Memorandum

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Date: 2/11/2018

Subject: UNSW D14 Section J Fabric Statement

This memo has been prepared by the Lendlease Applied Insight team to address anticipated compliance with BCA 2016 Section J fabric thermal performance requirements.

Section J Statement

A preliminary section J envelope assessment has been undertaken on the concept SSDA design that confirms the proposed façade (glazing, shading and insulation) performs better than the minimum Deemed-to-Satisfy (DTS) performance requirements stipulated in Section J of BCA 2016. An alternative solution thermal modelling approach was adopted as the thermal characteristics of parts of the proposed fabric do not meet the minimum performance requirements stipulated in Section J, notably Part J2 Glazing. Compliance via an alternative solution methodology is verified where the predicted annual energy consumption of the proposed building fabric with idealised building services is not more than that of a reference building with the same idealised building services

The whole building was modelled and assessed on the approach described above. The results of the assessment have been provided in the table below.

Scenario	Description	Energy use (MWh/yr)	% Reduction vs DTS
Prop	Proposed Design	1003	4.8%
DTS	Deemed-To-Satisfy model	1054	-

As seen above, the proposed design suggests an energy reduction of approximately 4.8% when compared to the DTS reference model demonstrating the concept SSDA building design complies with Section J fabric performance requirements.

The purpose of this study was to understand if the principles incorporated into the concept façade design result in a Section J compliant building from a fabric perspective only. All other aspects of the design, such as services, are assumed to meet the DTS provisions of Section J and therefore compliance verification is to be sought for these elements from the relevant designers prior to application of a Construction Certificate. A detailed Section J fabric analysis will be conducted during detailed design.

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Building D14 - University of NSW
BCA Assessment Report
Report 2018 / 2612 R1.5 – October 2018

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SWP Quality System

Job Number/Ref:	2018/2612
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Revision History

Revision No:	R1.5
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Author:	Nick Hontas
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Disclaimer:

This report is based on a desktop audit of the preliminary design 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 preliminary 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 Building D14 located within the grounds of the University of NSW 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 report details the non-compliances identified at Section 9 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 comprising facilities such as Retail, Office and areas for teaching
Class of Occupancy	Class 5, 6 & 9b
Type of Construction Required	Type A
Rise Storeys:	9 Storeys
Number of Storeys:	10 Storeys
Effective Height:	29.9m (Level 7 RL61.400 - Level Lower Ground RL 31.500)

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 13 of the report and should be resolved prior to construction.

Key issues which require additional details have been listed under Section 9.2 of this report and need to be clarified with SWP prior to the issue of a construction certificate.

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1. Introduction

This report presents the findings of a preliminary assessment undertaken of the proposed design of Building D14 located within the grounds of the University of NSW 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 Lend Lease

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 issue a construction certificate under Part 6 of The Act. This means the design 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
Development by the Crown	Section 6.28 of the Act	Certification at the time of tender that the design complies with the State's building laws.

5.1. 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.

5.2. Development by the crown

Development by the Crown is regulated by Part 4 Division 4.6 and Part 6 Division 6.8 of the EP&A Act. Section 6.28 of the Act requires that any demolition or building work cannot be commenced unless the works are certified as complying with the State's building laws at the date of calling for tenders. The above

regulatory requirements generally still apply.

One means of ensuring compliance with the certification requirement is to obtain a construction certificate in relation to the works.

7. Methodology

6.1. 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 an Alternative 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

The proposed development involves the construction of multi storey mixed use building which contains the following attributes:

- Retail and student led spaces to the ground floor;
- Areas for use as teaching spaces and meeting by the university throughout the ground floor and level 1 – 2; and
- Office space for use by faculty of the university on levels 3 – 7.

The building is located within the grounds of the University of NSW.

9. Assessment Data Summary

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

8.1. Assumptions

1. The four (4) double doors leading out to the Level 1 external terrace will be fitted with automatic fail-safe devices connected to the base building sprinkler and smoke detection systems such that occupants are able to egress back through the building in the event of an emergency.

2. University staff members on Ground to Level 2 form part of the population on Levels 3 to 7 with access to the amenities on those floors at all times;
3. Retail staff numbers are 10% of the ground floor retail population from Appendix D1.13; and
4. Sanitary facilities on ground floor (east), Levels 1 and 2 will be for student use only.

8.2. 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.

1. For the purposes of calculating population to the retail and student areas, the following densities have been used based on statistical data from the University of New South Wales:
    a. Student Led Space 3.5m^2/pp; and
    b. Retail population density: 2m^2/pp.
2. Retail staff members will be provided with access to the ground floor (west) facilities for the purposes of achieving compliance with Table F2.3 of the BCA (sanitary facilities). These facilities are separate to those provided for students.

9. Issues Requiring Resolution

9.1. Issues requiring amendments to plans

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

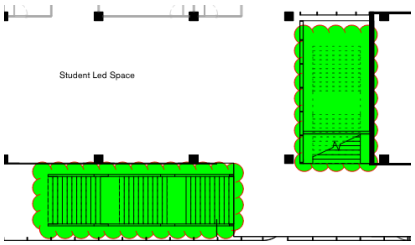
Item	DTS Clause	Description of Non-compliance	Requirement to Satisfy BCA
1.	D1.6 and D2.9	Level 2 requires an aggregate egress width of 4.5m to cater for the anticipated population of 470. The design currently documents 2 x fire stairs (1m each) and open stair (2.5m) without central handrail.	The open stair between Level 1 and 2 is required to be provided with a central handrail for the purposes of achieving compliant aggregate egress width. Note the stair will need to be widened to ensure min. 1250mm clearance is obtained on both sides of the central handrail.

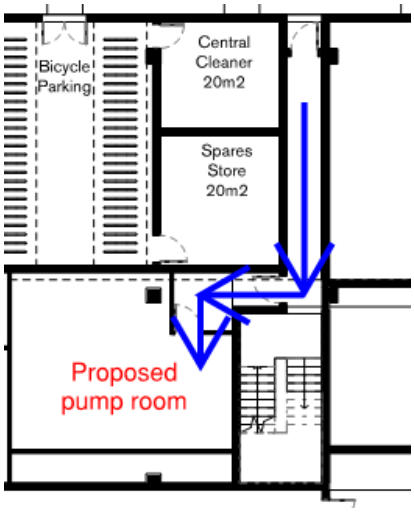
9.2. Performance solutions required

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

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Type of Construction	C1.1 & Spec C1.1	The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • A reduction of FRLs to the class 6 retail portion located on the ground floor (180/180/180 reduced to 120/120/120); • A reduction of FRLs to the class 9b and class 5 portions of the building (120/120/120 reduced to 90/90/90); • Construction throughout the building comprises of timber elements in lieu of constructing with the use of concrete or masonry; • As the building has an effective height of greater than 25m and is predominantly deemed class 5 compliance is not achieved with Clause 3.1(d) of Specification C1.1; and • The determination of fire rating will be in accordance with the Eurocode 5 instead of AS1720.4-1990	CP1 & CP2

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
2.	Non-Combustible building elements	C1.9	Timber is proposed to be implemented within the façade construction and is not considered to be non-combustible nor comply with the test requirements of AS5113-2016	CP1 & CP2
3.	Fire Hazard Properties	C1.10 & Spec C1.10	The material proposed to be installed within the fire isolated stairs and associated passageways do not achieve a group 1 rating and have not been tested to conform with the requirements of AS5637.1-2015. The finish to the CLT stair treads / risers exceed 1mm thickness and are attached to combustible substrate.	CP4
4.	Fire Protected Timber: Concession	C1.13	The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • Exposed timber elements are proposed to be installed throughout the buildings without consideration of being fire protected; and • The building is of predominantly class 5 and has an effective height being greater than 25m	DP5, CP1 & CP2
5.	Separation by fire walls and of classifications in the same storey	C2.7 and C2.8	A reduction of FRL's throughout the ground floor down to an FRL of 120/120/120 from an FRL of 180/180/180 fire rating is proposed to be implemented.	CP1 & CP2
6.	Separation of classifications in different storeys	C2.9	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 Retail (Class 6) & Assembly building (Class 9b) on the ground floor are to be separated from the Assembly building (Class 9b) on level 1 by a slab achieving an FRL of 120/120/120 *(The retail portion of the development is proposed to have a reduction of FRLs – 180/180/180 reduced to 120/120/120 – refer to Clause C1.1)* • The assembly building portions (Class 9b) on levels 1 & 2 are to be separated from the Commercial portions (Class 5) on levels 3 - 7 by a slab achieving an FRL of 120/120/120	CP1 & CP2
7.	Separation of lift shafts	C2.10	The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • A reduction in FRLs are proposed to the separating elements / walls of the class 6 portion of the building from 180/180/180 down to 120/120/120; • A reduction in FRLs are proposed to the separating elements / walls of the class 5 & 9b portion of the building from 120/120/120 down to 90/90/90; and • The shaft that houses the lift is proposed to be constructed of a combustible material	CP1 & CP2
8.	Openings in floors for services	C3.12	The service shafts that implemented throughout the building are proposed to be constructed of a combustible material.	CP2
9.	Openings in service installations	C3.15	The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • Openings for tested penetrations that do not achieve an insulation criteria are allowed to be within 100mm of a combustible building element	DP5, CP1 & CP2

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
10.	Number of exits required	D1.2	The following areas are not provided with access to two exits: <u>Ground floor</u> • Waste room (north west) • End of trip facilities (north west) • Retail store (north east) • Bicycle parking / central cleaner / spares store (north west) • Retail tenancies (north and south east) <u>Upper Ground</u> • Plant room	DP4 & EP2.2
11.	When fire isolated stairways and ramps are required	D1.3	The central non-fire isolated stair currently interconnects / passes by 4 storeys from ground floor through to level 2 (Ground Floor, Upper Ground, Level 1 & Level 2)  Details of this stair interconnecting more than 3 storeys is required to be documented by the projects accredited fire engineer as part of a performance solution	DP5, CP2 & EP2.2
12.	Exit travel distances	D1.4	Proposed travel distances throughout the building are to be as follows. These distances are subject to being provided with further detailed plans and also take into consideration future fitout of the premises: • 30m to a point of choice in lieu of 20m; and • 60m to the nearest available exit through a point of choice in lieu of 40m	DP4 & EP2.2
13.	Distance between alternative exits	D1.5	Proposed travel distances throughout the building are to be as follows. These distances are subject to being provided with further detailed plans and also take into consideration future fitout of the premises: • 90m between alternative exits in lieu of 60m	DP4 & EP2.2
14.	Travel by non-fire isolated stairways	D1.9	The following compliance issues are identified to the central non-fire isolated stair • Total travel distance to open space via the stair from the eastern side of Level 2 is approx. 95m in lieu of 80m; and • The stair is discontinuous between Level 1 and 2.	DP4 & EP2.2
15.	Fire Isolated Stairways & Ramps	D2.2	The fire isolated stair shafts that service the building are proposed to be constructed of a combustible material.	DP5, CP1 & CP2
16.	Installations in exits and paths of travel	D2.7	Cupboards housing electrical boards & comms boards installed within the path of travel throughout the building are to be constructed in timber.	DP5 & CP2
17.	Timber stairways Concession	D2.25	The proposed substrate to the stair risers and treads are deemed combustible.	DP5, CP1 & CP2
18.	Fire Hydrants	E1.3	The following performance solutions will need to be addressed by the projects accredited fire engineer:	EP1.3

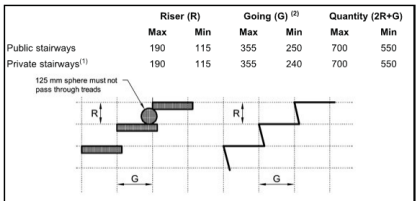
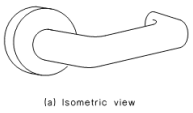
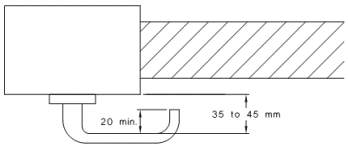
Item	Non-Compliance	DTS Clause	Description	Performance Requirement
			• The fire hydrant booster assembly is not provided with adequate fire rated separation to the building it serves (requirements of Section 7.3 of AS2419.1-2005); • As the proposed building has multiple main entrances the booster assembly will not comply with being within sight of the **main** entry (requirements of Section 7.3 of AS2419.1-2005; and • The Hydrant pump room is not provided with direct access from a fire isolated passageway / stairway. Access required attending fire brigade to pass through an airlock (direct access is required as per Clause 6.4.2 of AS2419.1-2005)  	
19.	Sprinklers	E1.5	The following performance solutions will need to be addressed by the projects accredited fire engineer: • Within the lift shaft a wet fire system is proposed in lieu of a dry sprinkler system required under Clause 13 of Specification E1.5	EP1.4
20.	Atrium Construction	G3.1 - G3.8 & Spec G3.8	The atrium proposed within the development (ground floor through to level 2) contains a number of departures from the DTS provisions outlined in part G3 and specification G3.8 of the BCA.	CP1, CP2, EP1.4 & EP2.2

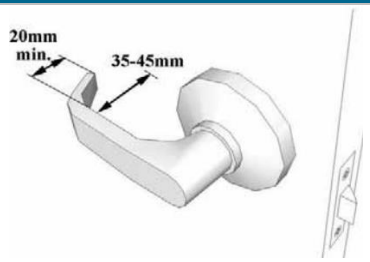
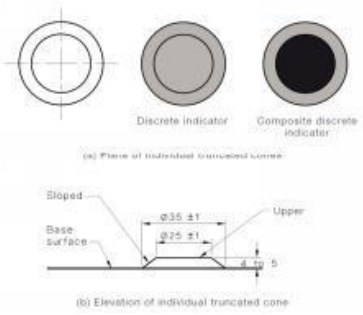
9.3. Items requiring additional details or documentation

The following items have been identified which require further details or documentation to be provided to ensure compliance is achieved before issuing the Construction Certificate.

Item	DTS Clause	Description	Requirement to Satisfy BCA
1.	B1.4	**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.	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage. **Termite Protection – Use of Timber** 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 (Only applicable and confirmation should be given for the use of timber products)
2.	C1.1	**Fire resisting construction**	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 **Colour coded set of architectural drawings need to be provided clearly identifying the proposed type of construction and fire rating to each building element in accordance with Clause and Specification C1.1 of the BCA**
3.	Spec C1.1	**Combustible Materials to External Walls in Fire**	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 either an alternative solution will be required or a variation to the selected material will need to be implemented within the design*
4.	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	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 an External & Common wall (Cladding and Wall register) Design Certificate from the projects façade engineer / Architect. The details provided also need to include relevant test reports, Codemark certification and certificates of conformity**

Item	DTS Clause	Description	Requirement to Satisfy BCA
		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	**demonstrating compliance with relevant Australian Standards.** *Should any deviation occur for the proposed cladding product or sarking material either an alternative solution will be required or a variation to the selected material will need to be implemented within the design*
5.	C2.9	**Separation of classifications in different storeys**	Structural details & specifications are to be submitted to the certifying Authority upon application of the relevant Construction Certificate which demonstrate the adequate separation and fire rating provisions between different classification.
6.	C2.10	**Separation of Lift Shafts**	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
7.	C2.12	**Separation of equipment**	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
8.	C2.13	**Electricity supply system**	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
9.	C3.8	**Openings in fire-isolated exits**	A door schedule indicating compliance is required to be provided and will be checked upon an application for the main works Construction Certificate
10.	C3.10	**Openings in fire-isolated lift shafts**	Certification from the lift supplier is required for the installation of the new lift
11.	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.	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
12.	D1.10	**Discharge from exits** An exit must not be blocked nor be capable of being blocked at its point of discharge.	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
13.	D2.3	**Non Fire Isolated Stairways and Ramps**	Details of the proposed methods of construction and materials used for the non-fire isolated stairways are required to be submitted to the Certifying Authority upon application for the Construction Certificate for review.
14.	D2.7	**Installations in Exits and Paths of Travel**	Details of the proposed doors serving service cupboards within the path of travel including notation of smoke seals and metal backed doors are to be incorporated within a door schedule to be submitted for the issue of the Construction Certificate
15.	D2.11	**Fire-isolated passageways**	**A Structural Engineer is to determine adequate FRLs and nominate these on structural plans associated**

Item	DTS Clause	Description	Requirement to Satisfy BCA
			with the application with the relevant Construction Certificate
16.	D2.13	**Goings and risers**	 Details and specifications of stairways are to be submitted to the Certifying Authority upon application of the Construction Certificate
17.	D2.16	**Barriers to prevent falls**	Detailed drawings of any proposed balustrades are to be provided at the Construction Certificate stage to the Certifying Authority for further review
18.	D2.17	**Handrails**	Detailed designs, drawings and specifications of the handrail design are to be submitted to the Certifying Authority for further review as [art of the application for the Construction Certificate
19.	D2.21	**<u>Class 5 & 6 Buildings / Portions</u>** All exit doors and doors in the path of travel must comply and have a handle compliant with achieving a single action motion and must have non-slip "D" pull handles with 35-45mm hand clearances.  (a) Isometric view  (b) Plan view **<u>Class 9b Buildings / Portions</u>** 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	Door hardware and associated specifications are required to be submitted to the Certifying Authority upon application for the relevant Construction Certificate for review

Item	DTS Clause	Description	Requirement to Satisfy BCA
		 • A room accommodating more than 100 occupants require a device such as a panic bar to allow a single hand pushing action. 	
20.	D2.22	**Re-entry from fire-isolated exits**	Details demonstrating a compliant solution of re-entry from the fire isolated stairway is required to be provided within the services documentation
21.	D2.23	**Signage to Fire Safety Doors**	**A signage schedule is required to be provided to the Certifying Authority upon application of the relevant Construction Certificate**
22.	D3.1 & D3.3	**Access for people with a disability**	**A full review is also to be undertaken by the projects access consultant with the provisions of a report to be submitted to the Certifying Authority**
23.	D3.6	**Signage**	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**
24.	D3.7	**Hearing Augmentation**	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.
25.	D3.8	**Tactile Indicators (TGSIs)**  (b) Elevation of individual truncated cone	**Tactile indicators are to be provided and shown on all the required Architectural drawings on submission for the Construction Certificate.** *Note - All tactile indicators are required to achieve a 30% luminance contrast to achieve compliance*
26.			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 head height issues occur are to be submitted to the certifying authority for review**

Item	DTS Clause	Description	Requirement to Satisfy BCA
27.	E1.3	**Fire hydrants** Fire hydrant cover is required throughout to AS2419.1 from hydrants located externally, within fire stairs or at other approved locations.	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 a Performance 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*
28.	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**
29.	E1.5	**Sprinklers**	The designing services engineer is to prepare the sprinkler system design incorporating the following: • 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.**
30.	E1.8	**Fire Control Centre**	Provisions of a fire control centre are required to be demonstrated within the Architectural plans in

Item	DTS Clause	Description	Requirement to Satisfy BCA
			accordance with clauses 2 - 5 of Specification E1.8 of the BCA **Drawings from both the Architect and services engineers demonstrating compliance are to be submitted to the certifying Authority for review.**
31.	E2.2	**Smoke Hazard Management** The following smoke hazard management systems are required: • Air-handling systems not forming part of a smoke hazard management system should be designed to AS1668.1 or should be fitted with smoke dampers and set to automatically shut down in fire mode; and • Smoke detectors installed to BCA Clause 5 of Specification E2.2a are required to automatically shut down the air handling system in accordance with AS1670.1-2015, • Smoke detectors installed to BCA Clause 5 of Specification E2.2a are required to activate stair pressurisation system and activate zone smoke control in accordance with AS1668.1: • Stair pressurisation for fire isolated stairs serving a storey over 25m effective height; • The building provided with a zone smoke control system in accordance with AS1668.1; • An automatic smoke exhaust system complying with Specification E2.2b; • The building must be provided with a sprinkler system complying with Specification E1.5; and • A Building occupant warning system is required to be installed throughout the building in accordance with Clause 6 of Specification E2.2a. The proposed BOWS system is to adaptive for provisions associated with SSISSEP which is required to be adopted in accordance with Clause E4.9 of the BCA and AS1670.4-2015	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
32.	E4.2, E4.5 & E4.6	**Emergency Lighting, Exit Signs & Directional Signage**	Design Documentation including electrical specifications, plans and a design certificate are to be provided to the Certifying Authority amongst the documentation submitted for the CC application for further review
33.	E4.9	**Sound system and intercom system for emergency purposes (SSISEP)**	Details demonstrating compliance and design certification will be required from services consultants at Construction Certificate stage.
34.	F1.0	**Water Proofing of External Walls**	A test report on the proposed wall system is to be provided to the certifying Authority for review. The test

Item	DTS Clause	Description	Requirement to Satisfy BCA
		Weatherproofing of external wall systems must be in accordance with BCA Verification Method FV1.	report must conform that the external wall complies with the provisions of the performance requirement FP1.4.
35.	F1.1	**Stormwater drainage**	Hydraulic drawings and design certification to be provided at Construction Certificate stage.
36.	F1.9	**Damp-proofing**	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 and confirmation should be given for the use of timber products)
37.	F2.4	**Facilities for Persons with Disabilities**	Floor plans, internal elevations and relevant specifications of the proposed toilet blocks including accessible and ambulant facilities compliant against clauses 15 – 17 of AS1428.1-2009 are to be provided to the certifying Authority for review
38.	F3.1	**Height of rooms and other spaces**	The project Architect is to provide detailed sections to the Certifying Authority for an assessment at the Construction Certificate stage to verify compliance of the relevant ceiling heights.
39.	F4.5	**Ventilation of Rooms**	Mechanical details including drawings, specification and a design certificate are required to be provided to the Certifying Authority from the projects Mechanical Engineer.
40.	F4.12	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.
41.	Section J	**Assessment of energy efficiency requirements**	Assessment of the requirements of Section J to be undertaken by Energy Efficiency Consultant and a report provided for review

10. 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,

11. Statutory Fire Safety Measures

All fire/essential safety measures installed within the building are 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.

12. 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.

13. 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.	Noted
Section A: General Provisions			
A3.2	**Classification and usage** Usage on each level of the building is as follows: **LEVEL** / **USE** / **CLASS** Ground – Retail Space & Student LED – 6 & 9b Upper Ground – Plant – 9b Level 1 – Level 2 – Teaching / Student Facilities – 9b Level 3 – Level 7 – Faculty Use – 5 Level 8 – Plant – 5	Plant on Level 8 is ancillary	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	-
B1.4	**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.	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage. **Termite Protection – Use of Timber** Details of the method of protection against moisture and other associated termite attack should be documented within the	Additional details required

Clause	Description	Comment	Status
		specifications and on the drawings proposed for construction (Only applicable and confirmation should be given for the use of timber products)	
B1.5	**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.	-	Noted
B1.6	**Construction of buildings in flood hazard areas**	-	N/A
Part B	**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.	The building has an importance level 3 in accordance with Table B1.2a as it is a building where more than 300 people can congregate in one area.	Compliance readily achievable
Section C: Fire Resistance			
Part C1 – Fire Resistance and Stability			
C1.1	**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	Fire resisting requirements to building elements 1. External walls • Must be non-combustible; 2. FRLs required to loadbearing elements • Achieve an FRL of 120/120/120 to the ground floor retail portion subject to a proposed performance solution; • Achieve an FRL of 90/90/90 from level 1 through to level 7 subject to a proposed performance solution; 3. Any loadbearing internal walls must be of concrete or masonry; 4. 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; 5. Any non-loadbearing internal walls required to be fire resistant or shafts must be non-combustible; and 6. Roof is not required to achieve a fire rating provided the covering is non-combustible as sprinklers are being installed throughout the development. **Structural details & specifications of the wall types and relevant FRLs proposed are to be submitted from a suitably**	Additional details required

Clause	Description	Comment	Status
		qualified Structural Engineer to the Certifying Authority upon application of the relevant Construction Certificate	
		The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • A reduction of FRLs to the class 6 retail portion located on the ground floor (180/180/180 reduced to 120/120/120); • A reduction of FRLs to the class 9b and class 5 portions of the building (120/120/120 reduced to 90/90/90); • Construction throughout the building comprises of timber elements in lieu of constructing with the use of concrete or masonry – this includes stair shafts, lift shafts, service shafts, wall and ceiling linings to fire stairs etc; • As the building has an effective height of greater than 25m and is predominantly deemed class 5 compliance is not achieved with Clause 3.1(d) of Specification C1.1; and • The determination of fire rating will be in accordance with the Eurocode 5 instead of AS1720.4-1990. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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	Refer to comments at C1.1 above and Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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	The following parameters apply: Rise in storeys: 9 storeys Effective Height: 29.9m (Level 7 RL61.400 - Level Lower Ground RL 31.500)	Noted

Clause	Description	Comment	Status
	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.		
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**	If a fire wall divides the building in accordance with Clause C2.7, the building portions are able to be constructed in differing levels of fire-resistance determined in accordance with Clause C1.1 and C1.3.	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 of Type A or B construction the following building elements and their components must be non-combustible: i. External walls and common walls, including all components. ii. The flooring and floor framing of lift pits iii. Non-loadbearing internal wall that are required to be fire resisting. 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	Combustible building elements are proposed. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
C1.10	**Fire Hazard Properties** Floor materials, floor coverings and wall and ceiling lining materials need to comply with	Compliance assumed and will require verification test data for all timber and other combustible linings and materials, including:- • Carpets	Compliance readily achievable

Clause	Description	Comment	Status
	prescribed fire hazard properties. Refer to Appendix C1.10.	• Vinyl's (walling and flooring) • Timber flooring and wall linings • Veneered wall panelling • Spray-on insulation material • Other combustible finishes • 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	
		The material proposed to be installed within the fire isolated stairs and associated passageways do not achieve a group 1 rating and have not been tested to conform with the requirements of AS5637.1-2015. The finish to the CLT stair treads / risers exceed 1mm thickness and are attached to combustible substrate. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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** *Fire-protected timber* in a Class 2, 3 or 5 building may be used wherever an element is *required* to be *non-combustible*,	The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • Exposed timber elements are proposed to be installed throughout the buildings without consideration of being fire protected; and • The building is of predominantly class 5 and has an effective height being greater than 25m Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution

Clause	Description	Comment	Status
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**		N/A
C2.7	**Separation by fire walls** A fire wall must extend to the underside of a floor having an FRL required for a fire wall or the roof covering.	The fire wall separating the ground floor retail from the non-retail portions will achieve an FRL of 120/120/120 in lieu of 180/180/180. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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 firewall.	Refer to comments at C2.7 above and Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	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 the BCA.	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 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 down to an FRL of 120/120/120; • The upper levels (Level 1 - 7) providing separation between storeys are to be constructed utilising timber construction; and • A reduction of FRLs to the class 9b and class 5 portions of the building (120/120/120 reduced to 90/90/90) Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
C2.10	**Separation of Lift Shafts** Openings for lift landing doors and services must be protected in accordance with the DTS provisions of Part C3 of the BCA	The proposed lift shafts serving the building must be separated as specified in Clause 2.10. Separation of the lift shaft must be achieved from the remainder of the building by complying with elements achieving the following nominated FRLs- • **Class 5, 6 & 9b - 120/120/120** *(The retail portion of the development is proposed to have a reduction of FRLs – 180/180/180 reduced to 120/120/120 – refer to Clause C1.1)* 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 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 are proposed to the separating elements / walls of the class 6 portion of the building from 180/180/180 down to 120/120/120; • A reduction in FRLs are proposed to the separating elements / walls of	Performance Solution

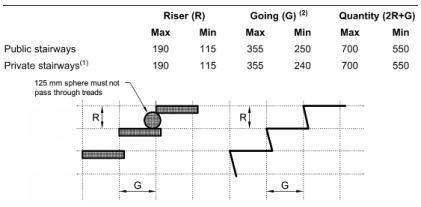
Clause	Description	Comment	Status
		the class 5 & 9b portion of the building from 120/120/120 down to 90/90/90; and • The shaft that houses the lift is proposed to be constructed of a combustible material Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	
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) 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. **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.**	Additional details required
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.	Any switch room located within the building which houses equipment to sustain emergency equipment 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.**	Additional Details Required
C2.14	**Public corridors in Class 2 & 3 buildings**		N/A
Part C3 – Protection of Openings			
C3.1	**Application of Part**		Noted
C3.2	**Protection of openings in external walls**		N/A
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	Noted

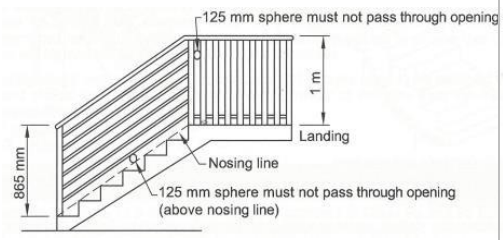
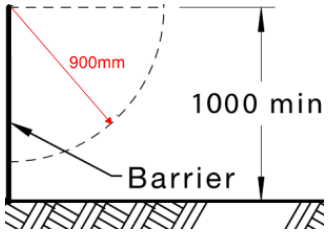
Clause	Description	Comment	Status
		• Automatic closing, or -/60/30 self-closing or automatic closing fire doors.	
C3.5	**Doorways in fire walls**	Doorways in firewalls are to be protected by a fire door or fire shutter that has an FRL of not less than that required for the firewall except that the insulation rating must be at least 30.	Compliance readily achievable
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 with an FRL of -/120/60, or water pipes for fire services are not permissible.		Noted
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.	**<u>Class 5, 6 & 9b</u>** 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
		The service shafts that implemented throughout the building are proposed to be constructed of a combustible material. Refer to Concept Fire Safety Strategy SY180278 prepared by Defire dated 19 October.	Performance Solution
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	Compliance readily achievable

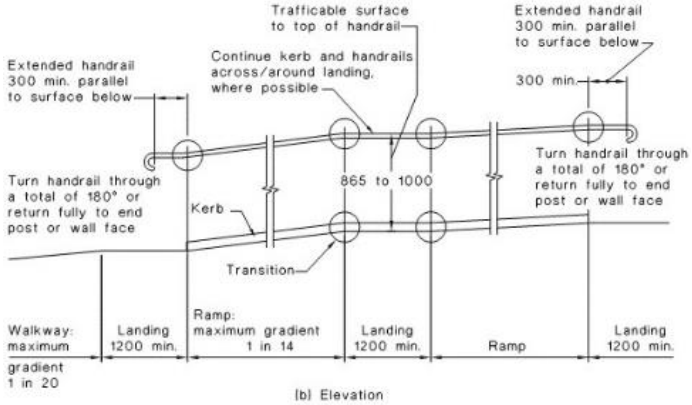
Clause	Description	Comment	Status
		not less than -/30/30, or • A self-closing -/60/30 fire door or hopper, or • An access panel with an FRL of not less than -/60/30, or • If the shaft is a garbage shaft - a door or hopper of non-combustible construction.	
C3.14	-	This clause has deliberately been left 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 The following performance solution need to be addressed by the projects fire engineer and implemented within the fire engineering report: • Openings for tested penetrations that do not achieve an insulation criteria are allowed to be within 100mm of a combustible building element Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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
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 are not provided with access to two exits: <u>Ground floor</u> • Waste room (north west) • End of trip facilities (north west) • Retail store (north east) • Bicycle parking / central cleaner / spares store (north west) • Retail tenancies (north and south east) <u>Upper Ground</u> • Plant room Refer to Preliminary Fire Safety Engineering Review SY180278 prepared	Performance Solution

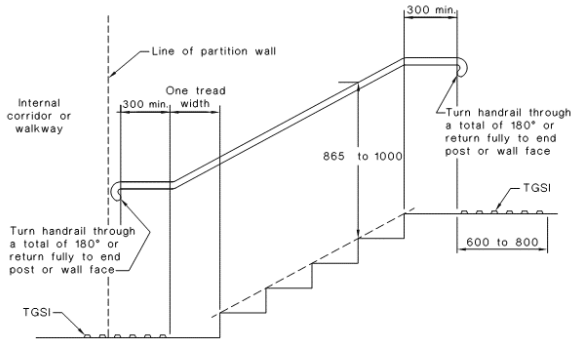
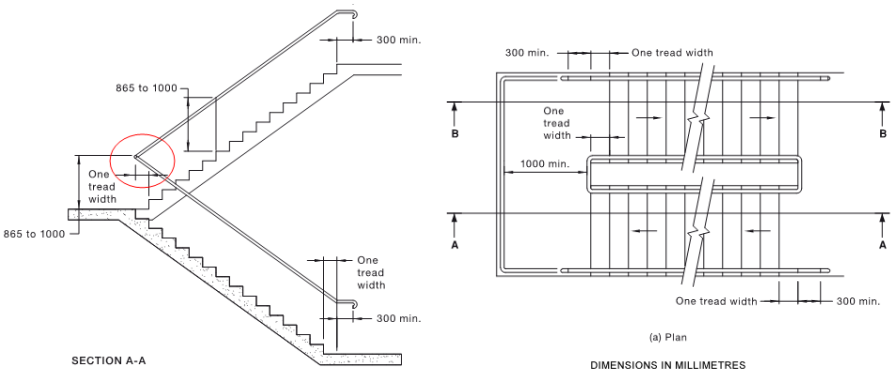
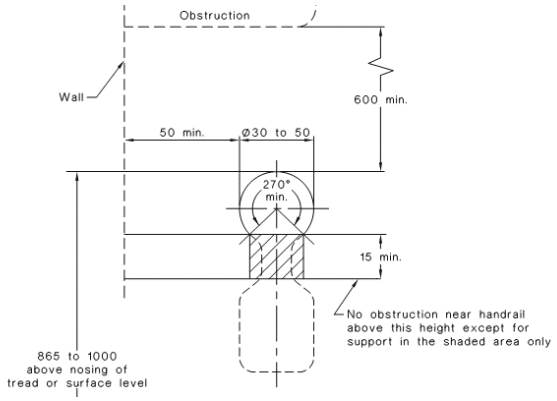
Clause	Description	Comment	Status
		by Defire dated 6 November 2018.	
D1.3	**When fire-isolated stairways and ramps are required** Every stair in a Class 5 to 9 building must be fire isolated unless it does not connect or pass through more than 3 consecutive floors in a sprinkler protected building	The central non-fire isolated stair currently interconnects / passes by 4 storeys from ground floor through to level 2 (Ground floor, upper ground, level 1 & level 2) Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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.	Proposed travel distances throughout the building are to be as follows. These distances are subject to being provided with further detailed plans and also take into consideration future fitout of the premises: • 30m to a point of choice in lieu of 20m; and • 60m to the nearest available exit through a point of choice in lieu of 40m Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
D1.5	**Distance between alternative exits** The following travel distance limits apply: • ≤ 20m to a single exit or to a point of choice to alternative egress paths, and • ≤ 40m to the closest alternative exit; • ≤ 60m travel distance between alternative exits and not less than 9m between alternative exits; • Exit paths to alternative exits should not converge at any point to be less than 6m apart.	Proposed travel distances throughout the building are to be as follows. These distances are subject to being provided with further detailed plans and also take into consideration future fitout of the premises: • 90m between alternative exits in lieu of 60m Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
D1.6	**Dimensions of exits and paths of travel to exits**	Level 2 requires an aggregate egress width of 4.5m to cater for the anticipated population of 470. The design currently documents 2 x fire stairs (1m each) and open stair (2.5m) without central handrail. The open stair between Level 1 and 2 is required to be provided with a central handrail for the purposes of achieving compliant aggregate egress width. Note the stair will need to be widened to ensure a minimum width of 1250mm is obtained on both sides of the central handrail.	Does Not Comply
D1.7	**Travel via fire-isolated exits**		Complies
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 following compliance issues are identified to the central non-fire isolated stair • Total travel distance to open space via the stair from the eastern side of Level 2 is approx. 95m in lieu of 80m; and • The stair is discontinuous between Level 1 and 2.	Performance Solution

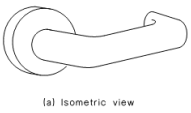
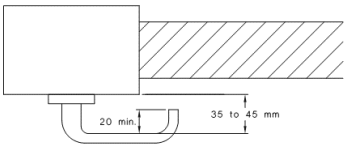
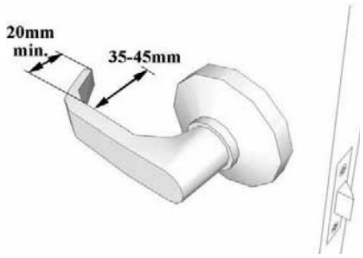
Clause	Description	Comment	Status
D1.10	**Discharge from exits** Suitable barriers such as bollards are to be provided to prevent the blockage of exits by vehicles, etc. An unobstructed path of travel to the road must be provided with a width not less than the width of the required exit.	Details of the 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**		
D1.12	**Non-required stairways, ramps or escalators**		N/A
D1.13	**Number of persons accommodated**	Refer to Appendix D1.13 or list below	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 stairways and ramps**	The fire isolated stair shafts that service the building are proposed to be constructed of a combustible material. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
D2.3	**Non Fire Isolated Stairways and Ramps**	The proposed stairs interconnecting the ground floor and level 2 is 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 **Details of the proposed methods of construction and materials used for this staircase are required to be submitted to the Certifying Authority upon application for the Construction Certificate for review**	Additional Details Required
D2.4	**Separation of rising and descending stair flights**		N/A
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-	Additional details required

Clause	Description	Comment	Status
		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**	
		Cupboards housing electrical boards & comms boards installed within the path of travel throughout the building are to be constructed in timber. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
D2.8	**Enclosure of space beneath stairs and ramps**		N/A
D2.9	**Width of required stairways and ramps**	The open stair serving Levels 1 and 2 is required to be provided with a central handrail for the purposes of achieving compliance aggregate egress width. Refer to Clause D1.6 above.	Does Not Comply
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 A 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**		N/A
D2.13	**Goings & 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	 Details and specifications of stairways are to be submitted to the Certifying Authority for the relevant Construction Certificate	Additional Details Required

<table>
<tr><th>Clause</th><th>Description</th><th>Comment</th><th>Status</th></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.
The below 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 at doors leading to the exterior; and
In a building required to be accessible and the doorway opens to a road or open space and is provided with a threshold ramp or step ramp in accordance with AS1428.1-2009</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 rowspan="2">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 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.</td><td rowspan="2">Additional Details Required</td></tr>
<tr><td> 
</td><td>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.
Detailed drawings of any proposed balustrades and other occupant barriers are to be provided at the relevant Construction Certificate stage for verification.</td></tr>
<tr><td>D2.17</td><td>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: -</td><td>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</td><td>Additional Details Required</td></tr>
</table>

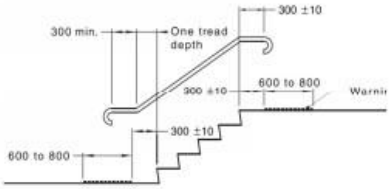
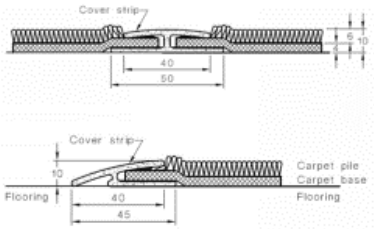
Clause	Description	Comment	Status
	• Handrails not to obstruct circulation space • 30-50mm diameter • 865-1000mm above nosing line of stairs • 865-1000mm above ramps and landings • Consistent height throughout • 50mm grip clearance and no obstructions to handhold • Continuous at internal (return) landings • Provided with handrail extensions and 180 degree curled ends	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.**	
	Ramps  (b) Elevation DIMENSIONS IN MILLIMETRES FIGURE 14 RAMP HANDRAILS **Stairways**		

Clause	Description	Comment	Status
	 SECTIONAL VIEW DIMENSIONS IN MILLIMETRES FIGURE 26(B) STAIRWAY LOCATION AND HANDRAIL EXTENSIONS AT END OF STAIRWAY OTHER THAN AT LINE OF BOUNDARY  SECTION A-A (a) Plan DIMENSIONS IN MILLIMETRES **Handrail Profile** 		
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.		Compliance Readily Achievable
D2.20	**Swinging doors**		Additional Details

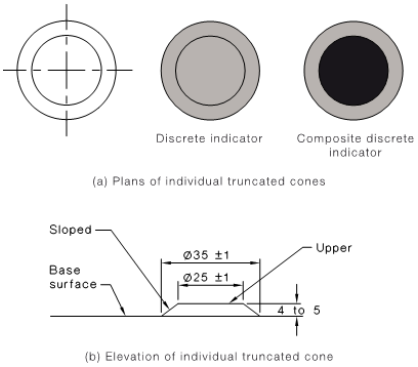
Clause	Description	Comment	Status
	Defined exit doors that serve a part of a building with a floor area over 200m^2 must swing outward in the direction of exit travel. Must not encroach more than 500mm into the required width of the stair or 100mm when fully open and swing in the direction of travel.		Required
D2.21	**Operation of latch**	**Class 5 & 6 Buildings / Portions** All exit doors and doors in the path of travel must comply and have a handle compliant with achieving a single action motion and must have non-slip "D" pull handles with 35-45mm hand clearances.  (a) Isometric view  (b) Plan view **Class 9b Buildings / Portions** 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**	Additional Details Required

Clause	Description	Comment	Status
		specifications are required to be submitted to the Certifying Authority upon application for the relevant Construction Certificate for review	
D2.22	**Re-Entry from Fire-Isolated Exits**	Fire isolated stair doors must facilitate re-entry from within the stair back onto the floor on every 4th level at all times and on all levels in the event of a fire alarm, where serving a health care or aged care building or where the exit stair serves a storey above 25m in effective height. Doors of fire-isolated exits must not be locked from the inside of a fire-isolated exit, unless: Option 1 • 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. Option 2 • 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 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*	Additional Details Required
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:	Additional Details Required

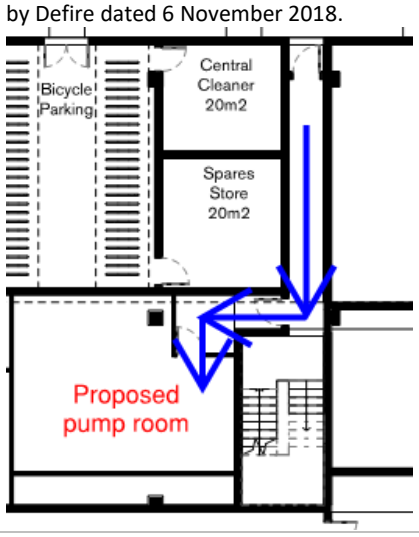
Clause	Description	Comment	Status
		OFFENCES RELATING TO FIRE EXITS It is an offence under the Environmental Planning and Assessment Act 1979 (a) to place anything in or near this fire exit that may obstruct persons moving to or from this exit, or (b) to interfere with or obstruct the operation of any 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**	
D2.24	**Protection of openable windows**		N/A
D2.25	**Timber stairways: Concession**	The proposed substrate to the stair risers and treads are deemed combustible. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
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 the projects accredited access consultant is to be provided to accompany the Construction Certificate. Any deviation from the DTS Provisions will require a Performance Based Solution to be developed and endorsed under a Construction Certificate.			
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: • To and within all areas normally used by occupants **A full review is to be undertaken by the access consultant with the provisions of a report to be submitted to the Certifying Authority**	Additional Details Required
D3.2	**Access to Buildings**	Access must be provided to a building from 1. the main points of a pedestrian entry at the allotment boundary, and 2. another accessible building connected by a pedestrian link, and 3. from any accessible car parking space on the allotment. An access way is required to be provided through the principal pedestrian entrance and through not less than 50% of all pedestrian entrances. In a building with a floor area over 500m2, a pedestrian entrance which is not accessible must not be located more than 50m from an accessible entrance.	Compliance readily achievable
D3.3	**Parts of the Building to be Accessible** All parts of the building must be accessible to people	Areas including the classrooms, tiered learning facility common corridors and all other areas within the proposed	Additional Details

Clause	Description	Comment	Status
	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.	development considered accessible 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.  • Accessways must have passing spaces and turning spaces complying with AS 1428.1 - 2009 • Pile height or pile thickness of carpets shall comply with the requirements of this Clause and AS 1428.1-2009  **A full review is to be undertaken on the Construction issued set of drawings and where non-compliances have been assessed an access consultant is required to be employed to assess the non-compliance as part of a performance solution**	Required
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
D3.5	**Accessible car parking**		N/A
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 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

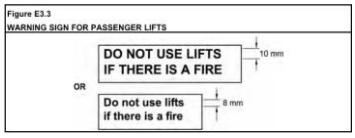
Clause	Description	Comment	Status
	 Signage must be provided within a room containing hearing augmentation identifying the type of hearing augmentation, the area covered in the room and if receivers are being used and where the receivers can be obtained.  Every doorway required to be provided with an 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	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
	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; 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 to SWP for review**	Additional details required
D3.9	**Wheelchair seating spaces in Class 9b assembly buildings**	No fixed seating is proposed in this development	N/A
D3.10	**Swimming pools**		N/A
D3.11	**Ramps**		N/A
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	Glazed shopfronts will need to have solid and non-transparent decals installed in accordance with AS 1428.1	Compliance readily achievable

Clause	Description	Comment	Status
	mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.		
Section E: Services and Equipment			
Part E1 – Fire Fighting Equipment			
E1.1	-	This Clause has deliberately been left blank	
E1.2	-	This Clause has deliberately been left blank	
E1.3	**Fire hydrants** Fire hydrant cover is required throughout to AS2419.1 from hydrants located externally, within fire stairs or at other approved locations. (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.	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 will need to be addressed by the projects accredited fire engineer: • The fire hydrant booster assembly is not provided with adequate fire rated separation to the building it serves (requirements of Section 7.3 of AS2419.1-2005); • As the proposed building has multiple main entrances the booster assembly will not comply with being within sight of the **main** entry (requirements of Section 7.3 of AS2419.1-2005; and • The Hydrant pump room is not provided with direct access from a fire isolated passageway / stairway. Access requires attending fire brigade to pass through an airlock (direct access is	Performance Solution

Clause	Description	Comment	Status
		required as per Clause 6.4.2 of AS2419.1-2005) Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018. 	
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 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	Additional Details Required

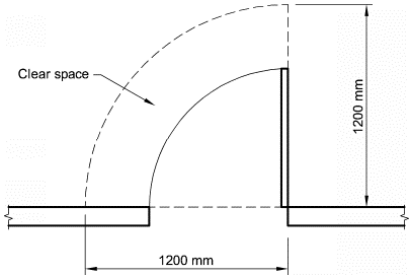
Clause	Description	Comment	Status
		design documentation of the pump and valve sets and water tanks; • Layout Schematics, Specifications and design documentation of the sprinkler system layout throughout the building The Services Engineer is to advise compliance of the system against the requirements of BCA Clause E1.5, BCA Specification E1.5 and AS2118.1-1999.	
		The following performance solutions will need to be addressed by the projects accredited fire engineer: • Within the lift shaft a wet fire system is proposed in lieu of a dry sprinkler system required under Clause 3 of Specification E1.5 Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance 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	**Fire control centre**	As the building has an effective height of greater than 25m a specific fire control centre is required to be provided in accordance with clauses 2 - 5 of Specification E1.8. **Details of compliance with clauses 2 to 5 of Specification E1.8 will be required to be provided for the Construction Certificate**	Additional Details Required
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 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.	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. This needs to be put in place early in the construction programme and may require liaison with the builder and his fire services contractor.	Compliance Readily achievable
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	Noted

Clause	Description	Comment	Status
		• plant rooms or the like	
E2.2	**Smoke Hazard Management** The following smoke hazard management systems are required: • Air-handling systems not forming part of a smoke hazard management system should be designed to AS1668.1 or should be fitted with smoke dampers and set to automatically shut down in fire mode; and • Smoke detectors installed to BCA Clause 5 of Specification E2.2a are required to automatically shut down the air handling system in accordance with AS1670.1-2015, • Smoke detectors installed to BCA Clause 5 of Specification E2.2a are required to activate stair pressurisation system and activate zone smoke control in accordance with AS1668.1: • Stair pressurisation for fire isolated stairs serving a storey over 25m effective height; • The building provided with a zone smoke control system in accordance with AS1668.1; • An automatic smoke exhaust system complying with Specification E2.2b; • The building must be provided with a sprinkler system complying with Specification E1.5; and • A Building occupant warning system is required to be installed throughout the building in accordance with Clause 6 of Specification E2.2a. The proposed BOWS system is to adaptive for provisions associated with SSISSEP which is required to be adopted in accordance with Clause E4.9 of the BCA and AS1670.4-2015	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	Additional Details Required
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.		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. The lift must serve every level to which 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	The following requirements apply to an emergency lift: - • Must serve all storeys served by a	Compliance Readily Achievable

Clause	Description	Comment	Status
	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	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) It should be noted that as the proposed development contains only 2 lifts within the same shaft both lifts are required to be installed to act in the capacity of serving the building as emergency lifts	
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 control switch	Compliance readily achievable
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 in accordance with Clause E4.2 of the BCA	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, and • 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 100m2 that does not open to a	Additional Details Provided

Clause	Description	Comment	Status
		corridor or space that has emergency lighting or to a road or open space. • In any room having a floor area more than 300m2. • In every required non-fire isolated stairway To every room or space that has public access in a Class 6 or 9b building if: • the floor area is more than 300m2; • 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**	
E4.3	**Measurement of distances**		Noted
E4.4	**Design and operation of emergency lighting**	Emergency lighting must comply with to AS2293.1-2005	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 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**	Additional details required
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

Clause	Description	Comment	Status
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.	Additional details required
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**		N/A
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 ground floor slab	Compliance Readily Achievable

Clause	Description	Comment	Status
F1.11	**Provision of floor wastes**		N/A
F1.12	**Sub-floor 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.	Complies
F2.4	**Facilities for Persons with Disabilities**	Accessible unisex toilets for people with a disability are required on each storey and at 50% of toilet banks on any storey and accessible facilities are to be constructed to AS1428.1 – 2009. Each bank of toilets where there is more toilets in addition to an accessible unisex facility at the bank of toilets , a sanitary compartment suitable for use for a person with an ambulant disability in accordance with clause 16 of AS1428.1-2009	Compliance readily achievable
		Floor plans, internal elevations and relevant specifications of the proposed toilet blocks including accessible and ambulant facilities compliant against clauses 15 – 17 of AS1428.1-2009 are to be provided to the certifying Authority for review	Additional details required
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
Part F3 – Room Heights			
F3.1	**Height of rooms and other spaces**	The project Architect is to provide detailed sections to SWP for an assessment at the	Additional Details

Clause	Description	Comment	Status
	Class 5 & 6 Building: • General floor areas – 2.4m • Corridor, passageways or the like – 2.1m • Bathroom, sanitary compartment, car parking area store room or the like – 2.1m • A commercial kitchen – 2.4m; and • Above a stairway, landing or the like – 2m measured vertically above nosing of stairway treads or floor surface of landing. **Class 9b Building:** • In a Class 9b assembly building which accommodates not more than 100 persons — 2.4 m; • A theatre, public hall or other assembly building which accommodates more than 100 persons — 2.7 m • In a corridor that serves an assembly building which accommodates not more than 100 persons — 2.4 m • In a corridor that serves an assembly building which accommodates more than 100 persons — 2.7 m;	Construction Certificate stage to verify compliance.	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**		N/A
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
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 G3 - Atrium Construction			
G3.1 – G3.8 & Spec G3.8	**Atrium Construction –** • **Dimensions of the atrium well;** • **Separation of atrium by bounding walls;** • **Construction of Bounding walls;** • **Construction of balconies;** • **Separation at roof;** • **Fire & Smoke control systems**	The atrium proposed within the development (ground floor through to level 2) contains a number of departures from the DTS provisions outlined in part G3 and specification G3.8 of the BCA. Refer to Preliminary Fire Safety Engineering Review SY180278 prepared by Defire dated 6 November 2018.	Performance Solution
G3.7	**Means of egress** All areas within the atrium must have at least 2 means of egress.		Complies
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(B) Energy Efficiency - Class 5, 6 & 9b Buildings **NSW J(B)1 - Compliance with BCA Provisions.** Class 5, 6 & 9b buildings must comply with all of the provisions of the national **Section J** that are applicable to the relevant classifications, except as varied by **NSW J3.1** Application of Part. The building is to be assessed by an Energy Efficiency Consultant and non-compliances addressed within a JV3 Solution from the Energy Efficiency Consultant. **Note: Climate Zone 6 to be used within the assessment.**			

14. Appendix A – Referenced Documentation

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

Drawing No.	Title	Issue	Date	Drawn By
ADDA00002	Site Plan	04	08.11.18	Tzannes
ADDA20000	Ground Plan	04	08.11.18	Tzannes
ADDA20M00	Upper Ground Plant	04	08.11.18	Tzannes
ADDA20100	Level 1 Plan	04	08.11.18	Tzannes
ADDA20200	Level 2 Plan	04	08.11.18	Tzannes
ADDA20300	Level 3-6 Plan	04	08.11.18	Tzannes
ADDA20700	Level 7 Plan	04	08.11.18	Tzannes
ADDA20800	Plant Plan	04	08.11.18	Tzannes
ADDA29000	Roof Plan	04	08.11.18	Tzannes
ADDA41000	Elevation South	04	08.11.18	Tzannes
ADDA42000	Elevation West	04	08.11.18	Tzannes
ADDA43000	Elevation North	04	08.11.18	Tzannes
ADDA44000	Elevation East	04	08.11.18	Tzannes
ADDA51000	Section E-W	04	08.11.18	Tzannes
ADDA52000	Section N-S	04	08.11.18	Tzannes

15. 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 or stair pressurisation system)	BCA2016 (AMENDMENT 1) Clause 5 of Specification E2.2a and AS/NZS 1668.1 – 2015 and AS 1670.1 - 2015
Automatic fire detection and alarm system (smoke detection system to automatically shut down air-handling system)	BCA2016 (AMENDMENT 1) Clause 5 of Specification E2.2a and AS/NZS 1670.1 – 2015
Automatic fire suppression systems (Combined sprinkler and hydrant system)	BCA2016 (AMENDMENT 1) Specification E1.5 and AS 2118.6-2012
Emergency lifts	BCA2016 (AMENDMENT 1) Clause E3.4
Emergency lighting	BCA2016 (AMENDMENT 1) Clause E4.2, E4.4 and AS 2293.1 – 2005
Sound System and Intercommunication System for Emergency Purposes (aka EWIS)	BCA2016 (AMENDMENT 1) Clause E4.9 and AS 1670.4 – 2015
Exit signs	BCA2016 (AMENDMENT 1) Clause E4.5, NSW E4.6, E4.8 and AS 2293.1 – 2005
Fire control centre	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 and AS 2419.1 – 2005
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 1670.1-2015
Mechanical air handling system (automatic air pressurisation system)	BCA2016 (AMENDMENT 1) Table E2.2a and AS/NZ 1668.1-2015
Mechanical air handling system (automatic smoke exhaust system)	BCA2016 (AMENDMENT 1) Table E2.2b 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
Portable fire extinguishers	BCA2016 (AMENDMENT 1) Clause E1.6 and AS 2444 – 2001
Warning and operational signs	BCA2016 (AMENDMENT 1) Clauses D2.23, D3.6, E3.3, E3.9, E3.10 and E1.8

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

16. 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

17. 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

18. Appendix C2.2 – Floor Areas and Volumes

Floor areas and volumes of each storey

Floor	Approx. Area (m^2)	Approx. Volume (m^3)	Comment
Ground	2150	22500	Levels are connected via open stair Plant on upper ground is separated by full height walls however not fire rated
Upper Ground	80		
Level 1	1340		
Level 2	2100	8820	
Level 3	2100	7980	
Level 4	2100	7980	
Level 5	2100	7980	
Level 6	2100	7980	
Level 7	1960	7500	

19. Appendix D1.13 – Populations/Exit Width Assessment

Location	Use	Population	Required aggregate egress width (m) or maximum permissible population*	Proposed aggregate egress width (m)	Status
Ground Floor	Student Led Space	133	1.5m	9m	Complies
	Retail	250	2.5m	Min. 1m proposed for each given tenancies discharge directly to outside independently	Complies
Level 1	CATS & LED	205	2.5m	5m	Complies
Level 2	CATS & LED	470	4.5m	4m Refer to comments at D1.6 above.	Does Not Comply
Level 3	Faculty Office	200	2m	2m	Complies
Level 4	Faculty Office	200	2m	2m	Complies
Level 5	Faculty Office	200	2m	2m	Complies
Level 6	Faculty Office	200	2m	2m	Complies
Level 7	Faculty Office	200	2m	2m	Complies

20. 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

21. Appendix F2.3 – Requirements for Sanitary Facilities

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

Class	Use	Occupant Numbers			WC		Urinal		Basin	
		Total			Required / Provided		Required / Provided		Required / Provided	
5	**Levels 3-7** Faculty Office	1000	Male	500	25	25	11	15	17	20
			Female	500	34	35	N/A		17	20
			Unisex Disabled	-	One (1) per bank provided at each floor					
6 and 9b	**Levels Ground, 1 and 2** Students	1033 (excl. 25 for retail staff on ground floor)	Male	517	8	12	7	8	9	11
			Female	517	14	18	N/A		9	11
			Unisex Disabled	-	One (1) per bank provided at each floor on Levels 1, 2 and Ground (east)					
6	**Ground** Retail Staff	25	Male	10	1	3	1	1	1	3
			Female	10	1	1	N/A		1	1
			Unisex Disabled	-	One (1) provided at ground floor bank (west)					

Notes / Assumptions:

1. 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;
2. 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);
3. University staff members on levels Ground – Level 2 are assumed to form part of the population on levels 3 to 7 with access to the amenities on those floors at all times;
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. One (1) of the male WC's at the ground floor bank (west) has been counted in place of a urinal as permitted by Clause F2.6;
6. Retail staff numbers are assumed to be 10% of the ground floor retail population from Appendix D1.13 above;
7. Facilities provided need to be separated by use for students and staff. The assessment above is based on the following:
   - Facilities on Ground (east), Levels 1 and 2 cater for all students on these 3 levels; and
   - Facilities on Ground (west) cater for the retail staff members.
8. The Parents room and End of Trip facilities are not required to be relied upon for the purposes of achieving compliance (i.e. surplus facilities).

22. 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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