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Building Regulations, Certification & Fire Safety Consultants
ABN 45 105 050 897

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National Construction Code (BCA) 2013 Assessment Report

AXIS (STAGE 2) ***2 HERB ELLIOTT AVENUE, SYDNEY OLYMPIC PARK,*** ***NSW***

**Construction of a mixed commercial and retail development including
a two- level basement car park**

Prepared for: *Capital Corporation*

Prepared by: *Building Certificates Australia Pty Ltd*
Suite 505, 64-76 Kippax Street
Surry Hills NSW 2010

Project No.: *13/0301*

Date: *10 May 2013*

Status: *DA Status*



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1.0 EXECUTIVE SUMMARY

Please find below a summary of the BCA deemed-to-satisfy non-compliances or areas of concern identified in this report.

Please note that this list should not be considered a full comprehensive list of non-compliances and therefore should be read in conjunction with the remainder of this report. Further details/confirmation of compliance is requested throughout and you are strongly recommended to review the contents accordingly.

You are reminded that this report is for Stage 2 of a development that is considered a single building, (with two further stages – being Stage 1 and 1A). Each of which had an independent review to determined non-compliances.

Collectively, identified non-compliances will apply to the whole building once the stages are competed, however, it should be acknowledged that some alternative solutions have been prepared by others on the basis of the design of Stage 1, therefore, they may be adopted where appropriate for Stage 2 proposal.

Notwithstanding the above, the following clauses should be considered to pursuant of this stage:

1. *D1.7: Travel via Fire Isolated Exits (page 15),*
2. *E1.3: Fire Hydrants, (page 23),*
3. *E1.5: Sprinklers (page 24),*
4. *E2.2: Smoke Hazard Management (page 25),*
5. *Part E3: Lift Installations (page 25),*



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1.1 INTRODUCTION

In accordance with your instruction, we have undertaken an assessment of the proposed mixed-use commercial and retail development under the National Construction Code (BCA 2013). It is understood that the primary reason for an assessment at this stage is to identify any potential BCA non-compliances from the information received to date and listed below.

Stage 2 consists of two basement levels of car parking directly connected to the corresponding levels of Stage 1. The ground floor level consists of two retail tenancies either side of the main commercial foyer with ancillary areas behind. There are seven levels of commercial space above with roof-top plant above Level 7. Stage 2 has no further connection with the remainder of the development above ground level, (being Stages 1 and 1A).

This report should be read in conjunction with the BCA assessments for Stage 1 and Stage 1A dated 18 March and 10 May 2013 respectively, prepared by *Building Certificates Australia Pty Ltd*.

For information purposes, Stage 1 proposal consists of two basement levels of car parking, a ground floor level consisting of retail tenancies, a foyer (incorporating a cafe), ancillary areas, and seven levels of commercial space over. A further storey is exclusively for plant/machinery. Stage 1A is situated above part of the two levels of basement car parking (of Stage 1) and consists of a ground floor retail tenancy with seven levels of commercial space above. A further storey is exclusively for plant/machinery.

It is understood that Stage 2 is the final stage of the development and is pending approval from the Consent Authority.

As requested, only the architectural plans listed below have been considered for this BCA review, therefore, the assessment is limited to the information represented in the plans. It is acknowledged that these plans are marked as "*Preliminary*".





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1.2 REFERENCED DOCUMENTS

The following documentation was reviewed in the preparation of this report:

- Architectural drawings: Project No. 090086 prepared by *Architectus*;

Drawing No's:

- | | |
|------------------------------|------------------------------|
| - DA-2-0005/A dated 10/05/13 | - DA-2-1006/A dated 10/05/13 |
| - DA-2-0020/A dated 10/05/13 | - DA-2-1007/A dated 10/05/13 |
| - DA-2-0021/A dated 10/05/13 | - DA-2-2000/A dated 10/05/13 |
| - DA-2-1000/A dated 10/05/13 | - DA-2-2001/A dated 10/05/13 |
| - DA-2-1001/A dated 10/05/13 | - DA-2-2010/A dated 10/05/13 |
| - DA-2-1002/A dated 10/05/13 | - DA-2-2011/A dated 10/05/13 |
| - DA-2-1004/A dated 10/05/13 | - DA-2-2020/A dated 10/05/13 |
| - DA-2-1005/A dated 10/05/13 | - DA-2-2021/A dated 10/05/13 |

- National Construction Code Volume 1, Building Code of Australia 2013
- Guide to the Building Code of Australia 2013
- Environmental Planning and Assessment Act 1979.
- Environmental Planning and Assessment Regulation 2000.
- *The Owners – Strata Plan No. 69312 v Rockdale City Council & Anor, Owners of SP 69312 v Allianz Aust Insurance [2012] NSWSC 1244.*
- Emailed correspondence dated 04/05/2013 from *Architectus* regarding BCA confirmation/commentary
- Emailed correspondence dated 09/05/2013 from *Defire* regarding alternative solution.

1.3 LIMITATIONS

- This report is a preliminary review of the above referenced documents to identify only BCA non-compliances for this stage.
- An assessment has been undertaken with respect to the Access Premises Standards 2010 and the Disability Discrimination Act 1992 (DDA). The building owner should also be satisfied that their obligations under the DDA have been addressed.
- No assessment has been made relative to compliance with AS4299.
- Please note under the NCC (BCA 2013), Part D3 – Access for Persons with a Disability, is assessed within the report. The same technical requirements within Part D3 of the BCA are contained within Schedule 1 of the Access Premises Standard 2010.
- No comment is made in regard to the structural components of the development, storm water control, mechanical, electrical, hydraulics or fire services installations.



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2.0 BUILDING CHARACTERISTICS

BCA Classification:	Class 5 - Commercial Levels – Foyer, Level 1 to Level 7 Class 6 - Retail – Ground Floor tenancies Class 7a- Car parking Basement Levels 1 and 2 (including loading dock provided no storage contained within dock).
Rise in Storeys:	Eight (8)
Type of Construction:	Type A Construction
Effective Height:	24.95m - based upon the RL of Level 7 (being 142.150) and Ground Level (being 117.20)*. <i>Mindful of the above measurement, please pay particular attention to finished floor levels in this regard.</i> <i>*Reference is made to the determination of calculating the 'Effective Height' from The Owners – Strata Plan No. 69312 v Rockdale City Council & Anor' Owners of SP 69312 v Allianz Aust Insurance [2012] NSWSC 1244.</i> <i>The whole building (being Stages 1, 1A and 2) is considered one building for the purposes of the BCA and is measured at less than 25m.</i> <i>As Stage 2 incorporates a direct link at the basement levels, the 'building' will be considered to encompass these additional parts also. Please acknowledge this in determining the effective height calculation and designing such parts according.</i>
Floor Area	Car park Levels: 4118m²* & 4079m² each (Stage 2, in isolation of Stage 1) Retail Tenancies: 721m²* each Commercial Levels: 2250m²* per floor <i>*Estimated floor areas. To be confirmed by Architect.</i>



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3.0 SUMMARY OF COMPLIANCE ISSUES

3.1 SECTION B – STRUCTURE

1. Structural Engineers design details and signed Certification will be required for the Construction Certificate stage to detail deemed-to-satisfy compliance to Part B1 – Structural Provisions of the BCA (2013 Edition) and AS1170 nominating Type A Construction and applicable FRL's to building elements.

Specific confirmation with the 2013 version of the BCA is required at the Construction Certificate stage. Your attention is drawn to the following areas:

- (a) Garage doors and other large access doors not more than 3m in height in external walls (wind region C or D)
- (b) Lift shafts that are not required to have an FRL

3.2 SECTION C – FIRE RESISTANCE

2. C1.10 Fire Hazard Properties

Fire hazard properties must comply with Spec C1.10 of the BCA (2013) as appropriate.

3. C2.2: General Floor Area and Volume Limitations

The size of any fire compartment for the Class 5, 6 and 7 parts must not exceed the floor area and volume limitations detailed under Table C2.2. In this regard, the floor area and volume limitations for Type A construction are 8,000m² and 48,000m³ for the commercial parts and 5,000m² and 30,000m³, for the retail and car parking components.

The basement car park levels are collectively considered to be one fire compartment that appears to exceed the maximum floor area/volume requirements of Table C2.2, (inclusive of Stage 1 and 2). Notwithstanding this, the requirements of Table C2.2 do not apply to car parks provided with a sprinkler system.

It is understood the installation of a sprinkler system to the carpark is proposed, (given the direct connection to Stage 1 car park).

It is acknowledged that the retail tenancies and the building's foyer at ground floor level are collectively less than the maximum compartment size, being 5000m². Similarly, the commercial floors are less than 8000m² each. Contrary to Stage 1, no atriums have been identified in this stage of the development, however, it should still be acknowledged that any alternative solutions under Stage 1 are also applicable to Stage 2 (given the development is considered one building).

4. C2.6: Vertical Separation of Openings in External Walls

Given the building has an Effective Height of less than 25m, it is not required to be provided with a sprinkler system in accordance with E1.5 (and Spec E1.5) for the purposes of this clause. For this



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reason, Stage 2 is required to be provided with spandrel separation as detailed in this clause unless otherwise advised as a result of any proposed fire engineered alternative solution.

Notwithstanding the above, it is acknowledged that an Alternative Solution is proposed for the atriums of Stage 1 only.

Compliance to be demonstrated at the Construction Certificate stage.

5. C2.7: Separation by Fire Walls

Where fire walls are proposed they are required to have an FRL as described below under Specification C1.1. In addition, any openings in the fire walls are required to be treated in accordance with Part C3 (Fire seals/Fire Doors etc). Furthermore, fire walls must extend from floor to slab or from floor to the roof covering.

6. C2.8 Separation of Classifications in the Same Storey

Different classifications in the same storey are required to be either fire-separated by fire walls achieving the higher FRL for this classification or the whole storey is required to have the higher FRL for this classification to all building elements in accordance with Table Spec C1.1 of the BCA.

Your attention is drawn to ground floor level where the retail parts (being class 6) are situated either side of the commercial foyer, (being Class 5). Separating construction is evident from the plans assessed.

Compliance to be demonstrated at the Construction Certificate stage.

7. C2.9: Separation of Classifications in Different Storeys

Where different classifications are situated one above the other in different storeys, they must be separated by floors having an FRL prescribed under Specification C1.1 for the classification of the lower storey.

Your attention initially is drawn to the Ground level and Level 1 where a different classification is proposed beneath.

Provide specific confirmation of FRLs, at the Construction Certificate stage.

8. C2.10 Separation of Lift Shafts

Given the proposed lifts connect more than 2 storeys or more than 3 storeys of the building is sprinklered (other than lifts which are wholly within an atrium); they are required to be located in a shaft having an FRL prescribed under Specification C1.1.

Provide confirmation of FRL to walls of shafts at respective storeys, at the Construction Certificate stage.



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9. C2.11: Stairways and Lifts in One Shaft

Under this clause a stairway and lift must not be located in the same shaft if either the stair or lift is required to have an FRL.

10. C2.12: Separation of Equipment

Where it is proposed to install lift motor rooms, emergency generators, central smoke control plant, boilers or battery rooms they are required to be separated by construction achieving an FRL of 120/120/120. Any doorways into such rooms are required to be self-closing Fire Doors requiring an FRL of -/120/30.

Compliance to be demonstrated at the Construction Certificate stage.

11. C2.13: Separation of Equipment

The proposed electricity substation and the main electrical switch rooms (sustaining equipment operating in emergency mode) are required to be enclosed in construction achieving an FRL of 120/120/120 and any door to such rooms must be a self closing -/120/30 Fire Door. This may be applicable to separate switch boards which supply emergency equipment to Hydrant booster pumps, Sprinkler pumps, Smoke Control Systems, Emergency Lifts and Sounds and Intercom Systems.

Compliance to be demonstrated at the Construction Certificate stage.

12. C2.14: Public Corridors in Class 2 and 3 Buildings

Not applicable

13. C3.2: Protection of Openings in External Walls

Any openings in the external wall of the building that are within three metres of a side or rear boundary of the allotment, or six metres from the far boundary of a road, river, lake or the like adjoining the allotment are required to be protected in accordance with C3.4 of the BCA.

It is acknowledged that stage 2 of the development is bounded by one existing road (being Herb Elliott Avenue) which would appear to comply with the distance to openings as detailed above to the far side of the road.

It is also acknowledged that new roads are proposed due to sequential staging of the development. All of which appear to facilitate compliance with the determination of fire-source-features to the far side of a road.

Notwithstanding the above, it is noted that the south/western boundary is a side boundary, and therefore, a fire-source-feature. The drawings appear to provide at least a 3m setback; and your confirmation of this has been received.



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14. C3.3 Separation of External Walls & Associated Openings in Different Fire Compartments

This clause would only apply where fire walls are provided to separate fire compartments and would require protection to openings in external walls of fire compartments that oppose another fire compartment.

Based upon the drawings received, compliance appears to be achieved.

15. C3.4 Acceptable methods of Protection

Where protection is required, doorways, windows and other openings must be protected as follows:

- I. Doorways—
 - A. internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or
 - B. –/60/30 fire doors that are self-closing or automatic closing.
- II. Windows—
 - A. internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or
 - B. –/60/– fire windows that are automatic closing or permanently fixed in the closed position; or
 - C. –/60/– automatic closing fire shutters.
- III. Other openings—
 - A. excluding voids — internal or external wall-wetting sprinklers, as appropriate; or
 - B. construction having an FRL not less than –/60/–.

Fire doors, fire windows and fire shutters must comply with Specification C3.4.

Compliance to be demonstrated at the Construction Certificate stage.

16. C3.5: Doorways in Fire Walls

Subject to C2.8 above, compliance of this clause is required, where applicable.

Compliance to be demonstrated at the Construction Certificate stage.



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17. C3.8: Openings in Fire Isolated Exits

The doors to the fire-isolated exits and passageways are required to be protected by -/60/30 self closing Fire Doors. In addition, any window in an external wall of a fire-isolated exit must be protected in accordance with C3.4 if it is within six metres of, and exposed to, a window or other opening in a wall of the same building other than the same fire-isolated enclosure.

Compliance to be demonstrated at the Construction Certificate stage.

18. C3.10: Openings in Fire Isolated Lift Shafts

The lift shafts are required to be protected by -/60/- Fire Doors that comply with AS 1735.11 and lift indicator panels to - /60/60, where applicable.

Compliance to be demonstrated at the Construction Certificate stage.

19. C3.11: Bounding Construction

Not applicable.

20. C3.12: Openings for Floors & Ceilings for Services

Services throughout the building passing through each storey are required to be protected within a shaft, achieving a FRL as detailed to Spec. C1.1 or in accordance with Clause C3.15.

21. C3.15: Openings for Service Installations

Where service installations penetrate floors or walls required to have an FRL, they are to be protected by fire seals (Fire Collars/Fire Stopping) that comply with Specification C3.15. Where a Mechanical Ventilation System penetrates floors, Fire Dampers are required to be provided in accordance with AS 1668.1 or the provision of a shaft as per Spec. C1.1.

22. Specification C1.1: Fire Resisting Construction

The following proposed building elements are required to comply with Table 3 of Specification C1.1 for Type A Construction. In this regard, the following FRL's generally apply (dependent upon distances to fire-source-features, where applicable):

Class 5 Commercial

FRL (in minutes)

External Walls (Load bearing):
Less than 1.5m (FSF):
1.5m to less than 3m (FSF):
3m or more (FSF):

120/120/120
120/90/90
120/60/30



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External Walls (Non-load bearing):	
Less than 1.5m (FSF):	- /120/120
1.5m to less than 3m (FSF):	- /90/90
3m or more (FSF):	- / - / -
External column (not incorporated in external wall):	
Load bearing columns	120/ - / -
Non load bearing columns	- / - / -
Common Walls and Fire Walls:	120/120/120
Internal Walls:	
Bounding public corridors, public lobbies and the like –	
Loadbearing	120/ - / -
Non load bearing	- / - / -
Other Loadbearing Internal Walls, Internal Beams,	
Trusses and Columns -	120/ - / -
Floors	120/120/120

Class 6 Retail

External Walls (Load bearing):	
Less than 1.5m (FSF):	180/180/180
1.5m to less than 3m (FSF):	180/180/120
3m or more (FSF):	180/120/90
External Walls (Non-load bearing):	
Less than 1.5m (FSF):	- /180/180
1.5m to less than 3m (FSF):	- /180/120
3m or more (FSF):	No FRL
Fire Walls:	180/180/180
Lift and Stair Shafts:	180/120/120
Service Shafts:	- /120/120
Internal Walls/Columns/Beams:	180/ - / -
Floors:	180/180/180
Roof:	180/60/30



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Class 7a Carpark Levels

External Walls (Less than 3m to FSF):	120/120/120
Internal Walls/Columns/Beams:	120/ - / -
Floors and Ramps:	120/120/120
Lift and Stair Shaft:	120/120/120

Note 1: The roof does not require the FRL detailed above if the roof is non-combustible and the building has a sprinkler system throughout, in accordance with Specification E1.5.

Your attention is drawn to other concessions that may be applicable under Clause 3 of Spec C1.1 of the BCA.

It is noted that no roof lights are proposed in the development.

It is understood that the proposed FRL's are to be deemed-to-satisfy compliant for Stage 2.

If applicable, any Alternative Solutions proposed by a fire engineer are to address the Performance Requirements of CP1 & CP2 and are to be demonstrated at the Construction Certificate stage.



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3.3 SECTION D – ACCESS AND EGRESS

23. D1.2: Number of Exits Required

As the Effective Height of the building is measured at less than 25 metres, each part of each storey (excluding the basement storeys) is required to be served by a minimum of one exit for the purposes of this clause.

Compliance in the basement car park appears to be achieved.

24. D1.3: When Fire isolated Stairways are Required

All exit stairs serving the commercial parts are required to be fire-isolated under this clause. It is acknowledged that stairs serving the basement levels are not '*required*' to be fire-isolated under this clause (given the number of storeys served); however they may be constructed as such or required for other reasons. If this is the case, they must still comply with the provisions of clause D1.7 (b) and (c).

Compliance to be demonstrated at the Construction Certificate stage.

25. D1.4: Exit Travel Distances

For the basement car park, retail and commercial parts, all points on the floor are required to be within 20 metres to an exit or a point-of-choice of two or more exits. Where there is a point-of-choice of two exits, all points on the floor are required to be within 40 metres to one of those exits.

It is acknowledged that no 'indicative' tenancy/partitioning layouts are shown. Please provide indicative plans showing travel distances for the commercial levels, pursuant of the Construction Certificate stage.

If applicable, it is understood that a C10 Accredited Fire Engineer may prepare an Alternative Solution to address the confirmed deemed-to-satisfy non-compliances, not least to incorporate the nominated alternative solutions confirmed under Stages 1 and 1A.

26. D1.5: Distances Between Alternative Exits

The distance between alternative exits on the all floors must not exceed 60m.

Whilst compliance appears to be achieved, it is acknowledged that no 'indicative' tenancy/partitioning layouts are shown. Please provide indicative plans showing travel distances for the commercial levels to determine the level of compliance.

It is acknowledged that an alternative solution may be adapted for other stages therefore applicable to this building as a whole.



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27. D1.6: Dimensions of Exits

Under this clause, the unobstructed height in a required exit or a path of travel to an exit must not exceed 2m, except doorways which may be not less than 1980mm. In addition, the unobstructed width of an exit, or a path of travel to an exit must not be not less than 1 metre. Please note that doors may be 750mm (or 850mm for disabled access requirements).

We have considered the required deemed-to-satisfy exit widths for Stage 2 in the table below for the following key areas:

Location	No. of Persons	Required Exit Width	Proposed Exit Width	Complies Yes/No
<i>Retail tenancies</i>	<i>Approx. 120 each</i>	<i>1.25m</i>	<i>TBC</i>	<i>TBC by Certifier</i>
<i>Level 1</i>	<i>214</i>	<i>2.5m</i>	<i>3m</i>	<i>Yes</i>
<i>Levels 2-7</i>	<i>225 each</i>	<i>2.5m</i>	<i>3m</i>	<i>Yes</i>

Note 1: The population can be calculated under Table D1.13 or to the number of seats shown, the actual occupancy numbers may be considered less.

Note 2: Doorways may be 250mm less than the required exit width.

28. D1.7: Travel via Fire Isolated Exits

A doorway from a room must not open directly into a stairway that is required to be fire-isolated unless it is from a public corridor/lobby or the like, or a sole occupancy unit occupying all of a storey or a sanitary compartment, airlock or the like.

In addition, each fire isolated stairway must provide independent egress from each storey served and discharge directly to a road or open-space. The fire-isolated exits may discharge into a 'covered area' that adjoins a road or open space that is open for 1/3 of its perimeter and has an unobstructed clear height throughout of not less than 3 metres, and is within 6 metres of a road or open space.

Your attention is initially drawn to the following areas:

- Fire stairs ST5 and ST7 at the commercial levels, where there is the potential to divide the floors into separate tenancies. On this basis, there is a non-compliance relating to clause D1.7 (a)(ii) where the sole occupancy unit does not occupy the whole storey and an airlock or similar may be required.
- Fire Stair ST6 at ground level where the discharge point is into a 'covered area'

Compliance to be demonstrated at the Construction Certificate stage. Where applicable, it is understood that a C10 Accredited Fire Engineer may prepare an Alternative Solution to address the confirmed deemed-to-satisfy non-compliances of Performance Requirements DP4.



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29. D1.8: External Stairway or ramps in lieu of fire isolated exits

Not applicable.

30. D1.9: Travel by non-fire isolated stairways or ramps

It is acknowledged that the fire stairs serving the basement levels are constructed as fire isolated exits and therefore the requirements of this clause are not applicable in this instance. However, the requirements of clause D1.7 (b) and (c) are still applicable.

31. D1.10: Discharge from Exits

All exit paths to 'open space' are required to be 1m in width and bollards will be required to exit doors that could be blocked by vehicles on the basement car parking levels. Please confirm compliance.

32. NSW D1.13: Number of Persons Accommodated

Refer to item 27 of this report.

33. D1.16: Plant rooms, lift machine rooms and electricity network substation: concession

If applicable, please confirm specific compliance with the 2013 edition of the BCA (in particular, lift machine rooms).

34. NSW D2.1: Application of Part

To be noted.

35. D2.2: Fire Isolated Stairways and Ramps

The fire isolated stairways are to be constructed of non-combustible materials and so that if there is local failure, it will not cause structural damage to, or impair the fire resistance of the shaft. Details and design certification are to be provided by the Structural Engineer for the Construction Certification stage.

36. D2.3 Non-fire-isolated stairways and ramps

As the building has a rise in storeys of more than 2, any non-fire-isolated stairs and ramps are required to comply with this clause.



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37. D2.4 Separation of Rising and Descending Stair Flights

The fire-isolated stair exits must have no direct connection between a flight rising from a storey below and a flight descending from a storey above at the level of access to a road or open space and any construction that separates or is common to the rising and descending flights must be non-combustible and smoke proof in accordance with clause 2 of spec C2.5..

Compliance appears to be achieved with Fire Stair ST6 where the design at ground floor level appears to match Figure D2.4 of the Guide to the BCA (2012).

Compliance to be demonstrated at the Construction Certificate stage.

38. D2.7: Installations in Exits and Path of Travel

Services or equipment comprising electricity meters, distribution boards, central telecommunication distribution boards/equipment, electrical motors or other motors serving equipment in the building, can be installed in a corridor or the like, leading to a required exit if the services or equipment are enclosed with non-combustible construction or appropriate fire-protection covering and doorways suitably sealed against smoke spread from the enclosure.

Compliance to be demonstrated at the Construction Certificate stage.

39. D2.8 Enclosure of space under stairs and ramps

Please review any enclosure beneath stairways or ramps (fire-isolated or otherwise) where compliance with this clause is required.

40. D2.11: Fire isolated passageways

Any fire-isolated passageways serving fire stairs at the level of egress to a road or open space are required to achieve the same FRL as the Fire Stairs and be fully enclosed.

Your attention is drawn to the passageway from Fire Stair ST6 in this regard.

Compliance to be demonstrated at the Construction Certificate stage.

41. D2.13/D2.14/D2.15/D2.16 & D2.17: Stairs, Thresholds, Balustrades and Handrails

The proposed treads and risers, landings, door thresholds, balustrades and handrails are required to comply with the requirements of the applicable sections as stated. All balustrades are required to be 1m high to landings, floors and residential balconies, and 865mm to the stairs. All balustrades are required to have no openings that could permit a 125mm sphere and no climbable elements where the drop below is 4m measured to the Ground Floor level.

Note, concessions for fire-isolated stair balustrades for use of emergency purposes only.

Where the building is accessible, a threshold ramp or step ramp is permitted close to the doorway than the width of the door (where it opens to a road or open space).



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Furthermore, handrails to *required* exits (fire stairs) are required to comply with Clause 12 of AS 1428 – 1(2009) in accordance with D2.17 (vi) of the BCA (2013).

Compliance to be demonstrated at the Construction Certificate stage.

42. NSW D2.13, D2.15, D2.16, D2.19, D2.21 and D2.101 (NSW Variations)

Not applicable in respect of Entertainment Venues.

43. D2.18 fixed platforms, walkways, stairs and ladders

Where applicable to the building, compliance with this clause is required and AS1657.

44. D2.19: Doorways & Doors

It is acknowledged that revolving doors are indicated on the drawings to the entrance foyer. However, it is understood that these doorways are not proposed as required exits.

If auto-sliding exit doors are proposed to the foyer or retail part they are required to be openable under a force of not more than 110N and open automatically on power failure and fire trip and lead directly to the road/open space.

Compliance to be demonstrated at the Construction Certificate stage.

45. D2.20: Swinging Doors

A swinging door in a required exit or forming part of a required exit is required to swing in the direction of egress. Where a building or part is less than 200m² and it is the only required exit from this part of the building, it may swing inwards provided it is fitted with a hold open device.

Compliance to be demonstrated at the Construction Certificate stage.

46. D2.21: Operation of Latch

A door in a required exit, forming part of a required exit, or in a path of travel to an exit must be readily openable from the side facing a person seeking egress, by a single hand downward action or pushing action on a single device located between 900mm and 1100mm above finished floor level and where serving an area required to be accessible:

- (a) Be such that the hand of person who cannot grip will not slip from the handle during the operation of the latch; and
- (b) Have a clearance between the handle and the back plate or door face at the centre grip section of the handle of not less than 35 mm and not more than 45 mm.

Compliance to be demonstrated at the Construction Certificate stage.



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47. D2.22: Re-entry from Fire-Isolated Exits

Doors of a fire isolated exit may be locked from the inside in a fire-isolated exit as the building is less than 25m in effective height.

Compliance to be demonstrated at the Construction Certificate stage.

48. D2.23: Signs on Doors

Signs are to be installed on Fire Doors to fire isolated exits on the side facing a person seeking egress. "FIRE DOOR - DO NOT OBSTRUCT, DO NOT KEEP OPEN". In addition the doors discharging from the fire isolated exits are to have signage located on the outside of the doors that states "FIRE SAFETY DOOR – DO NOT OBSTRUCT".

49. D2.24 Protection of Operable Windows

Given the building is of Class 5/6, a barrier with a height not less than 865mm above the floor is required to an openable window where 4m or more above the surface beneath. The barrier must not permit a 125mm sphere to pass through and have horizontal elements between 150mm and 760mm above the floor that facilitate climbing.

50. D3.1: General Building Access Requirements

In accordance with Table D3.1 of the BCA (2013) the class 5 and 6 parts are required to be accessible to and within all areas normally used by the occupants.

The class 7a parts (car parking) are required to be accessible to and within any level containing accessible carparking spaces.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

51. D3.2: Access to Buildings

An accessway must be provided to a building required to be accessible –

- From the main points of a pedestrian entry at the allotment boundary; and
- From another accessible building connected by a pedestrian link; and
- From any required accessible carparking space on the allotment.

As the building is required to be accessible, an accessway must be provided through the principal pedestrian entrance, and –

- Through not less than 50% of all pedestrian entrances including the principal entrance; and
- As the development has a total floor area more than 500m², a pedestrian entrance which is not accessible must not be located more than 50m from an accessible pedestrian entrance,



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Note: The above does not apply to pedestrian entrances serving only areas exempted by clause D3.4, (i.e. the loading dock).

Where a pedestrian entrance, required to be accessible has multiple doorways –

- If the pedestrian entrance consists of not more than 3 doorways – not less than 1 of those doorways must be accessible; and
- If a pedestrian entrance consists of more than 3 doorways – not less than 50% of those doorways must be accessible.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

52. D3.3: Parts of Buildings to be Accessible

As the building is required to be accessible –

- a) Every ramp and stairway, must comply with –
 - i) For a ramp, (except a fire-isolated ramp) clause 10 of AS 1428.1 (2009 Edition); and
 - ii) For a stairway, (except a fire-isolated stairway) clause 11 of AS 1428.1 (2009 Edition); and
 - iii) For a fire-isolated stairway, clause 11.1 (f) and (g) of AS 1428.1 (2009 Edition); and
- b) Every passenger lift must comply with E3.6; and
- c) Accessways must have –
 - i) Passing spaces complying with AS 1428.1 at maximum 20m intervals on those parts of an accessway where a direct line of sight is not available; and
 - ii) At maximum 20m intervals along the accessway; and
- d) An intersection of accessways satisfies the spatial requirements for a passing and turning space; and
- e) A passing space may serve as a turning space.
- f) Clause 7.4.1(a) of AS 1428.1 does not apply and is replaced with 'the pile height or pile thickness shall not exceed 11mm and the carpet backing thickness shall not exceed 4mm';
- g) The carpet pile height or pile thickness dimension, carpet backing thickness dimension and their combined dimension shown in figure 8 of AS 1428.1 do not apply and are replaced with 11mm, 4mm and 15mm respectively.



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It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

53. D3.5: Accessible carparking

With respect to the class 6 (retail) component of the development, where up to 1000 carparking spaces are provided the development requires 1 space for every 50 spaces or part thereof.

With respect to the class 5 (commercial) part, carparking spaces are required at 1 space for every 100 spaces or part thereof.

It is noted that three (3) accessible spaces are provided with corresponding shared areas (where applicable).

Provide confirmation that accessible car spaces are designed in accordance with AS 2890.6 – 2009 (including compliant head-height and bollards, where appropriate).

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

54. D3.6: Signage

Braille and tactile signage that complies with Specification D3.6 incorporating the international symbol of access as appropriate, is to be provided to identify each accessible toilet facilities and disabled access points including any other facilities in accordance with AS 1428.1 – 2009 and identify each door by E4.5 (of the BCA 2013) to be provided with a exit sign and state 'exit' and 'level' (followed by the floor level number).

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

55. D3.7 Hearing Augmentation

Not applicable.

56. D3.8: Tactile Indicators

As the building is required to be accessible, tactile ground surface indicators must be provided to warn people who are blind or have vision impairment that they are approaching –

- i. A stairway, other than a fire-isolated stairway; and
- ii. A ramp other than a fire-isolated ramp, step ramp, kerb ramp; and
- iii. In the absence of a suitable barrier –

A) An overhead obstruction less than 2m above floor level, other than a doorway; and



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- B) An accessway meeting a vehicular way adjacent to any pedestrian entrance to a building, excluding a pedestrian entrance serving an area referred to in D3.4, if there is no kerb or kerb ramp at that point.

Except for areas exempted by D3.4 of the BCA.

Tactile ground surface indicators must comply with Sections 1 and 2 of AS/NZS 1428.1.1.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

57. D3.9 Wheelchair seating spaces in class 9b assembly buildings

Not applicable.

58. D3.10 Swimming Pools

Not applicable.

59. D3.11: Ramps

On an accessway –

- a) A series of connected ramps must not have a combined vertical rise of more than 3.6m; and
- b) A landing for a step ramp must not overlap a landing for another step ramp or ramp.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

60. D3.12: Glazing on an Accessway

On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1 – 2009.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.



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3.4 SECTION E – SERVICES AND EQUIPMENT

61. E1.3: Fire Hydrants

The proposed building is required to be served by a Fire Hydrant System complying with AS 2419.1 - 2005. Details and design certification confirming deemed-to-satisfy compliance are required from the Hydraulic Consultant for the Construction Certification stage.

A hydrant booster assembly for the whole development is required to be located strictly in accordance with clause 7.3 of the above standard and the pump-set/room is to comply accordingly.

Pursuant of Stage 1, it is evident that the booster assembly is affixed to the external wall of the building (North West facing elevation adjacent to Fire Stair 1). The requirement of clause 7.3 of AS 2419.1 applies requiring the booster to be:

- a) Within sight of the main entrance to the building
- b) Separated from the building by a construction with a fire resistance rating of not less than 90/90/90 of a distance of less than 2m each side of and 3m along the upper hose connection in the booster assembly.

An internal pump room appears to have a door opening to a fire-isolated stair adjacent in accordance with clause 6.4.2 of AS 2419.1 – 2005.

It is strongly recommended that a qualified Fire Services Consultant (in conjunction with any nominated Fire Engineer) confirm deemed-to-satisfy detailed compliance with the system in order to determine the level of compliance for the appropriate statutory referrals to be made, (i.e. Fire and Rescue NSW).

Pursuant to the Construction Certificate stage, clarification is required as to whether a new hydrant booster assembly is proposed for Stage 2, (in addition to Stage 1). Furthermore, please confirm any new installation complies with the deemed-to-satisfy clauses of E1.3 of AS2429.1-2005.

62. E1.4: Fire Hose Reels

The proposed building is required to be served by Fire Hose Reels complying with AS 2441 – 2005. Hose reels can be located externally, internally within 4 metres of an exit, or internally adjacent to a fire hydrant (other than one within a fire isolated exit). Details are required from the Hydraulic Consultant for the Construction Certification stage.

Please advise whether system coverage may not be achieved in respect of compliance with clause 10.2 of AS 2441 – 2005 which states:

“All points on a floor should be within reach of a 4m hose stream issuing from a nozzle at the end of the hose laid on the floor. The hose length shall not exceed 36m.”

If applicable, and acknowledging clause E1.4 (e) (iii) of the BCA, please provide confirmation that fire hose reel coverage is still deemed a non-compliance with the BCA. If so, it is understood that C10 Accredited Fire Engineer may prepare an Alternative Solution accordingly.

Compliance to be demonstrated at the Construction Certificate stage.



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Notwithstanding the above, it is strongly recommended that a qualified Fire Services Consultant (in conjunction with the nominated Fire Engineer) confirm deemed-to-satisfy detailed compliance with the system in order to determine the level of compliance for the appropriate statutory referrals to be made, (i.e. *Fire and Rescue NSW*).

63. E1.5: Sprinklers

Notwithstanding the atrium provisions discussed under Section 3.6 of the Stage 1 BCA Assessment, it is acknowledged the proposed building has an Effective Height of less than 25m; therefore the building is not required to be provided with a sprinkler system complying with Spec E1.5 (including Clause 13 in accordance with BCA 2013) and AS 2118.1 (1999) for this reason. However, the basement carpark levels are required, given the number of vehicles accommodated. Details and design certification confirming deemed-to-satisfy compliance are required from the Hydraulic Consultant for the Construction Certification stage.

Note: Sprinkler Valve enclosures must be located in a secure enclosure which has direct egress to a road or open space for use by the Fire Brigade; in addition a Building Occupant Warning System is required connected to the sprinkler system with a direct monitoring link to the Fire Brigade.

If applicable, a C10 Accredited Fire Engineer should prepare an Alternative Solution to address the confirmed deem-to-satisfy non-compliances with the omissions of any fire safety provisions as described above, however, it is acknowledged that any alternative solution under Stage 1 is also applicable to Stage 2 (given the development is considered one building).

Notwithstanding the above, it is strongly recommended that a qualified Fire Services Consultant (in conjunction with the nominated Fire Engineer) confirm deemed-to-satisfy detailed compliance with the system or otherwise in order to determine the level of compliance for the appropriate statutory referrals to be made, (i.e. *Fire and Rescue NSW*).

64. E1.6: Portable Fire Extinguishers

Portable Fire Extinguishers in accordance with this clause and AS 2444 are required to Emergency Switch Room locations and any commercial kitchens associated with proposed Retail tenancies (i.e. the proposed cafe).

65. E1.8: Fire Control Centres

A fire control 'centre' is recommended to be provided in accordance with Spec E1.8 (clauses 2-5 only) despite the whole building is less than 25m in Effective Height and being used predominately as class 5 (commercial office).



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66. E2.2: Smoke Hazard Management

The Stage 1 BCA assessment addresses fire-isolated exits/passageways serving an atrium and the need for an **Automatic Air Pressurisation System** to the entire exit to AS 1668.1 (1998) and a smoke detection system to clause 5 of Spec E2.2a.

As the building has class 5 parts having a rise in storeys of more than three (3), it must be provided with one of the following:

- (a) **Automatic air pressurisation system** to the fire isolated exits or
- (b) **Zone smoke control** in accordance with AS 16689.1 or
- (c) **Automatic smoke detection and alarm system** to Spec E 2.2a or
- (d) **A sprinkler system** to Spec E1.5 throughout.

Compliance to be demonstrated at the Construction Certificate stage.

The car park basement levels are to be provided with **Mechanical Ventilation System** in accordance with AS 1668.2 and must comply with clause 5.5 of AS 1668.1 except that:

- (a) Fans with noted blades suitable for operation at normal temperatures may be used; and
- (b) The electrical power and control cabling need not be fire rated.

It is understood that the discharge location of mechanical exhaust for Stage 1 is contrary to the requirements of AS 1668.2, however, confirmation is required for the arrangements for Stage 2, and if necessary an alternative solution is to be proposed, pursuant of the Construction Certificate stage.

See Section 3.6 of the BCA report for Stage 1 for the Atrium provisions.

Acknowledging the above, it is understood that a C10 Accredited Fire Engineer may prepare an Alternative Solution to address the confirmed non-compliance with the omission of fire safety provisions, (where applicable).

Notwithstanding this, it is strongly recommended that a qualified Fire Services Consultant (in conjunction with the nominated Fire Engineer) to confirm deemed-to-satisfy detailed compliance with the system or otherwise in order to determine the level of compliance for the appropriate statutory referrals to be made, (ie. Fire and Rescue NSW).

67. Part E3: Lift Installations

One of the lifts for Stage 2 is required to have a **stretcher use facility** to serve all floors, having a clear space not less than 600mm wide x 2000mm long x 1400mm high in accordance with E3.2 given that the building has an effective height of more than 12m.

The type of lift is required to be in accordance with Table E3.6a of the BCA 2013 edition and have accessible features in accordance with Table E3.6b, together with Fire Service Controls in accordance with E3.7, Fire Service Recall Operation Switch in accordance with E3.9 and a Lift Car Fire Service Drive Control Switch in accordance with E3.10 of the BCA (2013).

Compliance to be demonstrated at the Construction Certificate stage.



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68. E4.2, E4.4, E4.5, E4.6, E4.8 & E4.9: Emergency Lighting & Exit Signage and Sound/Intercom systems

Emergency Lighting and Exit signage are required to be installed throughout the building in accordance with AS 2293.1 - 2005.

See Section 3.6 of the Stage 1 BCA Assessment for the Atrium requirements and common alternative solutions proposed.



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3.5 SECTION F – HEALTH AND AMENITY

69. Part F1 Damp and Weatherproofing

Provide confirmation of compliance in respect of the following clauses to BCA 2012:

- F1.1 Stormwater drainage
- F1.4 External above ground membranes
- F1.5 Roof coverings
- F1.6 Sarking
- F1.7 Waterproofing of wet areas in buildings
- F1.9 Damp-proofing
- F1.10 Damp-proofing of floors on the ground
- F1.11 Provision of floor wastes
- F1.12 Sub-floor ventilation
- F1.13 Glazed assemblies

70. F2.1: Facilities in Residential Buildings

Not applicable.

71. F2.3: Facilities in Class 3 to 9 Buildings

Having regards to the Class 5 parts, sanitary facilities and their locations are evident on the plans at all levels. The proposed number and allocation of sanitary facilities are required to comply with Table F2.3 of the BCA for the corresponding classification.

Given levels 2 to 7 have the highest occupancy loading of approx. 225 employees (based upon 10m²/person) the number of sanitary facilities indicated on these plans appear to comply.

Furthermore, provide commentary for any sanitary facilities proposed to the retail parts, mindful of employee and patron allocation (i.e. cafes/restaurants), pursuant of the Construction Certificate stage.

72. F2.4: Facilities for People with Disabilities

As the building is required to be accessible a unisex sanitary compartment must be provided in accessible parts of the building in accordance with Table F2.4 (a).

Sanitary facilities required to be a unisex accessible facility and must comply with the following:

- Contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary towels; and
- The circulation spaces, fixtures and fittings of all accessible sanitary facilities provided in accordance with Table F2.4 (a) and Table F2.4 (b) must comply with the requirements of AS 1428.1 (2009).



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Furthermore, the retail, and commercial parts are all required to have accessible sanitary facilities in accordance with Table F2.4 (a) as summarised below:

Where clause F2.3 requires closet pans –

- a) 1 on every storey containing sanitary compartments; and
- b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Please note the provision for left and right handed unisex facilities to be provided as evenly as possible per storey.

It is understood that an Access Consultant has been engaged and an independent report has been provided for this stage.

73. F2.5: Construction of Sanitary Compartments

Sanitary compartment facilities are required to have door and partitions that extend from floor to ceiling levels. In all other cases 1.8 metres above the floor level. Doors to a fully enclosed sanitary compartment must open outwards, or slid, or be readily removable from the outside unless there is a clear space of at least 1.2 metre between the closet pan and the nearest part of the doorway.

74. F3.1: Room Sizes

The ceiling height within the Class 5 and 6 parts is required to be no less than 2.4 metres above the finished floor level, except for corridors and passageways, bathrooms, store rooms. The basement car park is required to have a floor to ceiling height of at least 2.1 metres; however this varies to AS2890.1 compliance for carparking layouts.

Compliance to be demonstrated at the Construction Certificate stage.

75. F4.4: Artificial lighting

The artificial lighting system must comply with AS1680.0

Compliance to be demonstrated at the Construction Certificate stage.

76. F4.5: Ventilation of Rooms

The building is required to be ventilated in accordance with the natural ventilation requirements under F4.6 or a Mechanical Ventilation system complying with AS 1668.2. Details and design certification are required to be provided from the Mechanical Consultant.

Compliance to be demonstrated at the Construction Certificate stage.



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77. F4.11: Car parks

Every storey of the basement car park is required to be provided with a ventilation system strictly complying with AS 1668.2 or adequate permanent natural ventilation.

A mechanical ventilation system, serving a car park with more than 40 vehicle spaces and controlled by an atmospheric contaminant monitoring system in accordance with AS 1668.2, may be stopped when the monitored condition is below the determined maximum concentration if –

- i) the system operates intermittently to provide a minimum of 0.5 air changes per hour (ACH) during any 24 hour period; or
- ii) a supplemental natural ventilation system equivalent to i) is provided.

Compliance to be demonstrated at the Construction Certificate stage.

78. F4.12: Kitchen Local Exhaust Ventilation

Where provisions are being made for commercial kitchens to future restaurant tenancies, kitchen exhaust hoods are required to comply with AS/NZS 1668.1 and AS 1668.2 where any cooking apparatus has a total power input exceeding 8kW, or a total gas power output exceeding 29MJ/h, or where the total power input to more than one apparatus exceeds 0.5 kW or 1.8 MJ for gas per m² of floor area of the room of the enclosure.

Compliance to be demonstrated at the Construction Certificate stage.

79. Part F5: Sound Transmission and Insulation

Not applicable.



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3.6 SECTION G: ANCILLARY PROVISIONS

80. PART G3 ATRIUM CONSTRUCTION

Pursuant of Stage 1 BCA assessment, two (2) atriums are evident on the plans connecting three (3) storeys each, (being levels 2-4 and 5-7 respectively), and therefore needing to comply with the provisions of Part G3 of the BCA.

Given the detail provided in these plans, strict compliance with the following sub-clauses are required in respect of the BCA:

- a) Dimensions of atrium well,
- b) Separation of atrium by bounding construction,
- c) Construction of bounding walls,
- d) Construction at balconies,
- e) Separation at roof,
- f) Means of egress,
- g) Fire and Smoke control (Specification G3.8)
 - Automatic Fire Sprinkler system,
 - Smoke Control System,
 - Fire Detection and Alarm system,
 - Sound System and Intercom System for Emergency Purposes
 - Standby Power Systems, (if applicable),
 - System for excluding smoke from fire isolated exits

It is understood that the proposed atrium design will include deemed-to-satisfy non-compliances throughout, therefore, your itemised confirmation of compliance (or otherwise) are required in respect of their design.

It is further understood that a C10 Accredited Fire Engineer has prepared an alternative solution, being included in the FEBQ for Stages 1 and 1A for the formal Fire Brigade submission and by virtue of the development being considered one building, the alternative solutions can to be incorporated in to Stage 2.



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3.7 SECTION H: SPECIAL USE BUILDINGS (THEATRES, STAGES AND PUBLIC HALLS)

81. NSW H1.1 Application of Part

Not applicable.

82. Part H2 Public Transport Buildings

Not applicable.

3.7 SECTION J: ENERGY EFFICIENCY

83. NSW Section J: Energy Efficiency

A comprehensive report or details demonstrating that the proposed commercial and retail parts comply with Parts J1 – Building Fabric, J2 – External Glazing and J3 – Building Sealing will be required from a qualified consultant detailing either deemed-to-satisfy compliance or the provision of an overall building modelling report that details the buildings annual energy consumption with the BCA (2013 edition).

Details and design certification are to be provided from the Mechanical and Electrical Consultants having regards to Parts J5 – Air Conditioning and Ventilation, J6 – Artificial Lighting and Power and J7 – Hot Water Supply and J8 – Access for Maintenance and facilities for monitoring to the building with the BCA (2013 edition).

Provide confirmation by the submission of a Section J- Energy Efficiency report at the Construction Certificate stage detailing compliance with the 2013 edition of the BCA.



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4.0 CONCLUSION

This review contains an assessment of the proposed mixed-use development under the Deemed-to-Satisfy provisions of the National Construction Code (BCA) 2013, Volume One.

Where applicable, and in conjunction with a detailed Fire Engineering Assessment addressing the relevant Performance Requirements of the BCA, it is considered that the building could achieve an acceptable level of compliance with the current provisions of the BCA upon resolution of the compliance issues identified in this report by way of complying with the Deemed-to-Satisfy provisions and/or Alternative Solutions that satisfy the relevant Performance Requirements of the BCA.

Signed:

Lee Kippax

BSc (Hons), MRICS, MAIBS

A1 Accredited Certifier (BPB0810)

Date: 10 May 2013