BCA LOGIC PTY LTD

BUILDING REGULATION & FIRE SAFETY ENGINEERING CONSULTANTS

Project: **EPPING PARK, 61 MOBBS LANE EPPING**

Report: **BCA ASSESSMENT REPORT ON BUILDINGS 3, 4, 5 AND 7**

Date: 27th April 2009

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DOCUMENT CONTROL

Document No.	Issue Date	Report Details		
101708-r1/sb	**19th February 2009**	**Description:**	Preliminary BCA Assessment Report	
101708-r2/sb	**16th March 2009**	**Description:**	Preliminary BCA Assessment Report	
101708-r3/sb	**24th April 2009**	**Description:**	BCA Assessment Report for Central Resident Facility	
101708-r4/sb	**24th April 2009**	**Description:**	BCA Assessment Report for Child Care Centre	
101708-r5/sb	**24th April 2009**	**Description:**	Final Project Application BCA Assessment Report for Buildings 3, 4, 5 and 7	
101708-r5a/sb	**27th April 2009**	**Description:**	Final Project Application BCA Assessment Report for Buildings 3, 4, 5 and 7	
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PART 1 BASIS OF ASSESSMENT

1.1 Location and Description

The building development, the subject of this report, is located at 61 Mobbs Lane, Epping and is part of the development known as Epping Park (previously The Parklands). The subject development consists of 650 residential units spread over 17 separate buildings on the site as well as publicly accessible open space, resident's facilities and a child care centre. This report however relates only to Buildings 3, 4, 5 and 7 of the overall development. Reference if made to separate reports Numbered 101708-r6 and 101708-r6 prepared by BCA Logic Pty Ltd that relate to the Child Care Centre and Community Facilities.

1.2 Purpose

The purpose of this report is to assess the design proposal against the Deemed-to-Satisfy provisions of the BCA, and to clearly outline those areas where compliance is not achieved (if any) and where areas of the design may be assessed against the relevant performance provisions of the BCA.

1.3 Building Code of Australia

While the 2008 Version of the BCA is still current, the 2009 Version will be adopted as of 1st May, 2009, and as any application for a Construction Certificate for this Stage 1 Portion of the development will be after this date, the 2009 Version of the BCA has been adopted for this assessment.

1.4 Limitations

This report does not include nor imply any detailed assessment for design, compliance or upgrading for: -

(a) the structural adequacy or design of the building;

(b) the inherent derived fire-resistance ratings of any proposed structural elements of the building (unless specifically referred to); and

(c) the design basis and/or operating capabilities of any proposed electrical, mechanical or hydraulic fire protection services.

This report does not include, or imply compliance with:

(a) the Disability Discrimination Act (The assessment of the proposed development incorporated in the design documentation will be made against the deemed to satisfy provisions of BCA2009 Part D3 and F2.4);

(b) Demolition Standards not referred to by the BCA;

(c) Occupational Health and Safety Act;

(d) Construction Safety Act;

(e) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Sydney Water, Electricity Supply Authority, WorkCover, RTA, Council and the like; and

(f) Conditions of Development Consent.

1.5 Design Documentation

This report has been based on the Design plans and Specifications listed in Annexure A of this Report.

PART 2 BUILDING DESCRIPTION

For the purposes of the Building Code of Australia 2009 (BCA2009) the development may be described as follows.

2.1 Rise in Storeys (Clause C1.2)

The buildings have a rise in storeys as follows:

- Building 3 – Rise in Storeys of Two (2) other than House 1 and 12 that also include a mezzanine level containing a rumpus room.
- Buildings 4 and 5 – Rise in Storeys in excess of four (4).
- Building 7 – Rise in Storeys in excess of four (4).

2.2 Classification (Clause A3.2)

The buildings have been classified as follows.

Class	Level	Description
1a	Ground and Level 1	Building 3 – Residential
7a	Basement	Building 4, 5 and 7 car parking
2	Ground and Levels 1 to 5	Building 4, 5 and 7 Residential

2.3 Effective Height (Clause A1.1)

The buildings 4 and 5 has an effective height of less than 25.0 metres, however greater than 12.0m being 18.5m. Note that with the fire separation of the basement car park level, these buildings are for the purpose of the BCA treated as separate buildings.

The building 7 has an effective height of less than 25.0 metres, however greater than 12.0m being 18.4m.

Building 3 has an effective height of less than 25.0 metres, and less than 12.0m.

2.4 Type of Construction Required (Table C1.1)

Type A Construction required for Buildings 4, 5 and 7.

There is no type of Construction for Building 3 that is classified as class 1a single dwellings.

2.5 Floor Area and Volume Limitations (Table C2.2)

The building 4, 5 and 7 is subject to maximum floor area and volume limits of:-

- Class 2 — The Class 2 portions of the building are not subject to floor area and volume limitations of C2.2 as Table 3 of Specification C1.1 and Clause C3.11 of the BCA regulates the compartmentation and separation provisions applicable to buildings, or building portions, of Class 2 classifications.

- Class 7a — As the car parking areas to all basement levels are to be sprinkler protected there are no maximum values for these fully fire separated portions.

2.6 Climate Zone (Clause A1.1)

The buildings are located within Climate Zone 6.

PART 3 ESSENTIAL FIRE SAFETY MEASURES

The following fire safety measures are required to be installed in buildings 4, 5 and 7.

Item No.	Proposed Essential Fire Safety Measure	Minimum Standard of Performance
1.	Access panels, doors and hoppers to fire resisting shafts	BCA2009 Clause C3.13
2.	Automatic fire detection and alarm system within SOU's and within Common Corridors	BCA2009 Clause E2.2a and Clauses 3(c) (ii) of Specification E2.2a, AS3786-1993
3.	Automatic fire suppression system (sprinkler system) to Basement Car park levels	BCA2009 Clause E1.5, AS2118.1-1999
4.	Emergency lighting	BCA2009 Clauses E4.2 & E4.4, AS2293.1-2005
5.	Exit signs	BCA2009 Clauses E4.5, E4.6 & E4.8, AS2293.1-2005
6.	Fire dampers	BCA Clause C3.15 and AS/NZS1668.1-1998, AS1682.1 and 2
7.	Fire doors	BCA2009 Spec C3.4, AS1905.1-2005
8.	Fire hydrant system	BCA2009 Clause E1.3, AS2419.1-2005
9.	Fire seals protecting openings in fire resisting components of the building	BCA2009 Clause C3.15, Manufacturer's Specification
10.	Fire hose reel system	BCA2009 Clause E1.4, AS2441-2005
11.	Lightweight fire rated construction	BCA2009 Specification E1.8 and Manufacturer's Specification
12.	Mechanical Exhaust systems to Basement Car park	BCA2009 Clause F4.11 and AS/NZS1668.2-1991
13.	Paths of travel, stairways, passageways or ramps	BCA2009 Section D
14.	Portable fire extinguishers	BCA2009 Clause E1.6, AS2444-2001
15.	Solid core doors	BCA2009 Clause C3.11
16.	Warning and operational signs	BCA2009 Clause D2.23, EP&A Reg. 2000 Clause 183
17.	Wall Wetting Drenchers (Buildings 4 and 5 adjacent to FS1 and FS2)	BCA2009 Clause C3.4 and D1.7

The following fire safety measures are required to be installed within each of the single dwellings that make up building 3.

Item No.	Proposed Essential Fire Safety Measure	Minimum Standard of Performance
1.	Smoke Alarm System	BCA2009 Volume 2 Clause 3.7.2 and AS3786-1993

PART 4 FIRE RESISTANCE LEVELS

The following fire resistance levels (FRL's) are required for the various structural elements of the buildings 4, 5 and 7, with a fire source feature being the far boundary of a road adjoining the allotment, a side or rear boundary or an external wall of another building on the allotment except a Class 10 structure.

Note that the only elements within Building 3 that are required to achieve a FRL are the walls separating each dwelling that will need to achieve a 60/60/60 FRL and extend fully up to the underside of the roof sheeting material. Such walls will need to be free standing and structurally independent from the adjacent wall of the adjacent dwelling.

Item	Class 2	Class 7a Car park
Load bearing External Walls • less than 1.5m to a fire source feature • 1.5 – 3m from fire source feature; • more than 3m from a fire source feature.	 90/90/90 90/60/60 90/60/30	 120/120/120 120/90/90 120/60/30
Non-Load bearing External Walls • less than 1.5m to a fire source feature • 1.5 – 3m from fire source feature; • more than 3m from a fire source feature.	 -/90/90 -/60/60 -/-/-	 -/120/120 -/90/90 -/-/-
External Columns External Columns	90/-/- -/-/-	N/A
Fire Walls	90/90/90	120/120/120
Stair and Lift Shafts • Loadbearing • Non loadbearing	90/90/90 -/90/90	120/120/120 -/120/120
Internal walls bounding sole occupancy units • Loadbearing • Non loadbearing	90/90/90 -/60/60	N/A
Internal walls bounding public corridors, hallways and the like: • Loadbearing • Non loadbearing	90/90/90 -/60/60	N/A
Ventilating, pipe garbage and the like shafts: • Loadbearing • Non loadbearing	90/90/90 -/90/90	N/A
Other load bearing internal walls, beams trusses and columns	90/-/-	120/-/-
Floors	90/90/90	N/A
Roofs	90/60/30[(1)]	N/A

Notes: There are FRL concessions applicable for fully sprinkler protected car park portions under Clause 3.9 of Specification C1.1 of the BCA reducing the car park FRL's down from 120/120/120 to 60/60/60. As a portion of the roof deck of the basement level car park to Buildings 4 / 5 is required to be used as true "open space" for the purposes of egress this portion of the car park and supporting structure must have an FRL of 120/120/120 as required by D2.12.

[1] The roof need not comply with FRL specified above for the residential portion if the roof covering is of non-combustible construction and the internal walls separating each SOU extend fully up to the underside of the roofing material. As the top storey is Class 2, a concession is granted under Clause 3.5 of Specification C1.1 of BCA2009.

PART 5 MATTERS FOR FURTHER CONSIDERATION

5.1 General

Assessment of the architectural design documentation against the Deemed-to-Satisfy Provisions of the Building Code of Australia, 2009 (BCA) has revealed the following areas where compliance with the BCA may require further consideration.

Annexure B to this report provides a detailed assessment of the proposal against all relevant Deemed-to-Satisfy Provisions of the BCA.

Note: It is important that Annexure B is read in conjunction with the items below, as some matters may not have had sufficient information provided to allow a detailed assessment to be undertaken.

5.2 Building 3 Class 1a Provisions

The following items need to be taken into consideration with the ongoing design and construction of Building 3:

(a) The walls separating each dwelling will need to be constructed with a 60/60/60 FRL extending fully up to the underside of the roofing material with only timber battens permitted to pass through the fire separating walls in accordance with Part 3.7.1.8 of BCA2009 Volume 2. The construction of the adjoining dwellings must be structurally independent from the adjacent dwelling.

(b) Details of the proposed individual site boundaries to be provided at the Construction Certificate Stage for further assessment to ensure all windows are located greater than 900mm from any proposed boundaries.

(c) Any proposed roof lights are to be located greater than 900mm clear of the separating wall in accordance with Part 3.7.1.10 of BCA2009 Volume 2.

(d) Drainage, gutters and downpipes to comply with AS/NZS 3500.3.2.

(e) Termite risk management to comply with AS 3660.1.

(f) Timber construction to comply with AS 1684.

(g) Metal roof to comply with AS 1562.1.

(h) Glazing to comply with AS 1288 and AS 2047.

(i) Fire hazard properties of materials to comply with Clause 3.7.1.9 of Volume 2 of BCA2009.

(j) Smoke alarms to comply with Part 3.7.2 of Volume 2 of BCA2009and AS 3786.

(k) Waterproofing of wet areas to comply with AS 3740.

(l) Doors to the sanitary compartments to open outwards or slide or be readily removable from the outside of the compartment (i.e. by providing hinges that allow the doors to be removed in the fixed position), unless there is a clear space of at least 1.2m between the closet pan and the nearest part of the doorway.

(m) Artificial lighting to comply with Clause 3.8.4.3 of Volume 2 of BCA2009.

(n) Mechanical exhaust or natural ventilation to the sanitary compartments to comply with AS 1668.2-1991.

(o) Stair construction to comply with Part 3.9.1 of Volume 2 of BCA2009.

(p) Balustrades to comply with Part 3.9.2 of Volume 2 of BCA2009.

5.3 Further Information

Outlined below are areas in the design of the development where further information is required to ensure compliance is achievable – such information to be provided as the design progresses through to the Construction Certificate Stage:

(a) Vertical separation between openings in the external walls at different levels is required via either 900mm high 60/60/60 spandrel walls or 1100mm horizontal slab projections. Note spandrel separation is not required to the upper level of two storey units. Further detailed assessment of the window openings in the elevations will need to be carried out with ongoing design development – balcony slab projections need to extend 450mm either side of openings as well.

(b) Strictly the provisions of Part D3 of BCA do not require accessible car parking spaces. However with adaptable units as nominated on the plans, the same number of accessible car spaces as adaptable units are provided – note the clear width of an accessible car space is 3.2m and height is 2.5m with 2.3m head height provided from the car park entrance to the actual car spaces.

(c) Habitable room heights are to be a minimum of 2.4m, to the kitchen, laundry and passageways 2.1m, in the residential areas of the building (BCA2009 requirement not SEPP65 criteria). The car park is to have a minimum ceiling height of 2.1m in other areas however a height of 2.3m leading from the car park entrance to the accessible car spaces that then need a 2.5m head height clearance.

(d) Natural light is to be provided to all habitable rooms in the Class 2 portions of the building through openings with a glazed/open aggregate area not less than 10% of the floor area of the room served where an opening faces the boundary or a wall the horizontal distance from the window to the boundary/wall is to be not less than the horizontal distance from the boundary/wall that is either 1m or 50% of the square root of the exterior height of the wall in which the window is located measured in metres from its sill. Further detailed window / door dimensions to be provided to ensure compliance is achieved.

(e) Natural ventilation where proposed is to be provided via windows having an aggregate opening of not less than 5% of the floor area of the room to all SOUs. Further detailed window / door dimensions to be provided to ensure compliance is achieved.

(f) The hot water supply systems must be designed and installed in accordance with Section 8 of AS3500.4. Further details on the hot water supply system to be provided.

(g) Fire Isolated Stairs discharge as required alleviating any further protection of openings by this clause. The fire isolated stairs to buildings 4 and 5 require further detailing to ensure strict compliance with D1.7 of BCA2009 is achieved. This may require an internal wall wetting drencher over the entry doors to the lobby areas.

5.4 Performance Based Design – Alternate Solutions

There are specific areas throughout the development where an opportunity exists where strict Deemed-to-Satisfy BCA Compliance may not be achieved by the design. These matters will need to be assessed in a detailed Fire Safety Engineering Report to be prepared at the Construction Certificate Stage. Such Report would need to address the following matters:

Item No	Description of Alternate Solution	DTS Provision	Performance Requirement to be met
1.	Separation of Rising and Descending Stairs via a doorway to Building 7 Stairs 1 and 2	D2.4 of BCA2009	DP4 and DP5

A Preliminary FEDB (Fire Engineering Design Brief) will need to be prepared for discussion purposes that address the above issues. The final Fire Safety Engineering Assessment Report may need to identify additional fire safety measures and provisions to be incorporated within the subject development that forms the basis for the justification of the Alternate Solutions contained within the Fire Engineering Assessment Report.

This Final Fire Safety Engineering Assessment Report to be prepared will not however need to be formally referred to the NSW Fire Brigade under S144 of the Environmental Planning & Assessment Regulation 2000, prior to the issue of the main building works Construction Certificate for the subject development as the above referenced performance provisions are not called up under S144 of the EP & A Regulations 2000.

5.5 Specification

The following BCA matters are to be addressed by specific BCA Design Certifications to be issued by the relevant architectural, services and engineering consultants at the Construction Certificate Stage for Buildings 4, 5 and 7. This schedule should be forwarded to the architect, structural engineer and services consultants to obtain verification that these items have and will be included in the design documentation / specifications and will be incorporated in the onsite construction at the Construction Certificate Stage:

1. Materials, linings, surface finishes and air-handling ductwork used in the works will comply with the fire hazard properties in accordance with Specification C1.10 and Specification C1.10a of BCA2009.

2. Lightweight fire rated construction used for fire rated walls, ceilings and column encasements will be constructed in accordance with Specification C1.8 of BCA2009.

3. The main switch room sustains emergency equipment required to operate in emergency mode, thus the room will be separated from the remaining building with construction having a FRL of 120/120/120 in accordance with BCA2009 Clause C2.13.

4. The fire hydrant pump room will be located with direct access to a road or open space in construction having a FRL of 120/120/120 in accordance with AS2419.1-2005.

5. The doors leading from the basement car park into the private stairs will be provided as self closing -/120/30 fire doors.

6. The doors to all residential units, fire-isolated stairs, refuse rooms and garbage chute rooms will be provided as self-closing -/60/30 fire doors in accordance with C3.8 and C3.11 of BCA2009.

7. No services will be proposed to penetrate the fire isolated stairs / passages with the exception of those permitted by Clause C3.9 of BCA2009.

8. The lift doors will have a FRL of no less than -/60/- and are to comply with AS1735.11 in accordance with Clause C3.10 of BCA2009.

9. Services penetrating elements required to possess a FRL including the floor slabs, walls, etc will be protected in accordance with C3.12 and C3.15 of BCA2009.

10. All attachments to the external facade of the building will be of a non combustible material in accordance with Clause 2.4 of Specification C1.1 of BCA2009.

11. The fire isolated stair and riser shafts will be provided with fire rated lids in accordance with clause 2.7 of Specification C1.1 of BCA2009.

12. The FRL's of the building elements will be in accordance with Table 3 of Specification C1.1 of BCA2009 for a building of Type A Construction.

13. The dimensions of exits and paths of travel to exits will be provided in accordance with D1.6 of BCA2009.

14. Access to the lift pits will be in accordance with Clause D1.17 of BCA2009.

15. The fire isolated stairs will be constructed of concrete or metal construction in accordance with D2.2 of BCA2009.

16. The non fire isolated stairs will be constructed of steel or concrete construction in accordance with D2.3 of BCA2009.

17. The construction of EDB's will be in accordance with D2.7 of BCA2009 with the enclosures bounded by a non combustible or fire protective covering and smoke seals provided around the perimeter of the doors at each level.

18. The width of all stairways will be a minimum 1.0m measured between handrails / balustrades in accordance with D2.9 of BCA2009.

19. The handrails and balustrades to all stairs and throughout the building will be in accordance with D2.16 and D2.17 of BCA2009.

20. The pedestrian ramps being used for disabled access will have a gradient not steeper than 1:14 and provided with handrails on both sides in accordance with AS1428.1. Where ramps are proposed with a gradient of less than 1:20, no such handrails or TGSI's are considered necessary.

21. All stairs will have riser and going dimensions in accordance with Table D2.13 of BCA2009.

22. Landings and door thresholds throughout the development will be provided in accordance with D2.14 and D2.15 of BCA2009.

23. The door latching mechanisms to the proposed required exit doors will be in accordance with D2.21 of BCA2009.

24. Signage will be provided on all doors to the fire isolated stairs / passages in accordance with D2.23 of BCA2009.

25. Fire precautions during construction will be provided in accordance with E1.9 of BCA2009.

26. Any sarking proposed will be installed in accordance with F1.6 of BCA2009.

27. Waterproofing of all wet areas to the building will be carried out in accordance with F1.7 of BCA2009 and AS3740.

28. All glazing to be installed throughout the development will be in accordance with F1.13 of BCA2009 and AS1288 / AS2047.

29. Damp proofing of the proposed structure will be carried out in accordance with F1.9 and F1.10 of BCA2009.

30. Where the doorways to sanitary facilities are within 1.2m of the pan the doors will be capable of being removed from the outside in accordance with F2.5 of BCA2009.

31. Insulation will be in accordance with AS4859.1 and will be installed as required by NSW Part J1 of BCA2009.

32. Access for maintenance to all services and their components will be provided in accordance with Clause NSW J8.2 of BCA2009.

33. A means of cleaning of windows in accordance with the Occupational Health & Safety Act 2000 and G1.101 of BCA2009 will be provided.

34. The accessible car parking spaces will be provided with a clear width of 3.2m and height of 2.5m in accordance with AS2890.1.

Electrical Services Design Certification:

35. Exit signage and emergency lighting will be installed throughout the development in accordance with E4.2, E4.4, E4.5, E4.6, E4.8 of BCA2009 and AS2293.1-2005.

36. Artificial lighting will be installed throughout the development in accordance with AS1680 and F4.4 of BCA2009.

37. A system of smoke detection and alarm system will be installed throughout the residential portion of the building in accordance with Clause 3 and 3 (c) (ii) of Specification E2.2a of BCA2009, AS3786-1993 and AS1670.1-2004.

Hydraulic Services Design Certification:

38. Storm water drainage will be provided in accordance with F1.1 of BCA2009 and AS3500.3.2.

39. Fire hydrants will be installed in accordance with E1.3 of BCA2009 and AS2419.1-2005 as required.

40. Fire hose reels will be installed in accordance with E1.4 of BCA2009 and AS2441-2005.

41. An automatic sprinkler system complying with E1.5 of BCA2009 and AS2118.1-1999 will be provided to the entire basement car park portions.

42. Portable fire extinguishers will be installed in accordance with E1.6 of BCA2009 and AS2444-2005.

43. The hot water supply systems will be designed and installed to Section 8 of AS3500.4 and Clause J7.2 of BCA2009.

Mechanical Services Design Certification:

44. The bathroom and laundry areas to the Class 2 portions will be mechanically ventilated in accordance with F4.5 of BCA2009 and AS1668.2-1991.

45. The car park portion of the buildings will be mechanically ventilated in accordance with F4.11 of BCA2009 and AS1668.2-1991 as applicable.

Structural Engineers Design Certification:

46. The material and forms of construction for the proposed works will be in accordance with clause B1.2, B1.3 and B1.4 of BCA2009 as follows:

- Dead and Live Loads – AS1170.1
- Wind Loads – AS1170.2
- Masonry – AS3700
- Concrete Construction – AS3600
- Steel Construction – AS4100
- Aluminium Construction – AS/NZS1664.1 or 2
- Glazed Construction – AS1288 and AS2047

47. The FRL's of the structural elements for the proposed works will be designed in accordance with table 3 of Specification C1.1 of BCA2009 for a building of Type A Construction.

48. The construction joints to the structure will be in accordance with C3.16 of BCA2009 to maintain the FRL integrity of the element concerned.

49. Upon completion of the works, the structural engineer will certify local failure in accordance with D2.2 of BCA2009 of the fire isolated stairs.

Lift Services Design Certification:

50. The lifts will be provided with stretcher facilities in accordance with E3.2 and will be capable of accommodating a stretcher in accordance with Clause E3.2 of BCA2009. The lifts will also be suitable to accommodate disabled persons in accordance with E3.6 of BCA2009 and AS1735.12.

51. Warning signage in accordance with Clause E3.3 of BCA2009 will be provided to the lifts to advise not to use the lifts in a fire.

Acoustic Services Design Certification:

52. The sound transmission and insulation of the residential portions of the development will comply with Part F5 of BCA2009.

PART 6 STATEMENT OF COMPLIANCE

The architectural design documentation as referred to in this report has been assessed against the applicable provisions of the Building Code of Australia, 2009 (BCA) and it is considered that such documentation complies or is readily capable of complying with that Code.

Ongoing assessment of the design documentation through to Construction Certificate Stage will ensure strict BCA Compliance will be achieved.

ANNEXURE A

Design Documentation

This report has been based on the following design documentation.

Project Application Architectural Plans Prepared by PTW dated 27th April 2009		
Drawing Number	**Date**	**Title**
A4000	27/4/09	Building 4 Cover Sheet / Schedule
A4003	27/4/09	Building 4 Site Plan
A4004	27/4/09	Building 4 Integrated Ground Floor Plan
A4101	27/4/09	Building 4 Basement Plan
A4102	27/4/09	Building 4 Ground Floor Plan
A4103	27/4/09	Building 4 Level 1 & 2 Plan
A4104	27/4/09	Building 4 Level 3 & 4 Plan
A4105	27/4/09	Building 4 Level 5 & 6 Plan
A4106	27/4/09	Building 4 Roof Plan
A4200	27/4/09	Building 4 West Elevation
A4201	27/4/09	Building 4 East Elevation
A4202	27/4/09	Building 4 North & South Elevations
A4251	27/4/09	Building 4 Sections NS
A4252	27/4/09	Building 4 Sections EW
A5101	27/4/09	Building 5 Basement Plan
A5102	27/4/09	Building 5 Ground Floor Plan
A5103	27/4/09	Building 5 Level 1 & 2 Plan
A5104	27/4/09	Building 5 Level 3 & 4 Plan
A5105	27/4/09	Building 5 Level 5 & 6 Plan
A5106	27/4/09	Building 5 Roof Plan
A5200	27/4/09	Building 5 West Elevation
A5201	27/4/09	Building 5 East Elevation
A5202	27/4/09	Building 5 North & South Elevation
A5251	27/4/09	Building 5 Sections North & South
A5252	27/4/09	Building 5 Sections East & West
A5301	27/4/09	Building 5 Perspectives North-West View
A5302	27/4/09	Building 5 Perspectives South East View
A3000	27/4/09	Building 3 Cover Sheet / Schedule
A3005	27/4/09	Building 3 Overall Site Plan
A3006	27/4/09	Building 3 Site Plan House 1-6
A3007	27/4/09	Building 3 Site Plan House 7-12
A3008	27/4/09	Overall Street Elevations
A3009	27/4/09	Street Elevations Houses 1-6
A3010	27/4/09	Street Elevations Houses 7-12
A3011	27/4/09	Section Diagrams Houses 1-12
A3100	27/4/09	House 1
A3101	27/4/09	House 2
A3102	27/4/09	House 3
A3102	27/4/09	House 3
A3103	27/4/09	House 8
A3104	27/4/09	House 11
A3105	27/4/09	House 12
A3300	27/4/09	Street Perspective 1
A3301	27/4/09	Street Perspective 2
A7000	27/4/09	Building 7 Title Sheet
A7101	27/4/09	Building 7 Basement 1 Plan
A7102	27/4/09	Building 7 Basement 2 Plan
A7103	27/4/09	Building 7 Ground Floor Plan
A7104	27/4/09	Building 7 Typical Floor Plan
A7105	27/4/09	Building 7 Roof Plan
A7201	27/4/09	Building 7 South Elevation
A7202	27/4/09	Building 7 North Elevation
A7203	27/4/09	Building 7 East & West Elevations
A7251	27/4/09	Building 7 Sections
A7301	27/4/09	Building 7 South View
A7302	27/4/09	Building 7 West View

ANNEXURE B

DETAILED ASSESSMENT OF THE DEEMED-TO-SATISFY PROVISIONS OF BCA2009

BUILDING ASSESSMENT

Outlined below is a detailed assessment of the Deemed-to-Satisfy Provisions of the Building Code of Australia 2009 (BCA) including the State variations where applicable.

All Deemed-to-Satisfy clauses that are applicable to the subject building have been referred to below, including a comment adjacent to each clause of the proposal's ability to satisfy each respective clause.

The abbreviations outlined below have been used in the following tables.

N/A	-	Not Applicable. The Deemed-to-Satisfy clause does not apply to the subject building.
Complies	-	The relevant provisions of the Deemed-to-Satisfy clause have been satisfied by the proposed design.
CRA	-	'COMPLIANCE READILY ACHIEVABLE'. It is considered that there was not enough information included in the documentation to accurately determine strict compliance with the individual clause requirements. However, subject to noting the requirements of each clause, compliance can be readily achieved. This information may be included in other documentation, which was not forwarded to this office for assessment, such as door schedules, electrical, mechanical and hydraulic design documentation or architectural specifications.
FI	-	Further Information is necessary to determine the compliance potential of the building design.
AS	-	Alternative Solution with respect to this Deemed-to-Satisfy Provision is necessary to satisfy the relevant Performance Requirements.
DNC	-	Does Not Comply

It should be noted that the following detailed clause by clause assessment is of Buildings 4, 5 and 7 only. The detailed assessment of Building 3 being a class 1a building portion is assessed in brief under Part 5.2 of this report as the relevant provisions of BCA2009 Volume is applicable to class 1a buildings.

DEEMED TO SATISFY CLAUSE ASSESSMENT SUMMARY

Clause	Comment	Status
SECTION B: STRUCTURE		
PART B1 – STRUCTURAL PROVISIONS		
B1.0: Deemed-to-Satisfy Provisions	Noted	-
B1.1: Resistance to Actions	For Information Only – Structural Engineer to certify.	CRA – Structural Design Certification Required
B1.2: Determination of Individual Actions	No details of loads imposed upon the building – Structural Engineer to certify.	CRA – Structural Design Certification Required
B1.3 Loads	No details of loads imposed upon the building – Structural Engineer to certify.	CRA – Structural Design Certification Required
B1.4: Determination of Structural Resistance of Materials and Forms of Construction	No details of materials and forms of construction – Structural Engineer, Architect and Manufacturers to certify.	CRA – Structural and Architectural Design Certification Required
SECTION C: FIRE RESISTANCE		
PART C1 – FIRE RESISTANCE AND STABILITY		
C1.0: Deemed-to-Satisfy Provisions	Noted	-
C1.1: Type of Construction Required	The building 4, 5 and 7 are required to be of Type A construction as they all have a rise in storeys in excess of four (4).	Noted
C1.2: Calculation of Rise in Storeys	The buildings have a rise in storeys in excess of four (4), as the basement car park levels projects greater than 1.0m above natural ground level along the southern elevation to Buildings 4 and 5 and the western elevation to Building 7 thus counted in the rise in storeys.	Noted
C1.3: Buildings of Multiple Classification	The buildings are to be of Type A Construction.	Noted
C1.4: Mixed Types of Construction	The buildings are to be of a single Type of Construction being Type A Construction.	Noted
C1.8: Lightweight Construction	Lightweight construction may be used to achieve required fire resistance levels. No lightweight construction is identified on the referenced drawings.	CRA Architectural Design Certification Required
C1.10: Fire Hazard Properties	No details of the fire hazard properties of the materials and assemblies in the proposed building. Fire hazard indices to comply with Specification C1.10a for floor materials, floor coverings, wall and ceiling linings and Specification C1.10 for other materials within the building.	CRA Architectural Design Certification Required
C1.12: Non-combustible Materials	For Information Only	Noted
PART C2 - COMPARTMENTATION AND SEPARATION		
C2.0: Deemed-to-Satisfy Provisions	Noted	-
C2.1: Application of Part	Noted	-
C2.2: General Floor Area and Volume Limitations	The basement car park areas area to be sprinkler protected and as such there are no maximum values for these areas, nor are there restrictions on the residential areas.	Complies

C2.6: Vertical Separation of Openings in External Walls	Vertical separation between openings in the external walls at different levels is required via either 900mm high 60/60/60 spandrel walls or 1100mm horizontal slab projections. Note spandrel separation is not required to the upper level of two storey units. Further detailed assessment of the window openings in the elevations will need to be carried out with ongoing design development – balcony slab projections need to extend 450mm either side of openings as well	FI Refer Part 5.3
C2.7: Separation by Fire Walls	The car parking areas and the residential areas are to be separated with a fire wall with a FRL of 90/90/90 to separate the classifications. This is applicable at basement levels around the private stairs that lead up to the individual SOU's at ground level to buildings 4 and 5.	CRA – Structural and Architectural and Structural Design Certification Required
C2.8: Separation of Classifications in the Same Storey	The car parking areas and the residential areas are to be separated with a fire wall with a FRL of 90/90/90 to separate the classifications.	CRA
C2.9: Separation of Classifications in Different Storeys	The floor separating the storeys is to have the FRL relative to the storey below. I.e. the floor over the basement car park level is to be a 60/60/60 FRL.	CRA – Structural Design Certification Required
C2.10: Separation of Lift Shafts	The lift shafts are to have the FRL as required by Table 3 of Specification C1.1 of the BCA. See Part 4 of this report for further information.	CRA – Structural Design Certification Required
C2.11: Stairways and Lifts in One Shaft	The stairs and lifts are not contained in the same shaft.	Complies
C2.12: Separation of Equipment	There are no lift motor rooms proposed with machine less room lifts being installed. There are also no boilers proposed in the development. The fire hydrant pump rooms and sprinkler valve rooms have been nominated on the design documentation thus will require fire separation in 120/120/120 FRL.	CRA
C2.13: Electricity Supply System	As the main switch room will sustain emergency equipment required to operate in emergency mode, the room is required to be separated from the building with construction having a FRL of 120/120/120. No details of location or construction of main switch room shown on drawings at this stage. There are no internal substations with external substations assumed in the overall development. Thus no further fire separation is required to any external substations. Care will need to be made to ensure any fire hydrant booster assemblies are located at least 10m clear of any external substations or internal main switch rooms.	CRA
C2.14: Public Corridors in Class 2 and 3 Buildings	The public corridors to the residential levels to Buildings 4, 5 and 7 are less than 40m in length.	Complies
PART C3 – PROTECTION OF OPENINGS		
C3.0: Deemed-to-Satisfy Provisions	Noted	-
C3.1: Application of Part	Noted	-
C3.2: Protection of Openings in External Walls	The buildings are located on the site such that all openings in the external walls are greater than 3.0m clear of any side or rear boundaries and greater than 6.0m clear of any adjoining buildings on the same allotment. Note that as Building 4 and 5 sit on the same basement car park that has now been divided into two separate fire compartments they are considered to form a fire source feature to each other. At ground floor level the Buildings 4 and 5 are located 6.0m apart thus not exposed to each other. As a result no further protection of openings is required by this clause.	Complies
C3.3: Separation of External Walls and Associated Openings in Different Fire Compartments	The openings in external walls between adjoining fire compartments are suitably separated to alleviate any additional protection.	N/A

C3.4: Acceptable Methods of Protection	Fire Isolated Stairs discharge as required alleviating any further protection of openings by this clause. The fire isolated stairs to buildings 4 and 5 require further detailing to ensure strict compliance with D1.7 of BCA2009 is achieved. This will require an internal wall wetting drencher over the self closing entry doors to the lobby areas.	CRA Refer Part 5.3 of Report
C3.5: Doorways in Fire Walls	There are no required or proposed fire walls in the development, other than the walls bounding the private stairs at basement car park level that require to be 90/90/90 fire rated walls and as a result the doors will need to be -/90/30 fire doors.	CRA Architectural Design Certification Required
C3.8: Openings in Fire-isolated Exits	The doorways opening into the fire isolated exits at all levels are required to be protected by -/60/30 self-closing fire doors.	CRA Architectural Design Certification Required
C3.9: Service Penetrations in Fire-isolated Exits	Fire-isolated exits may not be penetrated by any services except electrical wiring for lighting, intercom, and water supply pipes for fire services. No details of any penetrations at this stage.	CRA Architectural Design Certification Required
C3.10: Openings in Fire-isolated Lift Shafts	The lift doors are to have a FRL of no less than -/60/- and are to be in accordance with AS1735.11.	CRA Lift Design Certification Required
C3.11: Bounding Construction: Class 2, 3 and 4 Buildings	The residential units are required to be separated from each other and the remainder of the building with bounding construction that meets the fire resistance levels specified in Part 4 of this report.	CRA Architectural Design Certification Required
C3.12: Openings in Floors and Ceilings for Services	All services shafts are to have a FRL as specified in Part 4 of this report. Alternatively the electrical and hydraulic services can be sealed at each slab level with fire rated mastic and fire collars to alleviate a fire isolated riser shaft system. Mechanical services risers will of course need to be enclosed in a fire rated shaft system.	CRA Architectural Design Certification Required
C3.13: Openings in Shafts	Access to any service shafts is to be through an access panel, or self-closing fire door, having a FRL of not less than -/60/30. This includes the garbage hoppers to any garbage chutes.	CRA Architectural Design Certification Required
C3.15: Openings for Service Installations	Installations through fire rated walls, floors and other elements are to be protected via a method having a FRL relative to the wall they are penetrating.	CRA Architectural Design Certification Required
C3.16: Construction Joints	Joints are to have the required FRL with respect to integrity and insulation relative to the building element they are joining. Structural Engineer to certify.	CRA Structural Design Certification Required
C3.17: Columns Protected with Lightweight Construction to Achieve an FRL	It is assumed that all columns will be of concrete construction and therefore will have sufficient fire resistance without the need for light weight construction to provide a FRL. FRL to each level to be verified by Structural Engineer. However to top floor level any steel columns proposed will need to be fire rated via lightweight fire rated construction.	CRA Structural Design Certification Required
SPECIFICATION C1.1 – FIRE-RESISTING CONSTRUCTION		
2.0: General Requirements	Noted	-
2.1: Exposure to Fire-Source Features	Further details of the internal boundaries proposed throughout the site are to be provided to ensure the buildings are not exposed to potential fire source features.	FI
2.2: Fire Protection for a Support of Another Part	Where elements not required to be fire rated, or are required to have a lesser fire rating, provide support to a fire rated element that supporting part is to be fire rated.	Noted

2.3: Lintels	Lintels are required to have the FRL required for the part of the building in which they are located, unless they are located in a non-load bearing external wall to the Class 2 portions. Based on the concrete framed construction there are no lintels required over openings in the external walls of the building.	Noted
2.4: Attachments Not to Impair Fire-resistance	All attachments proposed to the external façade of the building are to be of non-combustible materials that are permitted by this clause or combustible materials that achieve the required fire hazard indices detailed in this clause. It appears that external attachments are of steel and aluminium material. Further assessment required at CC stage.	CRA Architectural Design Certification Required
2.5: General Concessions	No concessions available as the rooftop terrace areas contain more than just plant and it is assumed that the balconies to Ground Level are extensions of the base building slabs and therefore will have the required FRL's.	Noted
2.6: Mezzanine Floors: Concession	There are no true mezzanine floors proposed to Buildings 4, 5 and 7.	N/A
2.7: Enclosure of Shafts	Fire rated shafts are required to be enclosed, at the top and bottom, with construction having a FRL identical to that of the shaft, unless the shaft extends beyond the roof covering (with the exception of fire isolated stair and lift shafts that are to have lids with a FRL of not less than 90/90/90). There are common mechanical toilet exhaust shafts. There needs to be a bottom on the garbage chute shaft as well. This will alleviate the fire rating of the entire basement level garbage rooms.	
2.8: Car parks in Class 2 and 3 Buildings	This concession is not applicable as the buildings 4, 5 and 7 have a rise in storeys of 7.	Noted
3.0: Type A Fire-resisting Construction	Noted	-
3.1: Fire-resistance of Building Elements	For the proposed fire resistance levels of the building elements see Part 4 of this report for details on required FRL's.	CRA Architectural and Structural Design Certification Required
3.2: Concessions for Floors	The basement level floor which is directly on the ground does not required an FRL.	Noted
3.4: Roof Superimposed on Concrete Slab: Concession	As the roofs of the buildings are in part of concrete construction, they will require a FRL of 90/60/30.	CRA Structural Design Certification Required
3.5: Roof: Concession	The roof does not require a FRL if its covering is non-combustible as the top floor is a Class 2 portion of the building and the walls between and bounding the class 2 residential units extend fully to the underside of the roofing material. Further construction details required to verify compliance.	CRA
3.6: Rooflights	All roof lights are located greater than 3.0m apart where serving separate SOU's as required to buildings 4, 5 and 7.	Complies
3.7: Internal Columns and Walls: Concession	If the roof complies with Clause 3.5 of Specification C1.1 then the internal walls for the top most storey may have a reduced FRL of 60/60/60.	Noted
3.9: Car parks	The car park may be constructed with the lower FRL's as prescribed in this clause as the car park is to be fully separated from the other classifications and is to be fully sprinkler protected.	N/A
3.10: Class 2 Buildings: Concession	The buildings have a rise in storeys in excess of 4 and therefore this concession is not applicable.	N/A
SPECIFICATION C1.8 - STRUCTURAL TESTS FOR LIGHTWEIGHT CONSTRUCTION		
1. Scope	Noted	-

2.	Application	No details of any lightweight construction proposed to achieve a FRL. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
3.	Tests	No details of any lightweight construction proposed to achieve a FRL. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
4.	Test Specimens	No details of any lightweight construction proposed to achieve a FRL. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
5.	Test Methods	No details of any lightweight construction proposed to achieve a FRL. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
6.	Criteria for Compliance	No details of any lightweight construction proposed to achieve a FRL. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
SPECIFICATION C1.10 - FIRE HAZARD PROPERTIES			
1.	Scope	Noted	-
2.	Class 2 to 9 Buildings: General Requirements	No details of Fire Hazard Indices of all materials proposed.	CRA Architectural Design Certification Required
3.	Fire-isolated Exits	No details of Fire Hazard Indices of materials proposed within the FIS's.	CRA Architectural Design Certification Required
4.	Class 2, 3 and 9 Buildings	No details of Fire Hazard Indices of all materials proposed.	CRA Architectural Design Certification Required
8.	Air-handling Ductwork	No details of Fire Hazard Indices of ductwork proposed.	CRA Architectural Design Certification Required
9.	Lift Cars	No details of Fire Hazard Indices of Lift Car linings proposed.	CRA Architectural Design Certification Required
SPECIFICATION C1.10a - FIRE HAZARD PROPERTIES – FLOORS, WALLS AND CEILINGS			
1.	Scope	Noted	-
2.	Floor Materials and Floor Coverings	No details of Fire Hazard Indices of all materials proposed.	CRA Architectural Design Certification Required
3.	Walls and Ceilings	No details of Fire Hazard Indices of materials proposed within the FIS's.	CRA Architectural Design Certification Required
4.	Lift Cars	No details of Fire Hazard Indices of lift car linings proposed.	CRA Architectural Design Certification Required

SPECIFICATION C3.4 – FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS		
1. Scope	Noted	-
2. Fire Doors	All fire doors are to comply with AS1905.1.	CRA Architectural Design Certification Required
SPECIFICATION C3.15 – PENETRATION OF WALLS, FLOORS AND CEILINGS BY SERVICES		
1. Scope	Noted	-
2. Application	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required
3. Metal Pipe Systems	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required
4. Pipes Penetrating Sanitary Compartments	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required
5. Wires and Cables	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required
6. Electrical Switches and Outlets	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required
7. Fire-stopping	No details of sealing of services penetrating fire rated elements.	CRA Architectural Design Certification Required

SECTION D: ACCESS AND EGRESS		
PART D1 – PROVISION FOR ESCAPE		
D1.0: Deemed-to-Satisfy Provisions	Noted	-
D1.1: Application of Part	Noted	-
D1.2: Number of Exits Required	As the buildings 4, 5 and 7 have an effective height of less than 25m strictly only one (1) exit is to be provided from all storeys of the building. Currently a single exit is proposed from all levels with multiple exits provided at basement level. Note that the private stairs leading up from basement level to Buildings 4 and 5 are not deemed to be required exits.	CRA Architectural Design Certification Required
D1.3: When Fire-Isolated Stairways and Ramps are Required	The stairs leading down from the upper residential levels are considered to be fire isolated stairs. However the basement egress stairs that connect basement and discharge direct to open space at ground level are considered as non fire isolated stairs.	CRA Architectural and Structural Design Certification Required
D1.4: Exit Travel Distances	The exit travel distance from all SOU entry doors to the required exits (FIS's) are currently all within the maximum 6.0m distance to an exit or point of choice Furthermore the egress travel distances within the car park portions are as required.	Complies
D1.5: Distance Between Alternative Exits	The distance between the alternative exits is in accordance with the relevant criteria of this clause to the building 4, 5 and 7 basement car park areas.	Complies

D1.6: Dimensions of Exits and Paths of Travel to Exits	Each exit is to have an unobstructed width of 1m and an unobstructed height of 2m, except where passing through a doorway, which may be no less than 750mm wide and 1980mm high.	CRA Architectural Design Certification Required
D1.7: Travel via Fire-Isolated Exits	Currently all FIS's discharge direct to open space as required except the southern FIS at ground level. Where path of travel from the discharge point of a fire-isolated exit to the road is within 6m, measured perpendicular to the path of travel, of the subject building protection will be required to be provided to the building openings with an internal method complying with BCA Clause C3.4, which does allow for the use of wall-wetting sprinklers on the internal face of fixed or automatically closing glazing. This occurs to FS1 and FS2 to Buildings 4 and 5 where further details of discharge points are required.	FI Refer Part 5.3 of Report
D1.9: Travel by Non Fire-Isolated Stairways or Ramps	The non fire isolated stairs leading up from the basement to discharge direct to open space satisfy this clause.	Complies
D1.10: Discharge from Exits	The discharge point of all the fire isolated stairs and required exits is such that the egress path cannot be blocked by parked vehicles or the like without the use of bollards.	Complies
D1.13: Number of Persons Accommodated	As there is no calculation for the residential portions of the buildings under Table D1.13, each level is considered to accommodate less than 50 people per storey per lift lobby	Noted
D1.14: Measurement of Distances	For information only.	Noted
D1.15: Method of Measurement	For information only.	Noted
D1.16: Plant Rooms and Lift Motor Rooms: Concession	Plant rooms are located on floor levels where direct access is available therefore this concession is not required.	N/A
D1.17: Access to Lift Pits	Access to the lift pits area assumed to be through the bottom landing doors as the pits are assumed to be less than 3m deep.	CRA Architectural Design Certification Required
PART D2 – CONSTRUCTION OF EXITS		
D2.0: Deemed-to-Satisfy Provisions	Noted	-
D2.1: Application of Part	Noted	-
D2.2: Fire-Isolated Stairways and Ramps	It is assumed that the stairways will be constructed of reinforced concrete or metal and therefore comply.	CRA Architectural Design Certification Required
D2.3: Non-Fire-Isolated Stairways and Ramps	It is assumed that the stairways will be constructed of reinforced concrete and therefore comply.	CRA Architectural Design Certification Required
D2.4: Separation of Rising and Descending Stair Flights	The rising and descending stairways are indicated to be separated as required other than to Building 7. Currently FS1 and FS2 discharge into the same egress passage as the basement stairs. This issue is to be assessed if required against the relevant performance criteria to ensure persons do not egress past the level at which access to open space is available.	AS Refer Part 5.4 of Report
D2.7: Installations in Exits and Paths of Travel	Any electrical and comms cupboards located in corridors are to be enclosed in non-combustible construction and smoke sealed.	CRA Architectural Design Certification Required
D2.8: Enclosure of Space Under Stairs and Ramps	No enclosures indicated within the stair shafts to Buildings 4, 5 and 7 as required.	Complies

D2.9: Width of Stairways	The stairways are to be a minimum of 1m in width measured clear of all obstructions including handrails, with a ceiling height of at least 2m. To be further assessed with ongoing design documentation.	CRA Architectural Design Certification Required
D2.10: Pedestrian Ramps	The ramps nominated on the drawings are to have a gradient of not more than 1:8 to be considered suitable for use for egress purposes. The ramps to access the ground floor lift lobby areas are to possess gradients not steeper than 1:14 for disabled access compliance to access the adaptable units.	CRA Architectural Design Certification Required
D2.11: Fire-Isolated Passageways	The fire-isolated passageway formed at the bottom of the Fire Isolated Stairs to all buildings are to have the FRL identical to that of the stairway being 90/90/90.	CRA Structural Design Certification Required
D2.12: Roof as Open Space	The portion of the ground floor slab to Buildings 4 and 5 that forms open space leading from the discharge point of the fire isolated stairs is to have an FRL of not less than 120/120/120.	CRA Structural Design Certification Required
D2.13: Goings and Risers	Stair geometry to all stairs to be as required in accordance with this clause / and Table D2.13.	CRA Architectural Design Certification Required
D2.14: Landings	Landing sizes appear adequate. It is assumed that the landings will have either a non-slip finish or a non-skid strip.	CRA Architectural Design Certification Required
D2.15: Thresholds	The step down from the discharge point of fire-isolated and required exit stairs to open space to be not greater than 190mm.	CRA Architectural Design Certification Required
D2.16: Balustrades or Other Barriers	Balustrades are required to be 1m above the floor of any balcony, path or the like. Insufficient details of the dimensions and configurations of the balustrading to all areas of the building have been supplied at this stage although the configuration of the fire stair balustrades appears able to achieve compliance, as do the glass balcony balustrades.	CRA Architectural Design Certification Required
D2.17: Handrails	Handrails are to be provided to a least one side of all stairways and ramps and both sides where required for disabled access to the accessible pedestrian entrance ramps.	CRA Architectural Design Certification Required
D2.18: Fixed Platforms, Walkways Stairways and Ladders	Access into all plant rooms direct from each respective floor level alleviating the need for AS1657 access stairs, ladders or the like.	N/A
D2.19: Doorways and Doors	Exit doors are shown as swinging doors as required to all levels.	Complies
D2.20: Swinging Doors	As required all swinging exit doors swing in the direction of egress, it is noted that the doors from the main foyer on the ground floor of Buildings 4, 5 and 7 are considered as doors in a path of travel, with the exit being the actual doors leading into the FIS's, and as such are not required to swing in the direction of travel.	CRA Architectural Design Certification Required
D2.21: Operation of Latch	Door Latches are to be in accordance with this clause.	CRA Architectural Design Certification Required
D2.22: Re-entry from Fire-Isolated Exits	The doors of the fire-isolated stairways can be locked from the inside of the stairway as the building has an effective height of less than 25m.	N/A

D2.23: Signs on Doors	Required signage is to be located on all fire doors stating **"Fire Door, Do Not Obstruct, Do Not Keep Open**" and the discharge door from the fire isolated stairways to the outside are to state **"Fire Safety Door – Do Not Obstruct"** in capital letters not less than 20mm in height.	CRA Architectural Design Certification Required
PART D3 - ACCESS FOR PEOPLE WITH DISABILITIES		
D3.0: Deemed-to-Satisfy Provisions	Noted	-
D3.1: Application of Part	Noted	-
D3.2: General Building Access Requirements	Access for people with a disability is not required to this building as it is a Class 2 structure and Part D3 – "Access for People with Disabilities" does not apply. You are reminded however that owners of all buildings may still be subject to action under the Disability Discrimination Act. Also the Consent authority will require adaptable units to be provided in the development as part of the Planning Controls. In this instance access will need to be provided to the main entrances and all floors where the adaptable units are located.	Noted
D3.3: Parts of Buildings to be Accessible	Access is strictly only required to the main entrances and levels where the adaptable units are proposed.	Noted
D3.4: Concessions	Disabled access is not required to store rooms or plant areas.	Noted
D3.5: Car Parking	Strictly the provisions of Part D3 of BCA do not require accessible car parking spaces. However with adaptable units we would recommend the same number of accessible car spaces as adaptable units are provided – note the clear width of an accessible car space is 3.2m and height is 2.5m with 2.3m head height provided from the car park entrance to the actual car spaces.	FI Refer Part 5.3 of Report
D3.6: Identification of Accessible Facilities, Services and Features	Signage not required to development by this clause.	N/A
D3.8: Tactile Indicators	Tactile indicators not required to this development by this clause.	N/A

SECTION E: SERVICES AND EQUIPMENT		
PART E1 – FIRE FIGHTING EQUIPMENT		
E1.0: Deemed-to-Satisfy Provisions	Noted	-
E1.3: Fire Hydrants	The buildings are required to be provided with a fire hydrant system with fire hydrants located inside the FIS's at each level. The current Hydrant Boosters to Buildings 4, 5 and 7 are relocated with access direct to open space and within 8.0m of street within sight of the main entrances to the building. Radiant heat protection will be required to the booster assembly serving building 7 due to its proximity of being within 10.0m of openings in the same building.	CRA Services Design Certification Required
E1.4: Fire Hose Reels	The building is required to be provided with a fire hose reel system with fire hose reels located within 4.0m of a required exit at each level – FHR coverage is also required to the ground floor units.	CRA Services Design Certification Required
E1.5: Sprinklers	As the basement car park of Buildings 4, 5 and 7 contain greater than 40 cars, the entire basement car park levels are to be sprinkler protected. The location of the sprinkler valve rooms must also be as per Specification E1.5. The sprinkler valve set to Buildings 4 and 5 are relocated on the basement level in a secure room with direct access to the road or open space. The sprinkler pump may be located on this level but must be located within fire resistant construction with a FRL of not less than 120/120/120.	CRA Services Design Certification Required
E1.6: Portable Fire Extinguishers	PFE's are to be installed in accordance with AS 2444.	CRA Services Design Certification Required

E1.9: Fire Precautions During Construction	Information only. Whilst the building is under construction there is to be not less than one fire extinguisher provided at all times to each storey.	Noted
SPECIFICATION E1.5 - FIRE SPRINKLER SYSTEMS		
1. Scope	Noted	-
2. Adoption of AS 2118	Sprinkler system to the entire building up to Podium Level to comply with AS2118.1-1999.	Noted
3. Separation of Sprinklered and Non-Sprinklered Areas	The entire basement car park levels are to be sprinkler protected with suitable fire separation provided between the levels above the basement level that are not to be sprinkler protected.	CRA Services Design Certification Required
4. Protection of Openings	The entire basement car parks are to be sprinkler protected.	CRA Services Design Certification Required
5. Fast Response Sprinklers	The sprinkler system at basement level is to comply with AS2118.1-1999. For a standard car park, fast response heads are not strictly required – thus standard response heads could be used.	CRA Services Design Certification Required
6. Sprinkler Valve Enclosures	The required sprinkler valve enclosures are to have direct egress to open space as currently shown to Buildings 4, 5 and 7.	CRA Services Design Certification Required
7. Water Supply	At least a Grade 3 water supply to be provided as per this clause.	CRA Services Design Certification Required
8. Building Occupant Warning System	BOWS to be in accordance with Clause 6 of Specification E2.2a.	CRA Services Design Certification Required
9. Connection to Other Systems	The sprinkler system to the building is to comply with AS2118.1-1999 and be connected to the BOWS.	CRA Services Design Certification Required
10. Anti-tamper Devices	Not a theatre or public hall thus provisions of this clause are not applicable.	N/A
11. Sprinkler Systems in Carparks	This clause requires separation of the sprinkler systems so that one area may be isolated from the other.	CRA Services Design Certification Required
PART E2 – SMOKE HAZARD MANAGEMENT		
E2.0: Deemed-to-Satisfy Provisions	Noted	-
E2.1: Application of Part	Noted	-
E2.2: General Requirements (including Tables E2.2a and E2.2b)	The Class 2 portion of the buildings are to be provided with an automatic smoke detection and alarm system complying with Specification E2.2a The car park ventilation system is to comply with this clause as an AS1668.2-1991 system.	CRA Services Design Certification Required
SPECIFICATION E2.2a – SMOKE DETECTION AND ALARM SYSTEMS		
1. Scope	Noted	-
2. Type of System	The type of system to the residential areas being an area of class 2 residential apartments must be in accordance with clause 3.	CRA Services Design Certification Required
3. Smoke Alarm System	No details of the proposed smoke detection and alarm system. Note that to Buildings 4 and 5 where egress travel distance may exceed 6.0m to an exit – additional / upgraded smoke detection and alarm systems may be required as a result of future Fire Engineering Justification.	CRA Services Design Certification Required
6. Building Occupant Warning System	No details of the BOWS.	CRA Services Design Certification Required

7. System Monitoring	The smoke detection system for the activation of the BOWS in the building is to required to be monitored, however the sprinkler system is required to be monitored under AS2118.1-1999.	CRA Services Design Certification Required
PART E3 – LIFT INSTALLATIONS		
E3.0: Deemed-to-Satisfy Provisions	Noted	-
E3.2: Stretcher Facility in Lifts	A stretcher facility accommodating clear space of not less than 600mm wide x 2000mm long x 1400mm high above the floor level is to be provided to all lifts as the building has an effective height in excess of 12m.	CRA Lift Design Certification Required
E3.3: Warning Against Use of Lifts in Fire	Warning against using the lifts in the event of a fire must be provided in accordance with this clause.	CRA Lift Design Certification Required
E3.5: Landings	Lift landing dimensions are satisfactory.	Complies
E3.6: Facilities for People with Disabilities	The buildings are not required by the BCA to be accessible to people with disabilities, however with adaptable units proposed where access is proposed from the basement car park levels to the ground floor adaptable units, the lifts will need to be accessible compliant	CRA Lift Design Certification Required
E3.7: Fire Service Controls	Fire services controls are required.	CRA Lift Design Certification Required
PART E4 – EMERGENCY LIGHTING, EXIT SIGNS AND WARNING SYSTEMS		
E4.0: Deemed-to-Satisfy Provisions	Noted	-
E4.2: Emergency Lighting Requirements	Emergency lighting is to be installed in every exit, every public corridor and lobby on all levels and the car parking areas.	CRA Services Design Certification Required
E4.3: Measurement of Distance	Information only.	Noted
E4.4: Design and Operation of Emergency Lighting	Emergency lighting is to comply with AS 2293.1-2005.	CRA Services Design Certification Required
E4.5: Exit Signs	Exits signs are to be provided above or adjacent to a door providing egress to a required exit.	CRA Services Design Certification Required
E4.6: Direction Signs	Where an exit is not readily apparent a directional sign is to be installed indicating the direction of egress.	CRA Services Design Certification Required
E4.7: Class 2 and 3 Buildings and Class 4 Parts: Exemptions	The doorways to each SOU are exempt from E4.5 of the BCA.	Noted
E4.8: Design and Operation of Exit Signs	Exit and directional signage is to comply with AS 2293.1-2005.	CRA Services Design Certification Required
E4.9: Sound Systems and Intercom Systems for Emergency Purposes	Such systems are not required by this clause within the proposed development.	N/A

SECTION F: HEALTH AND AMENITY		
PART F1 – DAMP AND WEATHERPROOFING		
F1.0: Deemed-to-Satisfy Provisions	Noted	-
F1.1: Stormwater Drainage	Stormwater drainage to comply with AS 3500.3.2.	CRA Services Design Certification Required
F1.5: Roof Coverings	Concrete / metal roof covering proposed.	CRA Architectural Design Certification Required

F1.6: Sarking	The sarking is to comply with AS 4200.	CRA Architectural Design Certification Required
F1.7: Water Proofing of Wet Areas in Buildings	Waterproofing to wet areas to comply with AS 3740.	CRA Architectural Design Certification Required
F1.9: Damp-proofing	Moisture is to be prevented from reaching the walls above a damp-proof course, and the underside of the suspended floors.	CRA Architectural Design Certification Required
F1.10: Damp-proofing of Floors on the Ground	A vapour barrier in accordance with AS 2870 must be installed.	CRA Architectural Design Certification Required
F1.11: Provision of Floor Wastes	In the residential units the bathrooms and laundries are to be graded to a floor waste that has been nominated on the architectural documentation.	Complies
F1.13: Glazed Assemblies	Glazed assemblies are to comply with AS 2047 and AS 1288.	CRA Architectural Design Certification Required
PART F2 – SANITARY AND OTHER FACILITIES		
F2.0: Deemed-to-Satisfy Provisions	Noted	-
F2.1: Facilities in Residential Buildings (including Table F2.1)	Generally the residential units appear to be provided with suitable facilities. Further detailed assessment to be undertaken with ongoing design development. At basement car park level to Buildings 4, 5 and 7 a dedicated sanitary facility for maintenance staff access has also been provided as required.	CRA Architectural Design Certification Required
F2.5: Construction of Sanitary Compartments	Where the pans to the bathroom areas are within 1.2m of the doorway with the doorway swinging inwards. In these instances the doors are to be removable from outside the bathroom.	CRA Architectural Design Certification Required
PART F3 – ROOM SIZES		
F3.0: Deemed-to-Satisfy Provisions	Noted	-
F3.1: Height of Rooms and Other Spaces	Habitable room heights are to be a minimum of 2.4m, to the kitchen, laundry and passageways 2.1m, in the residential areas of the building. The car park is to have a minimum ceiling height of 2.1m in other areas however a height of 2.3m leading from the car park entrance to the accessible car spaces that then need a 2.5m head height clearance.	FI Refer Part 5.3 of Report
PART F4 – LIGHT AND VENTILATION		
F4.0: Deemed-to-Satisfy Provisions	Noted	-
F4.1: Provision of Natural Light	Natural light is to be provided to all habitable rooms in the Class 2 units.	
F4.2: Methods and Extent of Natural Lighting	Natural light is to be provided to all habitable rooms in the Class 2 portions of the building through openings with a glazed/open aggregate area not less than 10% of the floor area of the room served where an opening faces the boundary or a wall the horizontal distance from the window to the boundary/wall is to be not less than the horizontal distance from the boundary/wall that is either 1m or 50% of the square root of the exterior height of the wall in which the window is located measured in metres from its sill. Further detailed window / door dimensions to be provided to ensure compliance is achieved.	FI Refer Part 5.3 of Report
F4.3: Natural Light Borrowed From Adjoining Room	Natural light may be borrowed from adjoining rooms.	Noted

F4.4: Artificial Lighting	Lighting to all areas is to comply with AS 1680.0.	CRA Services Design Certification Required
F4.5: Ventilation of Rooms	Natural ventilation will be provided to the residential areas and mechanical ventilation is assumed to be provided to the bathroom / laundry areas to comply with AS 1668.2-1991.	FI
F4.6: Natural Ventilation	Natural ventilation where proposed is to be provided via windows having an aggregate opening of not less than 5% of the floor area of the room to all SOUs. Further detailed window / door dimensions to be provided to ensure compliance is achieved.	FI Refer Part 5.3 of Report
F4.7: Ventilation Borrowed From Adjoining Room	Ventilation may be borrowed from adjoining rooms, however will not be necessary with this development.	Noted
F4.8: Restriction on Position of Water Closets and Urinals	It is assumed that all bathrooms, ensuites and WC's will be mechanically exhausted.	CRA Services Design Certification Required
F4.9: Airlocks	It is assumed that all bathrooms, ensuites and WC's will be mechanically exhausted.	CRA Services Design Certification Required
F4.11: Car parks	Car park areas to be mechanically exhausted. In accordance with AS1668.2-1991	CRA Services Design Certification Required
PART F5 – SOUND TRANSMISSION AND INSULATION		
F5.0: Deemed-to-Satisfy Provisions	Noted	-
F5.1: Application of Part	This part is applicable to the Class 2 portions of the buildings 4, 5 and 7.	Noted
F5.2: Determination of Airborne Sound Insulation Ratings	Information only	Noted
F5.3: Determination of Impact Sound Insulation Ratings	A wall requiring an impact sound insulation rating is to be of non-continuous construction in the Class 2 portions of the building.	Noted
F5.4: Sound Insulation Rating of Floors	The floors must have a $R_w + C_{tr}$ (airborne) not less than 50 and an $L_{n,w} + C_1$ (impact) of not more than 62.	CRA Acoustic Design Certification Required
F5.5: Sound Insulation Rating of Walls	The walls separating the units must have a $R_w + C_{tr}$ (airborne) not less than 50 and where a kitchen backs onto a habitable room the wall is to comply with Clause F5.3, to be specified on the drawings.	CRA Acoustic Design Certification Required
F5.6: Sound Insulation Rating of Services	If a soil or waste pipe passes through more than one unit the pipe must be separated from the rooms with construction that has a $R_w + C_{tr}$ (airborne) not less than 40 if adjacent to a habitable room, or 25 if adjacent to a kitchen or other room.	CRA Acoustic Design Certification Required
F5.7: Sound Isolation of Pumps	A flexible coupling must be used at the point of connection between the service pipes and any circulation or other pump.	CRA Acoustic Design Certification Required

SECTION G: ANCILLARY PROVISIONS		
PART G1 - MINOR STRUCTURES AND COMPONENTS		
G1.0: Deemed-to-Satisfy Provisions	Noted	**-**
NSW G1.101: Provision for Cleaning of Windows	As the building exceeds 3 storeys some form of provisions of cleaning of the windows is required.	CRA Architectural Design Certification Required

SECTION I: MAINTENANCE		
PART I1 – EQUIPMENT AND SAFETY INSTALLATIONS		
I1.0: Deemed-to-Satisfy Provisions	Noted	-
NSW I1.1: Essential Fire Safety Measures	Essential fire or other safety measures must be maintained in accordance with the original installation standards.	Noted

The Energy Efficiency Performance of the Class 2 portions in NSW is generally covered by the BASIX provisions with the BASIX Report required to be lodged with the Project Application. However there are also still some BCA Energy Efficiency provisions applicable to the subject development.

SECTION J: ENERGY EFFICIENCY (Class 2 and 4)		
NSW PART J(A)1 – BUILDING FABRIC		
NSW J(A)1.0: Deemed-to-Satisfy Provisions	Noted	-
NSW J(A)1.1: Application of Part	Applies to Class 2 Part where thermal insulation is required as a DA Condition.	Noted
NSW J(A)1.2: Compliance with BCA Provisions	To be included in the specification to AS/NZS4859.1 and Clause J1.2, for the Class 2 portion of the building. The installation certified by an appropriate consultant.	CRA Architectural Design Certification Required
NSW PART J(A)2 – BUILDING SEALING		
NSW J(A)2.0: Deemed-to-Satisfy Provisions	Noted	-
NSW J(A)2.1: Application of Part	This part is applicable to the Class 2 portions of the building, excluding any rooms where a building ventilation opening is necessary for the safe operation of a gas appliance and portions of the building that cannot be fully enclosed.	Noted
NSW J(A)2.2: Compliance with BCA Provisions	Compliance is to be achieved with Clauses J3.2, J3.4, J3.5 and J3.6.	Noted
J3.2: Chimneys and Flues	No chimneys or flues currently proposed.	N/A
J3.3: Roof Lights	Roof lights are proposed to Buildings 4 and 5 only.	CRA Architectural Design Certification Required Noted
J3.4: External Windows and Doors	The windows must be sealed, or comply with AS2047, and it is assumed that the doors to entry lobbies are self-closing doors.	CRA Architectural Design Certification Required
J3.5: Exhaust Fans	No details, exhaust fans must be provided with a self-closing damper or the like.	CRA Architectural Design Certification Required
J3.6: Construction of Roofs, Walls and Floors	Roofs, walls and floors must be sealed to minimise air leakage in accordance with this clause.	CRA Architectural Design Certification Required
NSW PART J(A)3 – AIR-CONDITIONING AND VENTILATING SYSTEMS		
NSW J(A)3.0: Deemed-to-Satisfy Provisions	Noted	-
NSW J(A)3.1: Application of Part	Noted	
NSW J(A)3.2: Compliance with BCA Provisions	Compliance is to be achieved with Clauses J5.2, J5.3, J5.4 and J5.5.	Noted
J5.2: Air-conditioning and Ventilation Systems	Air-conditioning to comply with this clause, certification to be provided by mechanical engineer.	CRA Services Design Certification Required
J5.3: Time Switch	Air-conditioning to comply with this clause, certification to be provided by mechanical engineer.	CRA Services Design Certification Required

SECTION J: ENERGY EFFICIENCY (Class 2 and 4)		
J5.4: Heating and Chilling Systems	Air-conditioning to comply with this clause, certification to be provided by mechanical engineer.	CRA Services Design Certification Required
J5.5: Miscellaneous Exhaust Systems	Exhaust systems to comply with this clause, certification to be provided by mechanical engineer.	CRA Services Design Certification Required
NSW PART J(A)4 – HOT WATER SUPPLY		
NSW J(A)4.0: Deemed-to-Satisfy Provisions	Noted	-
NSW J(A)4.1: Application of Part		
NSW J(A)4.2: Compliance with BCA Provisions	The hot water supply system must comply with Clause J7.2.	Noted
J7.2: Hot Water Supply	The hot water supply systems must be designed and installed in accordance with Section 8 of AS3500.4. Further details on the hot water supply system to be provided.	FI Refer Part 5.3 of Report
NSW PART J(A)5 – ACCESS FOR MAINTENANCE		
NSW J(A)5.0: Deemed-to-Satisfy Provisions	Noted	-
NSW J(A)5.1: Application of Part	Access for maintenance of equipment is to be provided within common areas.	CRA Architectural Design Certification Required
NSW J(A)5.2: Access for Maintenance	Access for maintenance of equipment is to be provided within common areas.	CRA Architectural Design Certification Required

ANNEXURE C

SECTION J INFORMATION

ANNEXURE C - ENERGY EFFICIENCY – SECTION J

C1 Introduction

BCA 2006 (now BCA2009) introduced requirements for Energy Efficiency for all buildings that contain conditioned spaces (heating or cooling).

This has an impact on the insulation of walls and ceilings in particular, and many existing standard types of construction no longer comply without insulation.

There are also controls on heating and cooling loads, and electrical loads.

The following is a summary of an assessment of the proposed building against the DTS provisions of the BCA, and outlines where further consideration is required by the designers or where specialised input from mechanical and electrical engineers is required.

In NSW the relevant Clauses of Section J are identified in NSW BCA Section J, Subsection J(A) for the Class 2 portion of the building. NSW Subsection J(A) removes some of the relevant Deemed-to-Satisfy (DTS) provisions as within NSW a Class 2 building is required to obtain a BASIX certificate at the Development Application stage. This is so that there is not a doubling up of requirements on a residential building. The Class 7a portions of the building are required to comply with the national Section J requirements.

The BCA does outline two verification methods being JV1 and JV3 (JV2 was deleted in the 2009 BCA update) which can also be used to demonstrate compliance with the performance requirements in lieu of the DTS provisions. These verification methods require detailed energy modelling to be carried out, however many of the items contained below may still be required to be satisfied.

C2 General Assessment Criteria

The building has been assessed against Section J based on the following assumptions.

(a) Climate Zone – The buildings are in Climate Zone 6 based on the BCA Climate Zone map.

(b) Conditioned Space – The conditioned space for the subject building includes all occupied floor areas provided with mechanical ventilation but excludes:

- Stairwells, lift shafts and other service shafts.
- Roof top plant room.
- Basement carpark level/s
- Other.

Please note that a building is considered conditioned even if in the base building construction active heating or cooling is not proposed but it is likely to be conditioned in the future

(c) Envelope – for the purposes of Section J, means the parts of a building's fabric that separate a conditioned space or habitable room from the exterior of the building or a non-conditioned space.

C3 Part J1 – Building Fabric

(a) J1.2 – Thermal Construction

Insulation must comply with AS/NZS 4859.1 and be installed so that it overlaps adjoining insulation, forms a continuous barrier and does not affect the safe or effective operation of services or fittings.

Reflective insulation must be installed with the necessary airspace required to achieve the R value and be closely fitted against doors and windows and adequately supported by framing members.

Reflective insulation must be overlapped not less than 50mm and taped together.

Bulk insulation must be installed so that it maintains its position and thickness, and overlaps walls by 50mm where no insulation is provided in the walls.

C7 Part J5 – Air Conditioning and Ventilation Systems

The mechanical engineer/designer is to certify that the car park ventilation system complies with Part J5 of the BCA.

C8 Part J6 – Artificial Lighting and Power

The electrical engineer/designer is to certify the design of the lighting and power systems to Part J6 of the BCA, which includes the following requirements and is applicable to the class 7a car park areas of the building:

(a) The aggregate design illumination power load must not exceed that specified in Table J6.2b for the Class 7a car park portion of the buildings unless adjustment factors are applicable due to dimming or motion detection as outlined in table J6.2C. These include:

Location	**Maximum Illumination Power Density (W/m²)**
Car park - general	6
Car park – entry zone (first 20m of travel)	25
Circulation space and corridor	8
Entry Lobby	15
Plant room	5

The requirement for the maximum lamp/illumination power density does not apply to emergency lighting and signage and display lighting within cabinets and display cases.

(b) Artificial lighting around a building must be controlled by either a daylight sensor or time switch in accordance with Specification J6, and when the total perimeter lighting load exceeds 100w, have a light source efficiency of not less than 60 lumens/w or be controlled by a motion detector in accordance with Specification J6 (Clause J6.5)).

(c) Power supply to any fixed boiling or chilled water storage units must be controlled by a time switch in accordance with Specification J6 (Clause J6.6)).

C9 Part J7 – Hot Water Supply

The hot water system must be designed and installed in accordance with Section 8 of AS/NZS 3500.4, which details requirements for the insulation of piping, heat traps, water storage containers and water flow rate efficiency, except if the hot water supply is provided by a solar hot water supply system in climate zones 1, 2 and 3.

C10 Part J8 – Access for Maintenance

Access for maintenance must be provided to all services and their components including time switches, thermostats, dampers, light fittings, heat transfer equipment and the like, and to adjustable or motorised shading devices.