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# BCA SIGNIFICANT ISSUES & CONSTRAINTS REPORT

# PROPOSED GLOBAL SYDNEY SWITCH 2 - REVISED DESIGN

# PYRMONT STREET, ULTIMO NSW

REPORT NO ►1321-15 REV03
DATE ► DECEMBER 2011
PREPARED FOR ► GLOBAL SWITCH
PREPARED BY ► AE&D

**C O N T E N T S**



| REVISION STATUS | | | | |
|---|---|---|---|---|
| **REPORT NO & REVISION** | **DATE** | **STATUS** | **WRITTEN** | **CHECKED** |
| 1321-15 REV 01 | 14.01.2010 | DRAFT ISSUE TO CLIENT | MS | NH |
| 1321-15 REV 02 | 17.02.2010 | COMPLIANCE REVIEW | MS | NH |
| 1321-15 REV 03 | 05.12.2011 | REVISED DESIGN | NH | NH |

## EXECUTIVE SUMMARY

This report has assessed the preliminary design documentation for the proposed Global Sydney Switch 2 Extension Project, Ultimo NSW. This assessment has been carried out in accordance with the provisions of the Building Code of Australia 2011 (BCA)[1] to determine if the submitted design can comply with the requirements of the BCA. The primary purpose of this report is to identify any significant non-compliance matters (or constraints) in comparison to the current Deemed-to-Satisfy (DTS) provisions of the BCA and identify if Alternative Solution may be applicable in relation to those identified BCA DTS non-compliance matters.

The outcome of the report has noted that the proposed design contains non-compliances with the deemed-to-satisfy provisions of the BCA that will most likely be addressed by Alternative Solution. There are also certain matters for which full BCA compliance can not be fully determined due to the current level of design containing an insufficient level of detail, such matters will be addressed as the design continues to progress.

Subject to the recommendations contained in Section 3.0 of this report, the current design can readily comply with the performance requirements of the BCA, including the provisions for Access for People with Disabilities.

[1] Australian Building Codes Board. "Building Code of Australia 2011"

## 1.0 INTRODUCTION

This report provides a Building Code of Australia 2011 (BCA) compliance assessment of the design documentation provided for the proposed Global Sydney Switch 2 Extension, against the significant requirements of the BCA 2011. Only major non-compliances have been identified at this stage, being those with the ability to affect the overall design &/or those requiring support by way of Alternative Solution. This report does not provide a comprehensive clause by clause assessment of the BCA, as the design is not at a level that allows that form of assessment.

The development comprises the construction of a major extension to the existing Global Sydney Switch Facility, located at 400 Harris Street, Ultimo NSW, which is located adjacent to an existing substation site as detailed below in Figure 1.0.


*Figure 1.0 – Proposed Site, showing two separate buildings*

## 1.1 Basis of Report

The key basis of this report is to address compliance with the significant requirements of the Building Code of Australia (BCA) 2011. The scope of services is limited to Sections C **- Fire Resistance**, Section D - **Access & Egress** and Section E - **Services & Equipment**, Section F - **Health and Amenity** and Section J - **Energy Efficiency** of the BCA.

This report is based on a desktop assessment of the Preliminary Design Prepared by DEM, with specific reference to the following:

- Architectural Plans prepared DEM – Drawing Numbers:

- Drawing No ar-0200, Rev B02, dated 01/12/11 – Site Plan
- Drawing No ar-1200, Rev B02, dated 01/12/11 – Floor Plan
- Drawing No ar-1202 Rev B02, dated 01/12/11 – Floor Plan
- Drawing No ar-1203 Rev B02, dated 01/12/11 – Ground Floor Plan
- Drawing No ar-1204 Rev B02, dated 01/12/11 – First Floor Plan
- Drawing No ar-1205, Rev B02, dated 01/12/11 –Second Floor Plan
- Drawing No ar-1206 Rev B02, dated 01/12/11 – Third Floor Plan
- Drawing No ar-1207 Rev B02, dated 01/12/11 – Fourth Floor Plan
- Drawing No ar-1208 Rev B02, dated 01/12/11 – Fourth Floor Mezzanine Floor Plan
- Drawing No ar-1209 Rev B02, dated 01/12/11 – Fifth Floor Plan
- Drawing No ar-1211 Rev B02, dated 01/12/11 – Roof Plan

- The Building Code of Australia 2011 (BCA), prepared by the Australian Building Codes Board.

- The Guide to the BCA 2011, prepared by the Australian Building Codes Board.

- The report has been based on both of the sites identified in figure 1.0 above, being a single consolidated allotment of land.

## 1.2 Purpose of the Report

The purpose of this report is to assess the following:

- Assessment under the current Building Code of Australia 2009 and detail any significant departures from the BCA2011.

- Provide recommendations to best address any significant departures from the requirements of BCA2011.

## 1.3 Limitations of the Report

- The report is limited to a desktop assessment of the nominated development only and does not constitute assessment of the existing site limitations in any way. Assessment is strictly limited to those works that have specifically been nominated within assessed documentation detailed in Section 1.1 of this report.
- This report does not provide any design advice and is limited to the provision of assessment of compliance with the BCA. The issues and matters identified by this report are to be considered by the design team for compliance with the BCA and any revision to the design must be carried out buy the design team without advice from AE&D, other than for items of BCA compliance.
- Consideration of Energy Australia Design Requirements, which often exceed the minimum BCA requirements.
- Some requirements of the BCA are recognised as being interpretive in nature. Where these matters are encountered, interpretations are made in accordance with AE&D policy. Specific interpretations relevant to this assessment are included in Section 2.0 “BCA Assessment Data”.
- Reporting on hazardous materials, OH&S matters or site contamination
- Assessment of mechanical plant operations, electrical systems or security systems
- Heritage significance
- Consideration of energy or water authority requirements
- Consideration of Council’s local planning policies
- Environmental or planning issues
- Requirements of statutory authorities

- Pest inspection or assessment building damage caused by pests (general/visual pest invasion or damage will be reported, however invasive or intrusive inspections have not be carried out)
- Sections B “Structure” (subject to Structural Design) and “I” Maintenance” (superseded in NSW) of the BCA are not specifically assessed.
- Provision of any construction approvals or certification under Part 4A or Part 5 of the Environmental Planning & Assessment Act 1979.

## 1.4 The Building

The floor plans will not be repeated in this report. The relevant floor plans showing the size and type of building are shown in the plans listed within section 1.1 of this report.

## 2.0 BCA ASSESSMENT DATA

Assessment data regarding the current Building Code of Australia:

**BCA Building Classification/s:** Class 5 – Technical Data Areas
Class 7b – Technical and other storage areas
NB: Plant areas and the like have the same classification as the part of the building in which they are located.

**Building rise in storeys:** 7

**Nunmber of storeys contained:** 8

**Type of Construction:** A

**General Floor area limitations:** **Class 5 Parts** - The building must have a floor area of not more than 8,000m$^2$ and a volume of not more than 48,000m$^3$
**Class 7b Parts** - The building must have a floor area of not more than 5,000m$^2$ and a volume of not more than 30,000m$^3$

**Effective Height:** 33.18m being greater than 25m but less than 50m.

***BCA Assessment/Interpretation Notes:***

- ***Rise in Storeys*** *– assessed in accordance with C1.2 of the BCA, and it is noted that the roof breakout area is considered a storey.*
- ***The building has not been considered a 'United Building',*** *as this will require the existing building at 400 Harris Street to be considered as having an Effective Height of more than 25m. Therefore the buildings will be considered as two separate buildings on the same allotment of land.*

## 2.1 Location of Fire Source features

West: Adjoining building at 400 Harris Street
East: Pyrmont Street, which is more than 6m wide.
North: Substation at ground level and highway overpass at level 3, which is more than 6 metres wide
South: Quarry Street, which is more than 6 metres wide

## 2.2 Building Layout

The building comprises the following:

| Level/Part | Approximate Occupant Numbers | Usage |
|---|---|---|
| Basement 1 | Maximum 10-20 | Plant and equipment |
| Ground Floor | Maximum 15-25 | Technical data & storage space.<br>Lobby and Reception areas |
| First Floor | Maximum 10-20 | Technical data space. |
| Second Floor | Maximum 10-20 | Technical data space. |
| Third Floor | Maximum 10-20 | Technical data space. |
| Fourth Floor | Maximum 10-20 | Technical data space. |
| Fifth Floor | 0 | Chillers and associated plant and equipment |
| Roof Level | 20-30 | Amenities and roof areas |

**NB**: Occupant numbers above are based on existing use conditions at Sydney Global Switch - 1 Facility.

## 3.0 BCA ASSESSMENT

The following Table 3.0 identifies the significant non-compliances and constraints applicable to the current design when assessed against the requirements of the Building Code of Australia 2009. This report does not provide a comprehensive clause-by-clause assessment of the BCA, as the design is not at a level that allows that form of assessment.

**TABLE 3.0 - SIGNIFICANT BCA ISSUES**

<table>
<tr><th>#</th><th colspan="2">SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS</th></tr>
<tr><td colspan="3">SECTION B “STRUCTURE”</td></tr>
<tr><td>1.</td><td>Informational</td><td>STRUCTURAL DESIGN<br>All buildings and structures should be designed by appropriately qualified structural engineers in accordance with Part B1 of the BCA and AS 1170 (SAA Loading Code), AS 1684, AS 1720, AS3600, AS4100 and other relevant structural codes. The structural certificate should state the classification of the site or the Geotechnical Report relied upon to carry out the structural design.</td></tr>
<tr><td colspan="3">SECTION C “FIRE RESISTANCE”</td></tr>
<tr><td>2.</td><td>Informational<br><br>POTENTIAL ALTERNATIVE SOLUTION REQUIRED</td><td>FIRE RATING OF BUILDING ELEMENTS (BCA SPEC C1.1)<br>The building is required to be constructed in Type A construction which is required to comply with the minimum fire resistance levels of Table 3 of Specification C1.1 of the BCA. In summary, the following minimum FRL’s must be maintained:
<table>
<tr><th>Building Element</th><th></th><th>Class 5</th><th>Class 7b</th></tr>
<tr><td colspan="2">External Wall (Loadbearing)</td><td></td><td></td></tr>
<tr><td colspan="2">Less than 1.5m from fire source feature</td><td>120/120/120</td><td>240/240/240</td></tr>
<tr><td colspan="2">1.5m to less than 3m from fire source feature</td><td>240/240/180</td><td>240/240/180</td></tr>
<tr><td colspan="2">3m or more from fire source feature</td><td>240/180/90</td><td>240/180/90</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">External Wall (Non-Loadbearing)</td><td></td><td></td></tr>
<tr><td colspan="2">Less than 3m from fire source feature</td><td>-/120/120</td><td>-/240/240</td></tr>
<tr><td colspan="2">3m or more from fire source feature</td><td>-/-/-</td><td>-/-/-</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">External Column</td><td></td><td></td></tr>
<tr><td colspan="2">Less than 3m</td><td>120/-/-</td><td>240/-/-</td></tr>
<tr><td colspan="2">3m or more</td><td>-/-/-</td><td>-/-/-</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Common Walls & Fire Walls</td><td>120/120/120</td><td>240/240/240</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="2">Internal Walls</td><td></td><td></td></tr>
<tr><td colspan="2">Loadbearing Fire Stairs & Lift Shafts</td><td>120/120/120</td><td>240/120/120</td></tr>
<tr><td colspan="2">Non-Loadbearing Fire Stairs & Lift Shafts</td><td>-/120/120</td><td>-/120/120</td></tr>
<tr><td rowspan="2">Ventilating pipe, garbage, and like shafts not used for the discharge of hot products of combustion</td><td>Loadbearing</td><td>120/90/90</td><td>240/120/120</td></tr>
<tr><td>Non-loadbearing</td><td>-/120/120</td><td>-/-/-</td></tr>
<tr><td rowspan="2">Bounding public corridors, public lobbies and the like, also<br>Bounding sole occupancy units</td><td>Loadbearing</td><td>120/-/-</td><td>120/90/90</td></tr>
<tr><td>Non-loadbearing</td><td>-/-/-</td><td>-</td></tr>
<tr><td colspan="2">Other loadbearing internal walls, internal beams, trusses</td><td>120/-/-</td><td>240/-/-</td></tr>
<tr><td colspan="2">Floors</td><td>120/120/120</td><td>240/240/240</td></tr>
<tr><td colspan="2">Roofs</td><td>120/60/30*</td><td>240/90/60*</td></tr>
<tr><td colspan="2">Equipment such as emergency generators, boilers, batteries and lift motor rooms</td><td>120/120/120 or -/120/120</td><td>120/120/120 or -/120/120</td></tr>
</table>
</td></tr>
</table>

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
|---|---|---|
| | | ***NB1**: Clause 3.1 of BCA Specification C1.1 requires:*<br>• *All loadbearing internal walls and fire rated walls must be of concrete or masonry.*<br>• *All external walls must be non-combustible.*<br>• *All internal non-loadbearing walls required to be fire rated are to be non-combustible.*<br>***NB2** – Concession 2.5(c) is applicable "structures on roofs" which allows for structures covering certain mechanical equipment located upon the roof to be except from the fire rating requirements of C1.1.*<br>***NB3**: Numerous concessions apply to building of Type A Construction. Reference is made to Clause 3 of BCA Specification C1.1. The application of the relevant exemptions would be assessed at the detailed design phase. These exemptions include:*<br>*Clause 3.5 – Roof concession if building is sprinklered throughout.*<br>***NB4**: The building must be designed to accommodate the requirements of Clause 2.2 of BCA Specification C1.1, relating to the support of another part. This will be important where the Class 7b is above or below the Class 5 parts. The higher FRL being 240 minutes may be required to areas above and below the Class 5 parts to ensure adequate structural stability.*<br>**POTENTIAL ALTERNATIVE SOLUTION REQUIRED -** it may be applicable to consider consistent FRL's throughout the entire building (ie reduced FRLs for the Class 7b storage areas). |
| **3.** | Informational | **ATTCHMENTS NOT IMPAIR FIRE RESISTANCE (BCA Clause 2.4 of SPEC C1.1)**<br>The veils shown over the front footpath must be further assessed to ensure they do not represent a fire hazard to occupants discharging from the fire isolated exits. |
| **4.** | Informational | **FIRE HAZARD PROPERTIES (BCA Clause C1.10)**<br>The building is required to have internal linings compliant with BCA Clause C1.10. The internal wall, floor and ceiling linings must comply with the requirements and exemptions provided within Clause C1.10 and as relevant to Specification C1.10 and Specification C1.10a. |
| **5.** | Informational | **FIRE COMPARTMENTS (BCA CLAUSE C2.2)**<br>The fire compartments must be maintained in accordance with the following maximums to comply with Clause C2.2 of the BCA:<br>• **Class 5 Parts** - The building must have a floor area of not more than 8,000m$^2$ and a volume of not more than 48,000m$^3$<br>• **Class 7b Parts** - The building must have a floor area of not more than 5,000m$^2$ and a volume of not more than 30,000m$^3$<br>It is assumed that the Class 5 & 7b parts will be separated by construction having an FRL of not less than 240/240/240. **POTENTIAL ALTERNATIVE SOLUTION REQUIRED –** it may be applicable to consider consistent FRL's throughout the entire building (ie a reduction in the Class 7b FRLs).<br>Based on the approximate floor plate of each storey being approximately 4,000m$^2$, the maximum fire compartment size would be unlikely to be exceeded in the Class 5 parts, however this should be fully detailed on plan to confirm full compliance.<br>The floor areas of each fire compartment appear to comply with the maximum compartment sizes for a building of Type Construction. |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
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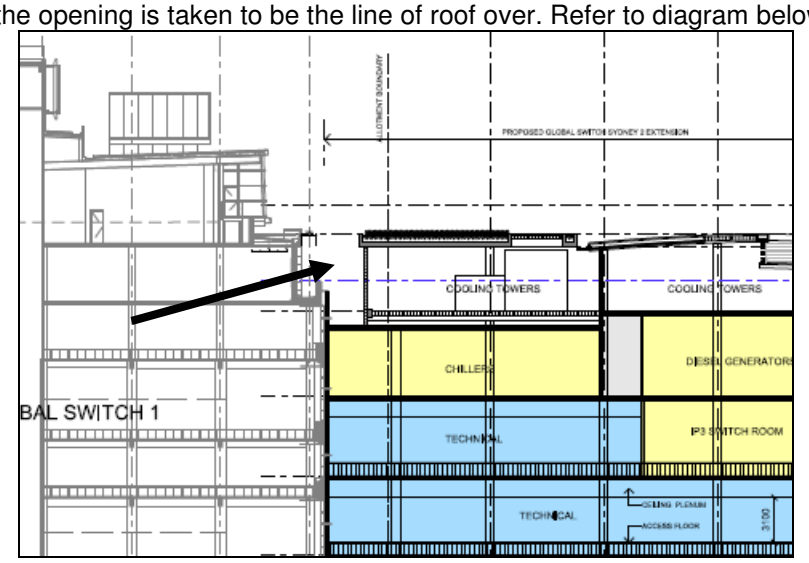
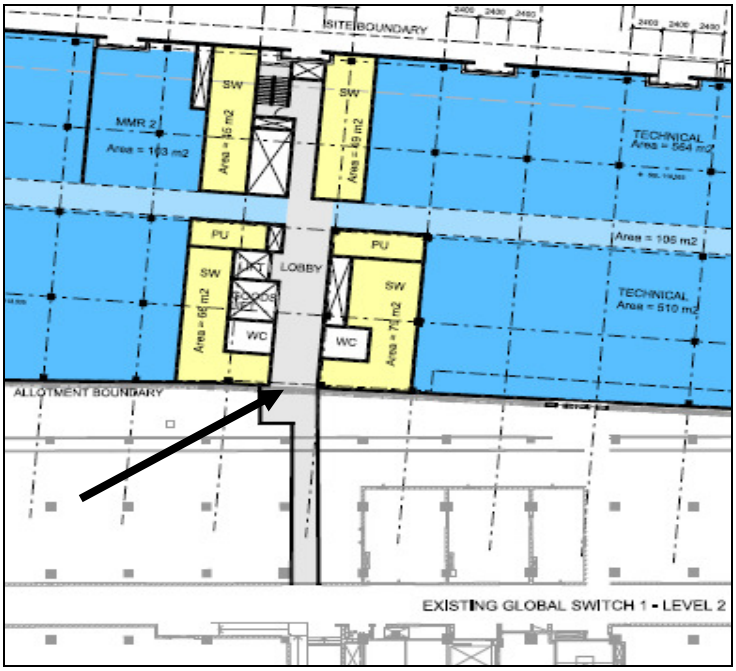
| | | |
| **6.** | Informational | **SEPARATION of EQUIPMENT (BCA CLAUSE C2.12 & C2.13)**<br>Separation of equipment as listed below must be separated from the remainder of the building by FRL 120/120/120:<br>- Boilers;<br>- Lift motors and control panels<br>- Emergency generators used to sustain emergency equipment in the emergency mode;<br>- Central smoke control plant;<br>- Battery stores<br>- Electricity substation and main switch boards (only switchboards used to sustain emergency equipment in the emergency mode) |
| **7.** | Informational and Potential Non-Compliance | **PROTECTION OF OPENINGS (BCA CLAUSE C3.2)**<br>To comply with BCA Clause C3.2, openings in external walls within 6m of side of the existing building on the same allotment, or 6m of the far side of the road must be protected in accordance with C3.4 of the BCA. Protection of openings to be detailed as the design progresses, however the following openings are specifically noted:<br>i. To all openings within 6m of the existing Sydney Global Switch 1 building should be protected. This includes all openings under covered roofs, where the opening is taken to be the line of roof over. Refer to diagram below.<br>  <br><br>ii. The link on Level 2 and 3. This link should be protected against the spread of fire from both buildings. ie. Have a fire door or fire shutter to protect the external wall opening in Sydney 1 and Sydney 2. Doorways in fire walls must comply with the provisions of BCA Part D3. Refer to diagram below. |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
|---|---|---|
| | |  |
| **PARTS D1 & D2 "EGRESS"** | | |
| **8.** | Informational and Potential Non-Compliance<br><br>**POTENTIAL ALTERNATIVE SOLUTION REQUIRED** | **NUMBER OF EXITS (BCA CLAUSE D1.2)**<br>In accordance with BCA Clause D1.2, each storey is required to have at least two (2) exits. The building may not comply in the following areas:<br><br>i. Various tenancies may require 2 or more exits to ensure access to 2 exits is provided within 20m travel distance<br><br>Access to exits, including door types and locations must be detailed as the design progresses to allow compliance with BCA D1.2 to be fully assessed. An alternative solution may be required should compliance with the deemed-to-satisfy provisions not be proposed. |
| **9.** | Informational<br><br>**POTENTIAL ALTERNATIVE SOLUTION REQUIRED** | **TRAVEL DISTANCES & EXIT LOCATIONS (BCA CLAUSE D1.4 & D1.5)**<br>Each storey must be provided with at least 2 exits providing a point of choice within 20m of all points on the floor, an exit within 40m of all points on the floor. Alternative exits must also be located between 9m to 60m apart. The proposed design appears generally compliant, however should the proposed fitout/s cause a non-compliance with the above parameters, it is suggested the non-compliance be addressed via alternative solution.<br><br>*NB: The individual fit-out of the technical areas may require an alternative solution, similar to the alternative solution currently applying to the Sydney 1 site. The technical area fit-outs will most likely cause the distance of travel to exceed 20m to a point of choice and the distance to one of the exits exceeding 40m. In addition it is likely that the fit-outs will create a non-compliance with the distance between alternative exits and exceed 60m.* |
| **10.** | Informational | **FIRE ISOLATED EXITS & EXIT STAIRS (BCA SECTION D)**<br>All stairs must be maintained as fire isolated exits to comply with D1.3 and D1.7 of the BCA, the proposed design appears to generally comply, with the following issues also noted: |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
|---|---|---|
| | | i. The discharge from all fire stairs must be compliant with Clause D1.7 and D1.10 and in this regard the discharge points must provide a complaint path of travel to the road and only discharge into covered areas as permitted by Clause D1.7. Details will be assessed as the design progresses. |
| **11.** | Informational | **DIMENSIONS OF EXITS AND PATHS OF TRAVEL TO EXITS (BCA CLAUSE D1.6)**<br>The BCA requires paths of travel to exits and dimensions of exits to comply with BCA Clause D1.6, which states:<br>i. Paths of travel and exit widths not less than 1,000mm, except at doorways where they can be reduced to 750mm<br>ii. Paths of travel and exit heights not less than 2,000mm except at doorways where they can be reduced to 1,980mm.<br>This aspect will be further assessed as the design continues to progress. |
| **12.** | Potential Non-Compliance | **RISING & DESCENDING STAIRWAYS (BCA CLAUSE D2.4)**<br>The fire isolated stairways that serve the basement (or below ground levels) must not be directly connected to the fire isolated stairways serving the above ground storeys. The stairways must be separated by construction that is non-combustible and smoke proof.<br><br>This aspect will be further assessed as the design continues to progress.<br>This relates to the northern most stair at ground level. |
| **13.** | Potential Non-Compliance | **RE-ENTRY FROM FIRE ISOLATED STAIRS (BCA CLAUSE D2.22)**<br>BCA Clause D2.22 requires fire isolated exits in this building not to be locked, unless unlocked at every fourth floor and activated by the fire alarm system to unlock the doors. Further detail required. |
| **PARTS D2 – CONSTRUCTION OF EXITS** | | |
| **14.** | Informational | **GENERAL – BCA PART D2**<br>The design has not developed to a stage where the assessment of the construction of exits and the like can be determined. The further detailed design of the requirements of BCA Part D2 will be undertaken once the design has been developed by the design team to a suitable level. This includes such matters as:<br>- Stair construction, risers and goings<br>- Handrails<br>- Balustrades<br>- Thresholds<br>- Smoke sealing of electrical/comms enclosures<br>- Fire isolation of fire isolated passageways<br>- Stair landings<br>- Doors and doorways, including door swing<br>- Door hardware<br>- Fire safety door signage |
| **PARTS D3 – ACCESS & EGRESS** | | |
| **15.** | Informational | **ACCESS FOR PEOPLE WITH DISABILITIES (BCA PART D3)**<br>Access for people with disabilities is required to and throughout the building, excluding the plant and equipment and maintenance areas. All technical space and technical storage space, as well as the amenities and reception areas would require compliant access. |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
|---|---|---|
| | | **General Access**<br><br>(a) An *accessway* must be provided to a building *required* to be *accessible*—<br>(i) from the main points of a pedestrian entry at the allotment boundary; and<br>(ii) from another *accessible* building connected by a pedestrian link; and<br>(iii) from any *required accessible* carparking space on the allotment.<br>(b) In a building *required* to be *accessible*, an *accessway* must be provided through the principal pedestrian entrance, and—<br>(i) through not less than 50% of all pedestrian entrances including the principal pedestrian entrance; and<br>(ii) in a building with a total *floor area* more than 500 $m_2$, a pedestrian entrance which is not *accessible* must not be located more than 50 m from an *accessible* pedestrian entrance<br><br>The building appears to comply in this regard.<br><br>**Accessible Carparking**<br><br>1 space for every 100 carparking spaces or part thereof. Carparking spaces must comply with AS 2890.6. Accessible carparking spaces should be not less than 3.2m wide, 5.5m long and have an unobstructed height of 2.5m. Note: Required only where carparking is provided.<br><br>The building appears to comply in this regard.<br><br>**Sanitary Facilities**<br><br>At least one (1) accessible sanitary facility constructed on each level of the building in accordance with AS 1428.1-2009, which must be accessible to all persons within the building.<br><br>The building appears to comply in this regard.<br><br>**Signage**<br><br>Clear and legible Braille and tactile signage complying with BCA Specification D3.6 and incorporating the international symbol of access or deafness or other symbol as appropriate, in accordance with AS 1428.1-2001, should be provided to identify accessible features and facilities and should identify:<br>(a) each:<br>(i) sanitary facility; and<br>(ii) accessible space with a hearing augmentation system; and<br>(b) where an entrance or lift is not accessible, identify each accessible:<br>(i) entrance; and<br>(ii) lift or bank of lifts, and<br>the path of travel from the principal public entrance to these features and facilities where their location is not apparent to the building occupant.<br><br>**Signage**<br>Lifts must de installed to comply with BCA Clause E3.6 and the relevant parts of AS 1735.<br><br>The building appears to comply in this regard. |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
|---|---|---|
| **Section E "Services and Equipment"** | | |
| **16.** | Informational | **SERVICES AND EQUIPMENT (SECTION E)**<br>The following services and equipment are required (or proposed) to be installed to the building to comply with Section E of the BCA:<br>• **Fire Hydrant Coverage** – in accordance with E1.3 of the BCA and AS2419.1-2005. Such hydrants must be located within the fire isolated stairs. Coverage to be fully confirmed in accordance with AS2419.1- 2005. The hydrant booster shall comply with AS 2419.1-2005 and be located near the main entry and be accessible directly from the road. Hydrant pump rooms must be provided with direct access from the roadway, which can be via a fire isolated stairway. The pump room cannot open directly to the fire stair without a smoke lobby. The fire hydrant system should be design by a hydraulic engineer.<br>• **Fire Hose Reels** – in accordance with BCA Clause E1.4, fire hose reels must be provided throughout the building to provide complete coverage. The system shall comply with AS 2441-2005 and should be designed by a hydraulic engineer.<br>• **Portable Fire Extinguishers** – suitable for the hazards must be provided to comply with E1.6 of the BCA and AS 2444-2001 throughout the building.<br>• **Sprinkler system** – In accordance with BCA Clause and Table E1.5, the building is required to have a sprinkler system throughout the entire building, installed in accordance with AS 2118.1-1999. The sprinkler valve room must be accessible direct from road or open space (via fire stair is acceptable) and be in a secure enclosure. Sprinkler booster arrangements must be accessible direct from the roadway.<br>• **Fire Control Centre** – A Fire Control *Centre* is required to be provided in accordance with BCA Clause and Specification E1.8. The specific details of the fire control centre should be obtained from BCA Specification E1.8. The fire control centre must incorporate the fire indicator panel, master control panel, including fan controls and smoke controls and be a designated area for use by the fire brigade as part of their fire fighting operations.<br>• **Provision for Special Hazards** – The building fire services must consider the special hazards that may be present within the building, in order to comply with BCA Clause E1.10. The fire services designers will need to demonstrate that the proposed fire services are adequate to address the special fire hazards contained within the building.<br>• **Smoke Hazard Management** – the following must be provided to the building to comply with E2.2 and E2.2a of the BCA for a Class 5 & 7 building with an effective height of more than 25m:<br>i. Stair pressurization to all stairs (above ground) in accordance with AS 1668.1-1998;<br>ii. Zone Smoke Control System throughout all areas, in accordance with AS 1668.1-1998;<br>• **Exit and Emergency Lighting** – shall be provided throughout the building in accordance with Part E4 of the BCA and AS 2293.1-2005.<br>• **Sound system and intercom system for emergency purposes** – In accordance with BCA Clause E4.9, the emergency system must be installed throughout in accordance with AS 1670.4-2005.<br>• **At least 2 Emergency Lifts** – refer to Item 17 below |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
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| **17.** | Informational | **LIFT REQUIREMENTS (BCA PART E3) –**The proposed lifts should be installed in accordance with Part E3 of the BCA and AS1735.1 or .2 & AS 1735.12. So as to comply, and to provide an appropriate level of occupant safety, the following is required/recommended to be installed:<br>• At least 2 of the lifts are required to be emergency **lifts** and be contained in separate fire isolated lifts shafts, each having an FRL of not less than 120/120/120.<br>• Have a standby power system<br>• All lift landing doors must achieve an FRL of -/60/-.<br>• In accordance with BCA Clause E3.4, the emergency lifts must maintain an internal floor area of no less than:<br>Car depth – 2,280mm<br>Car Width – 1,600mm<br>Car floor/ceiling height – 2,300mm<br>Min door height – 2,100mm<br>Min door width – 1,300mm<br>• Fire service controls be fitted to the lifts.<br>• Comply with AS 1735.12 and the requirements of Clause E3.6 for people with disabilities<br>• Warning Signs not to use lifts in the event of fire are to be placed next to all call buttons constructed of embossed/incised letters on a plate or similar, stating<br>"DO NOT USE LIFTS<br>IF THERE IS A FIRE"<br>(in 10mm CAPITAL letters, or 8mm Sentence case text) |
| **Section F "Health & Amenity"** | | |
| **18.** | Informational | **DAMP & WEATHERPROOFING (BCA PART F1)**<br>Must be provided in accordance with BCA Part F1. Detail to be indicated as the design progresses. |
| **19.** | Informational | **SANITARY & OTHER FACILITIES (BCA PART F2)**<br>Must be provided in accordance with BCA Part F2. Detail to be indicated as the design progresses.<br>***NB:*** *The sanitary facilities must include both male and female toilets. As discussed above in item 15, the building will require at least 1 accessible unisex disabled facility. The number of sanitary facilities will be based on occupants numbers, which are yet to be confirmed.* |
| **20.** | Informational | **LIGHT & VENTILATION (PARTF4 & F5)**<br>Must be provided in accordance with BCA Part F4. Detail to be indicated as the design progresses.<br>Due to the limited availability of natural light and ventilation, it is anticipated that the building will have artificial light and mechanical ventilation, which must comply with BCA Part F4. Artificial light is to be provided to comply with BCA Clause F4.4 and AS 1680.0-1998. Mechanical ventilation must comply with AS 1668.2-1992. |

| # | SIGNIFICANT BCA ISSUES AND COMPLIANCE MATTERS | |
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| **Section J "Energy Efficiency** | | |
| **21.** | Informational<br><br>**POTENTIAL ALTERNATIVE SOLUTION REQUIRED** | **ENERGY EFFICIENCY (BCA SECTION J)**<br>(a) The building is considered a conditioned space. As such the following parts of Section J "Energy Efficiency" are applicable. Compliance should be confirmed by the designing engineers with the relevant provisions as follows:<br>• Part J1 – Building Fabric<br>• Part J2 – Glazing<br>• Part J6 – Building Sealing<br>• Part J4 – Air Movement<br>• Part J5 – Air-conditioning and Ventilation Systems<br>• Part J6 – Artificial Lighting and Power<br>• Part J7 - Hot Water Supply<br>• Part J8 – Access for Maintenance<br><br>The subject design should be confirmed as complying with the above parts of Section J by the relevant disciplines architect &/or design engineers. Should any of the relevant disciplines not be confident with the application of Section J and it's implications on the design, it is recommended that an appropriately qualified Energy Efficiency Consultant be engaged to assist with ensuring compliance.<br><br>AE&D recommend a qualified and experienced Energy Efficient Consultant be engaged to verify compliance with Section J of the BCA. A performance based assessment (Alternative Solution) may be necessary to confirm compliance with the Energy Efficiency Requirements of Section J. |

## 4.0 CONCLUSION

This report has assessed the proposed development under the significant provisions of the BCA. The primary purpose of this report is to identify the non-compliance matters in comparison to the current Deemed-to-Satisfy provisions of the BCA, which are addressed in Section 3.0 above.

The proposed design contains non-compliances with the deemed-to-satisfy provisions of the BCA that must be addressed via either re-design or supported by an Alternative Solution to demonstrate compliance with the Performance Requirements of the BCA. There are also certain matters for which full BCA compliance can not be fully determined due to the current level of design containing an insufficient level of detail, such matters will be addressed as the design detail continues to progress. The matters identified that may be supportable via Alternative Fire Engineering Solution, are as follows:

1. Rationalise fire resistance levels throughout the building.
2. Travel distances, particularly with respect to tenancy fitouts.
3. Openings in external walls.

Subject to the comments contained in Section 3.0 of this report, the current design can comply with the performance requirements of the BCA.

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