# BUILDING CODE OF AUSTRALIA REPORT

## Bankstown Capital Development
## 83-99 North Terrace & 62 The Mall, Bankstown

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| Date | Revision Number | No. of pages | Issue or Description of Amendment | Checked By | Approved By | Date Approved |
|---|---|---|---|---|---|---|
| 5/10/16 | 04 | 22 | For DA Submission | Aaron Celarc | Vanessa Batty | 6/10/16 |

## Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by H3 and Nettleton Tribe (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 | Performance Requirement |
|---|---|---|
| C1.1 | Reduction in Fire Resistance Levels<br>Proposal to reduce Fire Resistance Levels of building elements in the retail are to be 120 minutes in lieu of 180 minutes. | CP1 and CP2 |
| C2.7 | The Retail area and Basement level 1 will be required to be fire separated in the escalator area. This is to be addressed through a performance based solution by the fire engineer. | CP1 and CP2 |
| C2.3 and C2.4 | Perimeter Vehicular Access<br>The retail fire compartment being in excess of that prescribed by Clause C2.2 and as such, the building is considered to be Large Isolated in accordance with Clause C2.3, due to the site constraints including the location of the existing building on Fetherstone Street, perimeter vehicular access does not comply with the DtS provisions of the BCA. | CP9 |
| C2.14 | The public corridors of building C and D exceed the maximum allowable of 40m, this is to be addressed through a fire engineered solution to provide smoke sealing to the SOUs | CP2 and EP2.2 |
| D1.2 | Number of exits<br>Block A levels 10- 18 residential levels are provided with one fire isolated exit in lieu of 2<br>Block D levels 2 and 3 are provided with one fire isolated exit in lieu of 2<br>Block B roof level 24 has access to 1 exit in lieu of 2<br>Plant levels are provided with one fire isolated exit in lieu of 2 | DP4 |
| D1.5, D1.7, D1.10 | Construction of exits<br>The current design documentation has been reviewed and has revealed that there are a number of deviations for the prescriptive requirements of the BCA that are required to be addressed through further design development and/or the development of an alternative solution by the fire engineer.<br>a) The proximity of the entrance to the fire stairs within the residential towers on the floor plate (i.e. their distribution across the floor) and the points of discharge of the stairs at ground level is to be addressed by the fire engineer through the development of an alternative solution. The requirements of BCA Clause D1.5 and D1.10 require the exits to be distributed across the floor and their discharge to be as far away as possible from each other.<br>b) Several fire isolated exits discharged into covered areas | DP4 and DP5 |

| | | |
|---|---|---|
| | and areas within the ground floor retail mall less than 1/3 open of its perimeter<br>c) Fire stair C1 discharges next to a glazed portion of the residential lobby. | |
| D1.10 | The fire stair from building C discharges onto the terrace level in lieu of discharging to a road or open space | DP4 and DP5 |
| D1.4 and D1.5 | Provisions for Egress – Travel Distance<br>Travel distances are proposed to be in excess of that prescribed by the BCA Deemed-to-satisfy provisions. The below travel distances are currently documented:<br>▪ Basement level- 1- 55m in lieu of 40<br>▪ Basement level-1- 110m between alternative exits in lieu of 60m<br>▪ Basement level-2- 45m in lieu of 40m<br>▪ Basement level-2- 79m between alternative exits in lieu 60m<br>▪ Ground floor retail -46m to a point of choice in lieu of 20m from retail 07<br>▪ Retail areas on level 1- 95m between alternative exits in lieu of 60m<br>▪ Level 1 external area- 41m to a single exit in lieu of 20m<br>▪ Level 1 carpark- 48m in lieu of 40m<br>▪ Level 2 carpark- 46m in lieu of 40m<br>▪ Level 1 and 2 carpark- 70m between alternative exits in lieu of 60m<br>▪ Levels 1, 2 and 3 Council Building - 42m to a single exit in lieu of 20m<br>▪ Building A residential – 11m in lieu of 6m<br>▪ Building A 27m to a single exit in lieu of 6m from external terrace on level 10<br>▪ Building B residential – 10m in lieu of 6m<br>▪ Building B Roof level 24- 25m to a single exit in lieu of 20m<br>▪ Building C residential- 7m in lieu of 6m<br>▪ Building C roof level 18- 24m to a single exit in lieu of 20<br>▪ Building D 30m to a point of choice in lieu of 6m from external terrace area on level 10<br>▪ Building D 13m to a point of choice in lieu of 6m from eastern terrace area on level 10<br>These distances are to be verified in consultation with the fire engineer. | DP4, EP2.2 |
| D1.6 | Aggregate Egress<br>The width of exits afforded to the retail areas is to be addressed as part of the fire engineered solution to demonstrate compliance with the performance requirements of the BCA. | DP6 and EP2.2 |
| E1.3 | The hydrant booster assembly is proposed to be located on the North Terrace street frontage. Due to there being multiple entrances to the site, the location is to be verified as part of the fire engineering strategy for the development. The booster | EP1.3 |

| | | |
|---|---|---|
| | assembly does not achieve the required radiant heat protection as outlined in AS2419.1 due to the retail glazing. | |
| E1.5 | The design of the soffit in the ground floor mall area may affect the coverage for the sprinkler system. **Note:** The proposed sprinkler system is to comply with the DtS provisions of the BCA, if compliance cannot be achieved, a Fire Engineered solution will be required. | EP2.2 |
| E1.8 | Due to the multiple entrances on site and the location of the fire control room is to be assessed as part of the alternate solution report. The fire control room is to be a minimum of 10m2 | EP1.6 |
| E2.2 | Smoke Hazard Management<br>The provision for smoke exhaust in the retail area is to be rationalised through the development of a performance based solution by the fire engineer. | EP2.2 |

The fire engineered solution relating to CP9, EP2.2, EP1.3, EP1.6 need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further design development is required to locate the fire services infrastructure and nominate any deviations for the prescriptive requirements which will require consultation with FRNSW.

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

Assessed By
Aaron Celarc

## 1.0 Introduction

Address: 83-99 North Terrace and 62 The Mall, Bankstown

The proposed development comprises of a mixed use development which includes:

1. Demolition and site preparation works;
2. A new Council Civic Centre administration building with 86 car spaces;
3. Commercial and retail premises;
4. Residential flat buildings; and
5. Car parking.

The site is bounded by North Terrace, Fetherstone Street, The Mall and The Appian Way,

## 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 Building Code of Australia (BCA).

The version of the BCA applicable to the development is the version that is in place at the time of the application to the Certifying authority for the Construction Certificate. For the purposes of this report, BCA 2016 has been utilised as the version of the BCA applicable at the time of preparation of this report

## 2.0 Building Assessment Data

Summary of Construction Determination: -

| | |
|---|---|
| Classification | 7a, 6, 5, 2, 9b |
| Number of Storeys Contained | 27 |
| Rise In Storeys | 25 |
| Type of Construction | Type A |
| Effective Height (m) | >50m |

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

| Part of Project | BCA Classification | Approx. Floor Area ($m^2$) | Assumed Population |
|---|---|---|---|
| Basement 1 | 7a* | 9583 | 320 |
| Basement 2 | 7a* | 9583 | 320 |

| Part of Project | BCA Classification | Approx. Floor Area ($m^2$) | Assumed Population |
|---|---|---|---|
| Ground | | | |
| Retail | 6 | 4921 | 1641 |
| Office (council) | 5 | 350 | 35 |
| Level 1 | | | |
| Retail | 6 | 2513 | 503 |
| Carpark | 7a | 3953 | 132 |
| Council | 5 | 1332 | 133 |
| Level 2 | | | |
| Office (council) | 5 | 1324 | 133 |
| Carpark | 7a | 3562 | 119 |
| Level 3 | | | |
| Office (council) | 5 | 1325 | 133 |
| **Total** | | **34884m2** | **3469** |

Notes:
1. The above populations have been based 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 for amenity calculations.
3. It is assumed that the basement storage areas will occupy less than 10% of the floor area. This is to be verified by the Architect. If the storage areas are greater than 10% they will be considered class 7b

## 3.0 Structural Provisions

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

Glazing is to comply with AS1288, and AS2047.

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

## 4.0 Fire Resistance

The buildings should be constructed generally in accordance with Table 3 of Specification C1.1 of the Building Code of Australia 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;

- Bounding construction to the sole occupancy units of 90 minutes,
- Separation between the carpark levels and the residential/retails portions of 180 minutes,
- Fire compartmentation of the building at each floor level (excluding retail which is considered a single compartment).
- Fire separation between classifications may where the void space connects from retail though to class 5 and class 2 portions of the building will need to be addressed.

Fire resistance levels for building structural members are as follows:

- Retail Portions 180 minutes
- Commercial portion 120 minutes
- Car park levels 120 minutes
- Storage areas (if greater than 10% of the floor area) 240 minutes
- Residential Portions 90 minutes

The Fire Resistance Levels required of the retail areas is proposed to be reduced from 180 minutes as part for the alternative solution prepared by the fire engineer.

As the retail area of the building exceeds the area / volume limitations of the BCA provisions, the building is considered a large isolated building and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA specifications E1.5 throughout the development / smoke detection and alarm system in accordance with AS1670,
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter,
- Smoke exhaust or smoke and heat vents required throughout the development.

Due to site constraints, the perimeter vehicular access to the building is proposed to deviate from the prescriptive requirements of the BCA, in which it is located greater than 18m from the building. This is to be addressed through a performance based solution developed by the fire engineer in consultation with Fire and Rescue NSW. In addition, smoke hazard management for the development is to be rationalised through the development of an alternative solution by the fire engineer.

### 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 or 180 minutes in retail areas;
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 180 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.*

Due to the proximity of the building to the property building, the openings and construction detail along that boundary is to be considered by the fire engineer and a performance based solution to be developed to address the fire protection requirements of the building due to the exposure.

### 4.3 Separation of external walls and associated openings in different fire compartments

External walls of adjoining/adjacent fire compartments are required to have an FRL of 60/60/60 and the openings in the external walls are to be protected by a means described above. The distance of protection required are detailed in the table below:-

| 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 less than $180^o$ | 2m |
| $180^o$ or more | Nil |

The protection of opening may include internal or external wall wetting drenchers or -60/- fire windows/doors or other type of construction.
Please note this will be particularly applicable to the bridges connecting the existing hospital and extension, clarification on proposed construction materials is to be provided.

### 4.4 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.

The roof terrace on level 4 is to be considered as roof as open space for egress purposes and will therefore be required to achieve a minimum fire resistance level of 120 minutes.

### 4.5 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.

### 4.6 Façade Combustibility

A building of Type A construction is required to have all external walls comprising of non-combustible construction. To demonstrate non-combustibility of components that make up an external wall, a test report, from a registered testing authority, is required to be provided that demonstrates the product is non-combustible when tested in accordance with AS 1530.1-1994.

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.

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.

### 4.7 Roof Lights

If roof lights/skylights are proposed on the residential roof terrace level 4 the following requirements need to be met as the roof is required to achieve an FRL:

a) have an aggregate area of not more than 20% of the roof surface; and
b) be not less than 3 m from—
   (i) Any boundary of the allotment other than the boundary with a road or public place;and
   (ii) Any part of the building which projects above the roof unless that part has the FRL required of a fire wall and any openings in that part of the wall for 6 m vertically above the rooflight or the like are protected in accordance with **C3.4**; and
   (iii) Any rooflight or the like in an adjoining sole-occupancy unit if the walls bounding the unit are required to have an FRL; and
   (iv) Any rooflight or the like in an adjoining fire-separated section of the building;

## 5.0 Egress

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways
- Required non-fire isolated stairways
- Roof as open space

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.

- Two fire isolated stairways are to be afforded to all residential levels
- Two fire isolated stairways are to be afforded to plant levels.

The current design documentation has been reviewed and has revealed that there are a number of deviations for the prescriptive requirements of the BCA that are required to be addressed through further design development and/or the development of an alternative solution by the fire engineer.

- The proximity of the entrance to the fire stairs within the residential towers on the floor plate (i.e. their distribution across the floor) and the points of discharge of the stairs at ground level is to be addressed by the fire engineer through the development of an alternative solution. The requirements of BCA Clause D1.5 and D1.10 require the exits to be distributed across the floor and their discharge to be as far away as possible from each other.

Two exits are to be provided to all levels this is to be resolved through design development

- Block A levels 10- 18 residential levels are provided with 1 fire isolated exit in lieu of 2
- Block D levels 2 and 3 are provided with 1 fire isolated exit in lieu of 2
- Block B roof level 24 has access to 1 exit in lieu of 2
- Residential corridors exceed 40m

### 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 2-3

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

The following areas exceed the maximum allowable travel distance and will require to be addressed through a Fire Engineered Performance Solution

Basement Levels
- Basement level- 1- 55m in lieu of 40
- Basement level-2- 45m in lieu of 40m

Carparks
- Level 1 carpark- 48m in lieu of 40m
- Level 2 carpark- 46m in lieu of 40m
- Level 3 carpark storage area 56m to a point of choice in lieu of 20m, further design development required.

Residential areas
- Building A residential – 11m in lieu of 6m
- Building A 27m to a single exit in lieu of 6m from external terrace on level 10
- Building B residential – 10m in lieu of 6m
- Building B Roof level 24- 25m to a single exit in lieu of 20m
- Building C residential- 7m in lieu of 6m
- Building C roof level 18- 24m to a single exit in lieu of 20
- Building D 30m to a point of choice in lieu of 6m from external terrace area on level 10
- Building D 13m to a point of choice in lieu of 6m from eastern terrace area on level 10

Distance between alternate exits
- Basement level-1- 110m between alternative exits in lieu of 60m
- Basement level-2- 79m between alternative exits in lieu 60m
- Retail areas on level 1- 95m between alternative exits in lieu of 60m
- Level 1 and 2 carpark- 70m between alternative exits in lieu of 60m

The following areas exceed the maximum allowable travel distance and will be required to be addressed through further design development:

Council Building
- Levels 1, 2 and 3 Council Building - 42m to a single exit in lieu of 20m

Retail areas
- Ground floor retail -46m to a point of choice in lieu of 20m from retail 07
- Level 1 external area- 41m to a single exit in lieu of 20m

Note: Travel distances extended greater then deemed to satisfy will be required to be addressed through a Performance Based Solution by an appropriately qualified Fire Engineer. Retail Stores 07, 08, 16, C.04 and C.03 will require alternative egress routes; this is to be resolved through further design development.

### 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).

The following table summarises the exit widths required:

| Floor Level | Exit Width Provided | Number of people (as provided) | Exit Width required |
|---|---|---|---|
| Basement 1 | 5 | 320 | 3 |
| Basement 2 | 5 | 320 | 3 |
| Ground retail | 30 | 4921 | 41.5 |
| Level 1 retail | 3 | 2513 | 21.5 |
| Level 1 carpark | 2 | 132 | 1.5 |
| Level 2 carpark | 3 | 119 | 1.25 |

| | | | |
|---|---|---|---|
| Ground level Office (council) | TBC | 35 | TBC |
| Level 1 Office (Council) | 1 | 133 | 1.5 |
| Level 2 Office (Council) | 1 | 133 | 1.5 |
| Level 3 Office (Council) | 1 | 133 | 1.5 |

The required exit width for the retail areas is proposed to be rationalised by the fire engineer in order to verify design compliance with the performance requirements of the BCA.

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).

### 5.3 Fire Isolated Exits

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

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

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

### 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.

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

Where the main public entrance is via a ramp, tactile indicators shall be provided in accordance with AS 1428.4 at the top and bottom. Parking shall be provided for people with disabilities in accordance with 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 throughout the building.
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Sound System & Intercom System for Emergency Purposes in accordance with AS 1670.4-2015.
- 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 as the building has an effective height of more than 50m.

## 7.0 Ventilation and Smoke Hazard Management

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

General Requirements for the building:
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2012. This applies to any fire isolated passageways exceeding 60m.

Retail
- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2b
- Passageways greater than 60m in length are required to be pressurised where they are part of a fire isolated exit.

Office (Council)
- Zone Smoke Control in accordance with the requirements of AS/NZS 1668.1-2012;

Residential
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2015

Carpark
- Mechanical Ventilation in accordance with AS1668.2 and Clause 5.5 of AS1168.1 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.
  - Basement storeys less than 2 storeys below ground level are not required to have Automatic Pressurisation to Fire Isolated Exits.

Note: If Jet Fans are proposed to be used to achieve ventilation requirements, a performance based solution will be required from an appropriately qualified Fire Engineer.

Any variations to the above provisions will require the development of an alternative solution by the fire engineer and consultation with Fire and Rescue NSW

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

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 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 1735.2
- 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 AS 1735.2. The lift is to service all levels within the building.
- 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.

Note: Each floor of each tower is to be serviced by an Emergency Lift in accordance with E3.4 of the BCA

## 9.0 Sanitary Facilities

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

| Class | Type | Pop. | WC | Urinals | Basins |
|---|---|---|---|---|---|
| 6 (Retail Patrons) | Male | 3568 | 3 | 4 | 4 |
| | Female | 3568 | 5 | NA | 4 |
| 6 (Retail Staff) | Male | 1499 | 8 | 4 | 8 |
| | Female | 149 | 10 | NA | 8 |
| **Total Retail** | | | **26** | **8** | **24** |
| Council Building | Male | 217 | 11 | 6 | 8 |
| | Female | 217 | 15 | NA | 8 |
| **Total Council** | | | **26** | **6** | **16** |

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.

Each sole occupancy unit is to be provided with:
- A kitchen sink and facilities for preparation and cooking of food; and
- A bath or shower; and
- A closet pan and wash basin; and
- Clothes washing facilities (tub and space for washing machine); and
- Clothes drying facilities (either 7.5m of clothes line or space for a dryer).

As the development contains more than 10 apartments, a closet pan and basin is to be provided at or near ground level for employees that can be accessed without going through a sole occupancy unit.

Notes:
1. The council Building is shown to provide its own amenities.
2. The ratio of employees to patrons has been calculated at 25:1

## 10.0 Energy Efficiency

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

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

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.

Due to special nature of the building some energy provisions may not be appropriate.

## 10.8 Access for Maintenance

Access if to be provided to all plant, equipment and components associated with the provision of the above energy requirements i.e.

- Adjustable or monitored shading devices
- Time switches and motion detectors
- Room temperature thermostats
- Plant thermostats such as boilers or refrigeration units
- Motorised air dampers and central valves
- Reflectors, Lenses and Diffusers of light fittings
- Heat transfer equipment

## 11.0 swimming pools

The proposed swimming pool will be required to be provided with the following:

- A continuous barrier for the full extent of the hazard; and
- be of a strength and rigidity to withstand the foreseeable impact of people; and
- restrict the access of young children to the pool and the immediate pool surrounds; and
- have any gates and doors fitted with latching devices not readily operated by young children, and constructed to automatically close and latch.

- The water recirculation system must incorporate safety measures to avoid entrapment of, or injury to, a person.

The swimming pool barrier fencing will also be required to be constructed in accordance with AS1926-2012.

## Appendix A - Design Documentation

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

| Drawing No. | Title | Date | Drawn By | Revision |
|---|---|---|---|---|
| 16003/DA1.01 | Basement 02 | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.02 | Basement 01 | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.03 | Ground Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.04 | Level 1 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.05 | Level 2 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.06 | Level 3 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.07 | Level 4 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.08 | Level 5 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.09 | Level 6 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.10 | Level 7 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.11 | Level 8 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.12 | Level 9 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.13 | Level 10 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.14 | Level 11 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.15 | Level 12 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.16 | Level 13 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.17 | Level 14 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.18 | Level 15 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |

| | | | | |
|---|---|---|---|---|
| 16003/DA 1.19 | Level 16 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.20 | Level 17 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.21 | Level 18 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.22 | Level 19 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.23 | Level 20 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.24 | Level 21 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.25 | Level 22 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.26 | Level 23 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.27 | Level 24 Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 1.28 | Floor Plan | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 2.01 | North Elevations | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 2.02 | East Elevations | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 2.03 | South Elevations | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 2.04 | West Elevations | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.01 | Section A | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.02 | Section B | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.03 | Section C | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.04 | Section D | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.05 | Section E | 09.09.16 | H3 Architects / Nettleton Tribe | - |
| 16003/DA 3.06 | Section F | 09.09.16 | H3 Architects / Nettleton Tribe | - |

## 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 – 2015 |
| 4. | Automatic Fire Suppression System | BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.6 – 1995 (Combined sprinkler & hydrant) |
| 5. | Building Occupant Warning System activated by the Sprinkler System | BCA Spec. E1.5 & AS 1670 – 2004 |
| 6. | Emergency Lifts | BCA Clause E3.4 & AS 1735.2 – 2001 |
| 7. | Emergency Lighting | BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 |
| 8. | EWIS | BCA Clause E4.9 & AS 1670.4 - 2015 |
| 9. | Emergency Evacuation Plan | AS 3745 – 2002 |
| 10. | Exit Signs | BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005 |
| 11. | Fire Control Rooms | BCA Spec. E1.8 |
| 12. | Fire Blankets | AS 2444 – 2001 |
| 13. | Fire Dampers | BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990 |
| 14. | Fire Doors | BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2005 |
| 15. | Fire Hose Reels | BCA Clause E1.4 & AS 2441 – 2005 |
| 16. | Fire Hydrant System | Clause E1.3 & AS 2419.1 – 2005 |
| 17. | Fire Seals | BCA Clause C3.15 & AS 1530.4 – 1997 |
| 18. | Lightweight Construction | BCA Clause C1.8 & AS 1530.3 – 1999 |
| 19. | Mechanical Air Handling System | BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 2012 |
| 20. | Paths of Travel | EP&A Reg 2000 Clause 186 |
| 21. | Perimeter Vehicular Access | BCA Clause C2.4 |
| 22. | Portable Fire Extinguishers | BCA Clause E1.6 & AS 2444 – 2001 |
| 23. | Pressurising Systems | BCA Clause E2.2 & AS/NZS 1668.1 – 2012 |
| 24. | Required Exit Doors (power operated) | BCA Clause D2.19(d) |
| 25. | Self-Closing Fire Hoppers | BCA Clause C3.13 & AS 1530.4 – 1997 |
| 26. | Smoke Hazard Management System | BCA Part E2 & AS/NZS 1668.1 – 2012 |
| 27. | Smoke and/or Heat Alarm System | BCA Spec. E2.2a & AS 3786 – 1993 |
| 28. | Smoke Dampers | AS/NZS 1668.1 – 2012 |
| 29. | Smoke Doors | BCA Spec. C3.4 |
| 30. | Solid Core Doors | BCA Clause C3.11 |
| 31. | Stand-by Power System | BCA Clause G3.8 |
| 32. | Wall-Wetting Sprinklers | BCA Clause C3.4 & AS 2118.2 – 1995 |
| 33. | 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 2015:

**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 |