Annexure 6

BCA Compliance Report (prepared by BCA Logic)

BCA LOGIC PTY LTD

BUILDING REGULATION & FIRE SAFETY ENGINEERING CONSULTANTS

Project:	**NSW POLICE FORCE, POTTS HILL BUSINESS PARK**
Report:	**BCA ASSESSMENT REPORT**
Date:	29th October 2008
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TABLE OF CONTENTS

PART 1 BASIS OF ASSESSMENT

1.1 Location and Description

The building development, the subject of this report, is located within the proposed Potts Hills Business Park. The subject site is bounded to the northern, southern and eastern boundaries by adjacent premises and to the west and part north by a proposed roadway.

1.2 Purpose

The purpose of this report is to assess the design proposal against the Deemed-to-Satisfy provisions of BCA2008, and to clearly outline those areas where compliance is / is not achieved and to identify those works required to ensure BCA2008 compliance can be achieved.

1.3 Building Code of Australia

This report is based on the Deemed-to-Satisfy Provisions of the Building Code of Australia, 2008 Edition incorporating the NSW State variations where applicable.

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;

(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 issued by the Consent Authority (Department of Planning).

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 2008 (BCA) the development may be described as follows.

2.1 Rise in Storeys (Clause C1.2)

The buildings have the following a rise in storeys:

- Building 1 – Rise in Storeys of three.
- Building 2 – Rise in Storeys of two.
- Building 3 – Rise in Storeys of two.

N.B. To Building 3 with the proposed mezzanine area over the office exceeding 200m^2, such area is deemed to be a storey within the definitions contained within the BCA.

2.2 Classification (Clause A3.2)

The buildings have been classified as follows.

Class	Level	Description
5	Part Ground, level 1 and 2	Office Area – Building 1
8	Part Ground Level	Workshop / Garage Area Building 1
5	Part Ground and level 1	Office Area – Building 2
8	Part Ground Level	Workshop / Garage Area Building 2
5	Part Ground Level	Office Area – Building 3
7b	Part ground Level	Warehouse / Storage – Building 3

2.3 Effective Height (Clause A1.1)

All buildings have an effective height of less than 25.0 metres and less than 12.0 metres.

2.4 Type of Construction Required (Table C1.1)

Type B Construction required for Buildings 1 and 2 and Type A for Building 3. N.B. As Buildings 2 and 3 only have a rise in storeys of 2 strictly they could be constructed out of Type C construction. However due to the floor area of the fire compartment sizes, the type of construction needs to be increased to Type B Construction for Building 2 and Type A Construction for Building 3 to permit the increased fire compartment size.

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

The buildings 1 and 2 of Type B Construction are subject to maximum floor area and volume limits of:-

- Class 5 - Maximum Floor Area 5,500m^2
  Maximum Volume 33,000m^3
- Class 8 - Maximum Floor Area 3,500m^2
  Maximum Volume 21,000m^3

The building 3 of Type A Construction is subject to maximum floor area and volume limits of:-

- Class 5 - Maximum Floor Area 8,000m^2
  Maximum Volume 48,000m^3
- Class 7b - Maximum Floor Area 5,000m^2
  Maximum Volume 30,000m^3

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 **Building 1**.

Item No.	Proposed Essential Fire Safety Measure	Minimum Standard of Performance
1.	Automatic fail safe devices	Manufacturer's Specification, AS1670.1-2004
2.	Automatic fire detection and alarm system	BCA Clause E2.2a, AS1670.1-2004, AS3786-1993
3.	Emergency lighting	BCA Clauses E4.2 & E4.4, AS2293.1-2005
4.	Exit signs	BCA Clauses E4.5, E4.6 & E4.8, AS2293.1-2005
5.	Fire doors	BCA Spec C3.4, AS1905.1-2005
6.	Fire hydrant system	BCA Clause E1.3, AS2419.1-2005
7.	Fire seals protecting openings in fire resisting components of the building	BCA Clause C3.15, Manufacturer's Specification
8.	Fire hose reel system	BCA Clause E1.4, AS2441-2005
9.	Lightweight fire rated construction	BCA Clause / Specification E1.8, Manufacturer's Specification
10.	Mechanical air handling systems	AS/NZS1668.1-1998, AS1668.2-1991
11.	Paths of travel, stairways, passageways or ramps	BCA Section D
12.	Portable fire extinguishers	BCA Clause E1.6, AS2444-2001
13.	Wall wetting sprinkler and drencher system	BCA Clause D1.7 and C3.4
14.	Warning and operational signs	BCA Clause D2.23, EP&A Reg. 2000 Clause 183

The following fire safety measures are required to be installed **Building 2**.

Item No.	Proposed Essential Fire Safety Measure	Minimum Standard of Performance
1.	Emergency lighting	BCA Clauses E4.2 & E4.4, AS2293.1-2005
2.	Exit signs	BCA Clauses E4.5, E4.6 & E4.8, AS2293.1-2005
3.	Fire doors	BCA Spec C3.4, AS1905.1-2005
4.	Fire hydrant system	BCA Clause E1.3, AS2419.1-2005
5.	Fire seals protecting openings in fire resisting components of the building	BCA Clause C3.15, Manufacturer's Specification
6.	Fire hose reel system	BCA Clause E1.4, AS2441-2005
7.	Lightweight fire rated construction	BCA Clause / Specification E1.8, Manufacturer's Specification
8.	Mechanical air handling systems	AS/NZS1668.1-1998, AS1668.2-1991
9.	Paths of travel, stairways, passageways or ramps	BCA Section D
10.	Portable fire extinguishers	BCA Clause E1.6, AS2444-2001

The following fire safety measures are required to be installed **Building 3**.

Item No.	Proposed Essential Fire Safety Measure	Minimum Standard of Performance
1.	Emergency lighting	BCA Clauses E4.2 & E4.4, AS2293.1-2005
2.	Exit signs	BCA Clauses E4.5, E4.6 & E4.8, AS2293.1-2005
3.	Fire hydrant system	BCA Clause E1.3, AS2419.1-2005
4.	Fire seals protecting openings in fire resisting components of the building	BCA Clause C3.15, Manufacturer's Specification
5.	Fire hose reel system	BCA Clause E1.4, AS2441-2005
6.	Paths of travel, stairways, passageways or ramps	BCA Section D
7.	Portable fire extinguishers	BCA Clause E1.6, AS2444-2001
8.	Automatic Fire Suppression System (Sprinkler system)	BCA Specification E1.5 and AS2118.1-1999

PART 4 FIRE RESISTANCE LEVELS

The following fire resistance levels (FRL's) required for the various structural elements of buildings 1 and 2 for Type B Construction, 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 same allotment excluding a Class 10 structure.

Item	Class 5	Class 8
Load bearing External Walls • less than 1.5m to a fire source feature • 3m – 9m to a fire source feature; • more than 9m from a fire source feature.	 120/120/120 120/30/30 -/-/-	 240/240/240 240/90/60 -/-/-
Non-Load bearing External Walls • less than 1.5m to a fire source feature • more than 3m from a fire source feature.	 -/120/120 -/-/-	 -/240/240 -/-/-
External Columns < 3.0m External Columns > 3.0m	120/-/- -/-/-	240/-/- -/-/-
Fire Walls	120/120/120	240/240/240
Stair and Lift Shafts • Loadbearing • Non loadbearing	120/120/120 -/120/120	240/120/120 -/120/120
Ventilating, pipe garbage and the like shafts: • Loadbearing • Non loadbearing	120/90/90 -/90/90	240/120/120 -/120/120
Other load bearing internal walls, beams trusses and columns	120/-/-	240/-/-
Floors [1]	Nil FRL	Nil FRL
Roofs [2]	Nil FRL	Nil FRL

1. There are no FRL requirements for floors within Type B Class 5 and 8 buildings unless the floors over fire separate different classifications such as the workshop areas from the office areas.
2. As both Buildings 1 and 2 do not exceed 3 storeys, there is no FRL requirement for the roof structure.

The following fire resistance levels (FRL's) required for the various structural elements of the building 3 for Type A Construction, 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.

Item	Class 5	Class 7b
Load bearing External Walls [1] • less than 1.5m to a fire source feature • 1.5 – 3m from fire source feature; • more than 3m from a fire source feature.	 120/120/120 120/90/90 120/60/30	 240/240/240 240/240/180 240/180/90
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.	 -/120/120 -/90/90 -/-/-	 -/240/240 -/240/180 -/-/-
External Columns External Columns	120/-/- -/-/-	240/-/- -/-/-
Fire Walls	120/120/120	240/240/240
Other load bearing internal walls, beams trusses and columns	120/-/-	240/-/-
Floors	120/120/120	240/240/240
Roofs	120/60/30	240/90/60

1. Under clause 2.5 of Specification C1.1 of BCA2008 for the columns located in the external walls of the warehouse building 3 it states:

*(a) **Steel columns** — A steel column, other than one in a fire wall or common wall, need not have an FRL in a building that contains—*

(i) only 1 storey; or

(ii) 2 storeys in some of its parts and 1 storey only in its remaining parts if the sum of the floor areas of the upper storeys of its 2 storey parts does not exceed the lesser of—

(A) 1/8 of the sum of the floor areas of the 1 storey parts; or

(B) in the case of a building to which one of the maximum floor areas specified in Table C2.2 is applicable — 1/10 of that area; or

(C) in the case of a building to which two or more of the maximum floor areas specified in Table C2.2 is applicable — 1/10 of the lesser of those areas.

The first floor storage component being some 246m^2, is significantly less than 1/8 of the floor area of the 1 storey part and 1/10 of the floor area under Clause (a)(ii)(B) above. Thus the columns incorporated in the external walls of the warehouse gain a concession under this clause to not require any FRL, with the only elements requiring a FRL in the subject building under Table 3 of Specification C1.1 of BCA2008 being the internal columns and first floor slab.

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, 2008 (BCA) has revealed the following areas where compliance with the BCA may require further consideration or assessment.

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 Sprinkler Protection

As the floor area of the subject fire compartment to Building 3 exceeds 2,000m^2, depending on the type of storage proposed within the warehouse could drive the requirement for the building to be treated as an occupancy of excessive fire hazard and as such require sprinkler protection.

Clause E1.5 requires occupancies of excessive hazard in fire compartments with a floor area of more than 2,000m^2 or 12,000m^3 to be provided with sprinkler protection. Occupancies of excessive hazard are determined under table E1.5 of the BCA as follows.

Occupancy			When sprinklers are required
3.	For the purposes of this Table, occupancies of excessive *fire hazard* comprise buildings which contain—		
	(a)	hazardous processes or storage including the following:	
		(i)	Aircraft hangars.
		(ii)	Cane furnishing manufacture, processing and storage.
		(iii)	Fire-lighter and fireworks manufacture and warehousing.
		(iv)	Foam plastic and foam plastic goods manufacture, processing and warehousing, eg, furniture factory.
		(v)	Hydrocarbon based sheet product, manufacture, processing and warehousing, e.g., vinyl floor coverings.
		(vi)	Woodwool and other flammable loose fibrous material manufacture.
	(b)	*Combustible* Goods with an aggregate volume exceeding 1000 m^3 and stored to a height greater than 4 m including the following:	
		(i)	Aerosol packs with flammable contents.
		(ii)	Carpets and clothing.
		(iii)	Electrical appliances.
		(iv)	*Combustible* compressed fibreboards (low and high density) and plywoods.
		(v)	*Combustible* cartons, irrespective of content
		(vi)	Esparto and other fibrous *combustible* material.
		(vii)	Furniture including timber, cane and composite, where foamed rubber or plastics are incorporated.
		(viii)	Paper storage (all forms of new or waste) e.g., bales, sheet, horizontal or vertical rolls, waxed coated or processed.
		(ix)	Textiles raw and finished, e.g., rolled cloth, clothing and manchester.
		(x)	Timber storage including sheets, planks, boards, joists and cut sizes.
		(xi)	Vinyl, plastic, foamed plastic, rubber and other *combustible* sheets, off cuts and random pieces and rolled material storage, e.g., carpet, tar paper, linoleum, wood veneer and foam mattresses.
		(xii)	All materials having wrappings or preformed containers of foamed plastics.

Under Combustible goods, it is noted there are two criteria that must be met for an occupancy to require sprinkler protection being:

- An aggregate combustible volume exceeding 1,000m^3 and
- Stored to a height greater than 4.0m.

In this instance there are three options to address the potential sprinkler issue being:

1. Restrict all storage in the warehouse to a height of less than 4.0m – will avoid sprinkler protection to the building,

2. Fire Compartment the building up into fire compartments that do not exceed 2,000m^2 – will avoid sprinkler protection to the building as the occupancy would not be deemed to be an excessive hazard, or

3. Provide sprinkler protection throughout the entire building.

Note that the base building shell does not require sprinkler protection under E1.5 of BCA2008, however the future use may drive the requirement for such sprinkler protection. As advised by the client, at this stage it is proposed to provide a sprinkler system to serve Building 3 as an open warehouse building in accordance with Specification E1.5 of BCA2008 and AS2118.1-1999.

5.3 Type of Construction – Fire Compartment Size

The total floor area of the subject buildings requires specific assessment / comment to clearly define the fire compartmentation criteria.

In assessing the fire compartmentation size of the proposed development to achieve compliance with C2.2 of BCA2008 outlined below is a detailed calculation in floor areas as detailed in the ABCB's "Guide to the BCA" where there is a mixture of workshop area and office areas together as occurs in Buildings 1 and 2. With the proposed buildings as detailed on the current design documentation, there is a higher than normal portion of workshop area versus office area.

Note that Building 1 will possess fire compartmentation that includes each floor to be treated as a separate fire compartment. As such with the ground floor level being constructed of the higher class 8 FRL of 240/240/240, the floor area limitations of C2.2 of BCA2008 will be satisfied.

However to Building 2 with the open stairs connecting ground and level 1 the total building will form the one single fire compartment. To assess the compartmentation allowance with a mixture of Class 5 and 8 areas the following calculations are made:

Building 2

The proposed total area of the ground and first floor of building 2 is approximately 4,160m^2.

The area of the Class 8 portion of the building is 64.7% (2,693 m^2) of the floor area of the whole building (that is, the combined Class 8 and Class 5 portions).

The area of the Class 5 portion of the building is 35.38% (1,467m^2) of the floor area of the whole building (that is, the combined Class 8 and Class 5 portions).

To determine if such a building complies with Table C2.2, the following calculations are necessary for a Type B Building:

- Maximum area of Class 8 allowed by Table C2.2 = **3,500 m^2**
- The percentage of Class 8 is 64.7% = 64.7% of 3,500m^2 = **2,264m^2**
- Maximum area of Class 5 allowed by Table C2.2 = **5,500 m^2**
- The percentage of Class 5 is 35.3% = 35.3% of 5,500m^2 = **1,941m^2**
- Maximum allowable floor area = 2,264 + 1941 = **4,205 m^2**

The maximum allowable floor area of the building is **4,205m^2**. Therefore, the building in this example complies with Table C2.2 for a Type B Constructed Building.

As a result the subject building needs to be designed and constructed as that of Type B Construction to alleviate the need to provide internal fire compartmentation to divide the fire compartment up into areas.

Building 3

Under Type A Construction, with the location of the main warehouse building 3 on site, the only element that would require any FRL are the columns supporting the first floor storage level and the first floor slab. Under Table 3 of Specification C1.1 of BCA2008 the first floor would require an FRL of 240/240/240. Furthermore under clause 2.5 of Specification C1.1 of BCA2008 for the columns located in the external walls of the warehouse building 3 portion it states:

*(a) **Steel columns** — A steel column, other than one in a fire wall or common wall, need not have an FRL in a building that contains—*

(i) only 1 storey; or

(ii) 2 storeys in some of its parts and 1 storey only in its remaining parts if the sum of the floor areas of the upper storeys of its 2 storey parts does not exceed the lesser of—

(A) 1/8 of the sum of the floor areas of the 1 storey parts; or

(B) in the case of a building to which one of the maximum floor areas specified in Table C2.2 is applicable — 1/10 of that area; or

(C) in the case of a building to which two or more of the maximum floor areas specified in Table C2.2 is applicable — 1/10 of the lesser of those areas.

The first floor storage component being some 321m^2, is significantly less than 1/8 of the floor area of the 1 storey part and 1/10 of the floor area under Clause (a)(ii)(B) above. Thus the columns incorporated in the external walls of the warehouse gain a concession under this clause to not require any FRL, with the only elements requiring a FRL in the subject building under Table 3 of Specification C1.1 of BCA2008 are the internal columns supporting the first floor slab and the first floor slab.

5.4 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 / Tender Documentation 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 BCA2008.

2. Lightweight fire rated construction used for fire rated walls and ceilings and any column encasement will be constructed in accordance with Specification C1.8 of BCA2008.

3. If the main switch rooms sustain emergency equipment required to operate in emergency mode, the rooms will need to be separated from the remaining buildings with construction having a FRL of 120/120/120 in accordance with BCA2008 Clause C2.13.

4. Any LMR's or fire hydrant pump rooms located within the buildings will need to be separated from the remaining buildings with construction having a FRL of 120/120/120 in accordance with BCA2008 Clause C2.12 and E1.3.

5. Internal wall wetting drenchers will need to be provided over fixed glazing where the path of travel from the eastern FIS's to Building 1 involves passing within 6.0m of openings at ground level as required by D1.7 and C3.4 of BCA2008.

6. The doors to all fire-isolated stairs in Building 1 and 2 at all levels will need to be provided as self-closing -/60/30 fire doors in accordance with C3.8 of BCA2008.

7. No services will be proposed to penetrate the fire isolated stairs / passages with the exception of those permitted by Clause C3.9 of BCA2008.

8. The lift landing doors to Building 1 will need to have a FRL of no less than -/60/- and are to comply with AS1735.11 in accordance with Clause C3.10 of BCA2008.

9. Services penetrating elements required to possess a FRL including the floor slabs, walls, etc will need to be protected in accordance with C3.12 and C3.15 of BCA2008.

10. All attachments to the external facade of building 3 will need to be of a non combustible material in accordance with Clause 2.4 of Specification C1.1 of BCA2008.

11. The fire isolated stairs and lift shaft to Building 1 and 2 will need to be provided with fire rated lids in accordance with clause 2.7 of Specification C1.1 of BCA2008.

12. The FRL's of the building elements will be in accordance with Table 3 of Specification C1.1 of BCA2008 for a building of Type A Construction for Building 3 and Table 4 of Specification C1.1 of BCA2008 for a building of Type B Construction for Buildings 1 and 2.

13. The dimensions of exits and paths of travel to exits will need to be provided in accordance with D1.6 of BCA2008.

14. Bollard protection will need to be provided at the discharge point of all fire stairs and required exits in accordance with D1.10 of BCA2008.

15. Access to the lift pit in Building 1will need to be in accordance with Clause D1.17 of BCA2008.

16. The fire isolated stairs to Building 1 and 2 will be constructed of concrete construction in accordance with D2.2 of BCA2008.

17. The non fire isolated stairs to Buildings 2 and 3 will be constructed of concrete or steel construction in accordance with D2.3 of BCA2008.

18. The construction of EDB's will need to be in accordance with D2.7 of BCA2008 with the enclosure bounded by a non combustible or fire protective covering and smoke seals provided around the perimeter of the doors at each level.

19. The handrails and balustrades to all stairs and throughout the buildings will need to be in accordance with D2.16 and D2.17 of BCA2008.

20. The door latching mechanisms to the proposed required exit doors to all buildings will need to be in accordance with D2.21 of BCA2008.

21. Signage will need to be provided on all doors to the fire isolated stairs / passages in Building 1 and 2 accordance with D2.23 of BCA2008.

22. Accessible signage will be provided in and around the subject building clearly indicating the disabled points of entry and sanitary facilities in accordance with AS1428.1 and D3.6 of BCA2008.

23. Accessible person's car parking spaces to be provided dimensionally in accordance with AS2890.3 and AS1428.1 and D3.5 of BCA2008.

24. Ground surface tactile indicators will need to be provided to the top and bottom of any stairways and ramps to all areas, except fire-isolated stairways, in accordance with Clause D3.8 of BCA2008 and AS1428.4.

25. Access to and circulation spaces will need to be provided to all areas of all buildings including access to the accessible sanitary facilities in accordance with AS1428.1.

26. Fire precautions during construction will need to be provided in accordance with E1.9 of BCA2008.

27. Any sarking proposed will need to be installed in accordance with F1.6 of BCA2008.

28. Waterproofing of all wet areas to the buildings will need to be carried out in accordance with F1.7 of BCA2008 and AS3740.

29. All glazing to be installed throughout the development will need to be in accordance with F1.13 of BCA2008 and AS1288 / AS2047.

30. Damp proofing of the proposed structure will need to be carried out in accordance with F1.9 and F1.10 of BCA2008.

31. The disabled person's sanitary facilities will need to be fitted out in accordance with AS1428.1.

32. Where the doorways to sanitary facilities are within 1.2m of the pan the doors will need to be capable of being removed from the outside in accordance with F2.5 of BCA2008.

33. Insulation will need to be in accordance with AS4859.1 and will be installed as required by Part J1 of BCA2008.

34. An R Value of 3.2 will be provided to the ceiling of all conditioned areas to all buildings in accordance with J1.3 of BCA2008.

35. An R Value of 1.8 will need to be provided to the walls of the conditioned spaces in accordance with J1.5 of BCA2008

36. Glazing will be installed to the class 5, 7b and 8 areas in accordance with Part J2.3 and J2.4 of BCA2008.

37. The class 5, 7b and 8 conditioned portions of the buildings will need to be sealed against the infiltration of air to conditioned spaces in accordance with Part J3 of BCA2008.

38. Access for maintenance to all services and their components will need to be provided in accordance with Clause NSW J8.2 of BCA2008.

39. A provision for the cleaning of windows to Building 1 will be provided in accordance with NSW G1.101 of BCA2008.

Electrical Services Design Certification:

40. Exit signage and emergency lighting will need to be installed throughout the development in accordance with E4.2, E4.4, E4.5, E4.6, E4.8 of BCA2008 and AS2293.1-2005.

41. Artificial lighting will need to be installed throughout the development in accordance with AS1680 F4.4 and J6 of BCA2008.

42. A system of smoke detection and alarm system will need to be installed throughout the building 1 portion in accordance with Clause 4 of Specification E2.2a of BCA2008 and AS1670.1-2004.

43. Lighting power and controls will be installed in accordance with Part J6 of BCA2008 throughout the class 5, 7b and 8 portions of the development.

Hydraulic Services Design Certification:

44. Storm water drainage will need to be provided in accordance with F1.1 of BCA2008 and AS3500.

45. Fire hydrants will need to be installed in accordance with E1.3 of BCA2008 and AS2419.1-2005 within the fire isolated stairs and around the perimeter of the buildings as required.

46. Fire hose reels will need to be installed in accordance with E1.4 of BCA2008 and AS2441-2005.

47. Portable fire extinguishers will need to be installed in accordance with E1.6 of BCA2008 and AS2444-2005.

48. The hot water supply systems will be designed and installed to Section 8 of AS3500.4 and Clause J7.2 of BCA2008.

Mechanical Services Design Certification:

49. The subject buildings will either need to be mechanically or naturally ventilated in accordance with F4.5 of BCA2008 and AS1668.2-1991.

50. Air-conditioning and ventilation systems will need to be installed in accordance with Part J5 of BCA2008 to the class 5 portions of the development.

Structural Engineers Design Certification:

51. The material and forms of construction for the proposed works will be in accordance with clause B1.2, B1.3 and B1.4 of BCA2008 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

52. The FRL's of the structural elements for the proposed works will been designed in accordance with table 3 of Specification C1.1 of BCA2008 for a building of Type A Construction for Building 3 and table 4 of Specification C1.1 of BCA2008 for a building of Type B for Buildings 1 and 2. This includes the entire ground floor portion of Buildings 1 and 2 possessing a 240/240/2400 FRL including the level 1 floor slab over.

53. The construction joints to the structure will be in accordance with C3.16 of BCA2008 to maintain the FRL integrity of the element concerned.

54. Any tilt up walls will be designed to provide for inwards collapse in accordance with C1.11 of BCA2008.

55. Upon completion of the works, the structural engineer will certify local failure in accordance with D2.2 of BCA2008 of the fire isolated stairs.

Lift Services Design Certification:

56. The lift in building 1 will need to be suitable for disabled persons in accordance with E3.6 of BCA2008 and AS1735.12.

57. Warning signage in accordance with Clause E3.3 of BCA2008 will be provided to the lifts to advise not to use the lifts in a fire.

5.5 Current BCA Design Items

The current design documentation exhibits areas where BCA Compliance will be achieved subject to some design modifications being made. These items are outlined below with such items requiring final design prior to the development of the Tender Documentation for the development:

- As required multiple exits are provided to all levels of all buildings. However egress doors have not at this stage been shown at ground level of Building 3. All exit doors in the perimeter of all buildings to be shown on final tender documentation.
- The only stairways to the development that need to be fire isolated are those serving Building 1 and 2 that connect three storeys. At this stage these stairs have not been shown as true fire isolated stairs that will require doors to be provided at each level leading into the stairways and a door leading from the stairway discharging direct to open space. Note that the external glazing of these stairs can be provided subject to adequate radiant heat protection being afforded by blade walls projecting out from the face of the walls. Two of these stairs will also need to extend up to serve the rooftop plant room to Building 1 and 2 that has an area in excess of 200m^2.
- The stair on grid line2X-4 / 2Y-1 needs to be a fire isolated stair as it connects three storeys that include the rooftop plant room to Building 2. Thus doors need to be provided at each level as well as the door to the plant room swinging into the stairway. We have assumed that the southern end of the plant room is open to the sky, if not then the second egress stair will need to extend up to serve the plant room level as with one stair the maximum travel distance to the single exit cannot exceed 20m – travel distances where say cooling towers are installed that are open to the sky are not measured as this portion of the plant room is not a defined “storey”.
- Exit travel distances to the Buildings 1 and 2 to all levels appear able to achieve compliance. However the egress travel distances to Building 3 upper floor storage area exceeds 20m to the single exit thus will require a secondary egress stair from this portion. The egress travel distances throughout the warehouse portion (Building 3) will need to be revisited once the actual warehouse racking layout is known to confirm compliance – although with the size of the warehouse, this should be achievable. However at this stage no egress doors have been shown in the external walls of the warehouse portion.
- The only FIS’s required are those to Building 1 and 2. The FIS’s that discharge along the eastern side of building 1 will involve persons walking past openings in the same building within 6.0m. As such protection of these openings will be necessary with internal wall wetting drenchers over fixed glazing.
- Based on the floor area provided and the ratios given in Table D1.13 and the relevant population criteria provided by the client the following populations have been calculated for the buildings:
    - Building 1 – Ground Floor - 74 persons, Level - 31 and Level 2 – 83 - **Total – 188 persons**.
    - Building 2 – Ground level 45, Level 1 - 22 – **Total 67 persons**.
    - Building 3 – **6 persons**.

ANNEXURE A

Design Documentation

This report has been based on the following design documentation.

Architectural Plans Prepared by HBO + EMTB Project Code SYA 000604		
Drawing Number	**Revision**	**Title**
PA-000	A	Title Page
PA-001	A	Site Plan
PA-002	A	Building 1 Ground Floor
PA-003	A	Building 1 Level 1
PA-004	A	Building 1 Level 2
PA-005	A	Building 1 Roof Plant Room Level
PA-006	A	Building 1 Roof Plan
PA-007	A	Building 1 Sections
PA-008	A	Building 1 Elevations 1
PA-009	A	Building 1 Elevations 2
PA-010	A	Building 1 Perspectives
PA-011	A	Building 2 Ground Floor
PA-012	A	Building 2 Level 1
PA-013	A	Building 2 Roof Plant Room Level
PA-014	A	Building 2 Roof Plan
PA-015	A	Building 2 Sections
PA-016	A	Building 2 Elevations 1
PA-017	A	Building 2 Elevations 2
PA-018	A	Building 2 Perspectives
PA-019	A	Building 3 Ground Floor
PA-020	A	Building 3 Mezzanine Level
PA-021	A	Building 3 Roof Plan
PA-022	A	Building 3 Sections
PA-023	A	Building 3 Elevations 1
PA-024	A	Building 3 Elevations 2
PA-025	A	Building 3 Perspectives
L003	A	Landscape Plan

ANNEXURE B

DETAILED ASSESSMENT OF THE DEEMED-TO-SATISFY PROVISIONS OF BCA2008

BUILDING ASSESSMENT

Outlined below is a detailed assessment of the Deemed-to-Satisfy Provisions of the Building Code of Australia 2008 (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

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 at Tender stage.	CRA Refer Part 5.4 of Report
B1.2: Determination of Individual Actions	No details of loads imposed upon the building – Structural Engineer to certify at Tender stage	CRA Refer Part 5.4 of Report
B1.3 Loads	No details of loads imposed upon the building – Structural Engineer to certify at Tender stage	CRA Refer Part 5.4 of Report
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 at Tender stage.	CRA Refer Part 5.4 of Report
SECTION C: FIRE RESISTANCE		
PART C1 – FIRE RESISTANCE AND STABILITY		
C1.0: Deemed-to-Satisfy Provisions	Noted	-
C1.1: Type of Construction Required	Type B Construction required for Buildings 1 and 2 due to rise in storeys and fire compartment size. Type A Construction to Building 3 due to fire compartment size.	Refer Part 5.3 of Report
C1.2: Calculation of Rise in Storeys	Building 1 has a rise in storeys of three, whilst buildings 2 and 3 have a rise in storeys of two.	Noted
C1.3: Buildings of Multiple Classification	All three buildings will possess different classifications.	Noted
C1.4: Mixed Types of Construction	Each Building 1 to 3 will be constructed of a single type of construction.	Noted
C1.8: Lightweight Construction	No details of any lightweight construction proposed to any buildings.	CRA Refer Part 5.4 of Report
C1.10: Fire Hazard Properties	No details of the fire hazard properties of the materials and assemblies in the proposed buildings. 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 Refer Part 5.4 of Report
C1.11: Performance of External Walls in Fire	The new concrete tilt up wall walls to the elevations must comply with Specification C1.11 of BCA2008.	CRA Refer Part 5.4 of Report
C1.12: Non-combustible Materials	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	Due to the fire compartment sizes of the buildings proposed, in all three buildings the type of construction needs to be increased to accommodate the fire compartment sizes. Building 1 will possess a fire compartment size of approximately 2,931m^2 to Ground Floor, and 2,021m^2 to level 1 and 2,061m^2 to level 2. To Building 2 a fire compartment size extending over and including both levels of approximately 4,160m^2, whilst Building 3 has a floor area of approximately 3,306m^2 and Volume of 24,611m^3. With the increased type of construction to all three buildings, the floor area and volume limitations of this clause will be satisfied.	Refer Part 5.3 of Report
C2.3: Large Isolated Buildings	As each building is within the fire compartmentation limitations of C2.2 for Type B and Type A construction, no buildings need to be treated as large isolated buildings.	N/A
C2.6: Vertical Separation of Openings in External Walls	The only building that is of Type A Construction is Building 3 that will be fully sprinkler protected. As such the provisions of this clause do not apply.	Noted
C2.7: Separation by Fire Walls	As each building is considered to form the one single fire compartment with Building 1 being one fire compartment per floor, there are no required or proposed fire walls as per this clause.	Noted

C2.8: Separation of Classifications in the Same Storey	To all three buildings to ground level, different classifications adjoin each other at the same level. Under the provisions of this clause, either the classifications can be separated by a fire wall with the higher FRL of the adjoining classifications, or the entire floor can be constructed of the same FRL being the higher FRL of the classifications concerned to avoid internal fire separation. In these circumstances we would suggest that to all three buildings the higher FRL be used. Details of FRL's contained within part 4.0 of report. To be further developed with ongoing design.	CRA Refer Part 4.0 of Report
C2.9: Separation of Classifications in Different Storeys	Other than Building 3, Buildings 1 and 2 are proposed to be of Type B Construction. As there are no class 2 or 3 portions proposed to these buildings, strictly the floors separating the levels require no FRL. However to Building 1, with the ground floor proposed to be constructed of the class 8 FRL being 240/240/240, the level 1 floor slab over this ground floor area will also require the 240/240/240 FRL.	CRA Refer Part 5.4 of Report
C2.10: Separation of Lift Shafts	The only lifts proposed to the development area within building 1. As the lift connects three consecutive storeys, accordingly the lift shaft will need to be constructed to be treated as a fire isolated shaft.	CRA Refer Part 4.0 of Report
C2.11: Stairways and Lifts in One Shaft	The stairways and lift in Building 1 that are both required to be fire isolated are contained in separate shafts as required.	CRA Refer Part 5.4 of Report
C2.12: Separation of Equipment	The only equipment required to be separated in the subject buildings by this clause are LMR's, any boilers / battery rooms and fire hydrant pump rooms. Further review required with ongoing design development.	CRA Refer Part 5.4 of Report
C2.13: Electricity Supply System	As proposed there are external kiosk style substations. Care will need to be taken to ensure the relevant requirements of Energy Australia are met with regards to construction of buildings in close proximity to these substations. The main switch rooms to be contained within the subject buildings, if they sustain any emergency equipment required to operate in the emergency mode will need to be fire separated from the rest of the building by 120/120/120.	CRA Refer Part 5.4 of Report
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	All buildings are located on site greater than 3.0m to any side or rear boundaries and greater than 6.0m from any other buildings on the same allotment and the far side of any roadway adjoining the allotment. As such no protection of openings in the external walls is are required by this clause.	N/A
C3.3: Separation of External Walls and Associated Openings in Different Fire Compartments	As each floor level will be constructed of the higher FRL, there will be no fire walls proposed to the development. As a result there is no requirement under this clause for protection of openings in the external walls between adjoining fire compartments.	N/A
C3.4: Acceptable Methods of Protection	The only possible additional protection of openings under this clause will be those along the eastern elevation of Building 1 where the fire isolated stairs discharge to open space and then occupants have to pass by openings in the same building within 6.0m. Further assessment of openings required to determine the extent of internal all wetting drencher protection required.	CRA Refer Part 5.5 of Report
C3.5: Doorways in Fire Walls	No fire walls proposed to development at this stage.	N/A
C3.8: Openings in Fire-isolated Exits	No details of fire doors required to fire isolated stairs to Building 1 and 2. To be further assessed at Tender stage.	CRA Refer Part 5.4 of Report
C3.9: Service Penetrations in Fire-isolated Exits	No details of any services penetrating FIS shafts. To be further assessed at tender stage.	CRA Refer Part 5.4 of Report
C3.10: Openings in Fire-isolated Lift Shafts	No details of lift landing doors to Building 1. To be further assessed at Tender stage.	CRA Refer Part 5.4 of Report

C3.12: Openings in Floors and Ceilings for Services	No details of protection of openings passing through elements required to be fire rated. To be further assessed at tender stage.	CRA Refer Part 5.4 of Report
C3.13: Openings in Shafts	The only building that is of Type A construction is building 3 which has no shafts required or proposed.	N/A
C3.15: Openings for Service Installations	No details of protection of openings passing through elements required to be fire rated. To be further assessed at Tender stage.	CRA Refer Part 5.4 of Report
C3.16: Construction Joints	No details of any construction joints proposed at this stage. Certification to be provided by Structural Engineer at tender stage.	CRA Refer Part 5.4 of Report
C3.17: Columns Protected with Lightweight Construction to Achieve an FRL	No details of any lightweight columns to any buildings to be protected with lightweight construction. To be further assessed at Tender stage.	CRA Refer Part 5.4 of Report
SPECIFICATION C1.1 – FIRE-RESISTING CONSTRUCTION		
2.0: General Requirements	Noted	-
2.1: Exposure to Fire-Source Features	No buildings on site are considered to be exposed to a fire source feature.	Noted
2.2: Fire Protection for a Support of Another Part	Elements contained within the same fire compartment require the same FRL	Noted
2.3: Lintels	Lintels are required to have the FRL required for the building element they are located in. External walls require no FRL to this development thus lintels will not be required.	N/A
2.4: Attachments Not to Impair Fire-resistance	No restriction on any attachments to the façade of the buildings 1 and 2 as the external walls require no FRL under Type B Construction. No details of any attachments to Building 3. To be further assessed at Tender stage.	N/A
2.5: General Concessions	The concessions applicable to the development are that the columns in the external walls of Building 3 require no FRL as the building is primarily of single storey with the two storey portion being less than one eighth of the ground floor area. To be further assessed at tender stage.	CRA Refer Part 4.2 of Report
2.6: Mezzanine Floors: Concession	No true mezzanines exist to the development with the first floor portion over the Building 3 office area being a true defined storey with an area of approximately 321m^2.	Noted
2.7: Enclosure of Shafts	No details of stair or lift shafts to Building 1 that required a fire rated lid as per this clause. To be further assessed at Tender stage.	CRA
3.0: Type A Fire-resisting Construction	Due to the fire compartment size of the main warehouse building 3, it has been assessed against the Type A Construction criteria.	CRA Refer Part 5.2 of Report
3.1: Fire-resistance of Building Elements	Due to the fire compartment size of the main warehouse building 3, it has been assessed against the Type A Construction criteria.	CRA Refer Part 5.2 of Report
3.2: Concessions for Floors	The only concession for floors to Building 3 is that the floor laid on the ground requires no FRL.	Noted
3.5: Roof: Concession	As Building 3 has a rise in storeys of two the roof requires no FRL.	Noted
3.6: Rooflights	There are no roof lights proposed to Building 3.	Noted
3.7: Internal Columns and Walls: Concession	Any internal columns in the storey immediately below the roof to Building 3 require no FRL. No details of columns shown on documentation at this stage.	CRA Refer Part 5.4 of Report
4.0: Type B Fire-resisting Construction	Due to the fire compartment size of the Buildings 1 and 2, They have been assessed against the Type B Construction criteria.	CRA Refer Part 5.2 of Report
4.1: Fire-resistance of Building Elements	Due to the fire compartment size of the Buildings 1 and 2, They have been assessed against the Type B Construction criteria.	CRA Refer Part 5.2 of Report
SPECIFICATION C1.8 - STRUCTURAL TESTS FOR LIGHTWEIGHT CONSTRUCTION		
1. Scope	Noted	-
2. Application	No details of any lightweight construction proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report

3.	Tests	No details of any lightweight construction proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
4.	Test Specimens	No details of any lightweight construction proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
5.	Test Methods	No details of any lightweight construction proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
6.	Criteria for Compliance	No details of any lightweight construction proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
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 Refer Part 5.4 of Report
3.	Fire-isolated Exits	No details of Fire Hazard Indices of all materials proposed within FIS's to Building 1 and 2.	CRA Refer Part 5.4 of Report
8.	Air-handling Ductwork	No details of Fire Hazard Indices of air handling ductwork proposed.	CRA Refer Part 5.4 of Report
9.	Lift Cars	No details of Fire Hazard Indices of lift car linings to Building 1 proposed.	CRA Refer Part 5.4 of Report
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 floor lining proposed.	CRA Refer Part 5.4 of Report
3.	Walls and Ceilings	No details of Fire Hazard Indices of all wall and ceiling lining proposed.	CRA Refer Part 5.4 of Report
4.	Lift Cars	No details of Fire Hazard Indices of lift car linings to Building 1 proposed.	CRA Refer Part 5.4 of Report
SPECIFICATION C1.11 – PERFORMANCE OF EXTERNAL WALLS IN FIRE			
1.	Scope	Noted	-
2.	Application	No details of any tilt up wall panels proposed at this stage. Structural engineer to certify at constructions stage such wall panels will collapse inwards as required.	CRA Refer Part 5.4 of Report
3.	General Requirements for External Wall Panels	No details of any tilt up wall panels proposed at this stage. Structural engineer to certify at constructions stage such wall panels will collapse inwards as required.	CRA Refer Part 5.4 of Report
4.	Additional Requirements for Vertically Spanning External Wall Panels Adjacent to Columns	No details of any tilt up wall panels proposed at this stage. Structural engineer to certify at constructions stage such wall panels will collapse inwards as required.	CRA Refer Part 5.4 of Report
SPECIFICATION C3.4 – FIRE DOORS, SMOKE DOORS, FIRE WINDOWS AND SHUTTERS			
1.	Scope	Noted	-
2.	Fire Doors	No details of any fire doors to development at this stage.	CRA Refer Part 5.4 of Report
SPECIFICATION C3.15 – PENETRATION OF WALLS, FLOORS AND CEILINGS BY SERVICES			
1.	Scope	Noted	-
2.	Application	For Information Only	Noted
3.	Metal Pipe Systems	No details of sealing of services and the like where penetrating fire rated elements. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
4.	Pipes Penetrating Sanitary Compartments	No details of sealing of services and the like where penetrating fire rated elements. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
5.	Wires and Cables	No details of sealing of services and the like where penetrating fire rated elements. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
6.	Electrical Switches and Outlets	No details of sealing of services and the like where penetrating fire rated elements. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
7.	Fire-stopping	No details of sealing of services and the like where penetrating fire rated elements. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report

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 required multiple exits are provided to all levels of all buildings. However egress doors have not at this stage been shown at ground level to all buildings.	CRA Refer Part 5.5 of Report
D1.3: When Fire-Isolated Stairways and Ramps are Required	The only stairways to the development that need to be fire isolated are those serving Building 1 and 2 that connect three storeys (A plant room is counted as a storey in building 2). At this stage these stairs have not been shown as true fire isolated stairs.	CRA Refer Part 5.5 of Report
D1.4: Exit Travel Distances	Exit travel distances to the Buildings 1 and 2 to all levels appear able to achieve compliance (subject to further details of FIS's to Building 1 and 2). However the egress travel distances to Building 3 upper floor storage area exceeds 20m to the single exit thus will require a secondary egress stair from this portion. The egress travel distances throughout the warehouse portion (Building 3) will need to be revisited once the actual warehouse racking layout is known to confirm compliance – although with the size of the warehouse, this should be achievable. However at this stage no egress doors have been shown in the external walls of the warehouse portion.	CRA Refer Part 5.5 of Report
D1.5: Distance Between Alternative Exits	The distance between alternative exits to all buildings at levels 1 and 2 are as required in accordance with the DTS provisions of this clause. However at this stage no egress doors have been shown in the external walls of the warehouse portion.	CRA Refer Part 5.5 of Report
D1.6: Dimensions of Exits and Paths of Travel to Exits	As required the dimensions of the exits and paths of travel to all required exits will need to be a minimum of 1m at all points. Further details required to verify strict compliance	CRA Refer Part 5.4 of Report
D1.7: Travel via Fire-Isolated Exits	The only FIS's proposed are those to Building 1 and 2. The FIS's that discharge along the eastern side of building 1 will involve persons walking past openings in the same building within 6.0m. As such protection of these openings will be necessary. To be further assessed with ongoing design documentation.	CRA Refer Part 5.5 of Report
D1.9: Travel by Non Fire-Isolated Stairways or Ramps	The non FIS's to Buildings 2 and 3 all discharge at ground level where access to open space is available within the required 20 and 40m distances.	Complies
D1.10: Discharge from Exits	All exits are to be protected from being blocked by vehicles using bollards, kerbs or other physical means. To be further assessed with ongoing design documentation.	CRA
D1.13: Number of Persons Accommodated	Based on the floor area provided and the ratios given in Table D1.13 and the relevant population criteria provided by the client the following populations have been calculated for the buildings: • Building 1 – Ground Floor - 74 persons, Level - 31 and Level 2 – 83 - **Total – 188 persons**. • Building 2 – Ground level 45, Level 1 - 22 – **Total 67 persons**. • Building 3 – **6 persons**	FI
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	No details of all plant rooms shown on documentation at this stage.	CRA Refer Part 5.4 of Report
D1.17: Access to Lift Pits	No details of lift pit depths to Building 1. Ideally if lift pit can be no more than 3.0m it can be accessed via the lower lift landing doors.	CRA Refer Part 5.4 of Report
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	No details of construction of FIS's to Building 1 and 2 although assume concrete construction.1	CRA Refer Part 5.4 of Report
D2.3: Non-Fire-Isolated Stairways and Ramps	No details of construction of non FIS's to Buildings 2 and 3 although assume concrete construction.	CRA Refer Part 5.4 of Report
D2.4: Separation of Rising and Descending Stair Flights	All stairs to all buildings are descending stairs only. Thus provisions of this clause are not applicable.	N/A
D2.7: Installations in Exits and Paths of Travel	If any EDB cupboards are located in a passageway, corridor, or the like that forms a path of travel to an exit the will need to be enclosed in a non combustible construction with smoke seals.	CRA Refer Part 5.4 of Report
D2.8: Enclosure of Space Under Stairs and Ramps	No enclosures are proposed at this stage beneath the fire isolated or non fire isolated stairways. To be further assessed with ongoing design development.	CRA Refer Part 5.4 of Report
D2.9: Width of Stairways	Stairway widths to be as required. Further details to be provided.	CRA Refer Part 5.4 of Report
D2.10: Pedestrian Ramps	No pedestrian ramps currently shown on design documentation – to be further assessed once RL's are nominated on plans.	CRA Refer Part 5.4 of Report
D2.11: Fire-Isolated Passageways	No details of FIP's connecting the FIS's to open space in the Building 1.	CRA Refer Part 5.4 of Report
D2.13: Goings and Risers	Stair geometry to all new stairs throughout the development to comply with Table D2.13.	CRA Refer Part 5.4 of Report
D2.14: Landings	Landing sizes appear adequate. It is assumed that the new landings will have either a non-slip finish or a non-skid strip.	CRA Refer Part 5.4 of Report
D2.15: Thresholds	Further perimeter section details required to confirm no steps in the new thresholds at the point of discharge at the doorways.	CRA Refer Part 5.4 of Report
D2.16: Balustrades or Other Barriers	Balustrades are required to be 1m above the floor of any balcony, path or the like. Details of the dimensions and configurations of the balustrading to all stairways have not been supplied at this stage.	CRA Refer Part 5.4 of Report
D2.17: Handrails	Handrails are to be provided to a least one side of all new stairways and to both sides of the stairs to Building 2 for ambulant disabled access as no lift facility is proposed within this building, in accordance with AS1428.1.	CRA Refer Part 5.4 of Report
D2.18: Fixed Platforms, Walkways Stairways and Ladders	No details of access ladders or the like to plant rooms – further details required.	CRA Refer Part 5.4 of Report
D2.19: Doorways and Doors	The new doors forming exits are to swing in the direction of egress where they are swinging doors. Further details required	CRA Refer Part 5.4 of Report
D2.20: Swinging Doors	The new doors forming exits are to swing in the direction of egress where they are swinging doors. Further details required	CRA Refer Part 5.4 of Report
D2.21: Operation of Latch	Latching mechanisms to all required exit doors and doors in a path of travel are to be readily operable with a single handed downward or pushing motion. Further details required	CRA Refer Part 5.4 of Report
D2.23: Signs on Doors	No details of signage required on the doors to the fire isolated stairs to Building 1 and 2.	CRA Refer Part 5.4 of Report
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	Disabled persons access is required to all three buildings. No details of access from external car park areas or footpath to site. Further detailed RL's required.	CRA Refer Part 5.4 of Report
D3.3: Parts of Buildings to be Accessible	All areas of all buildings to be accessible other than store room areas or other rooms in which access is inappropriate. Note that as no lifts are proposed to Buildings 2 and 3 one main stairway will need to be provided with a handrail either side for use by ambulant disabled persons in accordance with AS1428.1. To be further assessed with ongoing design documentation to ensure that clear doorway widths and circulation spaces at doorways are achieved as per AS1428.1 criteria.	CRA Refer Part 5.4 of Report

D3.4: Concessions	All areas of all buildings to be accessible other than store room areas or other rooms in which access is inappropriate.	Noted
D3.5: Car Parking	Four accessible car parking spaces shown on site plan at this stage. Accessible car spaces to be provided at the rate of 1 space per 100 car parking spaces provided.	Complies
D3.6: Identification of Accessible Facilities, Services and Features	No details of tactile Braille signage proposed at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
D3.7: Hearing Augmentation	Any conference / meeting rooms proposed that exceed 100m^2 with an in built amplification system will need to be provided with hearing augmentation loop in accordance with AS1428.1. Further details required from client to assess if such loop is required.	CRA Refer Part 5.4 of Report
D3.8: Tactile Indicators	No details of TGSI's that are required on all stairs and ramps other than the fire isolated stairs to building 1 and 2.	CRA Refer Part 5.4 of Report
SPECIFICATION D3.6 – BRAILLE AND TACTILE SIGNS		
1. Scope	Noted	-
2. Braille and Tactile Signage	Noted	-
2.1 Location of Braille and Tactile Signs	No details of tactile and Braille signage proposed.	CRA Refer Part 5.4 of Report
2.2 Braille and Tactile Sign Specification	No details of tactile and Braille signage proposed.	CRA Refer Part 5.4 of Report
2.3 Luminance-contrast	No details of tactile and Braille signage proposed.	CRA Refer Part 5.4 of Report
2.4 Lighting	No details of tactile and Braille signage proposed.	CRA Refer Part 5.4 of Report
2.5 Braille	No details of tactile and Braille signage proposed.	CRA Refer Part 5.4 of Report

SECTION E: SERVICES AND EQUIPMENT		
PART E1 – FIRE FIGHTING EQUIPMENT		
E1.0: Deemed-to-Satisfy Provisions	Noted	-
E1.3: Fire Hydrants	As the buildings all have a floor area in excess of 500m^2 fire hydrants are required to serve the buildings. The location of the nearby street hydrants will not afford coverage to the entire buildings thus on site fire hydrant system will be required which may include internal fire hydrants.	CRA Refer Part 5.4 of Report
E1.4: Fire Hose Reels	Fire hose reels will be required to serve all buildings. All new FHR's must be located within 4.0m of the required exits.	CRA Refer Part 5.4 of Report
E1.5: Sprinklers	Sprinklers are not required to the Warehouse Building 3 as a base building shell, however may be required due to eth type and quantity of materials proposed to be stored within the building.	Refer Part 5.2 of Report
E1.6: Portable Fire Extinguishers	No details of PFE's proposed that are required adjacent to main switchboards.	CRA Refer Part 5.4 of Report
E1.8: Fire Control Centres	A Fire Control centre is not required to the development.	N/A
E1.9: Fire Precautions During Construction	For Information only	Noted
E1.10: Provision for Special Hazards	For Information only	Noted
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)	Due to the rise in storeys of Buildings 2 and 3 only being 2, there are no smoke hazard management provisions applicable to these buildings under this clause. However to Building 1 with a rise in storeys of three, a smoke detection and alarm, system is required throughout the building.	CRA Refer Part 5.4 of Report
E2.3: Provisions for Special Hazards	For Information only.	Noted

SPECIFICATION E2.2a – SMOKE DETECTION AND ALARM SYSTEMS		
1. Scope	Noted	-
2. Type of System	A System in accordance with clause 4 is required.	CRA Refer Part 5.4 of Report
4. Smoke Detection System	No details of smoke detection and alarm system to Building 1 currently documented.	CRA Refer Part 5.4 of Report
5. Smoke Detection for Smoke Control Systems	No details of smoke detection and alarm system to Building 1 currently documented.	CRA Refer Part 5.4 of Report
6. Building Occupant Warning System	No details of smoke detection and alarm system to Building 1 currently documented that is required to activate a BOWS.	CRA Refer Part 5.4 of Report
7. System Monitoring	The smoke detection and alarm system serving Building 1 is not required to be connected to a monitoring system.	Noted
PART E3 – LIFT INSTALLATIONS		
E3.0: Deemed-to-Satisfy Provisions	Noted	-
E3.2: Stretcher Facility in Lifts	As Building 1 does not exceed 12m in effective height the lift is not required to accommodate a stretcher.	N/A
E3.3: Warning Against Use of Lifts in Fire	No details of signage to lifts	CRA Refer Part 5.4 of Report
E3.5: Landings	Lift landings to Building 1 are of adequate size and dimensions.	Complies
E3.6: Facilities for People with Disabilities	The lift facility serving building 1 will need to be suitable to accommodate disabled persons. No details of lift facility at this stage.	CRA Refer Part 5.4 of Report
E3.7: Fire Service Controls	No details of fire service controls to lift in building 1.	CRA Refer Part 5.4 of Report
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 provided throughout all building portions as required.	CRA Refer Part 5.4 of Report
E4.3: Measurement of Distance	Information only.	Noted
E4.4: Design and Operation of Emergency Lighting	No details. Emergency Lighting to comply with AS 2293.1-2005.	CRA Refer Part 5.4 of Report
E4.5: Exit Signs	Exits signs are to be installed throughout the buildings as required.	CRA Refer Part 5.4 of Report
E4.6: Direction Signs	No details. Where an exit is not readily apparent a directional sign is to be installed indicating the direction of egress.	CRA Refer Part 5.4 of Report
E4.8: Design and Operation of Exit Signs	No details. Exit Lighting to comply with AS 2293.1-2005.	CRA Refer Part 5.4 of Report

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 Refer Part 5.4 of Report
F1.5: Roof Coverings	Metal roof is to comply with AS1562.1.	CRA Refer Part 5.4 of Report
F1.6: Sarking	Sarking to comply with AS 4200.	CRA Refer Part 5.4 of Report
F1.7: Water Proofing of Wet Areas in Buildings	Wet areas to be suitably waterproofed as required.	CRA Refer Part 5.4 of Report
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 Refer Part 5.4 of Report
F1.10: Damp-proofing of Floors on the Ground	A vapour barrier in accordance with AS 2870 is not required to be installed to Building 3 due to the class 7b warehouse classification, however is required to all other buildings.	CRA Refer Part 5.4 of Report
F1.13: Glazed Assemblies	Al new glazed assemblies are to comply with AS 2047 and AS 1288.	CRA Refer Part 5.4 of Report

PART F2 – SANITARY AND OTHER FACILITIES		
F2.0: Deemed-to-Satisfy Provisions	Noted	-
F2.3: Facilities in Class 3 to 9 Buildings (including Table F2.3)	Based on the floor area provided and the ratios given in Table D1.13 and the relevant population criteria provided by the client the following populations have been calculated for the buildings: • Building 1 – Ground Floor - 74 persons, Level - 31 and Level 2 – 83 - **Total – 188 persons**. • Building 2 – Ground level 45, Level 1 - 22 – **Total 67 persons**. • Building 3 – **6 persons** The number of facilities in all buildings is suitable for this proposed population as per this clause	Complies
F2.4: Facilities for People with Disabilities (including Table F2.4)	One accessible sanitary facility proposed within each building as required. Details of fit out of accessible facility to be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
F2.5: Construction of Sanitary Compartments	No details of construction of sanitary facilities	CRA Refer Part 5.4 of Report
F2.6: Interpretation: Urinals and Washbasins	Individual urinals and washbasins proposed, whoever sanitary facilities not currently shown on design documentation	CRA Refer Part 5.4 of Report
PART F3 – ROOM SIZES		
F3.0: Deemed-to-Satisfy Provisions	Noted	-
F3.1: Height of Rooms and Other Spaces	Ceiling heights to all areas of all buildings based on sectional details appear able to achieve compliance.	CRA Refer Part 5.4 of Report
PART F4 – LIGHT AND VENTILATION		
F4.0: Deemed-to-Satisfy Provisions	Noted	-
F4.1: Provision of Natural Light	Natural light is not required to serve the buildings being of class 5, 7b and 8.	Noted
F4.4: Artificial Lighting	Lighting to all areas is to comply with AS 1680.0.	CRA Refer Part 5.4 of Report
F4.5: Ventilation of Rooms	Natural or mechanical ventilation to be provided with mechanical ventilation comply with AS 1668.2-1991. Further details required to assess compliance	CRA Refer Part 5.4 of Report
F4.6: Natural Ventilation	Natural ventilation where proposed is to be provided via openings in external walls having an aggregate opening of not less than 5% of the floor area of the room.	For Information
F4.8: Restriction on Position of Water Closets and Urinals	It is assumed that all sanitary facilities to all buildings will be mechanically ventilated.	CRA Refer Part 5.4 of Report
F4.9: Airlocks	It is assumed that all sanitary facilities to all buildings will be mechanically ventilated.	CRA Refer Part 5.4 of Report

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	No details of window cleaning that is required to Building 1 that contains a rise in storeys of three.	CRA Refer Part 5.4 of Report

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 and certified on an ongoing basis.	Noted

SECTION J: ENERGY EFFICIENCY (Class 3 and 5-9)		
PART J1 – BUILDING FABRIC		
J1.0: Deemed-to-Satisfy Provisions	Noted	-
J1.1: Application of Part	As the proposed buildings are considered to be of class 5, 7b and 8 classification, the provisions of this part are applicable to the development. Note that this Part would only apply to the areas that are being conditioned being the office areas – not the general warehouse or workshop areas.	Noted
J1.2: Thermal Construction General	Thermal insulation to comply with AS/NZS 4859.1.	CRA Refer Part 5.4 of Report

J1.3: Roof and Ceiling Construction	Being in climate zone 6 the roof construction of the new roof portion over the conditioned office areas must possess a R Value of 3.2	CRA Refer Part 5.4 of Report
J1.4: Roof Lights	No roof lights to roof area to any buildings proposed.	N/A
J1.5: Walls	Being in climate zone 6 the new wall construction of the conditioned office areas must possess a R Value of 1.8.	CRA Refer Part 5.4 of Report
J1.6: Floors	Concrete slab on ground – no R Value required	N/A
PART J2 – EXTERNAL GLAZING		
J2.0: Deemed-to-Satisfy Provisions	Noted	-
J2.1: Application of Part	This part applies to the conditioned areas of Building 1, 2 and 3 being the office areas – not the general warehouse / workshop areas.	Noted
J2.2: Applicable Glazing Provisions	At this stage no detailed glazing calculations have been made as based on the area and extent of glazing to Buildings 1 and 2 it may be prudent to undertake a JV1 or JV3 assessment.	FI
J2.3: Glazing – Method 1	At this stage no detailed glazing calculations have been made as based on the area and extent of glazing to Buildings 1 and 2 it may be prudent to undertake a JV1 or JV3 assessment.	FI
J2.4: Glazing – Method 2	At this stage no detailed glazing calculations have been made as based on the area and extent of glazing to Buildings 1 and 2 it may be prudent to undertake a JV1 or JV3 assessment.	FI
J2.5: Shading	No details of all shading devices contained within documentation at this stage. To be further assessed with ongoing design documentation.	CRA Refer Part 5.4 of Report
PART J3 – BUILDING SEALING		
J3.0: Deemed-to-Satisfy Provisions	Noted	-
J3.1: Application of Part	This part applies to the portions of the buildings 1, 2 and 3 that are conditioned.	Noted
J3.3: Roof Lights	No roof lights proposed to any buildings at this stage.	N/A
J3.4: External Windows and Doors	No details of sealing external windows and doors to conditioned areas. Further assessment required.	CRA Refer Part 5.4 of Report
J3.5: Exhaust Fans	No details of any exhaust fans – Further assessment required.	CRA Refer Part 5.4 of Report
J3.6: Construction of Roofs, Walls and Floors	Further details of bounding construction to conditioned portions of the buildings required to ensure air leakage is minimized.	CRA Refer Part 5.4 of Report
J3.7: Evaporative Coolers	No details of any evaporative coolers if proposed.	FI
PART J4 – AIR MOVEMENT		
J4.0: Deemed-to-Satisfy Provisions	Noted	-
J4.1: Application of Part	This part is not applicable as it is only applicable to Class 2 buildings.	Noted
PART J5 – AIR-CONDITION AND VENTILATION SYSTEMS		
J5.0: Deemed-to-Satisfy Provisions	Noted	-
J5.2: Air-conditioning and Ventilation Systems	No details of AC Systems proposed to the conditioned portions of the building. Mechanical consultant to provide certification of compliance of design.	CRA Refer Part 5.4 of Report
J5.3: Time Switch	No details of AC Systems proposed to the conditioned portions of the building. Mechanical consultant to provide certification of compliance of design.	CRA Refer Part 5.4 of Report
J5.4: Heating and Chilling Systems	No details of AC Systems proposed to the conditioned portions of the building. Mechanical consultant to provide certification of compliance of design.	CRA Refer Part 5.4 of Report
J5.5: Miscellaneous Exhaust Systems	No details of AC Systems proposed to the conditioned portions of the building. Mechanical consultant to provide certification of compliance of design.	CRA Refer Part 5.4 of Report
PART J6 – ARTIFICIAL LIGHTING AND POWER		
J6.0: Deemed-to-Satisfy Provisions	Noted	-
J6.1: Application of Part	This part applies to the entire three buildings.	Noted
J6.2: Interior Artificial Lighting	The interior lighting is to comply with this clause.	CRA
J6.3: Interior Artificial Lighting and Power Control	Lighting controls and switches are to be located in, or adjacent to, the space being controlled and must be linked to a time switch or occupant sensing device.	CRA Refer Part 5.4 of Report
J6.4: Interior Decorative and Display Lighting	Interior decorative and display lighting must be controlled separately to general lighting and be fitted with a time switch if the lighting exceeds 7kW.	CRA Refer Part 5.4 of Report

J6.5: Artificial Lighting Around the Perimeter of a Building	Perimeter lighting is to be controlled by a daylight sensor or time switch and where it exceeds 100W have an average light source density of 60 Lumens/W or be controlled by a motion sensor complying with Specification J6.	CRA Refer Part 5.4 of Report
J6.6: Boiling Water and Chilled Water Storage Units	The power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification J6.	CRA Refer Part 5.4 of Report
PART J7 – HOT WATER SUPPLY		
J7.0: Deemed-to-Satisfy Provisions	Noted	-
J7.2: Hot Water Supply	The hot water supply systems must be designed and installed in accordance with Section 8 of AS3500.4.	CRA Refer Part 5.4 of Report
PART J8 – ACCESS FOR MAINTENANCE		
J8.0: Deemed-to-Satisfy Provisions	Noted	-
J8.1: Application of Part	This part applies to all buildings to ensure maintenance can be carried out on equipment.	Noted
NSW J8.2: Access for Maintenance	Access for maintenance must be provided to all services and their components including time switches, motion detectors, thermostats, outside air dampers, reflectors, lenses and diffusers of light fittings, heat transfer equipment and adjustable or motorised shading devices.	CRA Refer Part 5.4 of Report

ANNEXURE C

SECTION J INFORMATION

ANNEXURE 3 - ENERGY EFFICIENCY – SECTION J

C1 Introduction

BCA 2006 (now BCA2008) 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 buildings 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.

The BCA does outline two verification methods being JV1 and JV3 (JV2 was deleted in the 2008 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 building is assumed to be Climate Zone 6 based on the BCA Climate Zone map.

(b) Conditioned Space – The conditioned space for the subject buildings include all occupied floor areas provided with mechanical ventilation but exclude:

- Stairwells, lift shafts and other service shafts.
- Roof top plant rooms.
- Workshop / storage areas.

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. For example the envelope of the conditioned space is formed by the external walls and the internal walls separating the warehouse portion from the office portion in Building 3.

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.

(b) R Values Required

The subject building is required, under Clauses J1.3, J1.5 and J1.6 to obtain the following R Values for the elements as listed.

Item	R Value	Comment
Roof	3.2	Where exposed to the outside
Walls	1.8	The walls are/are not shaded. Shading can reduce the overall value required.
Floors	Nil	No R Value required for floors in Climate Zone 6.

Notes:

1. The roof construction shown is a metal cladding on purlins with a suspended ceiling below, which has a typical R Value of 0.71. Therefore additional insulation to the ceiling cavity is required to achieve the above R Value.

2. The wall construction shown is in part a concrete panel, which has a typical R Value of 0.52. Therefore battens, insulation and an internal lining are required to achieve the above R Value. Further details of wall construction to Buildings 2 and 3 required for detailed assessment.

3. The floor is shown as concrete which has a typical R Value of 0.29. Therefore no further insulation to the underside will be required to any buildings.

4. A thermal break, using a material with an R-value of no less than 0.2 is required to be installed between the metal roof sheet and any metal framing where metal roof sheeting is fixed to metal roof framing and there is either no ceiling lining or the ceiling lining is fixed directly to metal purlins, rafters or battens.

C4 Part J2 – Glazing

(a) No assessment of the glazing in the building has been undertaken using the glazing calculators, as it is understood this is being carried out by others (Mechanical Engineer).

(b) Shading is considered to be provided by fixed horizontal elements that shade at least 80% of the summer solar radiation. For the purpose of assessing the glazing the individual windows will need to be broken down into shaded and unshaded elements where required to comply with BCA Clause J2.5 “Shading”, with shading being considered from the sides of the shading element as well as from the front edge. Specifically BCA Clause J2.5 states that the shading element must extend horizontally past the window on both sides the same distance as out from the wall. Further details required for assessment

C5 Part J3 – Building Sealing

It has been considered that the buildings will not be air-conditioned using only an evaporative cooler and as such the buildings area to be provided with the following:

(a) A seal to restrict air infiltration must be fitted to each edge of an external door, openable window or the like. This does not apply to windows complying with AS 2047, louvered openings, fire doors, or shutters used only for security.

(b) The main entrance to the building must have an airlock, self closing door, revolving door or the like.

(c) Miscellaneous exhaust fans must be fitted with a sealing device such as a self closing damper or the like.

(d) Roofs external walls, external floors and any openings such as windows and doors and the like must be constructed to minimise air leakage when forming part of the external fabric. Linings and the like are to be tight fitting or sealed by caulking, skirting, architraves, cornices or the like.

(e) An evaporative cooler must be fitted with a self closing damper or the like if proposed to be installed on site.

C6 Part J4 – Air Movement

Not applicable to class 5 to 9 buildings.

C7 Part J5 – Air Conditioning and Ventilation Systems

The mechanical engineer/designer is to certify that the air-conditioning and ventilation systems, including any carpark ventilation systems, comply with Part J5 of the BCA, which includes the following requirements:

(a) An air conditioning unit or system must be capable of being inactivated when the sole occupancy unit (tenancy) or part of the building is not occupied, and where motorised outside air and return dampers are provided, they must close when the system is inactivated (Clause J5.2 (a) (i)).

(b) All supply and return ductwork must be insulated and sealed in accordance with Specification J5.2 (Clause J5.2 (a) (ii)).

(c) When serving more than one sole occupancy unit (SOU) the system must thermostatically control the temperature of each SOU and not mix actively heated air with actively cooled air, and limit reheating to not more than a 7.5K rise in temperature (Clause J5.2 (a) (iii)).

(d) Must have an outdoor air economy cycle if the capacity is over 50kWr (Clause J5.2 (a) (iv).

(e) When the air flow is greater than 1,000 d/s be designed so that the total motor shaft power of the fans does not exceed 12w/m² for buildings less than 500m², or 15w/m² for a building of more than 500m² (Clause J5.2 (a) (v)).

(f) Any other mechanical ventilation system must be capable of being inactivated when the building or part is not occupied, and if serving a conditioned space, must comply with the requirements of Clause J5.2 (b).

(g) A time switch must be provided in accordance with Specification J6 when the power supply to:

- An air conditioning system is more than 10kWr; or
- A ventilation system with an air flow of more than 1000 l/s; or
- Heating systems of more than 10kW.

(h) Heating and chilling systems must comply with the energy efficiency requirements and pumping limitations outlined in Clause J5.4 of the BCA.

(i) Miscellaneous exhaust systems (e.g. kitchen exhaust) with a flow rate of more than 1000 l/s must have a variable speed fan and capable of being controlled or turned off by the operator (Clause J5.5).

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 all areas of the building including the non-conditioned areas:

(a) The aggregate design illumination power load must not exceed that specified in Table J6.2a for the Class 3 or 9c portions of the building and Table J6.2b for the Class 5, 6, 7, 8, 9a or 9b portions of the building 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)**
Board room and conference room	8
Circulation space and corridor	8
Control Room, switch room, and the like	10
Entry Lobby	15
Factory, industrial tasks and processes	17
Office – artificially lit to an ambient level of 200 lux or more	10
Office – artificially lit to an ambient level of less than 200 lux	7
Plant room	5
Storage with shelving no higher than 75% of the height of the aisle lighting	8
Storage with shelving higher than 75% of the height of the aisle lighting	10
Service area, locker room, staff room, cleaner's room, rest room and the like	3
Wholesale storage and display area	10

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 switches must be located in a visible position from the room being switched, and not operate an area of more than 250m² if the floor area is not more than 2,000m², or 1,000m² if the floor area of the space is more than 2,000m² (Clause J6.3 (c)).

(c) Artificial lighting in a building with a floor area of more than 250m² must be controlled by a time switch, or an occupant sensing device such as a security key card reader, or motion detector (Clause J6.3 (d)).

(d) Artificial lighting adjacent windows must be switched separately from other internal lighting (Clause J6.3 (e)).

(e) 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)).

(f) 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.

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.