REF: 074257-02BCA

# BUILDING CODE OF AUSTRALIA REPORT

## North Shore Health Hub
## 12 Frederick Street, St Leonards

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| 21.11.17 | 02 | 22 | DRAFT Report for DA Submission | Vanessa Batty | Geoff Pearce | 21.11.17 |

**Executive Summary**

As Accredited Certifiers, we have reviewed architectural design documents prepared by Billard Leece Partnership (refer appendix A) for compliance with the Building Code of Australia 2016.

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 |
|---|---|
| Spec C1.1 | **Reduction to FRLs for Retail Areas**<br>A proposed reduced to the Fire resistance levels of retails areas to 120minutes in lieu of 180 minutes |
| D1.7 | **Separation of Rising and Descending Stairs**<br>Separation of exits does not fully comply in fire stair 4. Stairs rising from the carpark below and descending from the tower above combine in a single passageway prior to egressing to the road or open space. |
| D1.7, C3.4 | **Travel vis Fire Isolated Stairs**<br>The discharge of fire stair 4, 3 and 1 require travel along the building to reach the road or open space. As such, treatment of the external wall which they pass within 6m of, require treatment. The rationalisation of that treatment may form part of the fire engineered solution. . |
| C3.2 and C3.4 | **Protection of opening in External Wall**<br>Openings in the carpark are located within 3m of the boundary require treatment in accordance with DtS provisions to address the exposure to the boundary as the fire source feature. Should treatment to BCA Cl C3.4 not be achieved, a performance solution is to be developed with the fire engineer. |
| D1.4 and D1.5 | **Travel Distances**<br>The following areas exceed the maximum allowable travel distance and are to be addressed by the Fire engineer as part of the performance solution:<br>▪ Tower A – Patient care areas,<br>◦ Travel distance of up to 30m to a point of choice in lieu of 12m<br>◦ Travel distance of up to 55m to an exit in lieu of 30m<br>▪ Basement – Patient Care Areas<br>◦ 17m to a point of choice in lieu of 12m<br>◦ 35m to an exit in lieu of 30m<br>▪ Retail:<br>◦ 65m to a point of choice in liey of 20m<br>◦ 90m to an exit in lieu of 40m<br>◦ 70m between alternative exits in lieu of 60m<br>▪ Carpark:<br>◦ 45m to a point of choice in lieu of 20m<br>◦ 75m to an exit in lieu of 40m |
| E1.8 | **Location of Fire Control Room**<br>A Fire Control Room shall be provided in accordance with Clause E1.8 of the BCA. The location fo the room shall provide access from the road or open space and an alternative access from the main entrance lobby. Access to the room for FRNSW personnel should not include a RL change from the street of more than 300mm. the location of the FCR will require addressing in the fire engineered solution in consultation with FRNSW. |

| | |
|---|---|
| **E1.3** | **Location of Hydrant Booster Assembly**<br>The location of the hydrant booster assembly deviates from the prescriptive requirements of AS2419.1-2005 whereby the booster is not located within 8m of a hardstand area for FRNSW pumping appliances, in addition, it is located within 10m of the building and a radiant heat shield is not currently documented. The design is to be amended to ensure access for FRNSW pumping appliances and adequate protection for emergency responded. This may require revised design together with a performance solution prepared by the Fire Engineer in consultation with FRNSW. |
| **E1.3** | **Location of Hydrant Pump Room**<br>The location of the hydrant pump room is not accessed off the road/open space nor is access afforded from the fire stair. This is a deviation from the requirements of AS2419.1-2005, and design is to be amended to either documentation deemed-to-satisfy compliance or a performance solution is to be prepared by the fire engineer in consultation with FRNSW. |

The fire engineered solution relating to EP2.2, EP1.3 and EP1.6 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

In addition to the above, it is anticipated that the following matters will require the development of performance based solutions to demonstrate compliance with the BCA:-

- Façade weatherproofing – with the introduction of BCA 2016, performance based solutions are to be prepared to demonstrate compliance with the weatherproofing requirements (FP1.4) for all facades.
- Amenities in Class 9a areas – performance solution to be developed for the omission of plunge baths in ward areas and other ancillary requirements based on the special nature of operations in the building.
- Accessibility – given the constraints of the site, access to the building from the site boundary is anticipated to require a performance based solution to demonstrate compliance with the performance requirements of the BCA.

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.

## 1.0 Introduction

The development includes the construction of a Commercial building with a mixed use of medial consulting suites, acute health care and retail uses. The building includes a 5 level basement carpark ancillary to the buildings use.

## 1.1 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 version that in place at the time of the application to the Certifying authority for the Construction Certificate. For the purpose of this assessment, BCA 2016 has been utilised being the current version of the BCA

## 2.0 Building Assessment Data

Summary of Construction Determination: -

| | **Building 1 (Towers A and B)** |
|---|---|
| Classification | 7a, 6, 5, 9a |
| Number of Storeys Contained | 17 |
| Rise In Storeys | 17 |
| Type of Construction | Type A |
| Effective Height (m) | 50.45 |

Notes:

1. The Rise is Storeys (RIS) for the building has been determined in accordance with BCA Cl C1.2, taking into this assessment, all the storeys above the finished ground. As such, basement carpark levels have been included in the calculation of the RIS of the building.
2. The Effective height of the building has been calculation from the FFL of Basement Level 5 (RL 80.050), and the FFL of Level 8 (RL130.500). This is the most conservative assessment as it assumes that the L9 plant room contains equipment that would warrant it's inclusion in the definition of effective height.

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

| **Part of Project** | **BCA Classification** | **Approx. Floor Area ($m^2$)** | **Assumed Population** |
|---|---|---|---|
| Basement Level 5 | 7a | 2364 | 100 |
| Basement Level 4 | 7a | 2945 | 120 |
| Basement Level 3 | 7a | 2939 | 100 |
| Basement Level 2 | 7a<br>9a (Linac) | 2924<br>480 | 122 |

| Part of Project | BCA Classification | Approx. Floor Area ($m^2$) | Assumed Population |
|---|---|---|---|
| Dock Level | 7a | 5470 | 185 |
| Ground Floor | 5 | 1995 | 200 |
| | 6 | 1205 | 402 |
| Podium | 9a | 2875 | 163 |
| Level 1 | 9a | 1400 | 127 |
| Level 3 | 9a (Tower 2A) | 1265 | 127 |
| | 5 (Tower 3B) | 1180 | 118 |
| Level 4 | 9a (Tower 3A) | 1264 | 127 |
| | 5 (Tower 4B) | 1182 | 118 |
| Level 5 | 9a (Tower 4A) | 1264 | 127 |
| | 5 (Tower 5B) | 1182 | 118 |
| Level 6 | 9a (Tower Plant A) | 1264 | 127 |
| | 5 (Tower 6B) | 1182 | 118 |
| Level 7 | 5 (Tower 7B) | 1182 | 118 |
| Level 8 | 5 (Tower 8B) | 1182 | 118 |
| Level 9 | 5 (Plant) | 174 | 6 |

Notes:
1. The above populations have been base on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. The Carpark areas have been considered ancillary to the use for the purposes of population numbers

## 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 & 3.9 of Specification C1.1 of the Building Code of Australia 2016. 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;

- Fire compartmentation of the building at each floor level,
- The basement carpark levels are considered a single fire compartment

- Fire separation of carpark from Health Care of 120 minutes.
- Separation between retail and class 5 areas in the same storey of 180 minutes
- Fire compartmentation between 9a areas and the remainder of the building of 120 minutes

Fire resistance levels for building structural members are as follows:
- Retail Portions (BCA Class 6) 180 minutes
- Commercial portion (BCA Class 5) 120 minutes
- Car park levels (BCA Class 7a) 120 minutes
- Patient Care Areas (BCA Class 9a) 120 minutes

External Wall Cladding

As the building is of Type A construction the external walls including any cladding & lining must be non-combustible as determined by AS1530.1. 1994.

The BCA does afford the following exceptions to the above:

1. Attachments not to Impair Fire Resistance

   a) A combustible material may be used as a finish or lining to a wall or roof, or in a sign, sunscreen or blind, awning, or other attachment to a building element which has the required FRL if—
      i. the material is exempted under C1.10 or complies with the fire hazard properties prescribed in Specification C1.10; and
      ii. it is not located near or directly above a required exit so as to make the exit unusable in a fire; and
      iii. it does not otherwise constitute an undue risk of fire spread via the facade of the building.
   b) The attachment of a facing or finish, or the installation of ducting or any other service, to a part of a building required to have an FRL must not impair the required FRL of that part.

   Where this option is adopted, confirmation of compliance with part (a) (ii) and (iii) above will be required by an accredited fire safety engineer, or a CertMark certificate will be required that addresses these items and is signed by an authorised representative. A test report is to be provided to verify part (a) (i)

   It is also noted that this option is appropriate only if the cladding is aesthetic and does not perform the functions of an external wall e.g. weatherproofing.

2. 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) 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 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.

### 4.2 Fire Compartmentation

Fire compartmentation drawings are to be developed by the Architect to demonstrate design compliance with the provisions of the BCA, including the requirements of any performance solution regrading fire rated building elements.

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

| BCA Classification | Type A Construction | |
|---|---|---|
| 5 | max floor area— | 8 000 $m^2$ |
| | max volume— | 48 000 $m^3$ |
| 6, 7 or 9a (except for patient care areas) | max floor area— | 5 000 $m^2$ |
| | max volume— | 30 000 $m^3$ |

### 4.3 Class 9a Fire and Smoke Compartmentation Provisions

In addition to the above general fire compartmentation requirements, the BCA also contains additional prescriptive fire and smoke compartmentation provisions for Class 9a patient care areas. The deemed to satisfy requirements are as follows:

Patient Care Areas (including wards and treatment areas):-

a) Are to have fire compartments no greater than 2000$m^2$, separated from the remainder of the building by construction achieving an FRL of 120/120/120.
b) Ward areas:-
   (i) fire compartments of 1000$m^2$ separated by construction achieving an FRL of 60/60/60, and
   (ii) smoke compartments no greater than 500$m^2$ are to be provided, smoke walls are to achieve compliance with Specification C2.5 of the BCA.
   (iii) where the floor area of a is not greater than 500$m^2$, the ward area is to be smoke separated from the remainder of the patient care area by smoke wall achieving compliance with Specification C2.5 of the BCA.
c) Treatment areas
   (i) fire compartments of 1000$m^2$ separated by construction achieving an FRL of 60/60/60, and
   (ii) where the floor area of a is not greater than 1000$m^2$, the treatment area is to be smoke separated from the remainder of the patient care area by smoke wall achieving compliance with Specification C2.5 of the BCA.

Ancillary Areas:-

a) Are to be separated from the remainder of the building by construction achieving an FRL of 60/60/60. Ancillary areas include:-
   - Areas containing high potential fire hazard equipment and materials;
   - Kitchens greater than 30m$^2$;
   - Pressure chambers;
   - Medical records storage greater an 10m$^2$;
   - Laundry with gas dryer or other high potential fire hazard equipment

Consideration of additional fire separation requirements are to be accommodated in the base building design to accommodate tenants with 9a classifications.

## 3 Protection of Openings in External Walls (BCA C3.2)

The prescriptive provisions of the BCA stipulate that any external opening within 3m of the fire source feature 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.

| Angle Between Walls | Minimum Distance |
|---|---|
| 0$^o$ (walls opposite) | 6m |
| More than 0$^o$ to 45$^o$ | 5m |
| More than 45$^o$ to 90$^o$ | 4m |
| More than 90$^o$ to 135$^o$ | 3m |
| More than 135$^o$ to 180$^o$ | 2m |
| More than 180$^o$ | Nil |

*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.*

## 4.1 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 an FRL of 120 minutes;
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 an FRL of 120 minutes (or 120/120/120 where it is a room such as a substation);
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).

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.

*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.*

Openings in the carpark are located within 3m of the boundary and will require protection in accordance with the provisions of this clause. Details are to be provided in architectural documentation of proposed method of protection. Alternatively a performance based solution is to be developed by the fire engineer to address deviations from the deemed-to-satisfy provisions of the BCA.

### 4.2 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,
- 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 Building Code of Australia.

## 5.0 Egress

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- 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
- Details of the egress provisions to the Road.

Fire Stair Re-Entry

The doors of a fire isolated exit must not be locked from the inside so as to allow provision for fire stair re-entry in Class 9a buildings or parts, or within fire isolated exits serving any storey above any effective height of 25m.

The requirement for doors to remain unlocked do not apply to a door fitted with a failsafe device that automatically unlocks the door upon activation of a fire alarm and –

a) 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
b) An intercommunication system, or an audible or visual alarm system operated from within the enclosure is provided, and a sign is fixed adjacent to such doors explaining its purpose and method of operation

## 5.1 Exit Travel Distances

The travel distances to exits should not exceed:

Class 5-9
- 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

Class 9a
- No point on the floor to be more than 12m from a point of choice
- Maximum distance of travel of 30m
- Alternative exits not more than 45m apart

The following areas exceed the maximum allowable travel distance and are to be addressed by the Fire engineer as part of the performance solution:
- Tower A – Patient care areas,
  - Travel distance of up to 30m to a point of choice in lieu of 12m
  - Travel distance of up to 55m to an exit in lieu of 30m

- Basement – Patient Care Areas
  - 17m to a point of choice in lieu of 12m
  - 35m to an exit in lieu of 30m
- Retail:
  - 65m to a point of choice in liey of 20m

- 90m to an exit in lieu of 40m
- 70m between alternative exits in lieu of 60m

- Carpark:
  - 45m to a point of choice in lieu of 20m
  - 75m to an exit in lieu of 40m

Design documentation is to include location of exits together with paths of travel to exits, including tenancies to ensure that travels distances can be calculated and parameters for compliance agreed. Design documentation currently shows excessive travel distances in the following areas. These distances will require resolution through amended design and development of performance solutions by the fire engineer:

- Basement Level 5 – travel distance to a point of choice being 45m

Separation of exits does not fully comply in fire stairs 2 and 4. Stairs rising from the carpark below and descending from the tower above combine in a single passageway prior to egressing to the road or open space. This to be addressed as part of the performance based solution prepared by the Fire engineer.

### 5.2 Dimensions of Exits

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 in which case a 600mm clear width is required).

Doorways are permitted to contain a clear opening width of 750mm 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).

The landings within the fire stairs serving the BCA class 9a areas (i.e. Tower A Stairs 1, 2 and 3), are to comply with BCA Clause D2.14 to afford assisted egress for stretchers. Design documentation does not currently indicate compliance.

### 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.

The discharge of fire stairs require travel along the building to reach the road or open space. As such, travel from the point of discharge of these 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.

## 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.

## 5.5 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 2011. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

Given the constraints of the site, an access consultant should be engaged to undertake a review of the design and proposed performance solution, where necessary, to ensure BCA compliance is capable of being achieved.

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 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.
- 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.

## 6.0 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
- 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.
- 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 location fo the room shall provide access from the road or open space and an alternative access from the main entrance lobby. Access to the room for FRNSW personnel should not include a RL change from the street of more than 300mm. the location of the FCR will require addressing in the fire engineered solution in consultation with FRNSW.

The location of the hydrant booster assembly deviates from the prescriptive requirements of AS2419.1-2005 whereby the booster is not located within 8m of a hardstand area for FRNSW pumping appliances, in addition, it is located within 10m of the building and a radiant heat shield is not currently documented. The design is to be amended to ensure access for FRNSW pumping appliances and adequate protection for emergency responded. This may require revised design together with a performance solution prepared by the Fire Engineer in consultation with FRNSW.

The location of the hydrant pump room is not accessed off the road/open space nor is access afforded from the fire stair. This is a deviation from the requirements of AS2419.1-2005, and design is to be amended to either documentation deemed-to-satisfy compliance or a performance solution is to be prepared by the fire engineer in consultation with FRNSW.

## 7.0 Ventilation and Smoke Hazard Management

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

Class 9a and 5
- Zone Smoke Control in accordance with the requirements of AS/NZS 1668.1-1998;
- 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
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-1998

Class 7a
- Mechanical ventilation system in accordance with AS1668.2 and Clause 5.5 of AS1668.1, except that fans with metal blades suitable for operation at normal temperature may be used and electrical power and control cabling need not be fire rated.
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-1998

Class 6

- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2b

Note: Smoke Exhaust need not be provided if the retail tenancies a limited to no more than 1000sqm in floor area; and all Class 6 areas are smoke separated from other classifications.

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

## 8.0 Lift Services

The passenger lifts to be installed are to be: -

- fitted with warning signs, fire service controls in accordance with AS 1735.1
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high.
- An emergency lift with stretcher facilities in accordance with part E3.4 of the BCA and service all levels of each tower..
- Be provided with the following: -
    - A handrail in accordance with AS 1735.12
    - Minimum internal floor dimensions as specified in AS 1735.12,
    - 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 AS 1735.12.

## 9.0 Sanitary and Other Facilities

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

| Sanitary Facilities Required / Provided | | | | | | | |
|---|---|---|---|---|---|---|---|
| Area & Total Population | | Required | | | Proposed | | |
| | | WC | Urinals | Basins | WC | Urinals | Basins |
| Ground Floor Office Population: 200 | Male | 4 | 3 | 3 | TBA | TBA | TBA |
| | Female | 6 | N/A | 3 | TBA | N/A | TBA |
| | Accessible | 1 | N/A | 1 | TBA | N/A | TBA |
| Ground Floor Retail Population: 402 | Sanitary facilities need not be provided for patrons in a retail shopping centre where patron numbers do not exceed 600. Further assessment of amenity requirements is to be considered once staff numbers are indicated. | | | | | | |
| Podium Office Population: 110 | Male | 2 | 3 | 1 | TBA | TBA | TBA |
| | Female | 3 | N/A | 1 | TBA | N/A | TBA |
| | Accessible | 1 | N/A | 1 | TBA | N/A | TBA |
| Podium Health Care | Male | 9 | N/A | 10 | TBA | TBA | TBA |
| | Female | 9 | N/A | 10 | TBA | N/A | TBA |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Population:163 | Accessible | 1 | N/A | 1 | TBA | N/A | TBA |
| Levels 1-6 Ward Population: 127 | Sanitary facilities need not be provided for patients in a ward area. Further assessment of amenity requirements is to be considered once staff numbers are indicated. | | | | | | |
| Level 3-8 Office Population: 118 | Male | 2 | 3 | 1 | TBA | TBA | TBA |
| | Female | 3 | N/A | 1 | TBA | N/A | TBA |
| | Accessible | 1 | N/A | 1 | TBA | N/A | TBA |

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.

Class 9a areas are to be afforded the following facilities:-

a) one kitchen or other adequate facility for the preparation and cooking or reheating of food including a kitchen sink and washbasin; and
b) laundry facilities for the cleansing and drying of linen and clothing or adequate facilities for holding and dispatch or treatment of soiled linen and clothing, sanitary towels and the like and the receipt and storage of clean linen; and
c) one shower for each 8 patients or part thereof; and
d) one island-type plunge bath in each storey containing a ward area.

Where it is proposed to omit an island plunge bath, a performance solution is to be prepared by the architect in consultation with the operator.

## 10.0 Energy Efficiency

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

3. 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

4. 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.

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

## Appendix A - Design Documentation

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

| Drawing No. | Title | Date | Drawn By | Revision |
|---|---|---|---|---|
| | | 16.10.17 | BLP | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## 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. | Emergency Lifts | BCA Clause E3.4 & AS 1735.2 – 2001 |
| 6. | Emergency Lighting | BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 |
| 7. | Sound systems and intercom systems for emergency purposes | BCA Clause E4.9 & AS 1670.4 - 2004 |
| 8. | Emergency Evacuation Plan | AS 3745 – 2002 |
| 9. | Exit Signs | BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005 |
| 10. | Fire Control Centres | BCA Spec. E1.8 |
| 11. | Fire Blankets | AS 2444 – 2001 |
| 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. | Required Exit Doors (power operated) | BCA Clause D2.19(d) |
| 23. | Smoke Hazard Management System | BCA Part E2 & AS/NZS 1668.1 – 1998 |
| 24. | Smoke Dampers | AS/NZS 1668.1 – 1998 |
| 25. | Smoke Doors | BCA Spec. C3.4 |
| 26. | Wall-Wetting Sprinklers | BCA Clause C3.4 & AS 2118.2 – 1995 |
| 27. | Warning and Operational Signs | Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, E3.3 |

## Appendix C- Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2016:

**Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS**

| **Building element** | **Class of building — FRL: (in minutes)** | | | |
|---|---|---|---|---|
| | ***Structural adequacy/Integrity/Insulation*** | | | |
| | **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 *fire-source feature* to which it is exposed is— | | | | |
| For *loadbearing* parts— | | | | |
| 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 |
| For non-*loadbearing* parts— | | | | |
| 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 *external wall*, where the distance from any *fire-source feature* 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—** | | | | |
| *Fire-resisting* lift and stair *shafts*— | | | | |
| *Loadbearing* | 90/ 90/ 90 | 120/120/120 | 180/120/120 | 240/120/120 |
| Non-*loadbearing* | –/ 90/ 90 | –/120/120 | –/120/120 | –/120/120 |
| Bounding *public corridors*, public lobbies and the like— | | | | |
| *Loadbearing* | 90/ 90/ 90 | 120/–/– | 180/–/– | 240/–/– |
| Non-*loadbearing* | –/ 60/ 60 | –/–/– | –/–/– | –/–/– |
| Between or bounding *sole-occupancy units*— | | | | |
| *Loadbearing* | 90/ 90/ 90 | 120/–/– | 180/–/– | 240/–/– |
| Non-*loadbearing* | –/ 60/ 60 | –/–/– | –/–/– | –/–/– |
| Ventilating, pipe, garbage, and like *shafts* not used for the discharge of hot products of combustion— | | | | |
| *Loadbearing* | 90/ 90/ 90 | 120/ 90/ 90 | 180/120/120 | 240/120/120 |
| Non-*loadbearing* | –/ 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 |

## Table 3.9 REQUIREMENTS FOR CARPARKS

| Building element | | | FRL (not less than) Structural adequacy/Integrity/Insulation |
|---|---|---|---|
| | | | ESA/M (not greater than) |
| **Wall** | | | |
| (a) | *external wall* | | |
| | (i) | less than 3 m from a *fire-source feature* to which it is exposed: | |
| | | *Loadbearing* | 60/60/60 |
| | | Non-*loadbearing* | –/60/60 |
| | (ii) | 3 m or more from a *fire-source feature* to which it is exposed | –/–/– |
| (b) | *internal wall* | | |
| | (i) | *loadbearing*, other than one supporting only the roof (not used for carparking) | 60/–/– |
| | (ii) | supporting only the roof (not used for carparking) | –/–/– |
| | (iii) | non-*loadbearing* | –/–/– |
| (c) | *fire wall* | | |
| | (i) | from the direction used as a *carpark* | 60/60/60 |
| | (ii) | from the direction not used as a *carpark* | as *required* by Table 3 |
| **Column** | | | |
| (a) | supporting only the roof (not used for carparking) and 3 m or more from a *fire-source feature* to which it is exposed | | –/–/– |
| (b) | steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a *carpark* | | 60/–/– or 26 $m^2$/tonne |
| (c) | any other column not covered by (a) or (b) | | 60/–/– |
| **Beam** | | | |
| (a) | steel floor beam in continuous contact with a concrete floor slab | | 60/–/– or 30 $m^2$/tonne |
| (b) | any other beam | | 60/–/– |
| **Fire-resisting lift and stair shaft** (within the *carpark* only) | | | 60/60/60 |
| **Floor slab and vehicle ramp** | | | 60/60/60 |
| **Roof** (not used for carparking) | | | –/–/– |

Notes:
1. ESA/M means the ratio of exposed surface area to mass per unit length.
2. Refer to Specification E1.5 for special requirements for a sprinkler system in a *carpark* complying with Table 3.9 and located within a multi-classified building.

## Appendix D – Implications of BCA Classification 9a versus Classification 5

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| | Neil Watson | Savills | nwatson@savills.com.au |
| **From** | Vanessa Batty | **Date** 7 November 2017 | **Ref** 074257-02EM |
| **Re** | **North Shore Health Hub – Implications of BCA Classification 9a vs Classification 5** | | |

This advice has been prepared as a summary of the BCA deemed-to-satisfy (DtS) variances between BCA Classifications 9a and 5. This document should not be used as a comprehensive list of BCA compliance matters; it should be used as a guide only on key BCA compliance differences between the classifications which may affect architectural and services design.

**Definitions:**

*Class 5:*

*An office building used for professional or commercial purposes, excluding buildings of Class 6, 7, 8 or 9.*

The BCA Guide gives further direction on this classification with examples including professional chambers or suites, lawyers' offices, government offices, advertising agencies and accountants' offices.

*Class 9:a building of a public nature—*

*Class 9a — a health-care building, including those parts of the building set aside as a laboratory;*

The BCA Guide gives further direction on this classification with examples including day-care surgeries or procedure units and the like. Health care buildings (or part) include areas where patients are undergoing medical treatment and require physical assistance to evacuate the building during an emergency.

Health care buildings are distinguished from a doctor's or dentist surgery because should evacuation in these places become necessary, patients would not require assistance (as a result of the treatment being administered).

Patient care area: means a part of a health-care building normally used for the treatment, care, accommodation, recreation, dining and holding of patients including a ward area and treatment area.

The subject building is noted to be used as both class 9a and class 5, Type A Construction and over 25m in effective height. The table below provides a summary of BCA compliance matters that will need to be considered to address the distribution of uses within the building only.

| BCA Clause | Class 9a | Class 5 |
|---|---|---|
| **C2.2 – General Floor area and volume limitations** | Maximum fire compartment size:<br>max floor area— 5 000 m2<br>max volume— 30 000 m3 | Maximum fire compartment size:<br>max floor area— 8 000 m2<br>max volume— 48 000 |

| | | |
|---|---|---|
| | | m3 |
| **C2.5 – Class 9a (and 9c) buildings** | Additional fire and smoke compartmentation of patient care areas, ward areas and treatment areas for health care uses. Including the fire separation of patient care areas from all non-patient care areas. | |
| **C2.8 – Separation of classifications in the same storey** | Fire walls construction in accordance with BCA Cl C2.7 to separate classifications in the same storey. Should fire separation of classification not be proposed the more onerous of the BCA DtS provisions will be applied to the fire compartment as a whole. | |
| **D1.4 – Exit travel distances** | In patient care areas:<br>a) 12m to a point of choice<br>b) 30m to an exit | a) 20m to a point of choice<br>b) 40m to an exit |
| **D1.5 – Distance between alternative exits** | Maximum travel distance of 45m travel between. | Maximum travel distance of 60m travel between. |
| **D1.6 - Dimensions of exits and paths of travel to exits** | Patient care areas where beds are transported are to have increased exit width and paths of travel to an exit of up to 1800mm. an increased door width along exits and paths of travel to exits is required. | 1m width of exit and path of travel to an exit. |
| **D1.10 – Discharge of exits** | Exits from patient care areas must not discharge at a point where access to the road required via a stairway. | |
| **D2.14 – landing** | Landings of stairs are to be increased to accommodate the movement of the stretcher. | |
| **E2.2a – Smoke Hazard Management** | In addition to zone smoke control, Class 9a buildings are to be provided with:<br>- Smoke detection and alarm to BCA Spec E2.2a, E2.2b and AS1670.1.<br>- Manual call points to BCA Spec E2.2a.<br>- Automatic shutdown on air handling systems.<br>- Building Occupant Warning System to Cl 3.22 of AS1670.1 | |
| **F2.3 – Sanitary facilities** | Additional facilities to be provided including:<br>- Kitchen;<br>- Laundry facilities<br>- Shower for every 8 patients<br>- Plunge bath | |
| **F3.1 – Heights of rooms and other spaces** | Operating or delivery rooms are to have a ceiling height of 3m. all other areas to be 2.4m minimum | |
| **F4.1 – provision of natural light** | To be provided to all sleeping spaces | |

Regards,

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