Our Ref: D2017-001(A/B)

05 May 2017

SITE E – BUILDINGS A & B
CHAPMAN STREET, WERRINGTON

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

BATHLA GROUP

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Table of Contents

0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	05/05/2017

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	14/02/2017
R02	Dean Morton	Final	05/05/2017

1.0 Executive Summary

This report has been prepared so as to assess the architectural documentation as detailed in Part 6 in accordance with the Building Code of Australia Volume 1 (BCA) 2016 and adopted standards. The proposed development is the construction of a residential flat building including a two storey deep basement and 5 above ground storeys that are contained in two towers. The building forms part of a complex of four buildings over the site of similar design in which this building is referred to as building A & B. It is noted the design will be that of separate buildings under the BCA in which case the fire walls to the basement levels will comply with Clause C2.7 and slabs will terminate at the fire wall locations.

The assessment has revealed that the proposed development will be capable of achieving compliance with BCA 2016. The following matters will require further consideration during detailed design development at the construction stage of the project:

1. The building is to adopt type A construction throughout.
2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire hose reels, sprinklers and hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to the above ground storeys of up to 10.0m will be subject to a performance solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. The point of discharge of the fire stair to the west core of building B is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage.
9. The windows to bed 1 of unit G05, bed 2 of G04, bed 2 of G11 is to be fixed closed and drencher protected internally.

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building A & B is located to the north west corner of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.15m (RL 39.45 – RL 27.30)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 167 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use of such materials would need to be subject to an alternate solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The residential garbage room to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to an alternate solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Levels 1-4 up to 10.0m to a single exit (6m max)

It is noted that the non-compliant travel distances will be assessed as a performance solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits generally comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basement are less than 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

The point of discharge of the fire stair to the west core of building B is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage. The windows to bed 1 of unit G05, bed 2 of G04, bed 2 of G11 is to be fixed closed and drencher protected internally.

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as an alternate solution at the construction certificate stage as advised by the client. The point of discharge of the east

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors will swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are not considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the four buildings on the site are separate buildings under the BCA each must have its own independent hydrant system.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.
- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is provided for maintenance staff. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements.

Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:

The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

Fire Safety and Other Measures

3.7. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

4. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

5. Referenced plans

Drawing No	Document	Revision	Date
A090a	Site E & F Basement level 2	E	Mar 2017
A091a	Site E & F Basement level 1	E	Mar 2017
A100a	Site E & F ground level	E	Mar 2017
A101a	Site E & F levels 1-2	E	Mar 2017
A102a	Site E & F level 2	E	Mar 2017
A103a	Site E & F level 3	E	Mar 2017
A104a	Site E & F level 4	E	Mar 2017
A200a	East elevations	E	Mar 2017
A201a	West elevations	E	Mar 2017
A203a	West elevations	E	Mar 2017
A204a	South elevations	E	Mar 2017
A205a	North elevations	E	Mar 2017
A300a	Sections	E	Mar 2017

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2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire hose reels, sprinklers and hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to levels 1-4 of up to 10.3m will be subject to an alternate solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage. The entry to the main foyers of building D are to be provided with a low rise platform lift.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. The point of discharge of the fire stair to the west core of building C is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage.
9. The windows to bed 1 of unit G13, bed 1 of G06, bed 2 of G03 and bed 1 of G11 is to be fixed closed and drencher protected internally.

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building C & D is located to the north west corner of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.2m (RL 38.40 – RL 26.20)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 167 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use of such materials would need to be subject to an alternate solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The residential garbage room to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to an alternate solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Levels 1-4 up to 10.0m to a single exit (6m max)

It is noted that the non-compliant travel distances will be assessed as a performance solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits generally comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basement are less than 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

The point of discharge of the fire stair to the west core of building C is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage. The windows to bed 1 of unit G13, bed 1 of G06, bed 2 of G03 and bed 1 of G11 is to be fixed closed and drencher protected internally.

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as a performance solution at the construction certificate stage as advised by the client.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors will swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are not considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.
6. The southern lobbies of building D are to be provided with a ramp or low rise platform lift to afford compliant access.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the four buildings on the site are separate buildings under the BCA each must have its own independent hydrant system. Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.
- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is provided for maintenance staff. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements.

Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:

The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

4. Fire Safety and Other Measures

4.1. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

5. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

6. Referenced plans

Drawing No	Document	Revision	Date
A090a	Site E & F Basement level 2	E	Mar 2017
A091a	Site E & F Basement level 1	E	Mar 2017
A100a	Site E & F ground level	E	Mar 2017
A101a	Site E & F levels 1-2	E	Mar 2017
A102a	Site E & F level 2	E	Mar 2017
A103a	Site E & F level 3	E	Mar 2017
A104a	Site E & F level 4	E	Mar 2017
A200a	East elevations	E	Mar 2017
A201a	West elevations	E	Mar 2017
A203a	West elevations	E	Mar 2017
A204a	South elevations	E	Mar 2017
A205a	North elevations	E	Mar 2017
A300a	Sections	E	Mar 2017

Our Ref: D2017-001(E/F)

05 May 2017

SITE F – BUILDINGS E & F
CHAPMAN STREET, WERRINGTON

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

BATHLA GROUP

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Table of Contents

0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	05/05/2017

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	14/02/2017
R02	Dean Morton	Final	05/05/2017

1.0 Executive Summary

This report has been prepared so as to assess the architectural documentation as detailed in Part 6 in accordance with the Building Code of Australia Volume 1 (BCA) 2016 and adopted standards.

The proposed development is the construction of a residential flat building including a two storey deep basement and 5 above ground storeys that are contained in two towers. The building forms part of a complex of four buildings over the site of similar design in which this building is referred to as building E & F. It is noted the design will be that of separate buildings under the BCA in which case the fire walls to the basement levels will comply with Clause C2.7 and slabs will terminate at the fire wall locations.

The assessment has revealed that the proposed development will be capable of achieving compliance with BCA 2016. The following matters will require further consideration during detailed design development at the construction stage of the project:

1. The building is to adopt type A construction throughout.
2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire hose reels, sprinklers and hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to the above ground storeys of up to 10.0m will be subject to a performance solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. The point of discharge of the fire stair to the west core of building F is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage.
9. The windows to bed 2 of unit G02, bed 2 of G10 (E), bed 2 of G10 (F) are to be fixed closed and drencher protected internally

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building E & F is located to the south west corner of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.55 (RL 39.40 – RL 26.85)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 167 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use of such materials would need to be subject to an alternate solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The residential garbage room to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to an alternate solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Levels 1-4 up to 10.0m to a single exit (6m max)

It is noted that the non-compliant travel distances will be assessed as a performance solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits generally comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basement are less than 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

The point of discharge of the fire stair to the west core of building F is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage. The windows to bed 2 of unit G02, bed 2 of G10 (E), bed 2 of G10 (F) is to be fixed closed and drencher protected internally.

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors will swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are not considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the four buildings on the site are separate buildings under the BCA each must have its own independent hydrant system.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.
- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is provided for maintenance staff. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements.

Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:

The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

4. Fire Safety and Other Measures

4.1. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

5. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

6. Referenced plans

Drawing No	Document	Revision	Date
A090a	Site E & F Basement level 2	E	Mar 2017
A091a	Site E & F Basement level 1	E	Mar 2017
A100a	Site E & F ground level	E	Mar 2017
A101a	Site E & F levels 1-2	E	Mar 2017
A102a	Site E & F level 2	E	Mar 2017
A103a	Site E & F level 3	E	Mar 2017
A104a	Site E & F level 4	E	Mar 2017
A200a	East elevations	E	Mar 2017
A201a	West elevations	E	Mar 2017
A203a	West elevations	E	Mar 2017
A204a	South elevations	E	Mar 2017
A205a	North elevations	E	Mar 2017
A300a	Sections	E	Mar 2017

Our Ref: D2017-001(G/H)

05 May 2017

SITE F – BUILDINGS G & H
CHAPMAN STREET, WERRINGTON

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

BATHLA GROUP

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Table of Contents

0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	05/05/2017

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	14/02/2017
R02	Dean Morton	Final	05/05/2017

1.0 Executive Summary

This report has been prepared so as to assess the architectural documentation as detailed in Part 6 in accordance with the Building Code of Australia Volume 1 (BCA) 2016 and adopted standards.

The proposed development is the construction of a residential flat building including a two storey deep basement and 5 above ground storeys that are contained in two towers. The building forms part of a complex of four buildings over the site of similar design in which this building is referred to as building G & H. It is noted the design will be that of separate buildings under the BCA in which case the fire walls to the basement levels will comply with Clause C2.7 and slabs will terminate at the fire wall locations.

The assessment has revealed that the proposed development will be capable of achieving compliance with BCA 2016. The following matters will require further consideration during detailed design development at the construction stage of the project:

1. The building is to adopt type A construction throughout.
2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire hose reels, sprinklers and hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to levels 1-4 of up to 10.0m will be subject to an alternate solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage. The entry to the main foyers of building H are to be provided with a low rise platform lift.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. The point of discharge of the fire stair to the west core of building G is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage.
9. The windows to bed 1 of unit G11, bed 2 of G09 and bed 2 of G02 are to be fixed closed and drencher protected internally.

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building G & H is located to the south east corner of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.10m (RL 38.50 – RL 26.40)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 167 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use such materials would need to be subject to an alternate solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The residential garbage room to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to an alternate solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Levels 1-4 up to 10.0m to a single exit (6m max)

It is noted that the non-compliant travel distances will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits generally comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basement are less than 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

The point of discharge of the fire stair to the west core of building G is not considered compliant as open space and to be subject to a performance solution at the construction certificate stage. The windows to bed 1 of unit G11, bed 2 of G09 and bed 2 of G02 are to be fixed closed and drencher protected internally

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors will swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are not considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.
6. The southern lobbies of building H are to be provided with a ramp or low rise platform lift to afford compliant access.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the four buildings on the site are separate buildings under the BCA each must have its own independent hydrant system. Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.
- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is provided for maintenance staff. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements.

Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:

The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

4. Fire Safety and Other Measures

4.1. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

5. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

6. Referenced plans

Drawing No	Document	Revision	Date
A090a	Site E & F Basement level 2	E	Mar 2017
A091a	Site E & F Basement level 1	E	Mar 2017
A100a	Site E & F ground level	E	Mar 2017
A101a	Site E & F levels 1-2	E	Mar 2017
A102a	Site E & F level 2	E	Mar 2017
A103a	Site E & F level 3	E	Mar 2017
A104a	Site E & F level 4	E	Mar 2017
A200a	East elevations	E	Mar 2017
A201a	West elevations	E	Mar 2017
A203a	West elevations	E	Mar 2017
A204a	South elevations	E	Mar 2017
A205a	North elevations	E	Mar 2017
A300a	Sections	E	Mar 2017

Our Ref: D2017-001(I/J/K)

05 May 2017

SITE I – BUILDINGS I, J & K
CHAPMAN STREET, WERRINGTON

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

BATHLA GROUP

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Table of Contents

0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	05/05/2017

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	14/02/2017
R02	Dean Morton	Final	05/05/2017

1.0 Executive Summary

This report has been prepared so as to assess the architectural documentation as detailed in Part 6 in accordance with the Building Code of Australia Volume 1 (BCA) 2016 and adopted standards.

The proposed development is the construction of a residential flat building including a two storey deep basement and 5 above ground storeys that are contained in three towers. The building forms part of a complex of two buildings over the site of similar design in which this building is referred to as building I, J & K. It is noted the design will be that of separate buildings under the BCA in which case the fire walls to the basement levels will comply with Clause C2.7 and slabs will terminate at the fire wall locations.

The assessment has revealed that the proposed development will be capable of achieving compliance with BCA 2016. The following matters will require further consideration during detailed design development at the construction stage of the project:

1. The building is to adopt type A construction throughout.
2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire hose reels, sprinklers and fire hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to the basement up to 43m to an exit and to the above ground storeys of up to 10.3m will be subject to an alternate solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. There is to be a toilet pan and basin provided for maintenance staff at or near ground level.

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building I, J & K is located to the north side of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.35m (RL 37.95 – RL 25.60)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 130 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use of such materials would need to be subject to a performance solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The garbage rooms to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to a performance solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Above ground levels up to 12.7m to a single exit (6m max)

On the ground floor entry to the fire isolated exit is required, travel distances up to 20m are permitted to the exit where discharging at ground level.

It is noted that the non-compliant travel distances will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits within the basements comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basements do not exceed 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as a performance solution at the construction certificate stage as advised by the client.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors are to swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the two buildings on the site are separate buildings under the BCA each must have its own independent hydrant system.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire. It is noted the effective height of the building is exactly 12m however allowing for construction tolerances it is recommended to incorporate a stretcher facility to the design.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.

- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is to be provided for maintenance staff of the residential levels which is to be located at or near ground level. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements. Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:
The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

4. Fire Safety and Other Measures

4.1. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

5. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

6. Referenced plans

Drawing No	Document	Revision	Date
A090b	Site I Basement level 2	E	Mar 2017
A091b	Site I Basement level 1	E	Mar 2017
A100b	Site I Ground level	E	Mar 2017
A101	Site I Level 1	E	Mar 2017
A101b	Site I Level 2 – level 3	E	Mar 2017
A104b	Site I Level 4	E	Mar 2017
A200b	Site D Elevation	E	Mar 2017
A201b	Site D Elevation	E	Mar 2017
A202b	Site I Elevation	E	Mar 2017
A203b	Site I Elevation	E	Mar 2017
A204b	Site I Elevation	E	Mar 2017
A300b	Site I Section	E	Mar 2017

Our Ref: D2017-001(L/M/N)

05 May 2017

SITE I – BUILDINGS L, M & N
CHAPMAN STREET, WERRINGTON

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

BATHLA GROUP

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Table of Contents

0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	05/05/2017

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	14/02/2017
R02	Dean Morton	Final	05/05/2017

1.0 Executive Summary

This report has been prepared so as to assess the architectural documentation as detailed in Part 6 in accordance with the Building Code of Australia Volume 1 (BCA) 2016 and adopted standards.

The proposed development is the construction of a residential flat building including a two storey deep basement and 5 above ground storeys that are contained in three towers. The building forms part of a complex of two buildings over the site of similar design in which this building is referred to as building L, M & N. It is noted the design will be that of separate buildings under the BCA in which case the fire walls to the basement levels will comply with Clause C2.7 and slabs will terminate at the fire wall locations.

The assessment has revealed that the proposed development will be capable of achieving compliance with BCA 2016. The following matters will require further consideration during detailed design development at the construction stage of the project:

1. The building is to adopt type A construction throughout.
2. Fire separation of the ground floor class 7a portions are to be generally 120 minutes to the first floor residential portion (unless reduced to 60 minutes where complying with Clause 3.9 of Spec C1.1)
3. Spandrel separation of vertical openings is required and to be provided by either spandrel panels or horizontal projections.
4. The provision of fire services including fire house reel, sprinklers and hydrants are to be coordinated with a hydraulic consultant at the construction certificate stage.
5. Extended travel distances to an exit to the basement up to 43m to an exit and to the above ground storeys of up to 10.3m will be subject to an alternate solution at the construction certificate stage as advised by the client.
6. Disabled access is generally compliant and subject to detailed review at the construction certificate stage.
7. The point of discharge from the fire-isolated exits will be subject to an alternate solution at the construction certificate stage to avoid the requirement for protection of openings within 6m of the path of travel.
8. There is to be a toilet pan and basin provided for maintenance staff at or near ground level.

2.0 Property Description

2.1 Location

The subject building is located at Chapman Street, Werrington, within the site complex the building L, M &N is located to the south side of the allotment.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Apartments (ground to level 4) Car parking (basement levels 1 and 2)
Rise in Storeys	The development will have a rise of five storeys	
Floor Area	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Volume	There the no maximum fire compartment floor area size for the building as the class 7a parts will be sprinkler protected and the class 2 parts are not subject to maximum compartment sizes	
Effective Height	The building will have an effective height of 12.5m (RL 38.35 – RL 25.85)	
Type of Construction	The building requires Type A Construction	
Climate Zone	For the purposes of Section J the climate zone is 6 (Penrith Council)	
Population	The population as determined from table D1.13 is: Car park – 136 persons per storey	

3.0 Building Code of Australia Assessment

3.1 Fire Resistance and Stability (Section C, BCA)

Fire Resistance

The building is to comply with Clause C1.1 and Clause 2 & 3 of Specification C1.1, for a building required to have Type A construction. Refer to Table 3 of Specification C1.1 of the BCA for the specific Fire Resistance Levels [FRL's].

Structural: the ability to maintain stability and adequate load-bearing capacity as determined by AS 1530.4.

Integrity: the ability to resist the passage of flames and hot gases specified in AS 1530.4.

Insulation: The ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

FRL's are generally as follows.

Building component	Class 2	Class 7a
External walls- load bearing (0 > 1.5m from FSF)	90/90/90	120/120/120
External walls- load bearing (1.5 > 3.0m from FSF)	90/60/60	120/90/90
External walls- load bearing (<3.0m from FSF)	90/60/30	120/60/30
External walls non load bearing (0 > 1.5m from FSF)	-/90/90	-/120/120
External walls non load bearing (1.5 > 3.0m from FSF)	-/60/60	-/90/90
External walls non load bearing (<3.0m from FSF)	-/-/-	-/-/-
External column	90/-/-	120/-/-
Shaft walls (lift and stairs)- load bearing	90/90/90	120/120/120
Shaft walls (lift and stairs)- non load bearing	-/90/90	-/120/120
Service shafts- load bearing	90/90/90	120/90/90
Service shafts- non load bearing	-/90/90	-/90/90
Common walls and fire walls	90/90/90	120/120/120
Walls bounding between SOU (load bearing)	90/90/90	120/-/-
Walls bounding between SOU (non load bearing)	-/60/60	-/-/-
Load bearing internal walls and columns	90/-/-	120/-/-
Loading bearing columns and walls in top most storey	60/60/60	n/a
Floors	90/90/90	120/120/120
Roofs	n/a	n/a

Note – sprinkler protected car parks can obtain a reduction of FRL's as per clause C3.9 of Specification C1.1 and may be applicable to this building

Lightweight construction &, fire hazard properties

Where lightweight fire rated construction is proposed for walls, the system must comply with Specification C1.8 of the BCA and the manufactures tested specification.

Columns protected with lightweight fire rated construction that are subject to mechanical damage must be protected and/or internally filled in accordance with Clause C1.8 (b) of the BCA.

The fire hazard properties of floor, wall and ceiling linings are to comply with Part C1.10 and Specification C1.10 of the BCA. All materials selected for use in the construction should be accompanied by a valid test report demonstrating compliance with defined fire hazard properties. The use of combustible lining materials such as aluminium composite panels to external walls or forming part of external wall construction is not permitted for type A construction, the use of such materials would need to be subject to a performance solution.

Compartmentation & separation

Parts of the building with different classifications on the same storey must be fire separated by a fire wall of the higher FRL specified under Specification C1.1 of the BCA for the classifications concerned or the entire storey is to be constructed of the higher FRL.

Construction of firewalls to form separate buildings in the basement levels must comply with Part C2.7 and Specification C1.1 of the BCA and generally achieve a FRL of 120/120/120.

Note that intervening floors between different classes are required to have the FRL of the classification in the lower storey applied to the separating floor.

The residential garbage room to the basement level 1 is to be fire separated from the remainder of the storey as forms the base of a shaft to the garbage chute. In this regard the bounding walls are to have a FRL of -/120/120 (non load bearing) and have entry doors with a FRL of minimum -/60/30, where utilizing roller shutters this is to be subject to a performance solution as fire shutters will not achieve the required 30 minutes insulation criteria.

The proposed development is capable of achieving the required FRL's, and are to be confirmed by the structural engineer at the construction certificate phase.

Protection of Openings

It is noted there are no openings within 3m of a fire source feature that require protection under part C3 of the BCA.

Bounding construction between residential sole occupant units (SOU) in class 2 buildings are to comply with the provisions of Specification C1.1, and Clause C3.11 of the BCA and generally achieve a FRL of 90/90/90 (loadbearing) or -/60/60 (non loadbearing).

Lift landing doors must achieve an FRL not less than -/60/- in accordance with Clause C3.12 of the BCA and AS 1735.11.

All entry doors to residential units and fire isolated stairs must be protected by self-closing -/60/30 fire doors.

Vertical Separation of openings

The proposed building will not be provided sprinklers to the above ground storeys and the design will provide for protection of external openings to different storeys as required by Clause C2.6 of the BCA.

Compliance will be achieve by either vertical spandrel panels not less than 900mm high and minimum 600mm above floor level or by horizontal projections being 1100mm deep and extending 450mm either side of the opening, in both instances the element is to achieve a FRL of 60/60/60.

Fire sealing of penetrations

All service penetrations must be sealed to the requirements of Clause C3.12 and C3.15 of the BCA.

Electrical Supply

Electrical equipment is to be separated from the building in accordance with Clause C2.13 of the BCA.

Any substation and/or main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 with the door being –/120/30 fire rated, unless higher FRL's required by electricity supplier (may vary based on type of substation required to be provided).

Protection of Equipment

The following equipment is to be fire separated with construction complying with Clause C2.12 (d) of the BCA.

(i) lift motors and lift control panels; or
(ii) emergency generators used to sustain emergency equipment operating in the emergency mode; or
(iii) central smoke control plant; or
(iv) boilers; or
(v) a battery or batteries installed in the building that have a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours.

Separation of on-site fire pumps must comply with the requirements of AS 2419.1-2005.

3.2. Access and Egress (Section D, BCA)

Number of exits required

It is noted that as the building is required to have a minimum of one exit to every above ground storey as per Clause D1.2 of the BCA. The basement storeys are to have a minimum of 2 exits to each floor. In this regard the design is considered compliant.

Exit travel distances

Exit travel distances to a required exit is generally exceeded and are noted as follows:

- Above ground levels up to 15.2m to a single exit (6m max)

On the ground floor all external doors are required to be designated as required exits, in this regard the doors are required to swing outwards in the direction of travel.

It is noted that the non-compliant travel distances will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Distance between alternative exits

The distance between alternative exits within the basements comply with Clause D1.5 of the BCA. In this regard the distance between exits in the basements do not exceed 60m apart.

Travel via fire isolated exits

The point of discharge from the fire-isolated exit (fire stair) located at the ground floor, and the path of travel to the open space is required to be protected as with D1.7 of the BCA where openings are within 6m at right angles to the path of travel to a height of 3m above and below the path. The method of protection is to be as per clause C3.4 and where drenchers are used they are to be located internal.

It is noted that as there is an alternate path of travel afforded from the point of discharge from the fire isolated exits it will be assessed as an alternate solution at the construction certificate stage as advised by the client.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m in width clear of any obstruction including hand rails or other fixtures. Reductions in width are available at doorways to not less than 750mm clear.

The unobstructed width of a required exit must not diminish in the direction of travel to a road or open space.

The required aggregate width based on the population determined in Section 2.2 of the report is required to be 2m and is consider compliant in this regard.

Construction of Stairways

Goings and risers are to be designed to comply with the provisions of Clause D2.13 of the BCA and to generally achieve a minimum going of 250mm and maximum rise of 190mm.

There is to be no step or ramp within the width of the door leaf to a door threshold unless it is an external door in which the maximum step is not to exceed 190mm. The plans generally detail compliance in this regard.

Handrails

Handrails will be provided to stairways as required by Clause D2.17 of the BCA, including internal stairs within a residential SOU. For non fire isolated stairs they are to be provided both sides of the flight (in reference to disabled access requirements of Part D3), for fire isolated stairs this can be limited to one side only. In this regard the stairs serving the basements are consider to be non fire isolated as connect only two storeys.

Balustrades

Balustrades will be provided for all areas where it is possible to fall more than 1m from the floor level to a lower surface. In general balustrades are to have no gap that will permit a 125mm diameter sphere to pass through, balustrades protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Balustrades within fire isolated stairways and used only for egress may be constructed with three horizontal rails with gaps up to 460mm (bottom rail max 150mm above the nosing line or floor). Compliance can be readily achieved and is to be further detailed at the construction certificate stage.

Egress Doors

All exit doors are to swing in the direction of egress and are required to be provided with the appropriate hardware in accordance with Clauses D2.20 & D2.21 of the BCA, the latches will be downward or pushing action on a single device located between 900-1100mm above floor level (noting in general the main entry doors are considered to be exits).

Any door automatic door acting as an exit door (final discharge door) will be required to be fitted with fail safe operation to open automatically on activation of any smoke/fire detection system or sprinklers.

Protection of openable windows

Openable windows in bedrooms where the floor is more than 2m above the surface beneath and with a sill height below 1.7m require restricted openings or protection in accordance with D2.24 of the BCA, measures to restrict the window opening may include security mesh or to restrict the opening to not permit a 125mm diameter sphere to pass through.

Where the window opening is restricted calculations are to be provided at Construction Certificate stage that sufficient natural ventilation is provided by Part F4.5.

For all windows not in bedrooms where the fall exceeds 4m from floor level to the surface below the sill height is to be minimum 865mm above floor level or a balustrade or similar provided in front of the opening.

Access for people with a disability

The proposed building is required to comply with the following:

- The Disability (Access to Premises — Buildings),Standards 2010;
- Part D3 of BCA;
- Australian Standard AS 1428.1-2009 , AS/NZS 1428.4.1-2009, AS/NZS 2890.6-2009

Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4, which requires access as follows:

Class 2 – From a pedestrian entrance required to be accessible to at least 1 floor containing sole-occupancy units and to the entrance doorway of each sole-occupancy unit located on that level.

To and within not less than 1 of each type of room or space for use in common by the residents, including a cooking facility, sauna, gymnasium, swimming pool, common laundry, games room, individual shop, eating area, or the like.

Where a ramp complying with AS 1428.1 or a passenger lift is installed—

(a) to the entrance doorway of each sole-occupancy unit; and

(b) to and within rooms or spaces for use in common by the residents, located on the levels served by the lift or ramp

Class 7a – To and within any level containing accessible car parking spaces.

The following areas are identified with respect to further review for accessibility:

1. Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600 x 1400mm and a clear doorway opening width of 900mm (refer to requirements stretcher facilities also)
2. The fire isolated exits are to have a handrail to one side being 30-50mm in diameter and have contrasting nosings being 50-75mm wide as per clause 11.1(f)&(g) of AS 1428.1-2009
3. It is noted that non fire isolated stair serving the basement levels are to comply with clause 11 of AS 1428.1-2009 including handrails both sides with extensions past the first and last riser.
4. Main entry doors to the ground floor are to have a minimum clear width of 850mm for an operable leaf.
5. External stairs and ramps are to be provided with handrails to both sides and tactile indicators top and bottom. The ramps are to incorporate kerbs and the stairs are to incorporate colour contrasting nosings.

3.3. Services and Equipment (Section E, BCA)

Hydrant Systems

The building is required to be provided with a system of hydrant coverage in accordance with the provisions of Clause E1.3 of the BCA and AS 2419.1- 2005. It is noted that each of the two buildings on the site are separate buildings under the BCA each must have its own independent hydrant system.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Hose Reel Systems

The building will be provided with a fire hose reel system in accordance with the provisions of Clause E1.4 of the BCA and AS 2441 - 2005. This system must cover the basement levels of the development. Locations of fire hose reels are required to be located 4m from an exit.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Portable Fire Extinguishers

Fire extinguishers are to be provided in accordance the provisions of Clause E1.6 of the BCA and AS2444 - 2001. There is to be a type ABE 2.5kg extinguisher located within 10m of the entry door to every apartment.

Exit and Emergency Lighting

Emergency lighting will be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1.2005.

Lifts

A stretcher lift in accordance with Clause E3.2 of the BCA will be required as the building has an effective height of greater than 12m. A sign must be provided in accordance with Clause E3.3 of the BCA warning against the use of lifts in a fire. It is noted the effective height of the building is exactly 12m however allowing for construction tolerances it is recommended to incorporate a stretcher facility to the design.

Fire service controls including a fire service recall control switch are to be provided in accordance with Clause E3.7, E3.9 and E3.10 as the being exceeds 12m in effective height.

Compliance with Specification E3.1 is required for an electric or electrohydraulic lift installation.

Every passenger lift is to be provided with handrails, minimum internal floor dimensions, clear door opening dimensions and car control buttons in accordance with AS1735.12 and be fitted with a series of sensory devices per clause E3.6 of the BCA.

Sprinklers

A sprinkler system in accordance with the provisions of Clause E1.5 of the BCA and AS 2118.1-1999 is required throughout the basement levels of the development.

Coverage can be readily achieved and is subject to design from a suitably qualified person.

Smoke Hazard Management

The building is to be provided with the following smoke control measures:

- Class 2: An automatic smoke detection and alarm system in accordance with Clause 3 or clause 4 of Specification E2.2a and AS 3786-1993.

- Class 7a: The mechanical exhaust system of the car park areas is to comply with clause 5.5 of AS/NZS 1668.1-2015 except that metal blade fans suitable for operation at normal temperature with non fire rated control cabling may be used

3.4. Health and Amenity (Section F, BCA)

Damp and Weatherproofing

Adequate measures will be employed to ensure compliance Part F1 of the BCA is achieved in terms of weatherproofing.

Sanitary and Other facilities

A pan and basin is to be provided for maintenance staff of the residential levels which is to be located at or near ground level. Within each apartment there is to be facilities for cooking, washing and laundry facilities comprising a wash tub and space for a washing machine and either a clothes line min 7.5m long or space for a heat operated dryer in the same room as the washing machine.

Sanitary Facilities for People with Disabilities

Accessible facilities are not required be provided in accordance with the provisions of Clause F2.3 and AS1428.1 – 2009 as there are no toilets proposed to be provided to resident common use areas.

Ceiling Heights

The following minimum building ceiling heights must be maintained.

- Common kitchen, laundry or the like – 2.1m
- Corridor, passageway or the like – 2.1m
- Bathroom, shower, sanitary compartment or the like – 2.1m
- Habitable rooms including common areas – 2.4m
- Stairways – 2.0m
- Car parking areas – 2.2m (for disabled accessible spaces min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms, natural light must consist of a minimum of 10% of the floor area of the room provided by light transmitting elements. Artificial lighting may be provided throughout other classes of buildings in accordance with the provisions of Clause F4.4 of the BCA and AS1680.0. Compliance can be readily achieved and is subject to detailed design development at the construction certificate stage.

Ventilation

The building is required to be provided with ventilation in accordance with the provisions of Clause F4.5 of the BCA. Ventilation may be provided by natural means or a mechanical system complying with AS 1668.2-2012.

Sound Transmission and Insulation

Class 2:
The floor separating the residential units and separating the sole occupancy units from public areas must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50 and an Ln,w+Ci (impact) not more than 62.

Walls separating units must achieve a sound insulation rating of Rw+Ctr (airborne) of not less than 50.

Walls separating units from plant rooms, lift shafts, stairways corridors or other public areas must have an insulation rating of Rw (airborne) not less than 50.

Walls separating a bathroom, sanitary compartment, laundry or kitchen in one sole occupancy unit from a habitable room in another or separating a unit from a lift shaft must be of discontinuous construction.

The doorway separating to sole occupancy unit from the public area must have an Rw not less than 30.

Soil, waste & stormwater services must be separated by construction having an Rw+Ctr (airborne) not less than

- 40 if the room is a habitable room
- 25 if the room is a non-habitable room

3.5. Ancillary Provisions (Section G, BCA)

Cleaning of Windows

As per NSW Clause G1.101 a building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.

This is satisfied where—

(i) the windows can be cleaned wholly from within the building; or

(ii) provision is made for the cleaning of the windows by a method complying with the Work Health and Safety Act 2011 and regulations made under that Act.

3.6. Energy Efficient Construction (Section J, BCA)

The class 2 sole occupancy units are subject to BASIX requirements and the relevant NSW J(A) variations to BCA Part J. The basement parts of the building are to comply with the requirements noted below:

Building Fabric

Parts of the building forming an envelope to a conditioned space are to achieve the minimum construction requirements for insulation R-Values required by BCA Part J1 for NSW J(A) compliance. It is noted there are no conditioned spaces for the class 7a part.

Glazing

This part is not applicable as there are no conditioned spaces to the class 7a part.

Building Sealing

Openings in the building such as doors, windows, exhaust fans and ventilation systems forming part of an envelope to a conditioned space must be sealed to the requirements of Part J3 of the BCA to prevent loss of conditioned air.

In that regard, all external doorways and windows must be fitted with a draft seal, exhaust fans to have dampers, there are to be tight fitting skirting boards, cornices and architraves. The requirement for seals does not apply to fire doors fitted between the fire-isolated stairways in the conditioned areas of the building.

Air-conditioning and Ventilation System

The design of all mechanical air-conditioning and ventilation systems must achieve compliance with Part J5 of the BCA with regard to input power and efficiency features for the class 2 part as applicable under NSW J(A)

Artificial Lighting and Power

The building is to maintain maximum lighting power levels and control systems as applicable. The design of lighting systems must comply with BCA Part J6 for the class 7a part.

Maximum illumination power densities for the car parking and ancillary use areas are to be as follows:

- First 20m of entry to car park 25 W/m^2
- Generally throughout car park 6 W/m^2
- Plant rooms 5 W/m^2

Hot Water Supply

Hot water supply systems will be installed in accordance with Part J7 of the BCA and AS/NZS 3500.4 and incorporate insulation to inlet and outlet lines of hot water storage units.

Access for Maintenance and Facilities for Monitoring of Energy Use

The building is to have facilities for maintenance and energy monitoring in compliance with BCA Part J8 and the NSW variations.

4. Fire Safety and Other Measures

4.1. Proposed Fire Safety Measures

In terms of the proposed works the following fire safety measures are proposed to be installed;

Fire Safety Measure	Standard of Performance
Automatic fire detection and alarm system	BCA 2016 Clause E2.2, Spec. E2.2a, AS 3786-1993, AS 1670.1-2015
Automatic fire suppression system (basement only)	BCA 2016 Clause, E1.5, Spec. E1.5, AS 2118.1-1999
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.4, E4.5, (NSW E4.6) & E4.8, AS 2293.1-2005
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.6, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire Engineering Report	Report prepared by: TBA
Fire hydrant systems	BCA 2016 Clause C2.12, E1.3, AS 2419.1-2005
Fire hose reel systems (basement only)	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Fire shutters	BCA 2016 Clause C3.13, AS 1905.2-2005
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Table E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012 (clause 5.5 car park exhaust operation)
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986
Occupant warning system	BCA 2016 Clause E2.2, Spec E2.2a (clause 6), AS 1670.1-2015
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Warning and operational signs	BCA 2016 Clause C3.6, D2.23, D3.6, E3.3, Spec E1.8, Clause 183 of the Environmental Planning and Assessment Regulation 2000

5. Conclusion

Following an assessment of the proposed building it is considered that the proposed building, can achieve compliance with the provisions of BCA 2016, without alteration that would necessitate an amendment to the development consent.

6. Referenced plans

Drawing No	Document	Revision	Date
A090b	Site I Basement level 2	E	Mar 2017
A091b	Site I Basement level 1	E	Mar 2017
A100b	Site I Ground level	E	Mar 2017
A101	Site I Level 1	E	Mar 2017
A101b	Site I Level 2 – level 3	E	Mar 2017
A104b	Site I Level 4	E	Mar 2017
A200b	Site D Elevation	E	Mar 2017
A201b	Site D Elevation	E	Mar 2017
A202b	Site I Elevation	E	Mar 2017
A203b	Site I Elevation	E	Mar 2017
A204b	Site I Elevation	E	Mar 2017
A300b	Site I Section	E	Mar 2017