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Western Sydney University Innovation Hub
2b – 6 Hassall Street, Parramatta

BCA Assessment Report
Report 2018/3170 R1.3

Prepared for Charter Hall & Western Sydney University
April 2019

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SWP Quality System

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Disclaimer:

This report is based on a desktop audit of preliminary documentation only.
Details contained in the report address issues of significance to broad BCA compliance relevant to this stage of design resolution.

This report is based on a review of the design documentation only. It represents a compliance report for "documentation to this point in time" and will be subject to amendment and expansion as project documentation develops

Executive Summary

An assessment of the proposed design of the mixed-use tertiary educational and commercial development at 2b-6 Hassall Street, Parramatta, also known as the Western Sydney University (WSU) Innovation Hub has been undertaken against the Deemed-to-Satisfy (DTS) provisions of the relevant sections of the Building Code of Australia and the applicable Building Regulations.

This State significant development application will seek consent for the redevelopment of the site as a mixed-use development comprising a tertiary institution, commercial and retail uses. Specifically, the proposal will seek approval for:

- Construction and use of a 19 storey building comprising:
  - Basement / Lower Ground level including car parking, a loading dock, back-of-house storage and plant, end-of-trip facilities and tertiary institution floor space;
  - Ground level including retail tenancies, tertiary institution lobby floor space, a commercial office lobby, plant equipment and driveway ramp;
  - Above Ground levels comprising tertiary institution and commercial floor space;
  - Mid-rise and rooftop terraces and plant equipment;
- Landscaping and public domain works including the provision of a Ground level through-site link; and
- Extension and augmentation of services and infrastructure as required.

This report details the non-compliances identified that require either amendments to plans or an Alternative Solution to satisfy the Performance Requirements of the BCA.

Summary of BCA Parameters:

Building Use:	Mixed use development (Commercial, retail, tertiary education facilities and car parking/ancillary)
Class of Occupancy	Class 5, 6, 7a & 9b
Type of Construction Required	Type A
Rise Storeys:	19 Storeys
Number of Storeys:	22 Storeys
Effective Height:	64.35m (Level 17 RL76.05 – Ground Level RL11.70)

The following are the main issues that require amendments to the design:

1. Provision of ambulant facilities within the ground floor amenity block (Clause F2.4)

The following are the main issues proposed to be addressed by the Fire Safety Engineer via a Performance Solution:

1. Reduced FRLs associated with the retail tenancies located on the ground floor (Clause & Specification C1.1);
2. Implementation of a performance based fire wall between the ground floor and the basement carpark

(Clause C2.7);

3. Unprotected openings located within 3m of a fire source feature (Clause C3.2);
4. Extended travel distances throughout the building (Clause D1.4 & D1.5);
5. Discharge arrangements associated with the fire isolated stairs located on the ground floor (Clause D1.7);
6. Interconnection of 3 storey's throughout the building where they do not facilitate discharge to a road or open space and indirect connection of 5 storeys (Clause D1.12);
7. Operation of the main entries to the commercial lobby being push to exit in lieu of failing open (Clause D2.19);
8. Location and protection associated with the hydrant infrastructure – Booster & Pumps (Clause E1.3);
9. Location of the sprinkler valve sets (Specification E1.5);
10. Potential smoke hazard management options throughout the building including the rationalisation and omission of systems (Clause E2.2 & Specification E2.2a and E2.2b); and
11. Atrium construction to voids connecting 3 or more levels throughout the building

The following are the main issues proposed to be addressed by the Access Consultant via a Performance Solution:

1. Use of a single handrail in lieu of 2 to the amphitheatre stair and external stair located within the plaza (Clause D3.3)

The following are the main issues proposed to be addressed by a BCA Consultant via a Performance Solution:

2. Assess the permissibility of students and staff to utilise the same banks of toilets for the tertiary levels of the development in lieu of being provided with separate banks (Clause F2.3)

The design is capable of complying with the requirements of the relevant sections of the Environmental Planning Assessment Act 1979, the Environmental Planning and Assessment Regulations 2000 and the Building Code of Australia 2016 amendment 1. Compliance is subject to resolution of the identified areas of non-compliance and compliance with the recommendations provided within the report.

Further detailed regulatory reviews will need to be progressively undertaken as designs advance and become more resolved to ensure compliance is achieved.

Whilst not precluding the issue of a Construction Certificate, it is noted that many detailed design issues are not indicated on the drawings. These issues are designated "Compliance Readily Achievable" in the *"Status"* column of the assessment in Section 14 of the report and should be resolved prior to construction.

Note: The BCA assessment undertaken is limited to a review of the 2016 (amendment 1) provisions. BCA 2019 will come into effect as of the 1st May 2019 and the building will be subject to compliance with the 2019 provisions.

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1. Introduction

This report presents the findings of a preliminary assessment undertaken of the proposed design of the mixed-use tertiary educational and commercial development at 2b-6 Hassall Street, Parramatta against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016 (Amendment 1).

It has been prepared by Steve Watson and Partners for Charter Hall & Western Sydney University

This State significant development application will seek consent for the redevelopment of the site as a mixed-use development comprising a tertiary institution, commercial and retail uses. Specifically, the proposal will seek approval for:

- Construction and use of a 19 storey building comprising:
  - Basement / Lower Ground level including car parking, a loading dock, back-of-house storage and plant, end-of-trip facilities and tertiary institution floor space;
  - Ground level including retail tenancies, tertiary institution lobby floor space, a commercial office lobby, plant equipment and driveway ramp;
  - Above Ground levels comprising tertiary institution and commercial floor space;
  - Mid-rise and rooftop terraces and plant equipment;
- Landscaping and public domain works including the provision of a Ground level through-site link; and
- Extension and augmentation of services and infrastructure as required.

2. Purpose

The purpose of this report is to provide an assessment of the design documentation against the current requirements of the BCA.

The assessment is undertaken for the purpose of, and to the extent necessary for, construction certification to be issued under Part 6 of the NSW Environmental Planning and Assessment Act 1979 (The Act) and Environmental Planning and Assessment Regulation 2000 (EPAR).

3. Scope and Limitations

3.1. Scope

The scope of this assessment is limited to the the design documentation referenced in Appendix A of this report.

3.2. Limitations

The following limitations apply to the assessment:

- The report considers matters of a significant nature only and should not be considered exhaustive.
- The plans are assessed to the extent necessary to submit an application for a SSDA. This means the design intent has been assessed to be capable of complying with the BCA without necessarily having all the detailed design completed at this stage.

- Details in regard to access for people with disabilities have been assessed to the extent of the deemed-to-satisfy provisions of the BCA/Premises Standard only. A detailed assessment against AS 1428 series, AS/NZS 2890.6 – 2009 and AS 4299 – 1995 is outside the scope of this report
- Generally, the assessment does not incorporate a detailed assessment of the requirements of the Australian Standards.
- Structural and services documentation have not been reviewed.
- Appraisals are limited to the provisions of the BCA and the Premises Standards. Other legislative requirements have not been considered. It does not address additional or specific requirements stipulated under other areas such as Safety in Design, Construction Safety, Disability Discrimination, Planning and Environment, Occupational Health and Safety, Health, Dangerous Goods, etc, which may impact on the design and use of the building. It is recommended that appropriate advice from suitably qualified consultants should be obtained for further information on these areas.

4. National Construction Code 2016 Amendment 1 –Volume 1: Building Code of Australia Class 2 to Class 9 Buildings

The National Construction Code (NCC) is a uniform set of technical provisions for the design and construction of buildings, structures and plumbing/drainage systems which is separated into 3 volumes. Volume 1 of the NCC is the Building Code of Australia (BCA) for Class 2 to 9 buildings which is the document to which the assessment in this report has been undertaken against. The BCA is legislated under The Act and specifies the Performance Requirements for the design and construction of Class 2 to 9 buildings that must be satisfied to achieve compliance. The Performance Requirements can only be satisfied by a Performance Solution, Deemed-to-Satisfy (DTS) solution or a combination of both.

5. Performance Solutions

The BCA is written in a performance format which allows performance based buildings. This has allowed for innovation and variation from the prescriptive deemed-to-satisfy requirements of the BCA, whilst maintaining the principle levels of health, safety and amenity of building occupants.

Performance solutions are generally adopted when a nominated deemed-to-satisfy provision appears inappropriate for the design, or when a proposed design varies from the prescriptive requirements of the BCA. Subsequently, a performance solution supported by Fire Engineering analysis can determine whether a proposed design that varies from prescriptive requirements, will satisfactorily meet the performance provisions of the BCA. Ultimately, it is with the discretion of the relevant building surveyor whether to accept a deviation from the prescriptive code requirements.

Utilising the performance provisions may result in more economical and somewhat safer building, however alternative solutions may require additional on-going maintenance. It is in this instance that all parties, such as the building owner, insurance companies, proposed tenants, etc., are aware of this decision making process and are kept informed of any additional requirements needed to maintain the level of safety.

6. Statutory Framework

The following table summarises the key statutory issues relating to fire safety and the BCA in relation to the certification of new building works.

Issue	Legislative reference	Comment
New Work	EPAR 145	All new works must comply

6.1. New Work

Clause 145 of the EPAR requires that all new work comply with the current requirements of the BCA.

This means that all works proposed in the plans are required to comply but that existing features of an existing building need not comply with the BCA unless required to under other clauses of the legislation.

7. Methodology

7.1. Process adopted

The following method of assessment has been used in the preparation of this report:

1) Determine the basic assessment data for the building.
2) Assess the design of the building against the current Deemed-to-Satisfy requirements of Sections B, C, D, E, F, G, H and J of the BCA. Establish the status of each clause into the following categories:
    1. Clause is administrative information only **(Noted)**;
    2. Clause is or is not relevant to the proposed work **(Applicable or N/A)**
    3. The proposed work complies with the requirements of the clause **(Complies)**;
    4. Compliance with the requirements of the clause is unable to be determined from the documentation provided **(Compliance Readily Achievable)**. A recommendation in the "Comments" column will indicate what is required to achieve compliance. The design and construction teams are responsible to ensure compliance is achieved;
    5. Compliance with the requirements of the clause is unable to be determined from the documentation provided. Additional details or relevant information required to verify compliance (**Additional Details Required**);
    6. Proposed work does not comply with the requirements of the clause **(Does Not Comply)**. An indication will be given in the Comments field as to the nature of the issue and whether an alternative solution has been proposed to address the issue;
    7. Proposed work is to be addressed on a performance basis via a Performance Solution satisfying the relevant Performance Requirements. (**Performance Solution**);
3) Nominate the status of the design against each BCA requirement;
4) Provide comments against each BCA requirement as appropriate.

8. Description of Proposed Development

This State significant development application will seek consent for the redevelopment of the site as a mixed-use development comprising a tertiary institution, commercial and retail uses. Specifically, the proposal will seek approval for:

- Construction and use of a 19 storey building comprising:
    - Basement / Lower Ground level including car parking, a loading dock, back-of-house storage and plant, end-of-trip facilities and tertiary institution floor space;
    - Ground level including retail tenancies, tertiary institution lobby floor space, a commercial office lobby, plant equipment and driveway ramp;
    - Above Ground levels comprising tertiary institution and commercial floor space;
    - Mid-rise and rooftop terraces and plant equipment;
- Landscaping and public domain works including the provision of a Ground level through-site link; and
- Extension and augmentation of services and infrastructure as required.

9. Assessment Data Summary

The following basic assessment data has been drawn from the provisions of the BCA 2016 amendment 1.

9.1. Assumptions

No assumptions have been made in preparing this report.

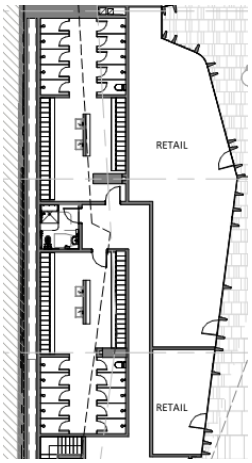
9.2. Interpretations

A number of issues within the BCA are recognised to be interpretive in nature. Where these issues are encountered, interpretations are made that are consistent with Standard Industry Practise and/or Steve Watson & Partners policy formulated in regard of each issue.

10. Issues Requiring Resolution

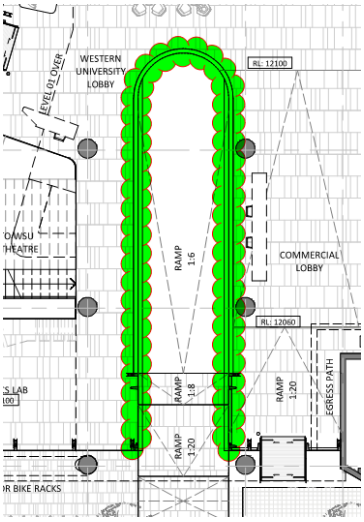
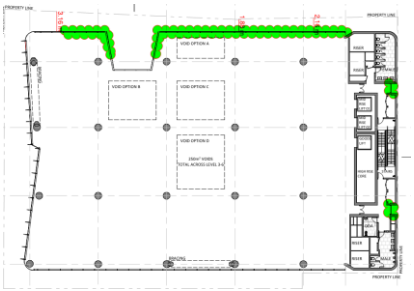
10.1. Issues requiring amendments to plans

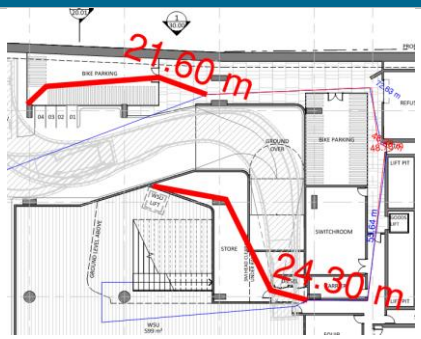
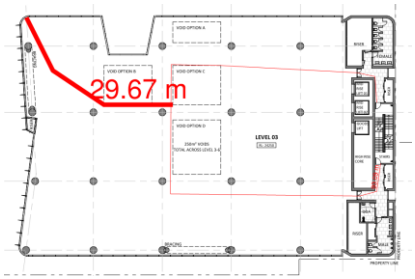
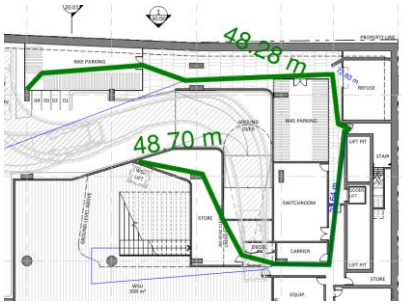
The following issues need to be resolved before issuing the Construction Certificate.

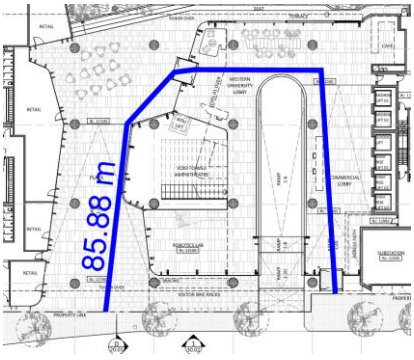
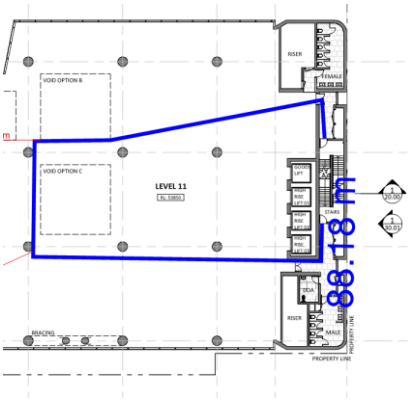
Item	DTS Clause	Description of Non-compliance	Requirement to Satisfy BCA
1.	D1.6	An assessment has been undertaken as per the breakdowns requested from WSU & Charter Hall. • An assessment with a population density of 1:10 has been shown to comply with the DTS provisions associated with the BCA. • An assessment has also been undertaken against a population density of 1:6.8. All levels which exceed a population of 200 occupants do not comply as there are only provisions allowed in the design for 2 exits (Levels 3 - 17)	Details need to be assessed on the required egress widths and the proposed population and whether additional means of exits can be incorporated or if a performance solution can be obtained through the projects fire engineer.
2.	F2.4	No ambulant facilities have been documented within the confines of the amenity block located on the ground floor  	Ambulant facilities that conform with the requirements of Section 16 of AS1428.1-2009 need to be documented with amended drawings to be issued to the Certifying Authority & Access Consultants for review

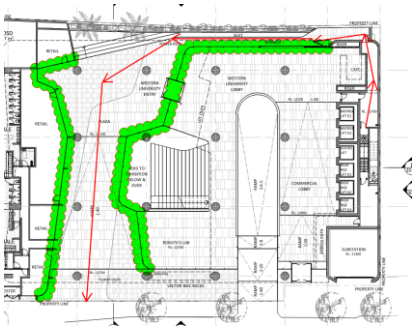
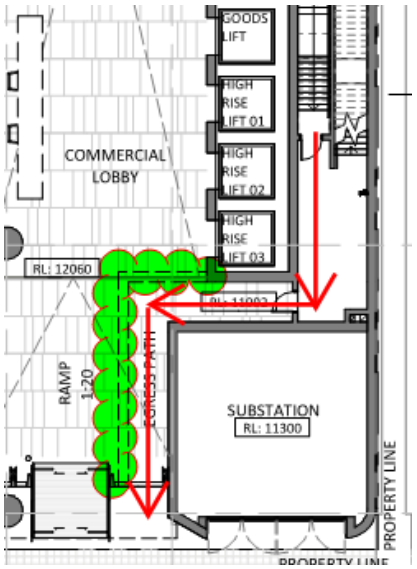
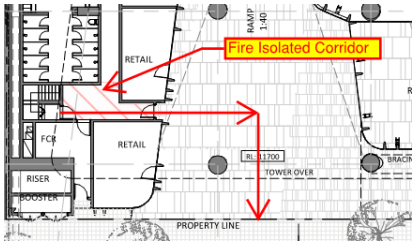
10.2. Performance solutions required – Fire Engineer

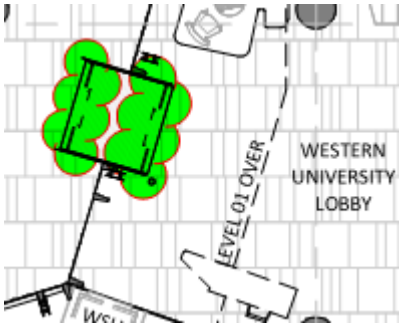
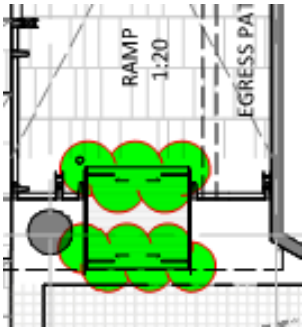
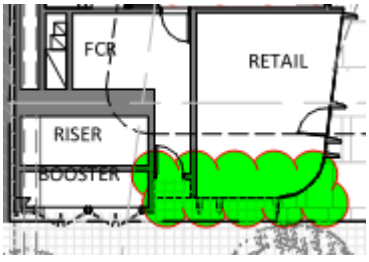
It is proposed to satisfy the following non-compliances via performance solutions:

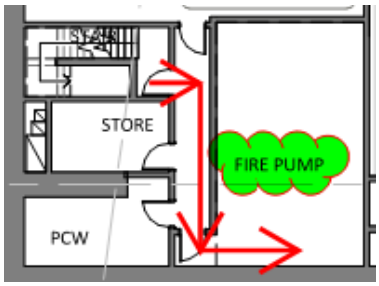
Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Fire Resisting Construction	C1.1, C2.8, C2.9, C2.10, C3.12	A reduction in FRLs are proposed to the separating elements / walls and floors of the class 6 portions of the building from 180/180/180 down to 120/120/120.	CP1 & CP2
2.	Separation by Fire Wall	C2.7	A performance based fire wall is proposed between the ground floor and the ramp and associated openings serving the basement carpark 	CP1 & CP2
3.	Protection of openings in external walls	C3.2	The following openings located on ground floor through to the level 18 plant room are located within 3m of the boundary (fire source feature). These openings are not proposed to be protected by measures listed within BCA Clause C3.4 and as such create a non-compliance that is to be addressed by means of a performance solution prepared by the projects Fire Engineer  *It should be noted that should a drencher system be installed to protect these unprotected openings a performance solution will be required to address the use of an active system which occupies more than 1/3 of the storey*	CP1 & CP2
4.	Exit Travel Distances	D1.4	The following areas have been identified with distances exceeding 20m to a point of choice: • Basement Level – Up to 25m to a POC	DP4 & EP2.2

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
			 • Level 1 through to Level 18 Plant – Up to 30m to a POC  The following areas have been identified with exit travel distances exceeding 40m through a POC to the nearest available exit: • Basement Level – Up to 50m  • Ground Floor – Up to 50m  • Level 1 through to Level 18 Plant – Up to 66m	

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
				
5.	Distance between alternative exits	D1.5	The following areas have been identified with distances between alternative exits exceeding 60m: • Basement Level – Up to 75m  • Ground Floor – Up to 86m  • Level 1 through to Level 18 Plant – Up to 90m 	DP4 & EP2.2
6.	Travel via fire-isolated exits	D1.7	The following discharge arrangements will require a performance solution to be obtained through the projects fire engineer: • Discharge arrangements from the Northern fire isolated stair necessitate passing by unprotected openings which are located within 6m of the path of travel to a road or open space. The discharge arrangement also requires occupants to return beneath the	DP5 & EP2.2

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
			building in which they are evacuating to reach Hassall street  • Discharge from the south-eastern fire stair requires traversing past the commercial lobby which is proposed to be protected by means of fire curtains. The use of a fire curtain does not achieve adequate insulation ratings and as such adequate protection for occupants to the road / open space are not achieved  • Discharge from the South Western stair requires discharging occupant within the confines of the plaza which is not considered more than 1/3 open for the perimeter (It is required that the path of egress from the fire stair is fire isolated and separated from the toilets and other such facilities accessed off the main corridor  	
7.	Non-required stairways, ramps	D1.12	The following building interconnections will need to	DP4 & EP2.2

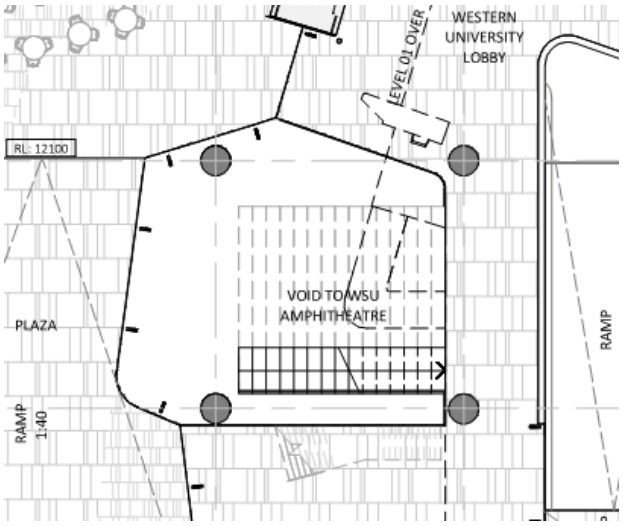
Item	Non-Compliance	DTS Clause	Description	Performance Requirement
	or escalators		be considered by the projects fire engineer: • Throughout the building there are 3 storey villages proposed. The proposal results is 3 storeys being connected without one of storeys having direct egress to a road or open space; and • The lower levels of the building are indirectly connected through stairs from Basement, ground, level 1, level 2 and potentially level 3. As such an interconnection of 5 storeys is proposed	
8.	Doorways & Doors	D2.19	Due to security reasoning the below listed doors are not proposed to fail open upon trip of the relevant active fire systems however the installation of a push to button exit accompanied by a battery backup source is proposed to be installed  	DP2
9.	Fire Hydrant	E1.3	The following performance solutions are required to be prepared by the projects fire safety engineer: • Currently unprotected openings are located within 2m either side of the outlet. Un-protected openings include a door serving the fire control room and glazing to the Southern retail facade  • Access to the pump room is by means of an air lock and not located directly off a	EP1.3

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
			fire isolated stair as per the requirements of Section 6.4.2 of AS2419.1-2005  	
10.	Sprinklers	E1.5	The sprinkler alarm valves are located within the confines of the pump room located in the basement. As such the valve sets are not located in an area that has direct access to a road or open space	EP1.4
11.	Smoke hazard management system required throughout the building (refer to Clause E2.2 in the body of this report)	E2.2, Spec E2.2a & Spec E2.2b	**It is recommended to liaise with the project's fire engineer to determine any scope in terms of opportunities for performance solutions in relation to smoke hazard management systems.** SWP consider that the following performance solutions are to be considered by the projects fire engineer: • With the nature of atriums being implemented throughout the building a performance based smoke hazard management system will need to be implemented which includes: ○ Rationalisation of the zone smoke control system to the affected levels; ○ Rationalise the stair pressurisation throughout the building due to the open compartment configuration between floors; and ○ Omission of smoke exhaust to the 3 storey villages where the class 9b portions are implemented throughout the building. • Omission of a zone smoke control system to the 4 retail tenancies located on the ground floor and the end of trip facilities located on the lower ground floor mezzanine level	EP2.2
12.	The building is proposed to contain the following: • 3 storey villages being connected throughout the building without one of storeys having direct egress to a road or open space; and • A void from which interconnects up to 6 storeys being from the Lower Ground through to potentially Level 3 (Lower ground, lower ground mezzanine, Ground, Level	Part G3, Spec G3.8	A performance solution will be required to for aspects of the design not capable of comply with Clause G3.2 to G3.8 including Specification G3.8 Atrium provisions.	CP2, EP1.4, EP2.2, EP4.2, EP4.3

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
	1, Level 2 & Level 3)			

10.3. Performance solutions required – Access Consultant

It is proposed to satisfy the following non-compliances via performance solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Parts of the Building to be Accessible	D3.3	The proposed amphitheater located within the ground floor of the main building currently has a set of stairs to access the tiered seating. The provision of only a single handrail is documented within the design for the stair. This stair to comply with DTS provisions of AS1428.1-2009 is required to have a handrail on both sides.  Details of the use of a single handrail in lieu of 2 handrails is required to be documented by the projects access consultant and adopted under a Construction Certificate as part of a performance solution.	DP2

10.4. Performance solutions required – BCA Consultant

It is proposed to satisfy the following non-compliances via performance solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Facilities in Class 3 to 9 buildings	F2.3	A performance solution is required from an accredited BCA consultant to assess the permissibility of students and staff to utilise the same banks of toilets for the tertiary levels of the development.	FP2.1

11. Relevant Authorities

Where an alternative solution is proposed to meet the performance requirements contained in any one or more of the Category 2 fire safety provisions referral to Fire and Rescue NSW under Clause 144 of the EP&A Regulations is required in either of the following types of buildings:

(a) a class 9a building that is proposed to have a total floor area of 2,000 square metres or more, or

(b) a building (other than a class 9a building) that is proposed to have:

(i) a fire compartment with a total floor area of more than 2,000 square metres, or

(ii) a total floor area of more than 6,000 square metres,

12. Statutory Fire Safety Measures

All fire/essential safety measures installed within the building are required required to be certified upon completion of the project and prior to occupation of the building by the owner of the building, by issuing a Final Fire Safety Certificate under the Act.

The owner is also required under the Act to certify each of the Fire Safety Measures annually by issuing a Fire Safety Statement.

With performance solutions, additional or more frequent maintenance may result.

13. Conclusion

The design is capable of complying with the requirements of the relevant sections of the of the Act and EPAR and the BCA 2016 subject to resolution of the identified areas of non-compliance and compliance with the recommendations provided within the report.

Further detailed regulatory reviews will need to be progressively undertaken as designs advance and become more resolved to ensure compliance is achieved.

14. BCA 2016 – Clause by Clause Assessment

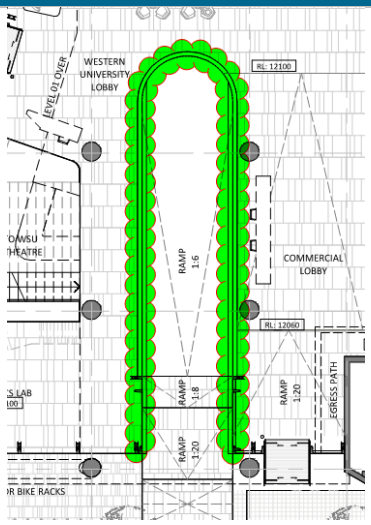
Clause	Description	Comment	Status
BCA Version			
BCA 2016	**BCA version** The BCA is generally updated every 3 years with amendments influencing health, safety and amenity features required within the building. Legislation typically allows future BCA changes to be ignored provided substantial progress on the design of the development has previously occurred.	This report assumes that the applicable BCA version is BCA 2016 amendment 1. In addition, requirements of the Premises Standards (PS) are covered as relevant. ***Note:*** *The BCA assessment undertaken is limited to a review of the 2016 (amendment 1) provisions. BCA 2019 will come into effect as of the 1st May 2019 and the building will be subject to compliance with the 2019 provisions.*	Noted
Section A: General Provisions			
A3.2	**Classification and usage** Usage on each level of the building is as follows: **LEVEL** / **USE** / **CLASS** Basement / Car parking / 7a University Space / 9b Ground / Tertiary Institute, Retail Tenancies & Commercial Lobby / 5, 6 & 9b Levels 1 – 17 / Tertiary Institute & Commercial Floor space / 5 & 9b Levels 18 & 19 / Ancillary Plant / Ancillary use to the building	The client is to confirm the use of the building in relation to what levels are for use as commercial purposes and what levels are for use for tertiary education facilities	Noted
A2.1	**Suitability of Materials** Every part of a building must be constructed in an appropriate manner to achieve the requirements of the BCA, using materials that are fit for the purpose for which they are intended.	The builder is responsible to adopt and install appropriate proprietary accredited building products and is to ensure that those products/assemblies are fit for the purpose they are intended and are installed in accordance with the manufacturer's specifications/ requirements for that system.	Compliance readily achievable
Section B: Structure			
B1.1	**Resistance to actions** The resistance of the building must be greater than the most critical action effect resulting from different combinations of actions	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage	Compliance readily achievable
B1.2	**Determination of individual actions** The magnitude of individual actions must be determined in accordance with Clause B1.2 of the BCA.	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage	Compliance readily achievable
B1.3	-	No provisions	-

<table>
<tr><th>Clause</th><th>Description</th><th>Comment</th><th>Status</th></tr>
<tr><td>B1.4</td><td>Determination of structural resistance of materials and forms of construction
The structural resistance of materials and forms of construction must be determined in accordance with the relevant Australian Standards in accordance with Clause B1.4 of the BCA.</td><td>Certification from a qualified structural engineer will need to be provided at Construction Certificate stage.</td><td>Additional details required</td></tr>
<tr><td>B1.5</td><td>Structural software
Structural software used in computer aided design of a building or structure that uses design criteria based on DTS provisions of the BCA must comply with the ABCB Protocol for Structural Software.</td><td>-</td><td>Noted</td></tr>
<tr><td>B1.6</td><td>Construction of buildings in flood hazard areas</td><td>-</td><td>N/A</td></tr>
<tr><td>Part B</td><td>Structure and importance level
Assessment of the building structure will be required for dead, live, wind, earthquake, fire and other loads required by current day AS Codes.
The design of the structure must be based on the appropriate ‘Importance Level’ under BCA Table B1.2a.</td><td>The building has an importance level 3 in accordance with Table B1.2a.</td><td>Compliance readily achievable</td></tr>
<tr><td colspan="4"><h2>Section C: Fire Resistance</h2></td></tr>
<tr><td colspan="4"><h2>Part C1 – Fire Resistance and Stability</h2></td></tr>
<tr><td>C1.1</td><td>Type of Construction Required
Type A Construction
BCA Type A fire resisting construction is required.
Refer to Appendix C1.1 and Specification C1.1 below for the relevant fire resisting requirements
The below is a summary of the FRL requirements
<table><tr><td>Loadbearing external walls, columns, beams</td><td>Generally a 2 hr FRL throughout subject to reduced FRL for the retail as part of a performance Solution</td></tr><tr><td>Non-loadbearing external walls, etc. less than 3m from a fire source or boundary or less than 6m from another building on the site</td><td>Generally a 2 hr FRL throughout subject to reduced FRL for the retail as part of a performance Solution</td></tr><tr><td>Non-loadbearing external walls etc. greater than 3m from a fire source or boundary or more than 6m from other buildings on the site.</td><td>Nil</td></tr><tr><td>Internal load-bearing walls/columns etc</td><td>Generally a 2 hr FRL throughout subject to reduced FRL for the retail as part of a</td></tr></table></td><td>Fire resisting requirements to building elements
1. All external walls within 3m from the boundary:
• Must be non-combustible;
• Achieve the following FRLs-
i. Ground Floor Retail & Tertiary Establishment – 120/120/120 or -/120/120; (subject to a performance based solution for the retail);
ii. All Upper levels being commercial or Tertiary use - 120/120/120 or -/120/120;
2. Any loadbearing internal walls must be of concrete or masonry;
3. Where a part of a building required to have an FRL depends upon direct vertical or lateral support from another part to maintain its FRL, that supporting part must have an FRL and be non-combustible as required by Clause 2.2 of the Specification;
4. Any non-loadbearing internal walls required to be fire resistant or shafts must be non-combustible; and
5. Roof is not required to achieve a fire rating provided the covering is non-combustible as sprinklers are being installed throughout the development.</td><td>Additional details required</td></tr>
</table>

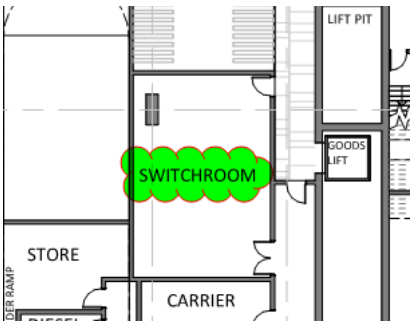
Clause	Description		Comment	Status
		performance Solution (The carpark is granted a concession to be 1hr as it is sprinkler protected)	**Structural details & specifications of the wall types and relevant FRLs proposed are to be submitted from a suitably qualified Structural Engineer to the Certifying Authority upon application of the relevant Construction Certificate**	
	Floors	Generally a 2 hr FRL throughout subject to reduced FRL for the retail as part of a performance Solution	A reduction in FRLs are proposed to the separating elements / walls and floors of the class 6 portions of the building from 180/180/180 down to 120/120/120. **Details of the proposed method of separation are required to be submitted to the projects fire Engineer to determine the feasibility of reducing the FRLs via means of a performance solution**	Performance Solution
	Roofs	Nil with sprinkler protection (non-combustible covering)		
C1.1, Spec C1.1	**Combustible Materials to External Walls in Fire** External walls should be constructed of non-combustible materials and/or otherwise not contribute to the risk of fire spread via the external façade. The following materials may be used where non-combustible materials are required:- • Plasterboard. • Perforated gypsum. • Fibrous-plaster sheeting to AS 2185. • Fibre-reinforced cement sheeting. • Pre-finished metal sheeting. • Bonded laminated materials. • As determined by testing to AS 1530.1 • An appropriately BCA accredited product or system		A detailed review of the external wall system and materials will be undertaken to ensure no combustible materials (including Aluminium Composite Panels ACP's) and non-compliant building products are proposed. **All materials proposed within and attached to the external wall are to be detailed and submitted as part of SWP's External & Common wall (Cladding and Wall register) Design Certificate. This also includes relevant test reports, Codemark certification and certificates of conformity demonstrating compliance with relevant Australian Standards.** *Should any deviation occur for the proposed cladding product or sarking material (being a greater thickness than 1mm and a flammability index rating of no greater than 5) either a performance solution will be required or a variation to the selected material will need to be implemented within the design*	Additional details required
C1.2	**Calculation of rise in storeys** **Effective Height / Calculation of rise in storeys**. Rise in storeys is a defined BCA term addressing the number of main building levels excluding basements. Effective height is defined under the BCA as vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units). These parameters influence the BCA provisions applicable to the building.		The following parameters apply: Rise in storeys: 19 storeys Effective Height: 64.35m (Level 17 RL76.05 – Ground Level RL11.70)	Noted

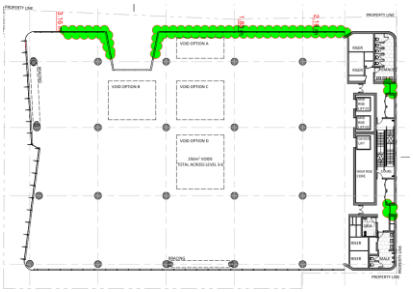
Clause	Description	Comment	Status
C1.3	**Buildings of multiple classification**	The building is required to be constructed of Type A fire resisting construction as the classification of the top storey is a Class 5	Noted
C1.4	**Mixed types of construction**		N/A
C1.5	**Two storey Class 2, 3 or 9c buildings**		N/A
C1.6	**Class 4 parts of buildings**		N/A
C1.7	**Open spectator stands and indoor sports stadiums**		N/A
C1.8	**Lightweight construction** Lightweight construction used in a wall system must comply with Specification C1.8. Lightweight construction used as a fire-resisting covering of a steel column or the like, and where the covering is not in continuous contact with the column must have the voids filled to a height of not less than 1.2m above the floor and where the column is liable to be damaged must be protected by steel or other suitable material.	Details of the proposed systems to be installed must be in accordance with a tested prototype.	Compliance readily achievable
C1.9	**Non-combustible building elements** In a building required to be of Type A construction, the following building elements and their components must be non-combustible: i. External walls and common walls, including all components incorporated within them including façade covering, framing and insulation; ii. The flooring and floor framing of lift pits; and iii. Non-loadbearing internal walls where they are required to be fire-resisting	A detailed review of the makeup of the wall systems and materials will be undertaken to ensure no combustible materials (including Aluminium Composite Panels ACP's) and non-compliant building products are proposed. **All materials proposed within and attached to the external wall are to be detailed and submitted as part of SWP's External & Common wall (Cladding and Wall register) Design Certificate. This also includes relevant test reports, Codemark certification and certificates of conformity demonstrating compliance with relevant Australian Standards.** *Should any deviation occur for the proposed cladding product or sarking material (being a greater thickness than 1mm and a flammability index rating of no greater than 5) either a performance solution will be required or a variation to the selected material will need to be implemented within the design*	Additional details required
C1.10	**Fire Hazard Properties** Floor materials, floor coverings and wall and ceiling lining materials need to comply with prescribed fire hazard properties. Refer to Appendix C1.10.	Compliance assumed and will require verification test data for all timber and other combustible linings and materials, including:- • Carpets • Vinyls (walling and flooring) • Timber flooring and wall linings • Veneered wall panelling • Spray-on insulation material • Other combustible finishes	Compliance readily achievable

Clause	Description	Comment	Status
		• Carpark soffit insulation fire test reports, based on 'room fire testing' will be required to meet fire brigade consent conditions if applicable.	
		The fire hazard properties of floor linings and coverings, wall linings and ceiling linings must comply with Specification C1.10 and NSW Specification C1.10. Test reports to be provided certifying that: • the floor linings achieve a critical radiant flux 1.2 • The wall and ceiling linings achieve a group 1, 2 or 3 rating Test reports of all the proposed lining materials are required to be provided to the project certifying Authority for review and acceptance prior to the installation	
C1.11	**Performance of external walls in fire**		N/A
C1.12	**Non-combustible materials**	Gypsum, metal and laminated non-combustible materials containing combustible components are deemed to be non-combustible.	Noted
C1.13	**Fire-protected timber: Concession**		N/A
C1.14	**Ancillary elements** An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is non-combustible or as specified under this clause.		Compliance readily achievable
Part C2 – Compartmentation and Separation			
C2.1	**Application of Part**	Clauses C2.2, C2.3 and C2.4 do not apply to a sprinkler protected carpark, open deck carpark or open spectator stand.	Noted
C2.2	**Floor area limitations** **(Type A construction)** The floor area and volume limitations are: Class 5 & 9b: 8,000m^2 and 48,000m^3 Class 6: 5,000m^2 and 30,000m^3	Refer to appendix C2.2 of this report for floor areas and volumes.	Complies
C2.3	**Large isolated buildings**		N/A
C2.4	**Perimeter vehicular access**		N/A
C2.5	**Class 9a and 9c buildings**		N/A
C2.6	**Vertical separation of openings in external walls**	The building is installed with an automatic fire suppression system	N/A
C2.7	**Separation by fire wall**	A performance based fire wall is proposed between the ground floor and the ramp and associated openings serving the basement carpark	Performance Solution

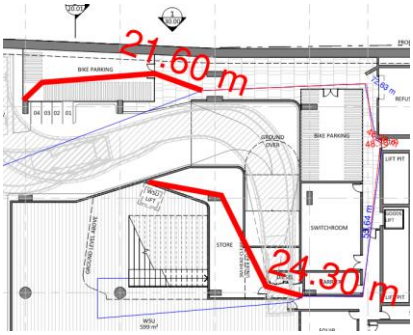
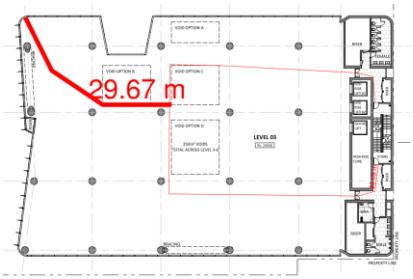
Clause	Description	Comment	Status
			
C2.8	**Separation of classifications in the same storey** As the building has parts of different classifications located alongside one another in the same storey each building element must have the higher FRL prescribed in Specification C1.1 of the BCA or the parts must be separated by a fire wall.	A reduction in FRLs are proposed to the separating elements / walls of the class 6 portions of the building from 180/180/180 down to 120/120/120 Details of the proposed method of separation are required to be submitted to the projects fire Engineer to determine the feasibility of reducing the FRLs via means of an Performance Solution *All other areas throughout the building will be provided with compliant structural elements which conform to the provisions of table 3 of Spec C1.1. Areas considered to include DTS provisions are the walls bounding the amphitheatre and the carpark & End of trip facilities.*	Performance Solution

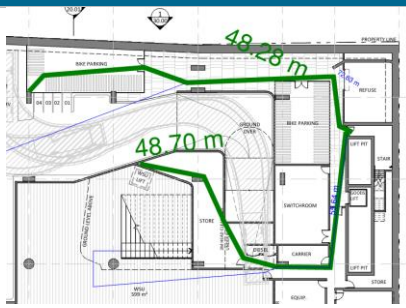
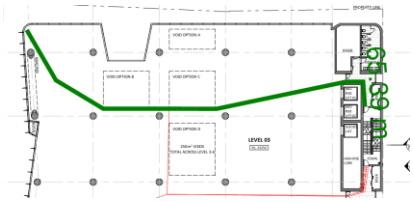
Clause	Description	Comment	Status
C2.9	**Separation of classifications in different storeys** As different classifications are situated one above the other in adjoining storeys they must be separated in accordance with the DTS provisions of Table of BCA 2016 Specification C1.1.	As different classifications are situated one above the other in adjoining storeys they must be separated in accordance with the DTS provisions of the BCA. • The Carpark (Class 7a) is to be separated from the Retail tenancies (Class 6) on the ground floor by a slab achieving an FRL of 120/120/120 (subject to a performance solution); • The Carpark (Class 7a) is to be separated from the Tertiary Education levels (Class 9b) on the ground floor by a slab achieving an FRL of 120/120/120; • The Retail tenancies (Class 6) on the ground floor are to be separated from the Tertiary Education levels (Class 9b) by a slab achieving an FRL of 120/120/120 (subject to a performance solution); • The Tertiary Education levels (Class 9b) are to be separated from the Tertiary Education levels (Class 9b) by a slab achieving an FRL of 120/120/120; • The Tertiary Education levels (Class 9b) is to be separated from the Commercial levels (Class 5) by a slab achieving an FRL of 120/120/120 • The Commercial levels (Class 5) is to be separated from the Commercial levels (Class 5) by a slab achieving an FRL of 120/120/120 **Structural details & specifications are to be submitted to the certifying Authority upon application of the relevant Construction Certificate.**	Additional Details Required
		The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • A reduction in FRLs is proposed throughout the ground floor retail spaces. The retail spaces are required to achieve an FRL of 180/180/180 and are proposed to be reduced by means of a performance-based solution down to an FRL of 120/120/120	Performance Solution
C2.10	**Separation of Lift Shafts**	The proposed lift shafts serving the building must be separated as specified in Clause 2.10. Separation of the lift including emergency lift shafts must be achieved from the remainder of the building by complying with elements achieving the following nominated FRLs-	Additional details required

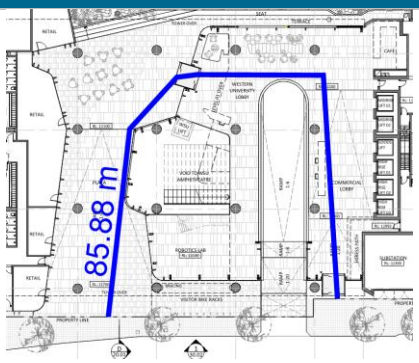
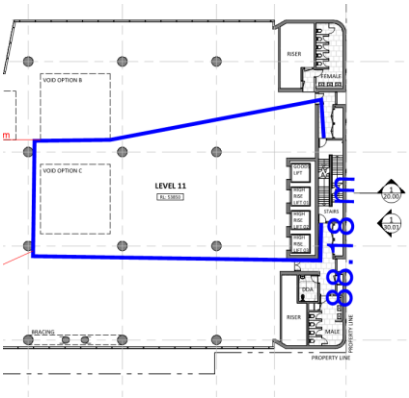
Clause	Description	Comment	Status
		• **Class 5, 6, 7a, & 9b - 120/120/120** Openings for lift landing doors and services must be protected in accordance with the DTS provisions of Part C3 of the BCA **Structural details & specifications of the wall types and relevant FRLs proposed are to be submitted from a suitably qualified Structural Engineer to SWP upon application of the Structural Construction Certificate.** *Note 1 – A reduction of FRLs is proposed for the class 6 portion of the development to achieve an FRL of 120/120/120 in lieu of 180/180/180*	
C2.11	**Stairways and lifts in one shaft**	The lift is within its own shaft	Complies
C2.12	**Separation of Equipment**	Equipment that comprises **boilers** or **batteries** (having a voltage exceeding 24 volts and a capacity exceeding 10 ampere hours) including a pump room that is not installed within a sprinkler protected building / area must be separated from the remainder of the building by construction with an FRL as required under Specification C1.1 but not less than 120/120/120.	Compliance readily achievable
C2.13	**Electricity Supply System** A substation located within a building or main switchboard, which sustains emergency equipment, must be separated from the remainder of the building by 2hr fire rated construction.	The switch room located within the basement level is required to be fire separated from the remainder of the building by no less than an FRL of 120/120/120.  **Structural details & specifications of the wall types and relevant FRLs proposed are to be submitted from a suitably qualified Structural Engineer to SWP upon application of the relevant Construction Certificate.** *It should be noted that the substation which is currently located on the ground floor is required to be separated from the remainder of the building by an FRL of not less than 180/180/180 to conform with the energy suppliers specifications.*	Additional Details Required
C2.14	**Public corridors in Class 2 & 3 buildings**		N/A

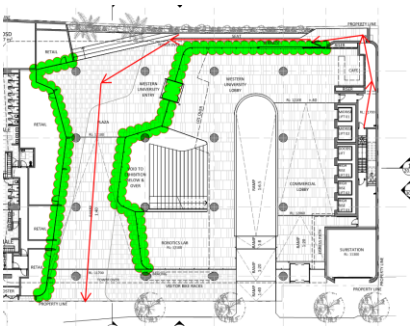
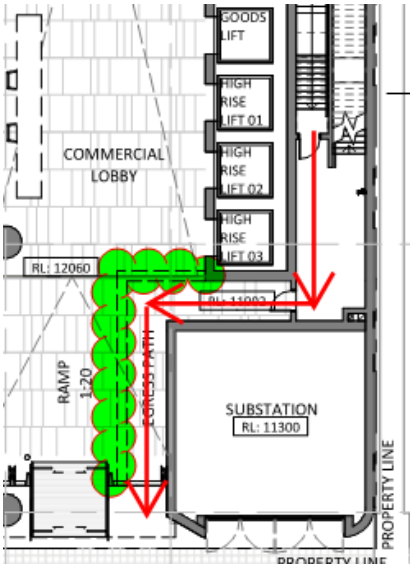
Clause	Description	Comment	Status
Part C3 – Protection of Openings			
C3.1	**Application of Part**		Noted
C3.2	**Protection of openings in external walls** Openings in the external walls of the building are to be protected in accordance with C3.4, being fire rated windows, external sprinklers or the like, if: • less than 3m to side or rear boundary, • less than 6m from the far boundary of a road or lane, • Less than 6m from another building on the same allotment. Openings that require protection should not occupy more than $^1/_3$ of the storey in which they occur.	The following openings located on ground floor through to the level 18 plant room are located within 3m of the boundary (fire source feature). These openings are not proposed to be protected by measures listed within BCA Clause C3.4 and as such create a non-compliance that is to be addressed by means of a performance solution prepared by the projects Fire Engineer  *It should be noted that should a drencher system be installed to protect these unprotected openings a performance solution will be required to address the use of an active system which occupies more than 1/3 of the storey*	Performance Solution
C3.3	**Separation of external walls and associated openings in different fire compartments**		N/A
C3.4	**Acceptable method of protection**	The following methods of protection are permissible within Clause C3.4 of the BCA- **Window Protection** • Wall wetting sprinklers; • -/60/- Fire rated windows that are automatic closing or permanently fixed in the closed position; or • -/60/60 automatic fire shutters. **Doorway Protection** • wall wetting sprinklers used with doors that are self-closing; or • Automatic closing or -/60/30 self-closing or automatic closing fire doors.	Noted
C3.5	**Doorways in fire walls**		N/A
C3.6	**Sliding Fire Doors**		N/A
C3.7	**Protection of doorways in horizontal exits**		N/A
C3.8	**Openings in Fire Isolated Exits** -/60/30 self-closing fire doors are required to doorways providing access to fire isolated stairways.	A door schedule indicating compliance is required to be provided and will be checked upon an application for the main works Construction Certificate	Additional Details Required
C3.9	**Service penetrations in fire isolated exits** Service penetrations other than electrical wiring for essential service installations, pressurisation ducts		Noted

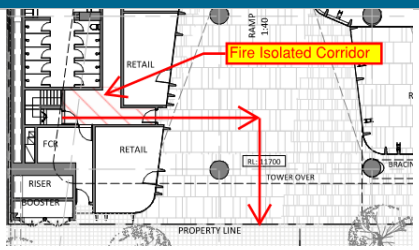
Clause	Description	Comment	Status
	with an FRL of -/120/60, or water pipes for fire services are not permissible.		
C3.10	**Openings in fire isolated lift shafts** Openings in lift shafts are to be protected by -/60/- fire doors complying with AS1735.11. Lift indicator panels are to be backed by construction having an FRL of not less than -/60/60 if it exceeds 35,000mm2 (175 X 200 mm).	Certification from the lift supplier is required for the installation of the new lifts	Additional Details Required
C3.11	**Bounding construction: Class 2, 3, 4 and 9 buildings**		N/A
C3.12	**Openings in floors for services** Services passing through floors are to be placed within fire resisting shafts or in accordance with Clause C3.15.	**Class 5, 7a, 6 & 9b** Loadbearing shafts are required to have an FRL of not less than 120/90/90, and for non-loadbearing shafts an FRL of not less than -/90/90. **Details of the Shaft wall and passive fire systems proposed to be used within the building are to be submitted within a schedule upon application of the relevant Construction Certificate to the Certifying Authority** *Note 1 – A reduction of FRLs is proposed for the class 6 portion of the development to achieve an FRL of 120/120/120 in lieu of 180/180/180*	Additional details required
C3.13	**Openings in shafts**	In a building of Type A construction an opening in a wall providing access to a ventilating, pipe, garbage, or other service shaft must be protected by: • If it is a sanitary compartment - a door or panel which together with its frame, is non-combustible or has an FRL of not less than -/30/30, or • A self-closing -/60/30 fire door or hopper, or • An access panel with an FRL of not less than -/60/30, or • If the shaft is a garbage shaft - a door or hopper of non-combustible construction.	Compliance readily achievable
C3.14	-	This clause has deliberately been left blank	-
C3.15	**Openings for service installation** Methods and materials used are to be identical to tested prototypes and in accordance with AS4072.1 and AS1530.4, and having achieved the required FRL or resistance to the incipient spread of fire or other specified method.	Any system used must be a certified system and installed in accordance with the tested method. Specifications of the methods of fire sealing need to be provided	Compliance readily achievable
C3.16	**Construction Joints** Construction joints in elements required to have a fire resistance with respect to integrity and insulation must be protected.	Construction joints are to be installed in accordance with a tested prototype in accordance with AS1530.4.	Compliance readily achievable

Clause	Description	Comment	Status
C3.17	**Columns protected with lightweight construction**	Columns must be protected in accordance with the identical tested prototype.	Compliance readily achievable
Section D: Access and Egress			
Part D1 - Provision for Escape			
D1.1	**Application of Part**		Noted
D1.2	**Number of exits required** At least two exits need to serve all areas of every storey as follows: • High rise buildings over 25m in effective height; • Class 9 buildings of more than 6 storeys; and • Class 9 storeys accommodating more than 50 persons	The following areas contain a single exit in lieu of 2 required exits: • The small retail tenancies located on the ground floor Details of the use of a single exit is required to be documented by the projects fire engineer as part of a performance solution.	Performance Solution
D1.3	**When fire-isolated stairways and ramps are required** Every stair in a Class 5 to 9 building must be fire isolated unless it does not connect or pass through more than 3 consecutive floors in a sprinkler protected building, or 2 storeys in a non-sprinkler protected building.	Each level is provided with a scissor stair / fire isolated exits	Complies
D1.4	**Exit travel distances** No point on the floor must be more than 20m to an exit or a point in which travel in different directions to 2 exits is available, in which case, the maximum distance to 1 exit cannot exceed 40m. *(Note distances have been considered from test fit plans and where not available the general floor arrangement on the other levels)*	The following areas have been identified with distances exceeding 20m to a point of choice: • Basement Level – Up to 25m to a POC  • Level 1 through to Level 18 Plant – Up to 30m to a POC  The following areas have been identified with exit travel distances exceeding 40m through a POC to the nearest available exit: • Basement Level – Up to 50m	Performance Solution

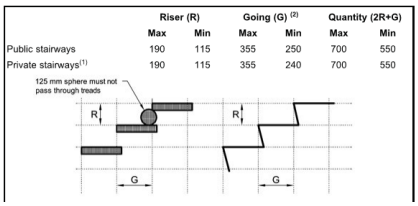
Clause	Description	Comment	Status
		 • Ground Floor – Up to 50m  • Level 1 through to Level 18 Plant – Up to 66m  Details of the extended travel distances are required to be documented by the projects fire engineer as part of a performance solution	
D1.5	**Distance between alternative exits** The following travel distance limits apply: • ≤ 60m travel distance between alternative exits and not less than 9m between alternative exits; and • Exit paths to alternative exits should not converge at any point to be less than 6m apart. *(Note distances have been considered from available general floor arrangements. Allowances for fit out may be required through Fire Engineering)*	The following areas have been identified with distances between alternative exits exceeding 60m: • Basement Level – Up to 75m  • Ground Floor – Up to 86m	Performance Solution

Clause	Description	Comment	Status
		 • Level 1 through to Level 18 Plant – Up to 90m  Details of the extended travel distances and reduced distances between alternative exits are required to be documented by the projects fire engineer as part of a performance solution	
D1.6	**Dimensions of exits and paths of travel to exits**	***Refer to appendix D1.13 of this BCA Report*** An assessment has been undertaken as per the breakdowns requested from WSU & Charter Hall. • An assessment with a population density of 1:10 has been shown to comply with the DTS provisions associated with the BCA. • An assessment has also been undertaken against a population density of 1:6.8. All levels which exceed a population of 200 occupants do not comply as there are only provisions allowed in the design for 2 exits (Levels 3 - 17). Details need to be assessed on the required egress widths and the proposed population and whether additional means of exits can be incorporated or if a performance solution can be obtained through the projects fire engineer.	Does Not Comply
D1.7	**Travel via fire-isolated exits**	The following discharge arrangements will require a performance solution to be obtained through the projects fire engineer: • Discharge arrangements from the Northern fire isolated stair necessitate	Performance Solution

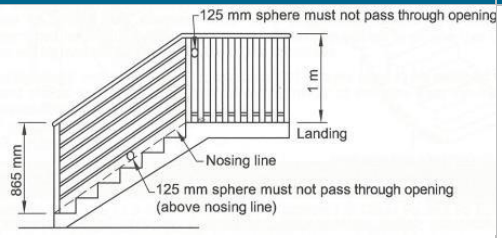
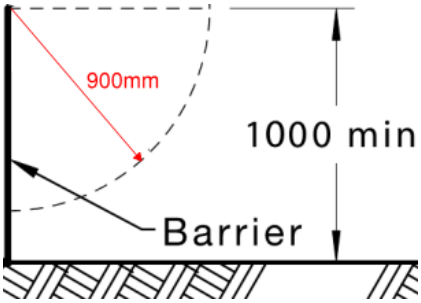
Clause	Description	Comment	Status
		passing by unprotected openings which are located within 6m of the path of travel to a road or open space. The discharge arrangement also requires occupants to return beneath the building in which they are evacuating to reach Hassall street  • Discharge from the south-eastern fire stair requires traversing past the commercial lobby which is proposed to be protected by means of fire curtains. The use of a fire curtain does not achieve adequate insulation ratings and as such adequate protection for occupants to the road / open space are not achieved  • Discharge from the South Western stair requires discharging occupant within the confines of the plaza which is not considered more than 1/3 open for the perimeter (It is required that the path of egress from the fire stair is fire isolated and separated from the toilets and other such facilities accessed off the main corridor	

Clause	Description	Comment	Status
			
D1.8	**External stairways or ramps in lieu of fire-isolated exits**		N/A
D1.9	**Travel by non-fire-isolated stairways or ramps**	The stair serving the lower ground floor amphitheatre has been considered as a required non-fire isolated stair	Complies
D1.10	**Discharge from exits**	An exit must not be blocked nor be capable of being blocked at its point of discharge. The path of discharge from the fire isolated exit must achieve a width of not less than 1m.	Compliance readily achievable
		Details of the methods of protection of the doors are required to be provided on the plans to demonstrate compliance against the requirements of BCA Clause D1.10	Additional Details Required
D1.11	**Horizontal exits**		N/A
D1.12	**Non-required stairways, ramps or escalators** Non-required stairs are permitted to connect up to 3 consecutive levels in a sprinkler protected building if one of the levels has direct access to open space	The following building interconnections will need to be considered by the projects fire engineer: • Throughout the building there are 3 storey villages proposed. The proposal results is 3 storeys being connected without one of storeys having direct egress to a road or open space; and • The lower levels of the building are indirectly connected through stairs from Basement, ground, level 1, level 2 and potentially level 3. As such an interconnection of 6 storeys is proposed	Performance Solution
D1.13	**Number of persons accommodated**	Refer to Appendix D1.13	Noted
D1.14	**Measurement of distance**		Noted
D1.15	**Method of measurement**		Noted
D1.16	**Plant rooms and lift machine rooms: Concession**		Noted
D1.17	**Access to lift pits**		Noted
Part D2 – Construction of Exits			
D2.1	**Application of Part**		Noted
D2.2	**Fire Isolated Stairs or Ramps**	A stairway or ramp that is required to be within a fire-resisting shaft must be constructed- a) Of non-combustible materials; and b) So that if local failure occurs it will not cause structural damage to, or impair the fire resistance of the shaft	Compliance Readily Achievable

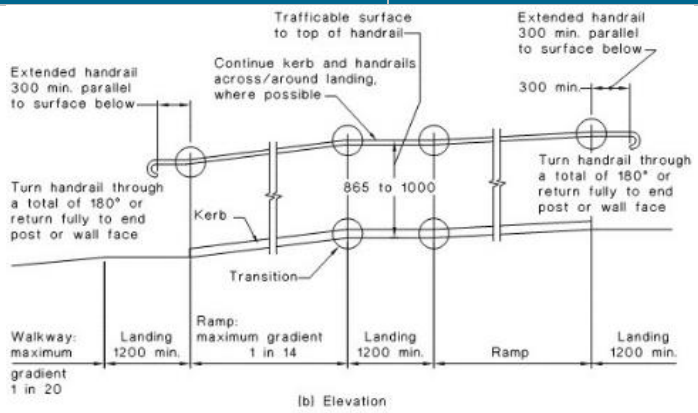
Clause	Description	Comment	Status
D2.3	**Non Fire Isolated Stairways and Ramps**	Any non-fire isolated required stairs throughout the project are required to be constructed in accordance with the provisions of D2.3, or only of- a) Reinforced or pre-stressed concrete; or b) Steel in no part less than 6mm thick; or c) Timber that- I. Has a finished thickness of not less than 44mm; and II. Has an average density of not less than 800kg/m3 at a moisture content of 12%; and III. Has not been joined by means of glue unless it has been laminated and glued with resorcinol formaldehyde or resorcinol phenol formaldehyde glue	Compliance Readily Achievable
D2.4	**Separation of rising and descending stair flights**		Complies
D2.5	**Open access ramps and balconies**		N/A
D2.6	**Smoke lobbies**		N/A
D2.7	**Installations in Exits and Paths of Travel**	Electrical boards and the like are to be located within and enclosed by non-combustible construction or have a fire-protective covering with the doorway suitably sealed against smoke spreading from the enclosure. Generally the services or equipment may be enclosed in non-combustible construction such as MDF with a solid core **Details of the proposed doors including notation of smoke seals and / or metal backed solid core doors are to be incorporated within a door schedule to be submitted for the issue of the relevant Construction Certificate for review**	Additional details required
D2.8	**Enclosure of space beneath stairs and ramps**		N/A
D2.9	**Width of required stairways and ramps**		N/A
D2.10	**Pedestrian ramps**		N/A
D2.11	**Fire-isolated passageways** Fire isolated passageways are to have an FRL equivalent to the fire resisting stair shaft as specified in Table 4 of Specification C1.1.	**A Structural Engineer is to determine adequate FRLs and nominate these on structural plans associated with the application with the relevant Construction Certificate**	Additional Details Required
D2.12	**Roof as open space** The roof is required to have an FRL of not less than 120/120/120 and not incorporate any roof lights or other openings within 3m of the path of travel.	Fire stairs serving the tower and basement levels of the building discharge to the ground floor and out onto Hassall Street, which is technically the roof of the carpark level below and end of trip facilities located below. **A Structural Engineer is to determine adequate FRLs and nominate these on structural plans associated with the**	Applicable

<table>
<tr><th>Clause</th><th>Description</th><th>Comment</th><th>Status</th></tr>
<tr><td></td><td></td><td>application of the relevant Construction Certificate</td><td></td></tr>
<tr><td>D2.13</td><td>Going and Risers
Stairways within this development are to be constructed and comply with the following-
• Stairs are to have risers measuring between 115-190mm and goings between 250-355mm.
• Goings and Risers are to satisfy the equation of 2R+G=700(max) and 550(min).
• Adjacent risers, or between adjacent goings a variation no greater than 5mm is permitted and the largest and smallest riser within the flight or the largest and smallest going within a flight is not to exceed a variation of 10mm.
• Under the requirements of AS1428.1-2009 open riser are not permitted.
• All treads to be fitted with non-slip finish or non-skid strips.
• Treads are required to have a surface or nosing strip with a slip-resistance classification not less than listed in Table D2.14 when tested in accordance with AS 4586</td><td> 

Details and specifications of all stairways are to be submitted to the Certifying Authority for review prior to the issue of the relevant Construction Certificate</td><td>Additional Details Required</td></tr>
<tr><td>D2.14</td><td>Landings
Ramps Surfaces, stair tread surfaces or nosing strips, and stair landing surfaces, or landing nosing strips to a flight below, must achieve slip-resistance classifications to AS4586-2013 as follows: -
<table>
<tr><th><u>Application</u></th><th><u>Dry Surface Conditions</u></th><th><u>Wet Surface Condition</u></th></tr>
<tr><td>1:14 or steeper ramps</td><td>P4 or R11</td><td>P5 or R12</td></tr>
<tr><td>Ramps of 1:14 to 1:20</td><td>P3 or R10</td><td>P4 or R11</td></tr>
<tr><td>Tread or Landing Surface</td><td>P3 or R10</td><td>P4 or R10</td></tr>
<tr><td>Nosing Strip or Landing Strip</td><td>P3</td><td>P4</td></tr>
</table></td><td>Certification / test reports on the slip resistance of the surfaces will need to be provided on constructed elements.
All stairways and ramps located throughout the ground floor are considered to adopt slip ratings associated with wet surface conditions within the table to the left.</td><td>Compliance readily achievable</td></tr>
<tr><td>D2.15</td><td>Thresholds
Steps should not occur at doorways without a threshold landing except as follows:
• A single 190mm step is permitted (other than in health or aged care buildings) at doors leading to the exterior.</td><td>Note that where access for people with disabilities is required it is not permitted to have a step at the threshold of a doorway</td><td>Compliance readily achievable</td></tr>
<tr><td>D2.16</td><td>Barriers to Prevent Falls</td><td>• Balustrades complying with Deemed-to-Satisfy provisions of the BCA are to be provided to where the level of the surface below is 1m or more;
• Where the level of the surface below is 4m or more, a balustrade or other barrier must not facilitate</td><td>Additional Details Required</td></tr>
</table>

Clause	Description	Comment	Status
	 	climbing of horizontal elements between 150mm and 760mm above the floor; • Any opening in the balustrade must not permit a 125mm sphere to pass through the balusters; and • Climbable elements cannot be located within 900mm of the top rail of each balustrade where the fall is greater than 4m. This measurement is taken in an arc as seen in the extract to the left.	
D2.17	**Handrails** Handrails to exits including parts of fire isolated exits serving an area required to be accessible to people with disabilities must comply with Clause 12 of AS1428.1: - • Handrails not to obstruct circulation space • 30-50mm diameter • 865-1000mm above nosing line of stairs • 865-1000mm above ramps and landings • Consistent height throughout • 50mm grip clearance and no obstructions to handhold • Continuous at internal (return) landings Provided with handrail extensions and 180 degree curled ends	Handrails are to be provided in compliance with Clause D3.3 and include the following- • **Non-Fire Isolated Stairways and Ramps** All stairs and ramps not used as an emergency exit are to have handrails installed on both sides that comply with Clause 10 & 11 of AS1428.1-2009 • **Fire Isolated Stairways and Ramps** In Fire Isolated Stairways & Ramps a handrail is required to be installed to at least one side of stair flights and located not less than 865mm above the nosing's of stair treads and the floor surfaces of landings • **Consistent Handrail Heights for all stairways** The height of the top of the handrail, measured at a height of between 865mm – 1000mm vertically from the stair nosing shall be consistent throughout the ramp (or stairs) and any landings. All stairs including fire stairs are required to be designed to comply with Clause 12 of AS1428.1 – 2009 **Detailed designs, drawings and specifications of the handrail design are to be submitted to the certifying Authority for a further detailed review upon application of the relevant Construction Certificate.**	Additional Details Required
	Ramps		

Clause	Description	Comment	Status

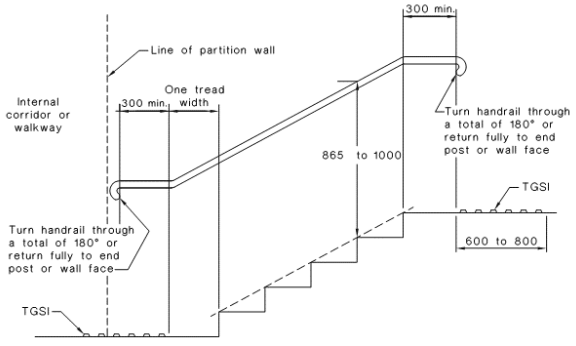


(b) Elevation

DIMENSIONS IN MILLIMETRES

FIGURE 14 RAMP HANDRAILS

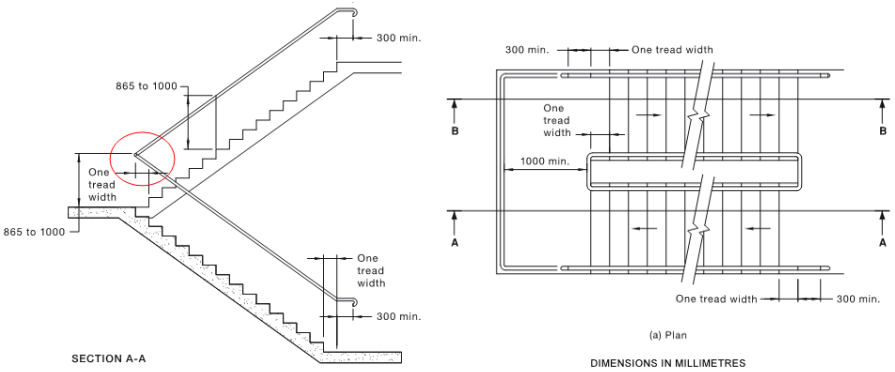
Stairways



SECTIONAL VIEW

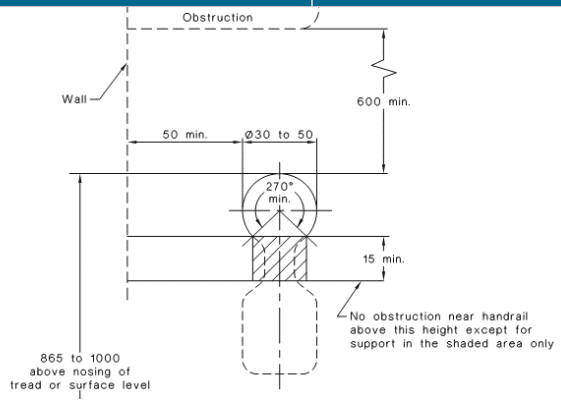
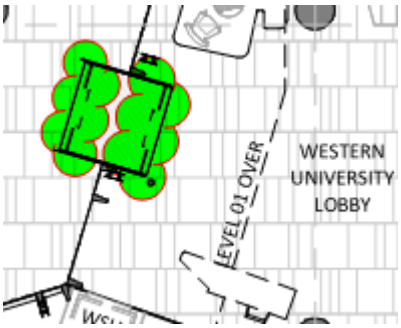
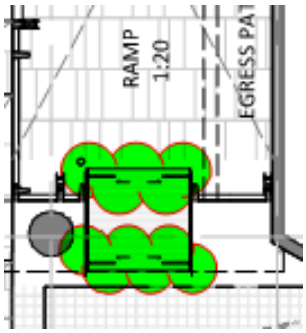
DIMENSIONS IN MILLIMETRES

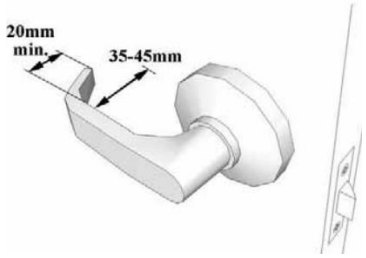
FIGURE 26(B) STAIRWAY LOCATION AND HANDRAIL EXTENSIONS AT END OF STAIRWAY OTHER THAN AT LINE OF BOUNDARY



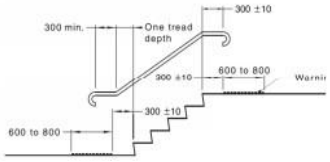
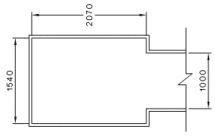
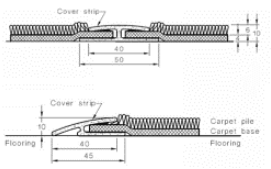
DIMENSIONS IN MILLIMETRES

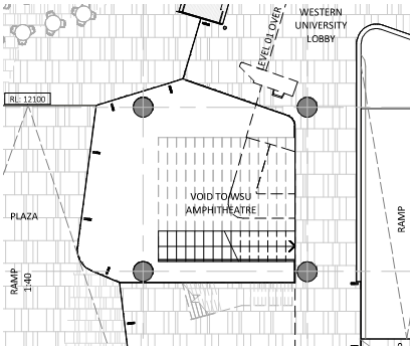
Handrail Profile

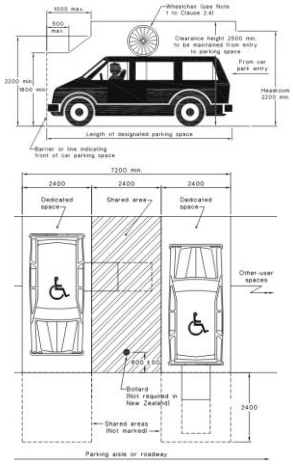
Clause	Description	Comment	Status
			
D2.18	**Fixed Platforms, Walkways, Stairways and Ramps** Platforms, walkways, stairs, ladders and the like that give access to and around plant and equipment, machine rooms, attic spaces and other low use areas of the building are permitted provided that construction details are to AS1657.		Noted
D2.19	**Doorways and doors** Must not be revolving door, roller shutter or tilt door. Can be fitted with a sliding door if it leads directly to open space and can be opened manually under a force of not more than 110N and be fitted with a fail-safe device if the door is power operated.	The 2 sets of automatic sliding doors extracted below are proposed to be installed at the ground floor main entry to the commercial lobby. These doors are required to be opened manually under a force of not more than 110N and be fitted with a fail-safe device if the door is power operated.   Due to security reasoning the doors are not proposed to fail open upon trip of the relevant active fire systems however the installation of a push to button exit accompanied by a battery backup source is proposed to be installed. **Details of the non-compliance is to be submitted to an accredited fire engineer to determine the feasibility of justifying this**	Performance Solution

Clause	Description	Comment	Status
		non-compliance as part of a Performance Solution.	
D2.20	**Swinging doors**		Complies
D2.21	**Operation of latch**	Doors in a Class 9b building that is a door to a required exit or forming part of a required exit or in the path of travel to a required exit are required to achieve compliance with the following: • A room accommodating less than 100 occupants requires a single hand downward action on a single device to conform with the requirements as extracted below from AS1428.1-2009  • A room accommodating more than 100 occupants require a device such as a panic bar to allow a single hand pushing action.  Door hardware and associated specifications are required to be submitted to the Certifying Authority upon application for the relevant Construction Certificate for review	Additional Details Required
D2.22	**Re-Entry from Fire-Isolated Exits** Doors of fire-isolated exits must not be locked from the inside of a fire-isolated exit, unless: <u>Option 1</u> All doors are fitted with a fail-safe device that automatically unlocks the door upon activation of a fire alarm; **AND** • On at least every fourth storey, the doors are not able to be locked at all and are sign posted stating re-entry is available at that level. <u>Option 2</u> • All doors are fitted with a fail-safe device that automatically unlocks the door upon activation of a fire alarm; **AND** An intercommunication or audible/visual alarm system is provided within the stair to assist persons	Levels which service a building over an effective height of 25m are required to facilitate re-entry provisions throughout the flights. Doors of fire-isolated exits must not be locked from the inside of a fire-isolated exit, unless all doors are automatically unlocked by a failsafe device by activation of a fire alarm. Additionally, on at least every fourth storey, the doors should not be locked at all and should be sign posted that re-entry is available at that level. Alternatively, an intercommunication or audible/visual alarm system is required within the stair to assist persons who may accidentally be locked within the stair.	Additional Details Required

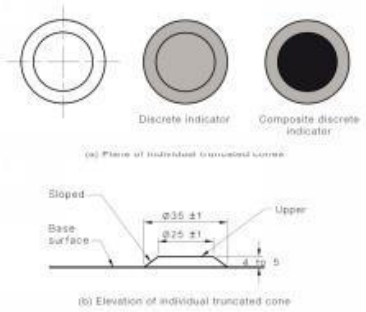
Clause	Description	Comment	Status
	who may accidentally be locked within the stair.	**Details of the proposed method of re-entry is required to be submitted to the Certifying Authority upon application for the relevant Construction Certificate.** *Note: Should a deviation be proposed to this DTS method a performance based solution should be sought by the projects accredited fire engineer*	
D2.23	**Signage to Fire Safety Doors** An automatic door held open by an automatic hold-open device: **FIRE SAFETY DOOR DO NOT OBSTRUCT** Or for a self-closing door **FIRE SAFETY DOOR** **DO NOT OBSTRUCT** **DO NOT KEEP OPEN** or for a door discharging from a fire-isolated exit **FIRE SAFETY DOOR DO NOT OBSTRUCT**	Under Clause 183 of the Environmental Planning and Assessment Regulation 2000 a notice is to be displayed in a conspicuous location adjacent to a doorway providing access to but not within a fire isolated stairway, passageway or ramp. The words "OFFENCES RELATING TO FIRE EXITS" are to be provided in letters at least 8mm high and the remaining words are to be at least 2.5mm high. The notice is to state the following: **OFFENCES RELATING TO FIRE EXITS** It is an offence under the Environmental Planning and Assessment Act 1979 (a) to place anything in or near this fire exit that may obstruct persons moving to or from this exit, or (b) to interfere with or obstruct the operation of any fire doors, or (c) to remove, damage or otherwise interfere with this notice. **A signage schedule is required to be provided to the Certifying Authority upon application of the relevant Construction Certificate**	Additional Details Required
D2.24	**Protection of openable windows** Where the fall distance from the floor to the surface below is 4m or more or where a release device occurs to a required screen, an additional barrier at 865mm above floor level is required and must be non-climbable with gaps no greater than 125mm between elements.		Compliance readily achievable
D2.24	**Timber stairways: Concession**		N/A
NSW D2.101	**Doors in the path of travel in an Entertainment Venue**		N/A
Part D3 – Access for People with Disabilities **An Access Report prepared by projects accredited access consultant is to be provided to accompany the main works Construction Certificate. Any deviation from the DTS Provisions an alternative solution is to be developed and endorsed under a CC**			
D3.1	**General building access requirements** Access is generally required for persons with a disability throughout all areas unless specifically exempted.	Access is required throughout complying with AS1428.1 – 2009 as follows: • From the pedestrian entrance on Ground floor to and within all areas normally used by the occupants. **A full review is to be undertaken by the**	Additional Details Required

Clause	Description	Comment	Status
		access consultant with the provisions of a report to be submitted to the Certifying Authority upon application of the relevant Construction Certificate	
D3.2	**Access to buildings** External access to the building for people with a disability must be provided: - • From main pedestrian entry points at the allotment boundary • Through the principle pedestrian entrance • Through at least 50% of all pedestrian entries	Access must be provided in accordance with AS1428.1 – 2009 **A detailed report from an access consultant is required to be provided to the certifying Authority upon application of the relevant Construction Certificate**	Compliance Readily Achievable
D3.3	**Parts of the Building to be Accessible** All parts of the building must be accessible to people with a disability except for areas where access would be inappropriate due to the particular use or areas that would pose a health or safety risk to people with a disability.	All common areas throughout the proposed building are to be readily accessible and comply with the requirements of Part D3 of the BCA, AS142.8.1 – 2009 & the Disability (Access to premises – buildings) standard 2010 Areas to be aware of include the following- • Every ramp, except a fire isolated ramp, must comply with Clause 10 if AS 1428.1. • Every stairway, except a fire isolated stairway, must comply with Clause 11 of AS 1428.1.  A fire isolated stairway must comply with Clause 11(f) and (g) of AS 1428.1. • Every passenger lift must comply with Clause E3.6. • Access ways must have passing spaces and turning spaces complying with AS 1428.1.  • Pile height or pile thickness of carpets shall comply with the requirements of this Clause and AS 1428.1.  **Design Documentation including a full review is to be undertaken upon receipt of the construction issued set of**	Additional Details Required

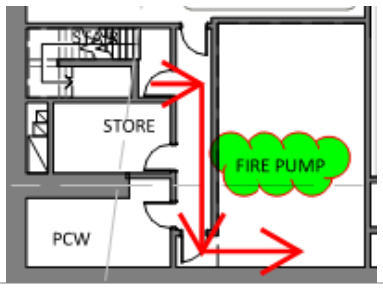
Clause	Description	Comment	Status
		drawings which are to include a full detailed set of specifications, drawings of stairways, ramps showing compliance against AS1428.1 – 2009.	
		The proposed amphitheater located within the ground floor of the main building currently has a set of stairs to access the tiered seating. The provision of only a single handrail is documented within the design for the stair. This stair to comply with DTS provisions of AS1428.1-2009 is required to have a handrail on both sides.  Details of the use of a single handrail in lieu of 2 handrails is required to be documented by the projects access consultant and adopted under a Construction Certificate as part of a performance solution.	Performance Solution
D3.4	**Exemptions** Certain areas may not need to be accessible if the area is deemed inappropriate because of the particular use or the area would pose a health or safety risk for people with disabilities.		Noted

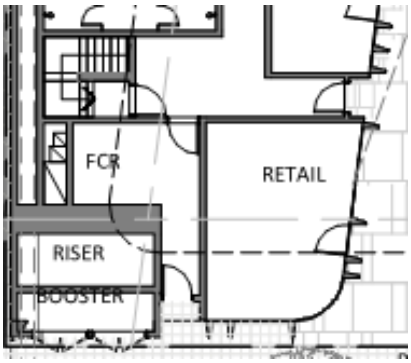
Clause	Description	Comment	Status
D3.5	**Accessible Car Parking** The accessible parking spaces must comply with AS/NZS 2890.6 – 2009. General requirements are: - • 2.4m x 5.4m. • 2.2m head clearance for access and egress routes to and from accessible car spaces. • 2.5m head clearances over accessible car spaces. • Flat even surfaces. • Designated and sign posted for disabled users.	Accessible car parking spaces for people with disabilities are to be provided in compliance with AS/NZS 2890.6.  **Details of height clearances including service drawings and Architectural sections & elevations of the accessible car spaces are to be submitted upon application of the Construction Certificate for review.** ***Class 5 & 9b*** *The class 5 & 9b portion of the development requires for every 100 car spaces, 1 space is required to accessible.* ***Class 6*** *The class 6 portion of the development requires for every 50 car spaces, 1 space is required to accessible.* **The number of required car parking spaces throughout this development is required to be assessed by the project Access Consultant and provide confirmation to SWP that the correct numbers have been implemented to the serve the site against the BCA & Relevant DA Conditions**	Additional Details Required
D3.6	**Signage** Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access or deafness in accordance with AS1428.1 must identify every accessible sanitary facility and space with a hearing augmentation system.  Signage must be provided within a room containing hearing augmentation identifying the type of hearing augmentation, the area covered in the room and if receivers are being used and where the receivers can be obtained.	Signage details for the proposed works must be in accordance with AS1428.1 - 2009 and Specification D3.6 of the BCA. **Details and a signage schedule are required to be submitted upon application of the relevant Construction Certificate**	Additional details required

Clause	Description	Comment	Status
	 Every doorway required to be provided with an exit sign under Clause E4.5 is to be provided with braille and tactile signage that states "EXIT" and identify the floor level "LEVEL #".  Signage identifying ambulant accessible sanitary facilities in accordance with AS 1428.1 must be located on the door of the facility.   Where a bank of sanitary facilities is not provided with an accessible unisex sanitary facility, directional signage must be placed at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex sanitary facility.		
D3.7	**Hearing Augmentation** A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed in a room in a Class 9b building. An induction loop must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system; or A system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than— A) If the room or space accommodates up to 500 persons, 1 receiver for every 25 persons or part thereof, or 2 receivers, whichever is the greater; B) If the room or space accommodates more than 500 persons but not more than 1000 persons, 20 receivers plus 1 receiver for every 33 persons or part thereof in excess of 500 persons;	Details of the proposed method of hearing augmentation is required to be documented in the specifications associated with the service design and approved by the Access Consultant & Certifying Authority against the provisions of Clause D3.7 and AS1428.1-2009.	Additional details required

Clause	Description	Comment	Status
	C) If the room or space accommodates more than 1000 persons but not more than 2000 persons, 35 receivers plus 1 receiver for every 50 persons or part thereof in excess of 1000 persons; and D) If the room or space accommodates more than 2000 persons, 55 receivers plus 1 receiver for every 100 persons or part thereof in excess of 2000 persons.		
D3.8	**Tactile Indicators (TGSIs)** Tactile indicators are to be provided to all stairways, ramps and escalators must be provided to warn people who are blind or have a vision impairment that they are approaching: • a stairway, other than a fire-isolated stairway, • a ramp other than a fire-isolated ramp, step ramp, kerb ramp, or • in the absence of a suitable barrier an overhead: ○ obstruction less than 2 m above floor level, other than a doorway; and ○ an access way meeting a vehicular way adjacent to any pedestrian entrance to a building, excluding a pedestrian entrance serving an area referred to in D3.4, if there is no kerb or kerb ramp at that point • Tactile ground surface indicators must comply with sections 1 and 2 of AS/NZS 1428.4.1	 **Tactile indicators are to be provided and shown on all stairs within the required Architectural drawings on submission for the Construction Certificate for review** *Note - All tactile indicators are required to achieve a 30% luminance contrast to achieve compliance* Where head heights below non fire isolated stairways are proposed to be less than 2000mm a suitable barrier (rail or tactile indicators) is required to be documented on the drawings. Drawings demonstrating the implementation of a suitable barrier where required is to be issued to the Certifying Authority for Review	Additional details required
D3.9	**Wheelchair seating spaces in Class 9b assembly buildings**	Where fixed seating is provided in a Class 9b assembly building, wheelchair seating spaces comply with AS 1428.1 must be provided in accordance with Table D3.9.	Compliance readily achievable
D3.10	**Swimming pools**		N/A
D3.11	**Ramps**		Complies
D3.12	**Glazing on an accessway** On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.	Glazed shopfronts will need to have solid and non-transparent decals installed in accordance with AS 1428.1	Compliance readily achievable
Section E: Services and Equipment			
Part E1 – Fire Fighting Equipment			
E1.1	-	This Clause has deliberately been left blank	

Clause	Description	Comment	Status
E1.2	-	This Clause has deliberately been left blank	
E1.3	**Fire hydrants** (It is understood a combined Fire Hydrant & Sprinkler System are proposed to be installed against AS2118.6)	Fire hydrants must conform to the pressure and flow requirements and distance limitations specified in AS 2419.1 – 2005 and AS2118.6-2012.	Compliance Readily Achievable
		Detailed hydraulic drawings & Specifications identifying the locations of all fire hydrants and the booster assembly are to be provided to the certifying Authority for review. The hydraulic engineer must ensure that compliant coverage is provided to all areas of the building from the internal hydrants and must provide design certification to accompany the drawings certifying the design complies with Clause E1.3 of the BCA and AS2419.1 – 2005 (noting any non-compliances, which are to be addressed as an Alternative Solution). *Note 1: Hydrant hose must extend at least 1m into rooms to be counted for coverage* *Note 2: If full coverage is not provided from hydrants located within the stairs alone. Intermittent hydrant outlets can be installed to achieve a compliant coverage.* *Note 3: As the building has an effective height of greater than 25m the system is required to be installed in the configuration of a ring main*	Additional Details Required
		The following performance solutions are required to be prepared by the projects fire safety engineer: • Currently unprotected openings are located within 2m either side of the outlet. Un-protected openings include a door serving the fire control room and glazing to the Southern retail facade  • Access to the pump room is by means of an air lock and not located directly off a fire isolated stair as per the requirements of Section 6.4.2 of AS2419.1-2005	Performance Solution

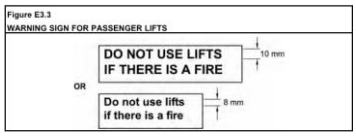
Clause	Description	Comment	Status
			
E1.4	**Fire Hose Reels** • Fire hose reels are required to be provided throughout the building. • Fire hose reels are to be installed internally within 4m of an exit or internally adjacent to a fire hydrant. • Additional hose reels are permitted to be installed further then 4m from exit to achieve coverage. • Fire hose reels are to be installed accordance with AS2441. • Hoses are not permitted to pass through fire or smoke doors to achieve hose reel cover where coverage is not achieved due to the installation of such door an additional intermediate hose reel is required the be installed.	Details hydraulic plans identifying the locations of all fire hose reels are to be provided to the certifying Authority for review. The hydraulic engineer must ensure that compliant coverage is provided to all areas of the building and must provide design certification to accompany the drawings certifying the design complies with Clause E1.4 of the BCA and AS2441 – 2005. **Hydraulic plans showing details of the fire hose reels for the building will be required to be submitted to the Certifying Authority for review upon application of the relevant Construction Certificate**	Additional Details Required
E1.5	**Sprinklers** (It is understood a combined Fire Hydrant & Sprinkler System are proposed to be installed against AS2118.6)	The building is to be provided with a sprinkler system throughout in accordance with Specification E1.5, AS2118.1-2017 and AS2118.6-2012 due to the development having an effective height of greater than 25m in effective height.	Applicable
		Provisions of a sprinkler system and associated infrastructure are required to be demonstrated within the services drawings in accordance with clauses 1 – 11 & 13 of Specification E1.5 of the BCA	Compliance readily achievable
		The designing services engineer is to prepare the sprinkler system design incorporating but not limited to the following items and submit it to the certifying Authority for review: • Sprinkler booster locations, schematics and specifications; • Layout Schematics, Specifications and design documentation of the pump and valve sets and water tanks; • Layout Schematics, Specifications and design documentation of the sprinkler system layout throughout the building The Hydraulic Engineer is to advise compliance of the system against the requirements of BCA Clause E1.5, BCA Specification E1.5 and AS2118.1-1999.	Additional Details Required
		The following performance solutions are	Performance

Clause	Description	Comment	Status
		required to be prepared by the projects fire safety engineer: • The sprinkler alarm valves are located within the confines of the pump room located in the basement. As such the valve sets are not located in an area that has direct access to a road or open space	Solution
E1.6	**Portable Fire Extinguishers**	Portable fire extinguishers are required to be provided in accordance with Table E1.6 of the BCA and Sections 1, 2, 3 and 4 of AS 2444.	Compliance readily achievable
E1.7	-	This Clause has deliberately been left blank	
E1.8 & Spec E1.8	**Fire Control Room** Buildings over 50m in effective height require a fire rated fire control room with prescribed requirements for layout, access, location and equipment with the following features: - • 2 hr FRL concrete/masonry construction. • Low hazard linings (per fire stairs) • No extraneous services passing through • 2 hr fire FRL doors • No penetrations through floor over • 2 hour fire dampers, etc • Doors must open into room • Two access points are needed - one from front entry foyer of building and one from a fire isolated exit / passageway • Contents required:- - FIP - Controls for pumps, fans and other emergency gear - Phone - Whiteboard and pinup board - Plan layout table - Tactical fire plans • May also contain - MECP - Lift annunciation panels - Gas/electric controls - Emergency generator backup • Dedicated fire isolated pressurisation system to ventilate with 30 air changes required.	A Fire Control Room has been documented with direct access from Hassall Street and appears to achieve compliance with the provisions of Clause 6 – 12 of Specification E1.8 of the BCA 	Complies
E1.9	**Fire Services During Construction** Fire services are required during construction, including fire hydrants and hose reels which must be active and operational after the building reaches a construction stage effective height of 12m. When the building reaches 12m effective height:- • All required hydrants and hose reels must be	BCA compliance with respect to fire services during construction can be problematic as hydrants with required pressures and flows and booster connections often cannot be achieved at the required time. A temporary fire protection system, possibly with temporary boosters and no fire pumps, may need to be agreed with the fire brigade.	Compliance Readily achievable

Clause	Description	Comment	Status
	operational on every storey covered by a roof or floor slab over, except for the two uppermost storeys. • Any required booster connections must be installed.	This needs to be put in place early in the construction programme and may require liaison with the builder and his fire services contractor.	
E1.10	**Provisions for special hazards**		N/A
Part E2 – Smoke Hazard Management			
E2.1	**Applicable of Part**	Part is not applicable to • open deck car parks • open spectator stands • a Class 8 electricity network substation with a floor area not more than 200m^2 • storerooms, etc. less than 30m^2 • sanitary compartments • plant rooms or the like	Noted

E2.2 & Spec E2.2a & E2.2b	**Smoke Hazard Management**
	Commercial, Tertiary & Retail Buildings
	The following smoke hazard management systems are required for the building:
	• Stair pressurisation throughout the entire stair in accordance with AS 1668.1 – 2015 for the fire stairs serving the building including the lower ground through to level 3 which are serviced by an atrium;
	• Zone smoke control system in accordance with AS 1668.1 – 2015 to all storeys containing Class 5 commercial, Class 6 retail and Class 9b areas containing tertiary education;
	• Automatic shutdown or air-handling system in accordance with NSW Table E2.2b to the Class 9b tertiary education levels;
	• Carpark mechanical ventilation system to the Class 7a carpark in accordance with AS 1668.2 and Clause 5.5 of AS 1668.1 except the exemptions under this clause;
	• Smoke detection system in accordance with Clause 5 of Specification E2.2a of the BCA to activate:-
	  ○ Stair pressurisation system to fire-isolated exits;
	  ○ Zone smoke control system;
	  ○ Automatic shutdown of air-handling systems.
	• Building occupant warning system (including SSISEP) in accordance with Clause 6 of Specification activated by smoke detection and/or sprinkler alarm;
	• Fire alarm monitoring system connected to a fire station or fire station dispatch centre in accordance with AS 1670.3 – 2004 is required; and
	• Automatic smoke exhaust system – In the proposed levels containing tertiary education facilities which have a floor area not considering classrooms greater than 2000sqm a smoke exhaust system is required under Specification E2.2b unless considered as part of a performance
		Details demonstrating compliance with the relevant standards such as however not limited to drawings, specifications and design certification are required to be submitted to the Certifying Authority from the relevant services Engineer for approval upon application of the relevant Construction Certificate
		It is recommended that the project's fire services and mechanical engineers review the smoke hazard managements requirements and provide comment (where applicable) on any co-ordination issues.
			Additional Details Required

		It is recommended to liaise with the project's fire engineer to determine any scope in terms of opportunities for performance solutions in relation to smoke hazard management systems.
		SWP consider that the following performance solutions are to be considered by the projects fire engineer:
		• With the nature of atriums being implemented throughout the building a performance based smoke hazard management system will need to be implemented which includes:
		  ○ Rationalisation of the zone smoke control system to the affected levels;
		  ○ Rationalise the stair pressurisation throughout the building due to the open compartment configuration between floors; and
		  ○ Omission of smoke exhaust to the 3 storey villages where the class 9b portions are implemented throughout the building.
		• Omission of a zone smoke control
			Performance Solution

Clause	Description	Comment	Status
	solution to remove the requirement by the projects fire engineer especially where multiple levels are interconnected in a village style layout.	system to the 4 retail tenancies located on the ground floor and the end of trip facilities located on the lower ground floor mezzanine level	
E2.3	**Provisions of special hazards**		N/A
Part E3 – Lift Installations			
E3.1	**Lift Installations** Electric and electrohydraulic lifts must comply with the design requirements of BCA Specification E3.1.	Certification of lift design to be provided	Compliance readily achievable
E3.2	**Stretcher Capacity Lifts** Buildings greater than 12m in effective height require a lift sized to accommodate a stretcher of 2m x 0.6m x 1.4m high. Where emergency lifts are proposed the lift must serve every level to which stretcher lift access is provided.	Ensure a suitably sized lift serves each level.	Compliance readily achievable
E3.3	**Warning Against Use of Lift in Fire** Warning signage is required at lift doors advising that lifts should not be used in the event of a fire.	The warning sign is to comply with the details and dimensions set out in Figure E3.3 of the BCA.  	Compliance readily achievable
E3.4	**Emergency Lifts** All of the lifts provided throughout this development are to have emergency Lift requirements prescribed size, operation and fire isolation are required in buildings where: - • the building has an effective height over 25m; and • Where more than two passenger lifts serve a storey, two emergency lifts must be provided, and these must be in separate shafts if multiple lift shafts occur	The following requirements apply to an emergency lift: - • Must serve all storeys served by a passenger lift; and • An emergency lift is required to be contained within a fire isolated shaft constructed in accordance with the requirements of clause C2.10 of the BCA (Shaft having an FRL of not less than 120/120/120)	Compliance Readily Achievable
E3.5	**Landings**		Complies
E3.6	**Passenger lifts**	Every passenger lift must be one of the types identified in Table E3.6a, have accessible features in accordance with Table E3.6b and not reply on a constant pressure device for its operation if the lift car is fully enclosed.	Compliance readily achievable
E3.7	**Fire Service Control**	Where lifts serve a storey above 12m in effective height: - • A fire service control switch is required for each lift or lift group; and • A lift car fire service drive control is required for each lift.	Compliance readily achievable
E3.8	**Aged care buildings**		N/A
E3.9	**Fire service recall control switch** .	The fire service control switch must be located at the landing nominated by the appropriate authority and, when activated, must return all lifts to the nominated floor. If a lift car drive control has been activated, it shall override the landing fire service	Compliance readily achievable

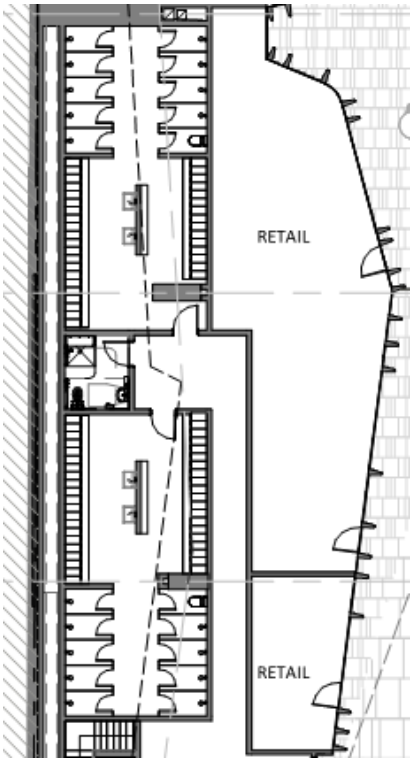
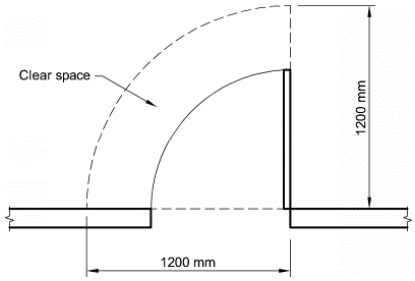
Clause	Description	Comment	Status
		control switch	
E3.10	**Lift car fire service drive control switch**	The lift car service drive control must be activated from within the lift car. The switch is to be located between 600mm and 1500mm above the lift car floor and be labelled '**FIRE SERVICE**" in indelible white lettering on red background. The "**OFF**" and "**ON**" positions are to be identified.	Compliance readily achievable
Part E4 – Emergency Lighting, Exit and Warning Systems			
E4.1	-	This clause has been intentional left blank	-

E4.2	**Emergency lighting requirements**
	Emergency lighting is to be provided throughout the building.
		Emergency lighting is to be provided in:
		• every fire-isolated stairway, fire-isolated ramp or fire-isolated passageway.
		• Every passageway, hallway, corridor or the like, that is part of the path of travel to an exit.
		• In every room having a floor area more than 100m^2 that does not open to a corridor or space that has emergency lighting or to a road or open space.
		• In any room having a floor area more than 300m^2.
		• In every required non-fire isolated stairway
		• To every room or space that has public access in a Class 9b building if:
		  • the floor area is more than 300m^2;
		  • or if any point on the floor is more than 20m from the nearest doorway opening directly to the road or open space; or
		  • if the egress involves a vertical rise within the building of more than 1.5m.
		Design Documentation including electrical specifications, plans and a design certificate are to be provided to the Certifying Authority amongst the documentation submitted for the relevant Construction Certificate application for further review
			Compliance readily achievable

E4.3	**Measurement of distances**		Noted
E4.4	**Design and operation of emergency lighting**	Emergency lighting must comply with to AS2293.1	Compliance readily achievable
E4.5	**Exit signs** Exit signs are to be provided in accordance with Clause E4.5 of the BCA.	Exit signs must be clearly visible to a person approaching the exit and must be installed on, above or adjacent to; 1. A door providing direct egress from a storey to a stairway, passageway or ramp serving as a required exit; 2. A door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space; and	Additional details required

Clause	Description	Comment	Status
		3. A door serving as or forming part of a required exit in a storey required to be provided with emergency lighting. **Design Documentation including electrical plans, specifications and a design certificate are to be provided to the certifying Authority upon application of the relevant Construction Certificate**	
E4.6	**Direction signs**	Where an exit is not readily apparent then exit signs with directional arrows must be installed in appropriate positions in corridors, hallways, lobbies and the like indicating the direction to a required exit in accordance with Clause E4.6 of the BCA. **Design Documentation including electrical plans, specifications and a design certificate are to be provided to the certifying Authority upon application of the relevant Construction Certificate**	Additional details required
E4.7	**Class 2 and 3 buildings and Class 4 parts: Exemptions**		N/A
E4.8	**Design and operation of exit signs** Exit signs are to operate in accordance with AS 2293.1. Photo luminescent exit sign are to comply with Specification E4.8		Compliance readily achievable
E4.9	**Sounds systems and intercom systems for emergency purposes** A sound system and intercom system for emergency purposes (SSISEP) complying with AS 1670.4 must be installed throughout the building.	Details demonstrating compliance and design certification will be required from services consultants at Construction Certificate stage.	Additional details required
Section F: Health and Amenity			
Part F1 – Damp and Weatherproofing			
F1.0	**Water Proofing of External Walls** Weatherproofing of external wall systems must be in accordance with BCA Verification Method FV1.	A test report on the proposed wall system is to be provided to the certifying Authority for review. The test report must conform that the external wall complies with the provisions of the performance requirement FP1.4.	Additional details required
F1.1	**Stormwater Drainage** Stormwater drainage must comply with AS/NZS 3500.3.	Hydraulic drawings and design certification to be provided at Construction Certificate stage.	Compliance readily achievable
F1.2	-	This clause has deliberately been left blank	-
F1.3	-	This clause has deliberately been left blank	-
F1.4	**External above ground membranes** External waterproofing membrane systems for roofs, decks, balconies and the like must comply with AS4654 Parts 1 and 2.	The standard membrane detailing for waterproofing including minimum upturn termination lengths, requirements for stepped balcony details at doorways and windows and provision of continuous grates where stepping does not occur.	Compliance readily achievable
F1.5	**Roof coverings**		Compliance readily

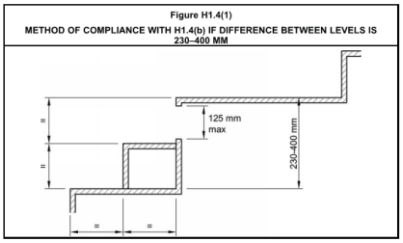
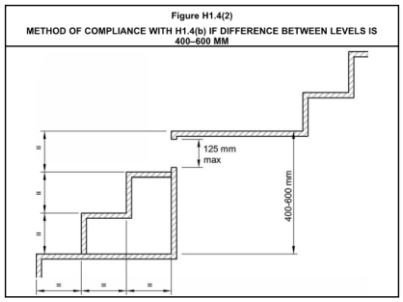
Clause	Description	Comment	Status
	Metal sheet roofing complying with AS 1562.1		achievable
F1.6	**Sarking**	Sarking type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.	Compliance readily achievable
F1.7	**Water Proofing of Wet Areas in Buildings**	Water proofing of wet areas within a building to comply with AS 3740.	Compliance readily achievable
F1.8	-	This clause has deliberately been left blank	-
F1.9	**Damp-proofing** Moisture from the ground must be prevented from reaching the lowest timber element of the building should there be any and the walls above the lowest floor joists, the walls above the dam proof course and the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders. Damp proof course must consist of a material that complies with AS/NZS 2904 or an impervious termite shield in accordance with AS 3660.1.	Details of the method of protection against moisture and other associated termite attack should be documented within the specifications and on the drawings proposed for construction (Termite protection is only applicable to and confirmation should be given for the use of timber products)	Additional details required
F1.10	**Damp-proofing of floors on the ground** A vapour barrier in accordance with AS2870 is to be provided beneath the basement floor slab.		Compliance Readily Achievable
F1.11	**Provision of floor wastes**		N/A
F1.12	**Subfloor ventilation**		N/A
F1.13	**Glazed assemblies** Windows, sliding doors with a frame, adjustable louvres, shopfronts and window walls with one piece framing in an external wall must comply with AS 2047 requirements for resistance to water penetration.		Compliance readily achievable
Part F2 – Sanitary and Other Facilities			
F2.1	**Facilities in residential buildings**		N/A
F2.2	**Calculation of number of occupants and fixtures**		Noted
F2.3	**Facilities in Class 3 to 9 buildings** Toilet facilities are required in appropriate numbers based on the number of persons accommodated.	Refer to appendix F2.3 of this report. A reverse calculation has been provided to demonstrate the maximum population based around the use of both commercial and tertiary education uses. Adequate amenities to cater for the proposed populations need to be documented	Additional Details Required
		A performance solution is required from an accredited BCA consultant to assess the permissibility of students and staff to utilise the same banks of toilets for the tertiary levels of the development.	Performance Solution
F2.4	**Facilities for Persons with Disabilities**	Floor plans, internal elevations and relevant specifications of the proposed toilet blocks associated within the commercial level and retail spaces including accessible and ambulant facilities compliant against clauses 15 – 17 of AS1428.1-2009 are to be provided to the certifying Authority for	Additional details required

Clause	Description	Comment	Status
		review.	
		No ambulant facilities have been documented within the confines of the amenity block located on the ground floor  Ambulant facilities that conform with the requirements of Section 16 of AS1428.1-2009 need to be documented with amended drawings to be issued to the Certifying Authority & Access Consultants for review	Does Not Comply
F2.5	**Construction of sanitary compartments** Where clear space between closet pan and doorway is less than 1.2m, doors must open outwards, slide or be readily removable from outside.	All hinged doors that swing inward to sanitary facilities and do not comply with achieving a 1200mm clearance to pan are required to be installed with lift-off hinges  	Compliance readily achievable
F2.6	**Interpretation: Urinals and washbasins**	Each 600mm length of a continuous urinal trough is counted as 1 urinal.	Noted
F2.7	*(NSW variation – Deleted)*	-	-
F2.8	**Waste management**		N/A

Clause	Description	Comment	Status
Part F3 – Room Heights			
F3.1	**Height of rooms and other spaces** The following ceiling heights apply- **Class 5, 6, 7a & 8 portion:** • Corridor, passageway or the like – 2.1m; • General habitable areas – 2.4m; • Above a stairway, landing or the like – 2m measured vertically above nosing of stairway treads or floor surface of landing; • Bathroom, sanitary compartment, car parking area store room or the like – 2.1m; and • Basement carpark – 2.1m (Note requirements under AS/NZS2890.6 – 2006 requires 2.2m leading to accessible car spaces and 2.5m above the actual accessible car spaces. **Class 9b Portion:** • Where the floor accommodates less than 100 persons – 2.4m; and • Where the floor accommodates more than 100 persons – 2.7m	The project Architect is to provide detailed sections to the Certifying Authority for an assessment at Construction Certificate stage to verify compliance of the relevant ceiling heights.	Additional Details Required
Part F4 – Light and Ventilation			
F4.1	**Provisions of natural light**		N/A
F4.2	**Methods and extent of natural lighting**		N/A
F4.3	**Natural Light borrowed from adjoining room**		N/A
F4.4	**Artificial lighting** The artificial lighting system must comply with AS/NZS 1680.0.	Design details and certification from an electrical engineer is required	Compliance readily achievable
F4.5	**Ventilation of rooms** Ventilation shall be provided throughout the building in by means of natural ventilation complying with Clause F4.6 or mechanical ventilation complying with the requirements of AS1668.2 as required by Clause F4.5 of the BCA.	Mechanical details including drawings, specification and a design certificate are required to be provided to the Certifying Authority from the projects Mechanical Engineer	Additional Details Required
F4.6	**Natural ventilation**	Natural ventilation must be provided via permanent openings, windows, doors or other devices which can be opened and achieve an aggregate size not less than 5% of the floor area of the room required to be ventilated.	Compliance readily achievable
F4.7	**Ventilation borrowed from adjoining room**		N/A
F4.8	**Restriction on position of sanitary compartments**		Complies
F4.9	**Airlocks**	If a sanitary compartment opens directly into a space, which is occupied by more than one person one of the following is required to be installed / implemented: 1. Implementation of an airlock, hallway or other room with a floor area of not less than 1.1m^2 and fitted with self closing doors; or 2. The sanitary compartment must be	Noted

Clause	Description	Comment	Status
		provided with mechanical exhaust ventilation and the doorway serving the room adequately screened from view	
F4.10	-	This clause has intentionally been left blank	-
F4.11	**Carparks**	Basement carparks must be provided with a system of mechanical ventilation complying with AS 1668.2. Design certification and other associated documentation such as drawings and system specifications from mechanical engineer are to be provided to demonstrate compliance *Note – Should the use of Jet fans be proposed the Fire Safety Engineer is to assess the non-compliance and address via means of a performance Solution*	Additional Details Required
F4.12	**Kitchen Local Exhaust Ventilation** A commercial kitchen must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 and AS 1668.2, where: • any cooking apparatus has a total maximum electrical power input exceeding 8kW, or • a total gas power input exceeding 29 MJ/h, or • the total maximum power input to more than one apparatus exceeds 0.5kW electrical power or 1.8 MJ gas per metre square of the room or enclosure.	Mechanical drawings and specifications are to be submitted to the Certifying Authority from a Mechanical Engineer if exhaust provisions are to be installed. Adequate provisions need to be made for the future use of these tenancies and a system adopted to cater for the largest capacity of output for the use.	Additional Details Required
Part F5 – Sound Transmission and Insulation			N/A
Section G: Ancillary Provisions			
Part G1- Minor Structures and components			
G1.1	**Swimming pools**		N/A
G1.2	**Refrigerated chambers, strong rooms and vaults**		N/A
G1.3	**Outdoor play spaces**		N/A
G1.101	**Provision for cleaning windows** A safe manner of cleaning windows is to be provided as windows are located 3 or more storeys above ground level.	The windows must either be able to be cleaned wholly from within the building, or a method complying with the Construction Safety Act 1912 and Regulations is required.	Compliance readily achievable
Part G2 - Boilers, pressure vessels, heating appliances, fire places, chimneys and flues			N/A
Part G3 - Atrium Construction			
G3.1	**Application of Part**	The BCA permits the following arrangements for voids to comply with the DTS provisions: • connects a maximum of 2 storeys above ground; or • connects a maximum of 3 storeys where one of the storeys has direct egress to a road or open space. The proposal results are as follows: • 3 storey villages being connected	Performance solution

Clause	Description	Comment	Status
		throughout the building without one of storeys having direct egress to a road or open space; and • A void from which interconnects up to 6 storeys being from the Lower Ground through to potentially Level 3 (Lower ground, lower ground mezzanine, Ground, Level 1, Level 2 & Level 3) **A performance solution prepared by the projects fire engineer will be required to for aspects of the design not capable of comply with Clause G3.2 to G3.8 including Specification G3.8 Atrium provisions.**	
G3.2	**Dimensions of atrium well** Minimum 6m diameter atrium well is required.	Atrium well exceeds 6m in diameter	Complies
G3.3	**Separation of atrium by bounding walls** An atrium well is required to be separated from the remainder of the building by bounding walls not more than 3.5m from the perimeter of the atrium well, except in the case of 3 consecutive storeys.	Atrium will not have bounding fire rated walls as per this clause.	Performance solution
G3.4	**Construction of bounding walls** Bounding walls must have an FRL not less than 60/60/60 or constructed of fixed toughened safety glass or wired safety glass in non-combustible frames protected with wall wetting sprinklers in accordance with Specification G3.8.	Atrium will not have bounding fire rated walls as per this clause.	Performance solution
G3.5	**Construction of balconies** If a bounding wall separating an *atrium* from the remainder of the building is set back from the *atrium well*, an imperforate and non-combustible barrier not less than 1 m high must be provided.	Proposed balustrades to the atrium are to comply with this clause.	Compliance readily achievable
G3.6	**Separation at roof** The atrium roof must have an FRL not less than that prescribed in Table 3 of Specification C1.1 or the roof structure and membrane are to be protected by a sprinkler system complying with Specification E1.5 and G3.8	Atrium roof to be protected by sprinklers	Compliance readily achievable
G3.7	**Means of egress** All areas within the atrium must have at least 2 means of egress.	2 exist are available from each floor within the atrium.	Complies
G3.8	**Fire and smoke control systems** The following systems are required to be implemented within an atrium: • Sprinklers are to be provided throughout in accordance with Specification E1.5 and G3.8. • A smoke control system complying with AS/NZS1668.1 and Specification G3.8 is required throughout. • An automatic fire detection and alarm system must comply with AS1670.1 and Specification G3.8. • A sound system and intercom system for	A performance solution is required through the projects fire engineer to determine the smoke hazard management requirements as compliance with Spec G3.8 will not be achieved.	Performance solution

Clause	Description	Comment	Status
	emergency purposes must be provided in accordance with AS1670.4 and must incorporate visual warning devices that operate on alarm and display the words "EVACUATE" in red letters. • A suitable alternative power supply (emergency generator) must be provided to operate "required" safety systems in the building in accordance with Specification G3.8. • Fire isolated stairways are required to be provided automatic air pressurisation in accordance with AS/NZS1668.1.		
Part G4 - Construction in Alpine Areas			N/A
Part G5 - Construction in Bushfire Prone Areas			N/A
Section H: Special Use Buildings – Auditoriums, Public Halls, Public Transport Buildings			
Part H1 - Class 9b Buildings			
H1.1	**Application of Part**	Clauses H1.4 & H1.7 apply to every enclosed Class 9b building, which are not considered to be an entertainment venue	Noted
H1.2	**Separation**		N/A
H1.3	**Proscenium wall construction**		N/A
H1.4	**Seating area** The gradient of the floor surface must not be steeper than 1 in 8, or the floor must be stepped so that— I. a line joining the nosing's of consecutive steps does not exceed an angle of 30° to the horizontal; and II. the height of each step in the stepped floor is not more than 600 mm; and III. the height of any opening in such a step is not more than 125 mm Where an aisle divides the stepped floor and the difference in level between any 2 consecutive steps exceeds 230 mm but not 400 mm an intermediate step must be provided in the aisle. If the difference in level exceeds 400 mm then 2 equally spaced intermediate steps must be provided. The going of intermediate steps must be not less than 270 mm The clearance between rows of fixed seats used for viewing performing arts, sport or recreational activities must be not less than— I. 300 mm if the distance to an aisle is not more than 3.5 m; or II. 500 mm if the distance to an aisle is more than 3.5 m.	Details of the terrace seating within the amphitheatre located within the ground floor is required to be provided to SWP for review   	Additional details required
H1.5	**Exit from stages**		N/A
H1.6	**Access to platforms and lofts**		N/A
H1.7	**Aisle lights**		N/A

Clause	Description	Comment	Status
Part H2 - Public Transport Buildings			**N/A**
Part H3 - Farm Building and Farm Sheds			**N/A**
NSW Section J: Energy Efficiency Energy Efficiency for buildings requires buildings to reduce greenhouse gas emissions by efficiently using energy. A building's services must have features that facilitate the efficient use of energy. The discipline of Energy Efficiency with the BCA has become a specialised field where compliance with BCA Section J is to be certified with the issue of a Certificate of Compliance – Design from the relevant Services Engineer/Consultant. The purpose of this section is to provide a brief explanation of which areas are to achieve compliance with BCA Section J – Energy Efficiency during design and construction. The BCA should be referenced for exact requirements, clarification and further explanation.			
Section J	**Energy efficiency measures** Energy efficiency measures are prescribed for the following building elements to limit energy consumption:- • Building fabric • External glazing • Building sealing • Air movement. • Air-conditioning and ventilation systems. • Artificial lighting and power • Hot water supply • Access for maintenance	Compliance assumed, although further information is required to confirm compliance. A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.	Compliance readily achievable
NSW Subsection J(A) & NSW J(B) Energy Efficiency - Class 2 - 9 Buildings			
Note: Assessment by energy efficiency consultant to be carried out on the design and a report provided with the documentation for Construction Certificate. **An inspection and completion report will be report will be required on completion.**			

15. Appendix A – Referenced Documentation

The following documentation prepared by Tzannes + BlightRayner Architects have been used in the preparation of this report:

Sheet No	Sheet Name	Rev
1.00	Cover Sheet & Drawing List	I
3.10	Site Plan	I
3.50	Proposed Setback Diagram	I
10.00	Basement	I
10.01	Ground Level	I
10.02	Level 01	I
10.03	Level 02	I
10.04	Level 03	I
10.05	Levels 04-06	I
10.06	Levels 07-09	I
10.07	Level 10	I
10.08	Level 11	I
10.09	Level 12 - Terrace	I
10.10	Levels 13-17	I
10.11	Level 18 - Plant	I
10.12	Level 19 - Plant	I
10.13	Roof Plan	I
11.03	Reflected Ceiling Plan - Level 02	I
18.00	GFA Diagrams - Midrise	I
18.01	GFA Diagrams - Highrise	I
20.0	Section A	I
20.01	Section B	I
20.10	Podium Section B	I
20.11	Podium Section A	I
30.00	North Elevation	I
30.01	East Elevation	I
30.02	South Elevation	I
30.03	West Elevation	I
30.10	Podium Elevation - South	I
52.01	Facade Section - North Façade	I
52.02	Facade Section -West Façade	I
52.03	Facade Section - South Façade	I
52.04	Façade Section - Plant	I

16. Appendix B – Statutory Fire Safety Measures

Schedule of Statutory Fire Safety Measures

Measure	Standard of Performance
Access panels, doors and hoppers to fire resisting shafts	BCA2016 Amendment 1 Clause C3.13 and tested prototypes (AS 1530.4 – 2014 and AS 4072.1-2005) Note: Systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1]
Automatic fail safe devices	Scheduled devices release upon trip of smoke detection and/or sprinkler activation in accordance with BCA2016 Amendment 1 Clauses D2.19 and D2.21.
Automatic fire detection and alarm system (smoke detection system to operate zone smoke control, stair pressurisation system and smoke exhaust system)	BCA2016 Amendment 1 Clause 5 of Specification E2.2a and AS 1670.1 - 2015
Automatic fire suppression systems (Sprinklers)	BCA2016 Amendment 1 Specification E1.5, AS 2118.1 – 1999 or 2017 and AS2118.6-2012
Emergency lifts	BCA2016 Amendment 1 Clause E3.4
Emergency lighting	BCA2016 Amendment 1 Clause E4.2, E4.4 and AS 2293.1 – 2005
Exit signs	BCA2016 Amendment 1 Clause E4.5, NSW E4.6, E4.8 and AS 2293.1 – 2005
Fire control room	BCA2016 Amendment 1 Specification E1.8
Fire dampers	BCA2016 Amendment 1 Clause C3.15 and AS/NZS 1668.1 – 2015 (AS 1682.1-1990 and AS 1682.2-1990)
Fire doors	BCA2016 Amendment 1 Specification C3.4 and AS 1905.1 – 2015
Fire hydrants systems	BCA2016 Amendment 1 Clause E1.3, AS 2419.1 – 2005 and AS2118.6-2012
Fire seals protecting opening in fire resisting components of the building	BCA2016 Amendment 1 Clause C3.15, Specification C3.15 and AS 1530.4 – 2014 and AS 4072.1 – 2005 and installed in accordance with the tested prototype. *[Note: Systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1]*
Hose reel system	BCA2016 Amendment 1 Clause E1.4 and AS 2441 – 2005
Mechanical air handling system *(automatic shutdown of air-handling system)*	BCA2016 Amendment 1 Clause E2.2 and AS/NZ 1668.1-2015
Mechanical air handling system *(automatic air pressurisation system)*	BCA2016 Amendment 1 Table E2.2a and AS/NZ 1668.1 – 2015
Mechanical air handling system *(zone smoke control system)*	BCA2016 Amendment 1 Table E2.2a and AS/NZ 1668.1 – 2015
Mechanical air handling system *(automatic smoke exhaust system)*	BCA2016 Amendment 1 Table E2.2b, Specification E2.2b and AS/NZ 1668.1-2015
Mechanical air handling system *(carpark mechanical ventilation system)*	BCA2016 Amendment 1 Table E2.2a and Clause 5.5 of AS/NZ 1668.1-2015 and fans with metal blades suitable for operation at normal temperature may be used and the electrical power and control cabling need not be fire rated
Portable fire extinguishers	BCA2016 Amendment 1 Clause E1.6 and AS 2444 – 2001
Sound System and Intercommunication System for Emergency Purposes (aka EWIS)	BCA2016 Amendment 1 Clause E4.9, Specification G3.8 and AS 1670.4 – 2015
Warning and operational signs	BCA2016 Amendment 1 Clauses D2.23, D3.6, E3.3, E3.9, E3.10, E1.8 and G3.8

Note the fire safety schedule will need to be amended subject to the inclusion of a fire engineered performance solution.

17. Appendix C1.1 – Fire Rating Requirements

Type A Construction: FRL of Building Elements				
Building element	**Class of building - FRL:** (in minutes) *Structural adequacy/Integrity/Insulation*			
	2, 3 or 4 part	5, 9 or 7a	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature to which it is exposed is-				
For loadbearing parts-				
less than 1.5m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/60/60	120/ 90/ 90	180/180/120	240/240/180
3 or more	90/60/30	120/ 60/ 30	180/120/90	240/180/ 90
For non-loadbearing parts-				
less than 1.5 m	-/90/90	- /120/120	- /180/180	- /240/240
1.5 to less than 3 m	-/60/60	- / 90/ 90	- /180/120	- /240/180
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
EXTERNAL COLUMN not incorporated in an external wall-				
For loadbearing columns	90/ - / -	120/ - / -	180/ - / -	240/ - / -
For non-loadbearing columns	- / - / -	- / - / -	- / - / -	- / - / -
COMMON WALLS and FIRE WALLS	90/90/90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS-				
Fire-resisting lift and stair shafts-				
Loadbearing	90/90/90	120/120/120	180/120/120	240/120/120
Non-loadbearing	- /90/90	- /120/120	- /120/120	- /120/120
Bounding public corridors, public lobbies and the like-				
Loadbearing	90/90/90	120/ - / -	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	- / - / -	- / - / -	- / - / -
Between or bounding sole-occupancy units-				
Loadbearing	90/90/90	120/ - / -	180/ - / -	240/ - / -
Non-loadbearing	- /60/60	- / - / -	- / - / -	- / - / -
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of Combustion-				
Loadbearing	90/90/90	120/ 90/ 90	180/120/120	240/120/120
Non-loadbearing	- /90/90	- / 90/ 90	- /120/120	- /120/120
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS	90/ - / -	120/ - / -	180/ - / -	240/ - / -
FLOORS	90/90/90	120/120/120	180/180/180	240/240/240
ROOFS	90/60/30	120/ 60/ 30	180/60/30	240/ 90/ 60

18. Appendix C1.10 – Early Fire Hazard Properties for Materials

Floor materials, floor coverings and wall and ceiling lining materials are required to comply with BCA prescribed fire hazard properties.

Floor Linings and Floor Coverings	
General Non Sprinklered Areas	Minimum 2.2 (or 4.5 for Class 3 areas and 9a patient care areas) kw/m^2 critical radiant heat flux and, a maximum smoke development rate of 750 percent minutes.
General Sprinklered Areas	Minimum 1.2(or 2.2 for Class 3, 9a patient care, and 9c residential use areas) kw/m^2 critical radiant heat flux
Fire Isolated Exits and Fire Control Rooms	Minimum 2.2/(or 4.5 for Class 3, 9a and 9c areas) kw/m^2 critical radiant heat flux
Lift Cars	Minimum 2.2 kw/m^2 critical radiant heat flux

Wall Linings and Ceiling Linings	
Generally	Variously Group 1,2, or 3 materials (more restrictive Group number for non-sprinklered areas, public corridors, health care corridors and other prescribed locations) when tested to AS/ISO 9705 or clause 3 of BCA Spec A2.4 and AS/NZ 3837
Fire Isolated Exits	Group 1 material when tested as above
Lift Cars	Group 1 or 2 materials when tested as above

In addition, in non-sprinklered areas, wall and ceiling linings must have a smoke growth rate index not more than 100 or an average specific extinction area less than 250m^2/g.

Other than above, construction materials generally need to achieve as1530.3 early fire hazard indices requirements as follows:	
Generally	Spread of flame Index not > 9 Smoke developed index not > 8
Sarking	Flammability Index not > 5
Fire Isolated Exits and Fire Control Rooms	Spread of Flame Index 0 Smoke Developed Index not > 2 Sarking Flammability 0
Non Fire Isolated Stairs & Escalators and Auditorium Fixed Seating	Spread of Flame Index 0 Smoke Developed Index not > 5
Lifts	To AS 1735.2
Air Ducts	To AS4254

19. Appendix C2.2 – Floor Areas and Volumes

Floor areas and volumes of each storey

Floor	Approx. Area (m^2)	Approx. Volume (m^3)	Comment
Lower Ground	5047	20,348	Complies with 8,000 maximum fire compartment for Class 5 & 9b Type A construction limitations.
Ground			
Level 1			
Level 2			
Level 3			
Level 4	1790	6623	
Level 5	1794	6637.8	
Level 6	1923	7115.1	
Level 7	1953	7226.1	
Level 8	1973	7300.1	
Level 9	1973	7300.1	
Level 10	1941	7181.7	
Level 11	1935	7159.5	
Level 12	1396	5165.2	
Level 13	1542	5705.4	
Level 14	1542	5705.4	
Level 15	1542	5705.4	
Level 16	1542	5705.4	
Level 17	1542	6553.5	
Total	24,388	91083.7	

Note – When considering the proposed 3 storey villages the floor area will remain within the limitation set under type A Construction set in Table C2.2 of the BCA for a class 5 and 9b building.

20. Appendix D1.4 – Exits

The exits from the building are set out below:

Exit No	Location	Type	Grid Ref	No of storeys connected / passed by	Comments
1.	Eastern Wall on levels 1 through to level 18	Scissor Stair – Fire Isolated Exits	-	18 Storeys	
2.	Ground Floor Lobby onto Hassall Street	Automatic Sliding Doors	-	1 Storeys	Considered as 1.5m in egress width
3.	Ground Floor Lobby on Plaza	Automatic Sliding Doors	-	1 Storey	Considered as 1.5m in egress width
4.	Ground Floor Lobby into the Eastern Fire Isolated corridor	Swing Doors	-	1 Storey	Considered as 1m in egress width
5.	Ground Floor - Retail Tenancies	Swing Doors	-	1 Storey	Each retail tenancy is provided with 1m of egress width
6.	Basement – South Western Wall	Fire Isolated Stair	-	2 Storeys	
7.	Basement – Eastern Wall	Fire Isolated Stair	-	2 Storeys	

21. Appendix D1.13 –
Populations/Exit Width Assessment (Density of 1:10)

Zone / Level	Area Within Zone	Assumed NLA (m^2)	Population Density @ (m^2/ person)	Population	Aggregate Exit Width required	Exit width provided
Levels 17	Commercial and / or Tertiary Education	1542	10	155	2m	2m
Level 16	Commercial and / or Tertiary Education	1542	10	155	2m	2m
Level 15	Commercial and / or Tertiary Education	1542	10	155	2m	2m
Level 14	Commercial and / or Tertiary Education	1542	10	155	2m	2m
Level 13	Commercial and / or Tertiary Education	1542	10	155	2m	2m
Level 12	Commercial and / or Tertiary Education	1396	10	140	2m	2m
Level 11	Commercial and / or Tertiary Education	1935	10	200	2m	2m
Levels 10	Commercial and / or Tertiary Education	1941	10	195	2m	2m
Level 9	Commercial and / or Tertiary Education	1973	10	198	2m	2m
Level 8	Commercial and / or Tertiary Education	1973	10	198	2m	2m
Level 7	Commercial and / or Tertiary Education	1953	10	196	2m	2m
Levels 6	Commercial and / or Tertiary Education	1923	10	193	2m	2m
Level 5	Commercial and / or Tertiary Education	1794	10	180	2m	2m
Level 4	Commercial and / or Tertiary Education	1790	10	179	2m	2m
Levels 3	Commercial and / or Tertiary Education	1908	10	191	2m	2m
Level 2	Commercial and / or Tertiary	811	10	82	1m	2m

	Education					
Level 1	Commercial and / or Tertiary Education	729	10	73	1m	2m
Ground Level	Commercial and / or Tertiary Education	716	10	72	1m	4m
Basement	Commercial and / or Tertiary Education	602	10	61	1m	2m

Populations/Exit Width Assessment (Density of 1:6.8)

Zone / Level	Area Within Zone	Assumed NLA (m^2)	Population Density @ (m^2/ person)	Population	Aggregate Exit Width required	Exit width provided
Levels 17	Commercial and / or Tertiary Education	1542	6.8	227	2.5m	2m
Level 16	Commercial and / or Tertiary Education	1542	6.8	227	2.5m	2m
Level 15	Commercial and / or Tertiary Education	1542	6.8	227	2.5m	2m
Level 14	Commercial and / or Tertiary Education	1542	6.8	227	2.5m	2m
Level 13	Commercial and / or Tertiary Education	1542	6.8	227	2.5m	2m
Level 12	Commercial and / or Tertiary Education	1396	6.8	206	2.5m	2m
Level 11	Commercial and / or Tertiary Education	1935	6.8	285	3m	2m
Levels 10	Commercial and / or Tertiary Education	1941	6.8	286	3m	2m
Level 9	Commercial and / or Tertiary Education	1973	6.8	291	3m	2m
Level 8	Commercial and / or Tertiary Education	1973	6.8	291	3m	2m
Level 7	Commercial and / or Tertiary Education	1953	6.8	288	3m	2m
Levels 6	Commercial and / or Tertiary Education	1923	6.8	283	3m	2m

Level 5	Commercial and / or Tertiary Education	1794	6.8	264	3m	2m
Level 4	Commercial and / or Tertiary Education	1790	6.8	264	3m	2m
Levels 3	Commercial and / or Tertiary Education	1908	6.8	281	3m	2m
Level 2	Commercial and / or Tertiary Education	811	6.8	120	2m	2m
Level 1	Commercial and / or Tertiary Education	729	6.8	108	2m	2m
Ground Level	Commercial and / or Tertiary Education	716	6.8	106	2m	4m
Basement	Commercial and / or Tertiary Education	602	6.8	89	1m	2m

22. Appendix D3 – Significant Accessibility Requirements

Access for wheelchair users and people with disabilities generally must be to AS1428.1-2009. Principle requirements are:

- Continuous accessible paths of travel throughout
- Minimum 1m wide travel paths with maximum 3-5mm joints, lips, level changes etc.
- No deep pile carpets or grates with large slots.
- Walls or 75-150mm kerbs at travel path sides or if level change occurs to cause a wheelchair hazard.
- 1.8m wide x 2m long wheelchair passing spaces at 20m intervals in passageways where a direct line of sight is not available.
- Turning spaces at 20m intervals and within 2m of dead end access ways. 1.5m x 1.5m 90 deg turning spaces (with splayed internal corner) and 1.54m x 2.07m long 180 deg turning spaces are required including at dead ends in passageways.
- Step ramps, kerb ramps and threshold ramps as prescribed.
- 1:14 maximum ramps with 9m between landings.
- 1.9m x 1 in 10 (maximum 190mm rise) step ramps
- 1.52m x 1 in 8 (maximum 190mm rise) kerb ramps.
- 30-50mm handrails with 300mm extensions and curls and 50mm clearances on both sides of steps, ramps, etc.
- 850mm clear width doors with 340 - 900mm latch side clearances and 1220-1670mm approach clearances depending on arrangements.
- Stairs and ramps set back from building lines and corridors to allow space for handrail extensions and TGSIs.
- Decals to glazing.
- 900-1100mm door hardware height.
- Lever handle hardware with low opening forces.
- Landings at doorways, direction changes and at intervals on ramps and inclined walkways.
- Walkways with colour contrast borders.
- Flat even surfaces.
- Colour contrasted hand rails and door frames.
- “D” pull handles to doors.
- Continuous protected paths from disabled persons’ car spaces to lifts, access points, etc.
- Ambulant disabled persons’ toilets with grab rails and outward swinging doors or longer cubicles.
- Prescribed types of water entry arrangements for swimming pools depending on pool size.
- Non fire enclosed stairs with opaque risers.
- Fire stairs and non-fire enclosed stairs with colour contrasting nosing strips.
- All switches and controls 900-1100mm above floor level.

The following general requirements apply to accessible toilets:

- Unisex facility.
- ~1.9 x 2.7m or 2.3 x 2.4m minimum room dimensions depending on arrangements. (~2.2m x 1.6m if AS1428.1-2001 concession applies).
- 30-40mm grab rails with 50-60mm clearances.
- Doors with appropriate clearances and circulation spaces and able to be operated externally in emergencies
- Washbasins with clearances as required.
- Shielded hot water pipes.
- Mirror, shelf, dispensers and coat hooks.
- Mirrored layout for alternative facilities

Appendix F2.3 – Requirements for Sanitary Facilities (Density of 1:6.8)

The status of sanitary facilities required by Part F2 of the BCA are set out below:

Class	Use	Occupant Numbers			WC Required / Provided		Urinal Required / Provided		Basin Required / Provided	
		Total								
9b	Basement - Students (602m²)	71	Male	36	**2**		**1**		**2**	
			Female	36	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Basement Floor - Staff (602m²)	18	Male	9	**1**		0		**1**	
			Female	9	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Basement Total**	**90**	**Male**	**45**	**3**		**1**		**3**	
			Female	**45**	**4**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Ground Floor - Students (716m²)	84	Male	42	**2**		**1**		**2**	
			Female	**42**	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Ground Floor - Staff (716m²)	22	Male	11	**1**		1		**1**	
			Female	**11**	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Ground Floor Total**	**106**	**Male**	**53**	**3**		**2**		**3**	
			Female	**53**	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Level 1 - Students (729m²)	86	Male	43	**3**		**2**		**2**	
			Female	43	**4**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Level 1 - Staff (729m²)	22	Male	11	**1**		1		1	
			Female	11	**2**		**N/A**		1	
			Unisex Disabled				**N/A**			
9b	**Level 1 Total**	**108**	**Male**	**54**	**4**		**3**		**3**	
			Female	**54**	**6**		**N/A**		**3**	
			Unisex Disabled				**N/A**			

Class	Use	Occupant Numbers			WC Required / Provided		Urinal Required / Provided		Basin Required / Provided	
		Total								
9b	Level 2 - Students ($811m^2$)	96	Male	48	**2**		**1**		**2**	
			Female	48	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Level 2 - Staff ($811m^2$)	24	Male	12	**1**		1		**1**	
			Female	12	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Level 2 Total**	**120**	**Male**	**60**	**3**		**2**		**3**	
			Female	**60**	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Level 3 - Students ($1908m^2$)	224	Male	112	**3**		**3**	112	**4**	
			Female	112	**6**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Level 3 - Staff ($1908m^2$)	57	Male	29	**2**		**2**		**1**	
			Female	29	**3**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Level 3 Total**	**282**	**Male**	**141**	**5**		**5**		**5**	
			Female	**141**	**9**		**N/A**		**5**	
			Unisex Disabled				**N/A**			
9b	Level 4 - Students ($1790m^2$)	211	Male	106	**3**		**3**		**4**	
			Female	106	**6**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Level 4 - Staff ($1790m^2$)	53	Male	27	**2**		**2**		**1**	
			Female	27	**3**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Level 4 Total**	**264**	**Male**	**132**	**5**		**5**		**5**	
			Female	**132**	**9**		**N/A**		**5**	
			Unisex Disabled				**N/A**			

Class	Use	Occupant Numbers			WC Required / Provided		Urinal Required / Provided		Basin Required / Provided	
		Total								
9b	Level 5 - Students (1794m²)	211	Male	106	3		3		4	
			Female	106	6		N/A		4	
			Unisex Disabled				N/A			
9b	Level 5 - Staff (1794m²)	53	Male	27	2		2		1	
			Female	27	3				1	
			Unisex Disabled							
9b	**Level 5 Total**	**266**	**Male**	**133**	5		5		5	
			Female	**133**	9		N/A		5	
			Unisex Disabled				N/A			
9b	Level 6 - Students (1923m²)	226	Male	113	3		3		4	
			Female	113	6		N/A		4	
			Unisex Disabled				N/A			
9b	Level 6 - Staff (1923m²)	57	Male	29	2		2		1	
			Female	29	3		N/A		1	
			Unisex Disabled				N/A			
9b	**Level 6 Total**	**284**	**Male**	**142**	5		5		5	
			Female	**142**	9		N/A		5	
			Unisex Disabled				N/A			
9b	Levels 7 -9 Students (1973m²)	232	Male	**116**	3		3		4	
			Female	**116**	6		N/A		4	
			Unisex Disabled				N/A			
9b	Levels 7 -9 Staff (1973m²)	59	Male	**30**	2		2		1	
			Female	**30**	3		N/A		1	
			Unisex Disabled				N/A			
9b	**Levels 7 - 9 Total**	**292**	**Male**	**146**	5		5		5	
			Female	**146**	9		N/A		5	
			Unisex Disabled				N/A			
5	Level 10 (1941m²)	286	Male	143	8		4		5	
			Female	143	10		N/A		5	
			Unisex Disabled				N/A			
5	Level 11 (1935m²)	285	Male	143	8		4		5	
			Female	143	10		N/A		5	
			Unisex Disabled				N/A			

5	Level 12 (1396m²)	206	Male	103	**6**		**4**		**4**	
			Female	103	**7**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
5	Level 13-17 (1542m²)	227	Male	114	**6**		**4**		**4**	
			Female	114	**8**		**N/A**		**4**	
			Unisex Disabled				**N/A**			

Requirements for Sanitary Facilities (Density of 1:10)

The status of sanitary facilities required by Part F2 of the BCA are set out below:

Class	Use	Occupant Numbers			WC Required / Provided		Urinal Required / Provided		Basin Required / Provided	
		Total								
9b	Basement - Students (602m²)	48	Male	29	**1**		**1**		**2**	
			Female	29	**2**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Basement Floor - Staff (602m²)	13	Male	13	**1**		1		**1**	
			Female	13	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Basement Total**	**61**	**Male**	**42**	**2**		**2**		**3**	
			Female	**42**	**4**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Ground Floor - Students (716m²)	57	Male	29	**2**		**1**		**2**	
			Female	**29**	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Ground Floor - Staff (716m²)	15	Male	8	**1**		0		**1**	
			Female	**8**	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Ground Floor Total**	**72**	**Male**	**37**	**3**		**1**		**3**	
			Female	**37**	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			

9b	Level 1 - Students (729m²)	58	Male	29	**2**		**1**		**2**	
			Female	29	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Level 1 - Staff (729m²)	15	Male	8	**1**		0		1	
			Female	8	**2**		**N/A**		1	
			Unisex Disabled				**N/A**			
9b	**Level 1 Total**	**73**	**Male**	**66**	**3**		**1**		**3**	
			Female	**66**	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Level 2 - Students (811m²)	65	Male	33	**2**		**1**		**2**	
			Female	33	**3**		**N/A**		**2**	
			Unisex Disabled				**N/A**			
9b	Level 2 - Staff (811m²)	17	Male	9	**1**		0		**1**	
			Female	9	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Level 2 Total**	**82**	**Male**	**42**	**3**		**1**		**3**	
			Female	**42**	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Level 3 - Students (1908m²)	152	Male	76	**3**		**2**		**3**	
			Female	76	**5**		**N/A**		**3**	
			Unisex Disabled				**N/A**			
9b	Level 3 - Staff (1908m²)	39	Male	20	**1**		**1**		**1**	
			Female	20	**2**		**N/A**		**1**	
			Unisex Disabled				**N/A**			
9b	**Level 3 Total**	**191**	**Male**	**96**	**4**		**3**		**4**	
			Female	**96**	**7**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Level 4 - Students (1790m²)	143	Male	72	**2**		**2**		**3**	
			Female	72	**4**		**N/A**		**3**	
			Unisex Disabled				**N/A**			

9b	Level 4 - Staff (1790m²)	36	Male	18	1		1		1	
			Female	18	2		N/A		1	
			Unisex Disabled				N/A			
9b	**Level 4 Total**	**179**	**Male**	**90**	**3**		**3**		**4**	
			Female	**90**	**6**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Level 5 - Students (1794m²)	144	Male	72	2		2		3	
			Female	72	4		N/A		3	
			Unisex Disabled				N/A			
9b	Level 5 - Staff (1794m²)	36	Male	18	1		1		1	
			Female	18	2		N/A		1	
			Unisex Disabled				N/A			
9b	**Level 5 Total**	**180**	**Male**	**90**	**3**		**3**		**4**	
			Female	**90**	**6**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Level 6 - Students (1923m²)	154	Male	77	3		2		3	
			Female	77	5		N/A		3	
			Unisex Disabled				N/A			
9b	Level 6 - Staff (1923m²)	39	Male	20	1		1		1	
			Female	20	2		N/A		1	
			Unisex Disabled				N/A			
9b	**Level 6 Total**	**193**	**Male**	**97**	**4**		**3**		**4**	
			Female	**97**	**7**		**N/A**		**4**	
			Unisex Disabled				**N/A**			
9b	Levels 7-9 Students (1973m²)	158	Male	79	3		2		3	
			Female	79	5		N/A		3	
			Unisex Disabled				N/A			
9b	Levels 7-9 Staff (1973m²)	40	Male	20	1		1		1	
			Female	20	2		N/A		1	
			Unisex Disabled				N/A			

9b	**Levels 7-9 Total**	**198**	**Male**	**99**	**4**		**3**	**4**	
			Female	**99**	**7**		**N/A**	**4**	
			Unisex Disabled				**N/A**		
5	Level 10 (1941m²)	195	Male	98	**5**		**3**	**4**	
			Female	98	**7**		**N/A**	**4**	
			Unisex Disabled				**N/A**		
5	Level 11 (1935m²)	194	Male	97	**5**		**3**	**4**	
			Female	97	**7**		**N/A**	**4**	
			Unisex Disabled				**N/A**		
5	Level 12 (1396m²)	140	Male	70	**4**		**3**	**3**	
			Female	70	**5**		**N/A**	**3**	
			Unisex Disabled				**N/A**		
5	Level 13-17 (1542m²)	155	Male	78	**4**		**3**	**3**	
			Female	78	**6**		**N/A**	**3**	
			Unisex Disabled				**N/A**		
5	Level 11 (1935m²)	194	Male	97	**5**		**3**	**4**	
			Female	97	**7**		**N/A**	**4**	
			Unisex Disabled				**N/A**		
5	Level 12 (1396m²)	140	Male	70	**4**		**3**	**3**	
			Female	70	**5**		**N/A**	**3**	
			Unisex Disabled				**N/A**		
5	Level 13-17 (1542m²)	155	Male	78	**4**		**3**	**3**	
			Female	78	**6**		**N/A**	**3**	
			Unisex Disabled				**N/A**		

Notes / Assumptions:

1. The sanitary facilities below have been calculated based on the population considering a population of 1 person per 6.8sqm & 1 person per 10sqm as requested by Charter Hall & WSU;
2. A common unisex accessible facility may be counted once for both male and female facilities in accordance with Clause F2.2(c) of the BCA;
3. A common unisex accessible facility must be provided at not less than 50% of the banks per storey in accordance with Table F2.4(a);
4. At least one ambulant sanitary compartment must be provided within each the male and female facilities complying with Section 16 of AS1428.1 – 2009;
5. A WC may be used in place of a urinal in accordance with F2.6 if required;
6. * Equate to the use of a unisex accessible facility within the count; and
7. A performance solution is to be obtained to allow Staff & Students to share a common bank of facilities.

23. Appendix J1 – Energy Efficiency R-Values

Roofs and Ceilings - Minimum Total R-Value (Table J1.3a)

Climate zone	1, 2, 3, 4 & 5	6	7	8
Direction of heat flow	**Downwards**		**Upwards**	
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of not more than 0.4	3.2	3.2	3.7	4.8
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.4 but not more than 0.6	3.7	3.2	3.7	4.8
Minimum *Total R-Value* for a roof or ceiling with a roof upper surface solar absorptance value of more than 0.6	4.2	3.2	3.7	4.8

Adjustment of Minimum Total R-Value for Loss of Ceiling Insulation (Table j1.3b)

Percentage of ceiling area uninsulated	Minimum R-Value of ceiling insulation required to satisfy J1.3(a)										
	1.0	**1.5**	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**	**5.0**	**5.5**	**6.0**
	Adjusted minimum R-Value of ceiling insulation required to compensate for loss of ceiling insulation area										
0.5% to less than 1.0%	1.0	1.6	2.2	2.8	3.4	4.0	4.7	5.4	6.2	6.9	
1.0% to less than 1.5%	1.1	1.7	2.3	2.9	3.6	4.4	5.2	6.1	7.0		
1.5% to less than 2.0%	1.1	1.7	2.4	3.1	3.9	4.8	5.8	6.8			
2.0% to less than 2.5%	1.1	1.8	2.5	3.3	4.2	5.3	6.5				
2.5% to less than 3.0%	1.2	1.9	2.6	3.6	4.6	5.9	Not Permitted				
3.0% to less than 4.0%	1.2	2.0	3.0	4.2	5.7						
4.0% to less than 5.0%	1.3	2.2	3.4	5.0							
5.0% or more											

Note: Where the minimum *R-Value* of ceiling insulation *required* to satisfy J1.3(a) is between the values stated, interpolation may be used to determine the adjusted minimum *R-Value*.

Roof Lights - Thermal Performance of Transparent and Translucent Elements (Table j1.4)

Roof light shaft index (see Note 1)	Constant	Total area of roof lights serving the room or space as a percentage of the floor area of the room or space			
		Up to 2%	More than 2% to and up to 3%	More than 3% and up to 4%	More than 4% and up to 5%
Less than 0.5	*Total System SHGC*	Not more than 0.83	Not more than 0.57	Not more than 0.43	Not more than 0.34
	Total System U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
0.5 to less than 1.0	*Total System SHGC*	Not more than 0.83	Not more than 0.72	Not more than 0.54	Not more than 0.43
	Total System U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
1.0 to less than 2.5	*Total System SHGC*	Not more than 0.83	Not more than 0.83	Not more than 0.69	Not more than 0.55
	Total System U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
2.5 and more	*Total System SHGC*	Not more than 0.83	Not more than 0.83	Not more than 0.83	Not more than 0.83
	Total System U-Value	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4

Notes:

- The roof light shaft index is determined by measuring the distance from the centre of the shaft at the roof to the centre of the shaft at the ceiling level and dividing it by the average internal dimension of the shaft opening at the ceiling level (or the diameter for a circular shaft) in the same units of measurement.
- The total area of roof lights is the combined area for all roof lights serving the room or space.
- The area of a roof light is the area of the roof opening that allows light to enter the building.
- The thermal performance of an imperforate ceiling diffuser may be included in the Total System U-Value and Total System SHGC of the roof light.
- The total area of roof lights serving the room or space as a percentage of the floor area of the room or space must not exceed 5% unless allowed by J1.4(b).

Options for Each Part of an External Wall that is Part of an Envelope (Table J1.5a)

Climate zone	Options
1, 2 and 3	(a) (i) Achieve a minimum *Total R-Value* of 3.3. (ii) The minimum *Total R-Value* in (i) is reduced (A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and (B) for a wall that is (aa) facing the south orientation as described in Figure J2.3, by 0.5; or (bb) shaded with a projection shade angle in accordance with Figure J1.5 of (AA) 15 degrees to not more than 45 degrees, by 0.5; or (BB) more than 45 degrees, by 1.0; and (C) if the outer surface solar absorptance value is not more than 0.6, by 0.5.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of Table J2.4a.
4, 5 and 6	(a) (i) Achieve a minimum *Total R-Value* of 2.8. (ii) The minimum *Total R-Value* in (i) is reduced - (A) for a wall with a surface density of not less than 220 kg/m^2, by 0.5; and (B) for a wall that is - (aa) facing the south orientation as described in Figure J2.3, by 0.5; or (bb) shaded with a projection shade angle in accordance with Figure J1.5 of (AA) 30 degrees to not more than 60 degrees, by 0.5; or (BB) more than 60 degrees, by 1.0.
	(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of Table J2.4a.
7	(a) Achieve a minimum *Total R-Value* of 2.8. (b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum *Total R-Value* of 1.4; and (ii) satisfy *glazing* energy index Option B of Table J2.4a.
8	(a) Achieve a minimum *Total R-Value* of 3.8.
	(b) Where the wall is an earth retaining wall or earth-berm, achieve a minimum *Total R-Value* of 2.0.

An Envelope Wall Other than an External Wall Minimum Total R-Value (Table J1.5b)

Location			Climate zone							
			1	2	3	4	5	6	7	8
(a)	Where the adjacent enclosed non- *conditioned space* has		1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
	(i)	ventilation of not more than 1.5 air changes per hour of outside air during occupied hours; and								
	(ii)	glazing in the external fabric as required by Part J2; and								
	(iii)	*roof lights* in the external *fabric* as *required* by J1.4.								
(b)	For other than (a)		2.3	2.3	2.3	1.8	1.8	1.8	2.8	3.8

Note:
When assessing the glazing and roof lights as required by Part J2 and J1.4, assess the glazing and roof lights as if the non- conditioned space is the same separate conditioned space.

Floors - Minimum Total R-Value (Table J1.6)

Location			Climate zone							
			1	2	3	4	5	6	7	8
Direction of heat flow			Upwards	Downwards and upwards		Downwards				
(a)	A slab on ground:									
	(i)	Without an in-slab heating or cooling system	Nil	Nil	Nil	Nil	Nil	Nil	1.0	2.0
	(ii)	With an in-slab heating or cooling system	1.25	1.25	1.25	1.25	1.25	1.25	1.25	2.25
(b)	A suspended floor without an in-slab heating or cooling system where the non- *conditioned space* is		1.0	1.0	Nil	Nil	1.0	1.0	1.5	2.5
	(i)	enclosed; and								
	(ii)	where mechanically ventilated by not more than 1.5 air changes per hour.								
(c)	A suspended floor with an in-slab heating or cooling system where the non- *conditioned space* is		1.25	1.25	1.25	1.25	1.25	1.25	1.75	2.75
	(i)	enclosed; and								
	(ii)	where mechanically ventilated by not more than 1.5 air changes per hour								
(d)	For other than (a), (b) or (c)		2.0	2.0	2.0	2.0	2.0	2.0	2.0	3.5

Note:
A sub-floor space with not more than 150% of the required sub-floor ventilation is considered enclosed.

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