Our Ref: D2017-058

24 January 2018

87-91 NUWARRA ROAD, MOOREBANK

BUILDING CODE OF AUSTRALIA 2016

CAPABILITY STATEMENT FOR DA SUBMISSION

Prepared for

SGCH SUSTAINABILITY LIMITED

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0.0 Author and Reviewer

Document acceptance

Author		Position	Date
Prepared by	Dean Morton	Director	24/01/2018

Revision history

Revision No.	Reviewed by	Description	Date
R01	Dean Morton	Draft	12/10/2017
R02	Dean Morton	Gateway 2.1	27/10/2017
R03	Dean Morton	Gateway 2.2	03/11/2017
R04	Dean Morton	Gateway 2.2 revised	13/11/2017
R05	Dean Morton	Final	24/01/2018

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 consisting of on grade car parking and a total of 42 apartments and ground level external communal spaces.

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 and to comply with table 3 of Specification C1.1 in respect of fire resistance levels.

2. The car park area is considered to be an open deck car park with regards to fire resistance levels and is to comply with table 3.9 of Specification C1.1.

3. The corridor on the ground floor accessing units 1 and 2 is to be fire separated from the car parking including -/60/30 fire rated doors.

4. Disabled access is generally compliant and subject to detailed review at the construction certificate stage.

5. The hydrant service will have a non compliant booster location and will be subject to a performance solution at the construction certificate stage as advised by the client.

2.0 Property Description

2.1 Location

The subject building is located at 87-91 Nuwarra Road, Moorebank and is bounded by residential developments to the north, south and west boundaries. The property is taken to face east to Nuwarra Road for the purpose of the report.

2.2 Building Description

Use / Classification	Class 2: Class 7a:	Residential apartments levels (ground to level 5) Car park (ground level)
Rise in Storeys	The development will have a rise of six storeys	
Floor Area	Floor area limitations are not applicable to this building relating to class 2 apartments and class 7a complying as an open deck car park.	
Volume	Floor area limitations are not applicable to this building relating to class 2 apartments and class 7a complying as an open deck car park.	
Effective Height	The building will have an effective height of 15.6m (RL27.10 – RL 42.70)	
Type of Construction	The building requires Type A Construction.	
Climate Zone	For the purposes of Section J the climate zone is 6	
Population	The population as determined from table D1.13 is: Car park – 16 persons The BCA does not impose a ratio to determine a population for class 2 parts of building in this regard a consideration of 2 persons per bedroom is considered suitable to determine a likely population to residential parts.	

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

NOTE- The car park area is considered to meet the definition of open deck car park and therefore permitted to comply with table 3.9 of Spec C1.1 but subject to further review at the construction certificate stage.

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 materials as either wall systems or as attachments to a wall are restricted under the BCA. The use of building materials incorporating plastic polymer type permanent formwork (eg Dincel) for external walls or fire stair shafts that are required to be of non combustible materials will be required to be assessed as 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.

The use of flat plate slabs to residential levels are to have a minimum thickness of 200mm, any reduction due to set downs to wet areas or to balconies will require further assessment as to the level of compliance with AS 3600.

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 and subject to review of the design of the car park area for achieving compliance with open deck car park.

Protection of Openings

There are no openings within 3m to a fire source feature that will require protection in accordance with the provisions contained within 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)

The corridor formed to the ground floor accessing units G01 and G02 is to be have bounding walls achieve a FRL of -/60/60 and the internal access doors achieve -/60/30.

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 protection of a fire spread via external openings will be afforded with a combination of vertical spandrel panels or horizontal projections as per Clause C2.6.

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.

The main switchboard is to be constructed to achieve a fire resistance level of 120/120/120 where bounding to the building with the door not required to be fire rated as does not open to an internal part of the building.

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 serving every storey and part of a storey as required in D1.2 of the BCA. The design is considered compliant in this regard.

Exit travel distances

Exit travel distances to a required exit or a point of choice between exits comply with Clause D1.4 of the BCA. In this regard travel distances do not exceed 6m to a point in choice in travel to two exits on levels 1-5. On the ground floor travel distances to the class 2 parts may be up to 20m to an exit and are consider compliant.

Egress from the car park will be via the entry drive and the northern open side and will have compliant travel distances of less than 20m to a point in choice in travel and overall maximum 40m to an exit.

Distance between alternative exits

The distance between alternative exits is considered to be compliant with Clause D1.5 and exits do not exceed 45m a part in the residential levels and 60m to the car park area.

Travel via fire isolated exits

The point of discharge from the fire-isolated exits is to a location that permit egress to the road without passing by openings and is considered compliant generally.

Dimensions of exits

Exits and paths of travel to exits are to comply with D1.6 of the BCA. Generally exits widths are 1m 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 1m and is considered to be compliant.

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, for fire isolated stairs this can be limited to one side only. The plans generally note compliance.

Barriers

Barriers 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 barriers are to have no gap that will permit a 125mm diameter sphere to pass through, barriers protecting a difference in levels of over 4m must not have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

Barriers within fire isolated stairways 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.

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 barrier 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:

- Lifts are to comply with AS 1735.12 and have an internal lift car dimension of 1600mm deep x 1400mm wide and a clear doorway opening width of 900mm (refer to requirements for stretcher facilities also)
- The fire stair configuration where not incorporating an offset tread to the rising flight at mid landings will be unlikely to permit a compliant handrail, handrails are required to maintain a consistent height throughout the flight between the flight and landings.
- 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
- Accessible parking spaces are noted as being provided and are to comply with AS/NZS 2890.6-2009. The shared zones are to include a bollard located 800mm from the front of the space. There is to be a clear height to obstructions of not less than 2.5m.
- Access to the garbage room is to incorporate compliant circulation spaces to the door and latch hardware to allow access for disabled persons

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. The location of the booster assembly will be within 10m of the building served and will be subject to a performance solution at the construction certificate stage as advised by the client.

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 car park section 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.

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 (or combination of both) of Specification E2.2a and AS 1670.1-2015 and AS 3786-2014.

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, this is to include compliance with AS 4654.2-2012 in respect of waterproofing of external balconies.

Sanitary and Other facilities

A pan and basin are provided for maintenance staff of the residential levels which is located at 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. Plans generally detail compliance in this regard.

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 and shared zones min 2.5m)

Natural and Artificial Lighting

Natural lighting is to be provided class 2 sole occupancy units to habitable rooms and is to be not less than 10% of the floor are of the room concerned based on the light transmitting area of the glazing element (eg exclusive of framing elements), artificial lighting may be provided throughout other parts in accordance with the provisions of Clause F4.4 of the BCA and AS 1680.0.

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. All other parts of the building are to comply with the requirements of NSW J(B).

The following BCA Section J (both J(A) and J(B)) provisions are applicable to the class 2 and 7a parts:

Building Fabric

There are no elements of the class 7a part of the building forming an envelope to a conditioned space required to obtain an insulation R-Value by BCA Part J1.

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 to the class 2 parts.

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 3786-2014, AS 1670.1-2015
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, C3.8, 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	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
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
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.	DESCRIPTION	STATUS	REV & DATE
DA-A-000	TITLE	FOR DA	- 23/01/2018
DA-A-001	NOTES	FOR DA	- 23/01/2018
DA-A-010	SITE PLAN	FOR DA	- 23/01/2018
DA-A-011	DEMOLITION & SITE MANAGEMENT PLAN	FOR DA	- 23/01/2018
DA-A-100	LEVEL 0 (GROUND)	FOR DA	- 23/01/2018
DA-A-101	LEVEL 1	FOR DA	- 23/01/2018
DA-A-102	LEVELS 2 & 3	FOR DA	- 23/01/2018
DA-A-103	LEVEL 4	FOR DA	- 23/01/2018
DA-A-104	LEVEL 5	FOR DA	- 23/01/2018
DA-A-105	ROOF	FOR DA	- 23/01/2018
DA-A-150	ADAPTABLE UNITS	FOR DA	- 23/01/2018
DA-A-200	EAST ELEVATION	FOR DA	- 23/01/2018
DA-A-201	WEST ELEVATION	FOR DA	- 23/01/2018
DA-A-202	NORTH & SOUTH ELEVATIONS	FOR DA	- 23/01/2018
DA-A-203	SECTION 01	FOR DA	- 23/01/2018
DA-A-204	SECTION 02	FOR DA	- 23/01/2018
DA-A-205	SECTION 03 (STAIR)	FOR DA	- 23/01/2018
DA-A-800	GFA CALCULATIONS	FOR DA	- 23/01/2018
DA-A-801	LANDSCAPE CALCULATIONS	FOR DA	- 23/01/2018
DA-A-802	CROSS VENT & SOLAR ACCESS	FOR DA	- 23/01/2018
DA-A-803	STORAGE CALCULATIONS (1)	FOR DA	- 23/01/2018
DA-A-804	STORAGE CALCULATIONS (2)	FOR DA	- 23/01/2018
DA-A-851	SHADOWS - WINTER SOLSTICE	FOR DA	- 23/01/2018
DA-A-852	SHADOWS - EQUINOX SEPTEMBER	FOR DA	- 23/01/2018
DA-A-853	SHADOWS - SUMMER SOLSTICE	FOR DA	- 23/01/2018
DA-A-854	SHADOWS - EQUINOX MARCH	FOR DA	- 23/01/2018
DA-A-855	SHADOWS - 93 NUWARRA RD	FOR DA	- 23/01/2018
DA-A-900	MATERIALS AND FINISHES	FOR DA	- 23/01/2018