, access to premises, clubs and sports, and the provision of goods, facilities, services and land, existing laws and the administration of Commonwealth laws and programs.**

This report assesses against the requirements contained with the Building Code of Australia (and documents referred to therein) and is not considered to be a full assessment against the Disability Discrimination Act.

An Accredited Access Consultant has been engaged to provide design compliance reviews and resolve compliance matters leading to the issue of Crown Certificates.

### 12.1. General Building Access Requirements (BCA D3.1)

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 2019 Amdt 1 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Access for persons with a disability is to be provided as follows:

#### Office (Class 5 buildings)

To and within all areas normally used by the occupants

#### Schools

To and within all areas normally used by the occupants.

#### Assembly Halls/Sporting venues

To all required wheelchair seating spaces and to all areas normally used by occupants except tiers or seating areas or platforms not containing accessible wheelchair seating areas.

### 12.2. Provision for Access to Buildings

The BCA prescribes access to be provided to and within the building as follows:

- Via the principle pedestrian entry and at least 50% of all other entrances from the allotment boundary
- From designated car parking spaces for the use of occupants with a disability.

- From another accessible building connected by a pedestrian link.
- All areas used by the occupants.

In buildings over 500m<sup>2</sup> in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

A door is considered to be accessible if it is automatic (open and closing) or is more than 850mm in clear opening width and contains the required door circulation space.

### **12.3. Accessibility within Building (BCA D3.3)**

A building required to be accessible is required to be equipped with either a AS 1428.1 compliant lift or AS 1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

Lifts are proposed to be provided within the development and are to meet the specifications of the BCA nominated above.

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3;
- Doorways must have a clear opening of 850mm;
- Passing spaces (1.8m wide passages) must be provided at maximum of 20m intervals
- Within 2.0m of end access ways/corridors, turning areas spaces are required to be provided.
- Carpet pile height of not more than 11mm to an adjacent surface and backing <4mm
- Any glazing capable of being mistaken for a doorway or opening must be clearly marked (or contain chair rail, hand rail or transom as per AS 1288 requirements)

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.

### **12.4. Tactile Indicators (BCA D3.8)**

Tactile indicators are required to be provided to warn occupants of all stairs (except Fire Isolated stairs) and ramps regardless of public nature or private environment and where an overhead obstruction occurs less than 2.0m above the finished floor level.

### **12.5. Seating in Assembly Building (BCA D3.9)**

In an assembly building, when fixed seating is provided, the wheelchair spaces to the following are required to be provided.

<b>Number of fixed seats in a room or space</b>	<b>Number of wheelchair seating spaces</b>	<b>Grouping and location</b>
Up to 150	3 spaces	1 single space; and 1 group of 2 spaces

It noted that the Theatre is to accommodate up to 150 persons, as such, the design is to accommodate wheelchair spaces as per the table above.

### **12.6. Stairs (BCA D3.3 inter Alia AS1428.1)**

Stairs shall be constructed as follows:

- a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail and TGSIs do not protrude into the transverse path of travel.
- b) Where the intersection is at an internal corridor, the stair shall be set back one tread width plus 300mm (nominally 700mm as per AS 1428.1-2009 Fig 26(b)), so the handrails do not protrude into transverse path of travel.
- c) Stairs shall have opaque risers.
- d) Stair nosing shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm.
- e) Stair nosing profiles shall;
  - Have a sharp intersection;
  - Be rounded up to 5mm radius; or
  - Be chamfered up to 5mm x 5mm
- f) All stairs, including fire isolated stairs shall, at the nosing of each tread have a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall not exceed a difference of 5mm.

It is understood that all stairs are to be used for both circulation and emergency evacuation, as such, all stairs are to meet the provisions for accessibility.

## 12.7. Accessible Sanitary Facilities (BCA F2.4)

### *Unisex Accessible Sanitary Facilities*

An accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only and provided in accordance with AS 1428.1-2009 and must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary products and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	<ol style="list-style-type: none"> <li>a) 1 on every storey containing sanitary compartments; and</li> <li>b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.</li> </ol>

### *Ambulant Facilities*

At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1-2009 must be provided for use by males and females.

Where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.

An accessible unisex sanitary compartment or an accessible unisex shower need not be provided on a storey or level that is not provided with a passenger lift or ramp complying with AS 1428.1-2009.

## 12.8. Signage (BCA D3.6)

As part of the detailed design package, specifications will need to be developed indicating:

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);



- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating 'EXIT' and 'Level' number
- Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

#### **12.9. Hearing Augmentation (BCA D3.7)**

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A hearing augmentation system shall be installed throughout the building in accordance with the requirements of Clause D3.7 of the BCA, where ever in a 9b building, auditorium conference room, meeting room etc. contain a PA system not used for emergency purposed or any ticket office or teller's booth or reception where the public is screened from the service provider.

#### **12.10. Lifts (BCA E3.6)**

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Lifts compliant to BCA E3.6 and BCA E3.7 must be provided, where required to be provided, with a minimum size of 1400 x 1600mm or 1100mm x 1400mm (whichever is appropriate) in size – with appropriate handrails and auditory commands.

### 13. Appendix A - Reference Documentation

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

Drawing No.	Title	Project No.	Revision
SSDA-2201	Ground Floor Plan	121468	X
SSDA-2202	Level 1 Floor Plan	121468	X
SSDA-2203	Level 2 Floor Plan	121468	X
SSDA-2204	Level 3 Floor Plan	121468	X
SSDA-2205	Level 4 Floor Plan	121468	X
SSDA-3201	Sections	121468	X
SSDA-3202	East and West Elevations	121468	X
SSDA-3203	North and South Elevations	121468	X

## 14. 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 Smoke Detection and Alarm System	Clause 3 or 4 or 5 BCA Spec. E2.2a, AS 1670.1 – 2018, AS/NZS 1668.1 – 2015, AS 3786-2014
4.	Building Occupant Warning System	BCA Spec. E1.5 & Specification E2.2a Clause 7
5.	Emergency Lifts	BCA Clause E3.4
6.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2018
7.	EWIS	BCA Clause E4.9 & AS 1670.4 - 2018
8.	Emergency Evacuation Plan	AS 3745 – 2002
9.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2018
10.	Fire Dampers	BCA Clause C2.12, C3.15, Spec C2.5, D1.7, E2.2, E2.3, F4.12, Spec E2.2, E2.3, Spec E2.2b, Spec G3.8 & AS 1668.1 – 2015
11.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2015
12.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Amdt 1
13.	Fire Hydrant System	Clause C2.12, E1.3, Spec E1.5a, H3.9 & AS 2419.1 – 2005 Amdt 1
14.	Fire Seals	BCA Clause C3.15, C3.16, Spec C3.15, Spec D1.12, & AS 1530.4 –2014
15.	Lightweight Construction	BCA Clause C1.8, Spec C1.8
16.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 2015 & AS 1668.2 – 2012
17.	Paths of Travel	EP&A Reg 2000 Clause 186
18.	Portable Fire Extinguishers	BCA Clause E1.6 & H3.11, AS 2444 – 2001
19.	Required Exit Doors (power operated)	BCA Clause D2.19 (b)(iv)
20.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 2015
21.	Smoke Dampers	BCA Clause Spec E2.2, E2.3, Spec E2.2b, Spec G3.8 & AS/NZS 1668.1 – 2015
22.	Smoke Doors	BCA Spec. C3.4
23.	Warning and Operational Signs	AS 1905.1 –2015, BCA Clause C3.6, D2.23, E3.3

## 15. Appendix D - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2019 Amendment 1:

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS	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
<b>EXTERNAL WALL</b> (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature 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	-/-/-	-/-/-	-/-/-	-/-/-
<b>EXTERNAL COLUMN</b> 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	-/-/-	-/-/-	-/-/-	-/-/-
<b>COMMON WALLS and FIRE WALLS</b>	90/ 90/ 90	120/120/120	180/180/180	240/240/240
<b>INTERNAL WALLS</b>				
<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
<b>OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS</b>				
	90/-/-	120/-/-	180/-/-	240/-/-
<b>FLOORS</b>	90/ 90/ 90	120/120/120	180/180/180	240/240/240
<b>ROOFS</b>	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60