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University of Sydney
Engineering and Technology precinct

DRAFT BCA Assessment Report

Report 2016 / 2529 R1.3

Prepared for the University of Sydney
February 2018



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SWP Quality System

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Revision History

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Author: Andrew Rys
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Disclaimer:

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

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



Executive Summary

An assessment of the proposed design of the University of Sydney Engineering and Technology precinct 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 that require either amendments to plans or an Alternative Solution to satisfy the Performance Requirements of the BCA.

Summary of BCA Parameters:

Building Use:	Research and education centre
Class of Occupancy	Class 5, 8 & 9b
Type of Construction Required	Type A
Rise Storeys:	9
Number of Storeys:	8
Effective Height:	26.78 m

The following are the main issues that will be addressed during design resolution:

1. Staged occupation of the premises.
2. Travel distance to a point of choice is excessive and beyond what could be justified by an Alternative Solution the following areas must be redesigned:
 - a. Level 1 research lab over 33 m
 - b. Level 2 teaching lab over 30 m
 - c. Typical level teaching labs over 35 m
3. Travel between exits is up to 85 m on typical floors
4. The doors to the western stair must be widened to accommodate the full width of the stair;
5. The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings.

The following are the main fire safety issues proposed to be addressed by the Fire Safety Engineer via an Alternative Solution:

1. FRLs
 - (a) The reduction of laboratory FRLs should be investigated;
 - (b) Existing structure FRLs must be established;
 - (c) Non-rated exhaust fume risers.
2. Large isolated building without compliant perimeter vehicular access
3. Travel distance and distance between exits as above (Fire Engineer to establish parameters)
4. In sufficient egress width is provided for the proposed population
5. Travel by various stairs due to change in levels creates non-complaint egress as egress by a single stair is not provided.



6. The horizontal exits proposed are not compliant
7. Some discharge point require travel over parts of the building below and do not achieve a FRL of at least 120/120/120
8. Location fire control centre not within 300 mm of roadway;
9. Atrium:
 - (a) Dimensions of atrium well
 - (b) Separation of atrium by bounding walls
 - (c) Construction of bounding walls
 - (d) Construction of balconies
 - (e) Separation at roof
 - (f) Means of egress
 - (g) Fire and smoke control systems

The following are the main non-fire safety issues proposed to be addressed by the Fire Safety Engineer via an Alternative Solution:

1. Equitable access is required to and throughout the premises.
2. A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.

Subject to the resolution of the issues identified above 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. 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 0 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 the Engineering and Technology precinct at the University of Sydney against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016.

It has been prepared by Steve Watson and Partners for the University of Sydney

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 4A 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 4A of The Act. This means the design has been assessed to be capable of complying with the BCA without necessarily having all the details required to issue a Building Permit 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. Alternative Solutions (Performance Based)

Further development of the BCA has introduced provisions to allow 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.



Alternative 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, an alternative 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.

5. 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
Existing building fire safety	EPAR 94	Council may require upgrading in some circumstances
Alts and adds – change in building use	143(1)	Fire safety to be upgraded in affected part of building Structural adequacy to be signed off Category 1 fire safety provisions to be upgraded. (Hydrants, sprinklers, fire control centres, smoke detection, smoke hazard management, emergency lifts.)
Alts and adds – no change in use	EPAR 143(3)	No reduction in the level of safety permitted
New Work	EPAR 145	All new works must comply
Access to premises	Disability (Access to Premises — Buildings) Standards 2010	Upgrade of the “Affected Part” to provide access for people with disabilities
Development by the Crown	Section 109R 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 Environmental Planning and Assessment Regulation 2000 (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 Consent authority may require building to be upgraded

When determining a development application, a Consent Authority (Council) is required to assess fire safety in an existing building under Clause 94 of the EPAR.

The assessment must consider whether the measures contained in a building are inadequate

- (i) to protect persons using the building and facilitate their egress in the event of a fire or



- (ii) to restrict the spread of fire between buildings.

In determining a development application, the consent authority is to take into consideration whether it would be appropriate for the building to be brought into total or partial conformity with the BCA. Normally this discretionary power would only be enacted in the following circumstances:

- the proposed scope of works encompasses a large portion of the building so that a total building upgrade would not be considered an onerous requirement (ie ½ the total volume of the building including other works undertaken in the last 3 years) ;
- the upgrading measure(s) significantly increase the level of safety and are able to be cost-effectively incorporated into the proposed works so that they would not be considered an onerous requirement
- the existing level of safety is so deficient that the council consider a upgrade is necessary irrespective of the scope of works proposed.

5.3 No change of building use - structural strength and fire safety

Clause 143 (3) of the Environmental Planning and Assessment Regulation 2000 (EPAR) prevents a certifying authority from issuing a construction certificate if the proposed new work will result in a reduction to the fire protection and structural capacity of the building.

5.4 Change of building use - structural strength and fire safety

If a change in use is involved under the application, Clause 143 (1) of the EPAR requires that the fire protection (egress), structural capacity and Category 1 Fire Safety provisions must be applicable to the new use of the building.

5.5 Access to premises

The Disability (Access to Premises – Buildings) Standards came into force via BCA2011 throughout Australia on 01 May 2011, and with it introduced a higher standard of access to that required by previous versions of the BCA. In prescribed circumstances, the legislation requires upgrade of access and facilities for persons with disabilities when building work is proposed. In particular, unless works are undertaken by a lessee who does not lease the entire building, proposed building work anywhere in the building could trigger a need for enhanced access at the main building pedestrian entry and from that entry to all areas of the building that are subject to the building work.

5.6 Development by the crown

Development by the Crown is regulated by Part 4 Division 4 and Part 4A Division 2 of the EP&A Act. Section 109R 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.

6. 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. (**Alternative Solution**);
 8. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is not exacerbated by the new works. (**No Reduction in Safety**);
 9. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is being exacerbated by the new works. (**Reduction in Safety**);
 10. In the event the report is intended to address Council’s discretionary upgrading responsibility, the existing feature of the building does not comply and is recommended to be upgraded to provide adequate safety. (**Upgrade Required**) This status may be concurrent with the status of the proposed new work.
 11. In the event of a change of building use, the existing feature of the building does not comply and must be upgraded to provide safety adequate to the new use (**Upgrade Required**) This status may be concurrent with the status of the proposed new work.
 12. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is not exacerbated by the new works. (**No Reduction in Safety**)
 13. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is being exacerbated by the new works. (**Reduction in Safety**)
- 3) Nominate the status of the design against each BCA requirement;
- 4) Provide comments against each BCA requirement as appropriate.

7. Description of Proposed Development

Proposed development involves the refurbishment and renewal of the existing Electrical Engineering Building, Rex Vowels Theatre and associated landscaping. The existing EEB_CRM houses the School of Electrical Engineering and Telecommunications and contains a mixture of lectures theatres, teaching labs, research labs and office space.

8. Assessment Data Summary

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

8.1 Assumptions

The following assumptions have been made in the preparation of this report.



1. Occupation of the existing portion of the premises during is subject to the resolution of fire safety and egress strategy approved by the Fire Safety Engineer and other relevant parties.

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.

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.	D1.4	Exit travel distances	Access to and location of the following exits needs to be re-designed: <ul style="list-style-type: none">▪ L1 research lab over 33 m▪ L2 teaching lab over 30 m▪ Typical level teaching labs over 35 m
2.	D1.6	In sufficient egress width is provided for the proposed population	The door to the western stair must be widened.
3.	D1.7	The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings	Protect opening as required

9.2 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.	C1.1	External cladding conformity	Detailed review of the external cladding should be undertaken to ensure that there are no combustible materials and non-complaint claddings have not been nominated that could increase the risk of fire spread via the external façade.
2.	E1.3 & E1.4	Hydrant and hose reel coverage	Additional hydrant and hose reels beyond the one associated with the fire stairs will be required to achieve coverage
3.	E2.2	Smoke hazard management	Details of measures to be installed are required
4.	D2.21	Paths of travel will have to be activated by fail safe devices	



9.3 Alternative solutions required

It is proposed to satisfy the following non-compliances by alternative solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	FRLs	C1.1	Reduction of FRL (where possible) Non-fire rated exhaust fume risers on outside of building.	
2.	Large isolated building without compliant perimeter vehicular access	C2.2, C2.3 & C2.4	The premises is affectively a large isolated building without compliant perimeter vehicular access	
3.	Separation of openings in different fire compartments	C3.3		
4.	Travel distance and distance between exits	D1.4 & D1.5	The following travel distance limits are exceeded: <ul style="list-style-type: none">• 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;	
5.	Egress width	D1.6	In sufficient egress width is provided for the proposed population	
6.	Discharge of fire isolated stair	D1.7	The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings.	
7.	Discontinuous travel	D1.9	Travel by various stairs due to change in levels creates non-complaint egress as egress by a single stair is not provided.	
8.	Horizontal exits	D1.11	The horizontal exits proposed are not compliant	
9.	Roof as open space	D2.12	Some discharge point require travel over parts of the building below and do not achieve a FRL of at least 120/120/120	
10.	Location fire control centre	E1.8		
11.	Atrium	Part G3	<ul style="list-style-type: none">▪ Dimensions of atrium well▪ Separation of atrium by bounding walls▪ Construction of bounding walls▪ Construction of balconies▪ Separation at roof▪ Means of egress▪ Fire and smoke control systems	

It is proposed to satisfy the following non-fire non-compliances by alternative solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Access to and throughout the premises	Part D3	Equitable access is required to and throughout the premises.	
2.	Energy Efficiency	Part J	A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.	



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 alternative 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 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 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. 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: <table><thead><tr><th>LEVEL</th><th>USE</th><th>CLASS</th></tr></thead><tbody><tr><td rowspan="2">Level 1</td><td>Laboratories</td><td>8</td></tr><tr><td>Storage</td><td>7b</td></tr><tr><td rowspan="2">Level 2</td><td>Teaching</td><td>9b</td></tr><tr><td>Laboratories</td><td>8</td></tr><tr><td>Level 3</td><td>Library</td><td>9b</td></tr><tr><td rowspan="2">Level 4</td><td>Teaching</td><td>9b</td></tr><tr><td>Laboratories</td><td></td></tr><tr><td>Level 5</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 6</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 7</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 8</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 9</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 10</td><td>Roof plant</td><td>9b</td></tr></tbody></table>	LEVEL	USE	CLASS	Level 1	Laboratories	8	Storage	7b	Level 2	Teaching	9b	Laboratories	8	Level 3	Library	9b	Level 4	Teaching	9b	Laboratories		Level 5	Teaching	9b		Laboratories		Level 6	Teaching	9b		Laboratories		Level 7	Teaching	9b		Laboratories		Level 8	Teaching	9b		Laboratories		Level 9	Teaching	9b		Laboratories		Level 10	Roof plant	9b		Noted
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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																																																						

Clause	Description	Comment	Status
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	Compliance readily achievable
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.	Noted	Compliance readily achievable

Section C: Fire Resistance

Part C1 – Fire Resistance and Stability

C1.1	Type of Construction Required BCA Type A fire resisting construction is required.	Details of the proposed construction and how it will achieve the required FRL is to be provided. Non-fire rated exhaust fume risers on outside of building. Investigation and certification from a structural engineer will be required for all existing FRL's of all structural elements.	Additional details required / Alternative 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. Combustible materials are not permitted to be located near or directly above a required exit so as to make the exit unusable in a fire. The following materials may be used where non-combustible materials are required: <ul style="list-style-type: none"> • Plasterboard. • Perforated gypsum. • Fibrous-plaster sheeting to AS 2185. 	Architect and Structural engineer to make provisions for this requirement in the design. Detailed review of the external cladding should be undertaken to ensure that there are no combustible materials and non-complaint claddings have not been nominated that could increase the risk of fire spread via the external façade. Ensure all façade materials have a current Certificate of Conformity or a current Certificate of Accreditation, or the like to determine their acceptance by the Fire Brigade.	Additional details required / Compliance readily achievable

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> 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 		
C1.2	<p>Calculation of rise in storeys</p> <p>Effective Height / Calculation of rise in storeys.</p> <p>Rise in storeys is a defined BCA term addressing the number of main building levels excluding basements.</p> <p>Effective height is defined under the BCA as vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).</p> <p>These parameters influence the BCA provisions applicable to the building.</p>	<p>The following parameters apply:</p> <p>Rise in storeys: 8 storeys</p> <p>Effective Height: 26.78m</p>	Noted
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 9b	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	<p>Lightweight construction</p> <p>Lightweight construction used in a wall system must comply with Specification C1.8.</p> <p>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.</p>	Details of the proposed systems to be installed must be in accordance with a tested prototype.	Compliance readily achievable
C1.9	-	This Clause has deliberately been left blank	-
C1.10	<p>Fire Hazard Properties</p> <p>Floor materials, floor coverings and wall and ceiling lining materials need to comply with prescribed fire hazard properties. Refer to Appendix C1.10.</p>	<p>Compliance assumed and will require verification test data for all timber and other combustible linings and materials, including:</p> <ul style="list-style-type: none"> Carpets Vinyls (walling and flooring) Timber flooring and wall linings Veneered wall panelling 	Compliance readily achievable

Clause	Description	Comment	Status
		<ul style="list-style-type: none"> 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. 	
C1.11	Performance of external walls in fire	Concrete external walls that could collapse as complete panels are to be designed in accordance with Specification C1.11 to minimise the likelihood of external walls collapsing outwards in the event of a fire and separating from supporting members.	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 <i>Fire-protected timber in a Class 2, 3 or 5 building may be used wherever an element is required to be non-combustible,</i>		N/A
Part C2 – Compartmentation and Separation			
C2.1	Application of Part		Noted
C2.2,	Floor Area Limitations (Type A construction) The floor area and volume limitations are: Class 5 and 9b: 8,000m ² and 48,000m ³ Class 8: 5,000m ² and 30,000m ³ <u>Note:</u> <ul style="list-style-type: none"> The BCA does not require Class 2 and 3 parts of the building to be considered The basement carpark levels are not required to be considered as they're provided with a sprinkler system throughout 	The whole of the premises form one fire compartment and exceed the floor area and volume limitations of this clause	Alternative Solution
C2.3	Large isolated buildings Where the building exceeds the limitations under Clause C2.2 above but not more than 18,000m ² nor 108,000m ³ : Class 7 or 8: <ul style="list-style-type: none"> Contains no more than 2 storeys, and Is provided with 18m wide open space complying with Clause C2.4(a) Class 5, 6, 7, 8 or 9: <ul style="list-style-type: none"> Sprinkler protection throughout 6m wide perimeter vehicular access complying with Clause C2.4(b) Where the building exceeds 18,000m ² or 108,000m ³ : <ul style="list-style-type: none"> Sprinkler protection throughout A 6m wide perimeter vehicular access complying with Clause C2.4(b) Refer to Clause E2.2 for smoke hazard management requirements	It is proposed to address this issue by an alternative solution	Alternative Solution

Clause	Description	Comment	Status
C2.4	Perimeter Vehicular Access Vehicular access / open space is provided from the public road for emergency vehicular access and is not to be used for the storage or processing of materials and must not be built upon except for guard houses and service structures as long as they do not unduly impede firefighting. Vehicular access must have a loadbearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles. Vehicular access must be capable of providing <u>continuous</u> access for emergency vehicles to enable travel in a <u>forward</u> direction from the public road around the entire building.	It is proposed to address this issue by an alternative solution	Alternative Solution
C2.5	Class 9a and 9c buildings		N/A
C2.6	Vertical separation of openings in external walls Only applicable to a building of Type A Construction, which is not sprinkler protected.	The building is proposed to be sprinkler protected.	Complies
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.	Separation of new work from existing to be investigated and addressed.	Additional details required
C2.8	Separation of classifications in the same storey As the building has parts of different classifications located alongside one another in the same storey each building element must have the higher FRL prescribed in Specification C1.1 of the BCA or the parts must be separated by a fire wall.		Compliance readily achievable
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.	An alternative solution has been proposed to reduce the FRL's down to 2 hours throughout. Floors are required to have an FRL not less than 120/120/120. Confirmation that the existing structure achieves an FRL of 120/120/120 is required from the structural engineer	Compliance readily achievable
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		Complies
C2.11	Stairs and Lift in One Shaft	The lift is within its own shaft	Complies
C2.12	Separation of Equipment Two-hour fire enclosure is required for: <ul style="list-style-type: none"> lift motor rooms emergency generators sustaining emergency equipment operating in emergency mode central mechanical smoke control plant boilers 	Any UPS system with a voltage exceeding 24 volts and a capacity exceeding 10 amp hours must be fire separated.	Additional details required

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> batteries with voltage over 24 volts and a capacity exceeding 10 ampere hours. (Batteries within an electricity network substation are exempt.) 		
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.		Compliance readily achievable
C2.14	Corridors in Class 2 & 3 Building Public corridors must be divided at intervals of not more than 40m by smoke-proof walls complying with Clause 2 of Specification C2.5.		N/A
Part C3 – Protection of Openings			
C3.1	Application of Part		Noted
C3.2	Protection of Opening in External Walls Openings in the external walls of the building are to be protected in accordance with C3.4, being fire rated windows, external sprinklers or the like, if: <ul style="list-style-type: none"> less than 3m to side or rear boundary, less than 6m from the far boundary of a road or lane, Less than 6m from another building on the same allotment. Openings that require protection should not occupy more than one third of the storey in which they occur.	Separation from adjacent buildings and Fire Compartments required.	Additional details required
C3.3	Separation of Openings in Different Fire Compartments External walls within the distances specified in Table C3.3 of the BCA are to be protected by construction with an FRL not less than 60/60/60 and the associated openings protected in accordance with Clause C3.4 of the BCA.	Separation from adjacent buildings and Fire Compartments required.	Additional details required
C3.4	Acceptable method of protection Window openings that are required to be protected are to be protected by wall wetting sprinklers with windows that are automatic closing or permanently fixed in the closed position, -/60/- fire windows or -/60/60 automatic fire shutters. Doorways are to be protected by wall wetting sprinklers used with doors that are self-closing or automatic closing, or -/60/30 self-closing or automatic closing fire doors.		Noted
C3.5	Doorways in fire walls 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

Clause	Description	Comment	Status
C3.7	Protection of doorways in horizontal exits Doorways in horizontal exits are to be protected by a fire door, which 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
C3.8	Openings in Fire Isolated Exits -/60/30 self-closing fire doors are required to doorways providing access to fire isolated stairways.		Compliance readily achievable
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.		Compliance readily achievable
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 35,000mm ² (175 X 200 mm).	Certification from the lift supplier is required for the installation of the new lift	Compliance readily achievable
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.	See C1.1 Services penetrations of fire rated structure generally need to be fire-stopped and/or located in fire rated riser shafts. Openings in fire rated elements need to be fire resisting to maintain the function of the elements.	Alternative Solution / Compliance readily achievable
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: <ul style="list-style-type: none"> • If it is a sanitary compartment - a door or panel which together with its frame, is non-combustible or has an FRL of not less than - /30/30, or • A self-closing -/60/30 fire door or hopper, or • An access panel with an FRL of not less than - /60/30, or • If the shaft is a garbage shaft - a door or hopper of non-combustible construction. 		Compliance readily achievable
C3.14	-	This Clause has deliberately been left blank	-
C3.15	Openings for service installation Methods and materials used are to be identical to tested prototypes and in accordance with AS4072.1 and AS1530.4, and having achieved the required FRL or resistance to the incipient spread of fire or other specified method.	Any system used must be a certified system and installed in accordance with the tested method. Specifications of the methods of fire sealing need to be provided	Compliance readily achievable

Clause	Description	Comment	Status
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: <ul style="list-style-type: none"> • High rise buildings over 25m in effective height • Each basement level • Class 9 buildings of more than 6 storeys • Class 9 storeys accommodating more than 50 persons. 		Complies
D1.3	When Fire Isolated Exits Are Required Every stair in a Class 5 to 9 building must be fire isolated unless it does not connect or pass through more than 3 consecutive floors in a sprinkler protected building, or 2 storeys in a non-sprinkler protected building.		Complies
D1.4	Exit Travel Distances No point on the floor must be more than 20m to an exit or a point in which travel in different directions to 2 exits is available, in which case, the maximum distance to 1 exit cannot exceed 40m.	The nominated exits in the building are listed in appendix D1.4 of the report. The following areas have been identified with distances exceeding 20m to a point of choice: <ol style="list-style-type: none"> 1. Level 1 research lab over 33 m 2. Level 2 teaching lab over 30 m 3. Typical level teaching labs over 35 m These distances are beyond a distance that can be addressed by an Alternative Solution. The following areas have been identified with exit travel distances exceeding 40m: <ol style="list-style-type: none"> 1. Typical floors 	Does Not Comply / Alternative solution
D1.5	Distance between alternative exits The following travel distance limits apply: <ul style="list-style-type: none"> • ≤ 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. 	The following areas have been identified with distances between alternative exits exceeding 60m: <ol style="list-style-type: none"> 1. Typical floors are up to 85 m. This will be dependent on an Alternative Solution for travel to a point of choice	Alternative solution
D1.6	Dimensions of exits		Alternative

Clause	Description	Comment	Status
			Solution
D1.7	Travel via fire-isolated exits	The eastern fire stair discharges to a space that is not open for 1/3 of its perimeter. Further the discharge of this stair is exposed to opening in the adjacent building.	Complies
D1.8	External stairways in lieu of fire-isolated exits External stairs or ramps may be used instead of fire-isolated stairs to a building under 25m in effective height, subject to: <ul style="list-style-type: none"> Stair to be non-combustible construction. Exit doors onto the stair to be 1-hour fire rated. Exit paths via the stair must be shielded if within 6m of openings in external wall of building. 		N/A
D1.9	Travel by non-fire-isolated stairways or ramps		N/A
D1.10	Discharge from exits An exit must not be blocked nor be capable of being blocked at its point of discharge.		Compliance readily achievable
D1.11	Horizontal Exits Horizontal exits must have a clear area on the side of the fire wall, to which the occupants are evacuating, to accommodate the total number of persons serviced by the horizontal exit of not less than 0.5m ² per person in any other case		Compliance readily achievable
D1.12	Non-required stairs, ramps or escalators Non-required stairs are permitted to connect up to 3 consecutive levels in a sprinklered building if one of the levels has direct access to open space		Compliance readily achievable
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		Compliance readily achievable
D1.17	Access to lift pits Access requirements apply to lift pits over 3m in depth.	Lift consultant to confirm.	Compliance readily achievable
Part D2 – Construction of Exits			
D2.1	Application of Part		Noted
D2.2	Fire Isolated Stairs or Ramps		Compliance readily achievable
D2.3	Non Fire Isolated Stairways and Ramps		Compliance readily achievable
D2.4	Separation of Rising and Descending Stair Flights		Complies
D2.5	Open access ramps and balconies		N/A

Clause	Description	Comment	Status
D2.6	Smoke lobbies		N/A
D2.7	<p>Installations in Exits and Paths of Travel</p> <p>Electrical meters and motors, distribution boards and telecommunication boards must not be accessed from fire isolated exits and, if located in corridors leading to exits, should occur in non-combustible or fire protective smoke sealed enclosures.</p> <p>No openings to ducts conveying hot products of combustion permitted in required exits.</p> <p>Gas or fuel services not permitted in required exits.</p> <p>Electric or services equipment in paths of travel to exits must be within a non-combustible and smoke sealed enclosure.</p>	Install non-combustible linings to the internal walls, ceiling and doors of relevant cupboards and install smoke seals to the doors.	Compliance readily achievable
D2.8	<p>Enclosure of Space Beneath Stairs</p> <p>If the space below a fire-isolated stairway is within the fire isolated shaft it must not be enclosed to form a cupboard or similar enclosed space.</p> <p>The space below non fire-isolated stairs must not be enclosed to form a cupboard or similar enclosed space unless the enclosing walls have an FRL of not less than 60/60/60 and any doorway to the enclosed space is fitted with a self-closing -/60/30 fire door.</p>		Compliance readily achievable
D2.9	<p>Width of stairways</p> <p>A stairway more than 2m in width is only counted as having a width of 2m unless it is divided by a continuous handrail or balustrade between landings and each division is less than 2m wide.</p>		Compliance readily achievable
D2.10	<p>Pedestrian ramps</p> <p>Ramps serving as required exit must have a gradient not less steep than 1:8. If the ramp is required for disabled access under Part D3 it must comply with AS1428.1.</p> <p>The surface of the ramp must have a non-slip finish.</p>		Compliance readily achievable
D2.11	<p>Fire-isolated passageways</p> <p>Fire isolated passageways are to have an FRL equivalent to the fire resisting stair shaft as specified in Specification C1.1 when tested from the outside</p>		N/A
D2.12	<p>Roof as open space</p> <p>The roof is required to have an FRL of not less than 120/120/120 and not incorporate any roof lights or other openings within 3m of the path of travel.</p>	The accessible research roof deck may need to be treated as open space to ensure egress works on roof level.	Compliance readily achievable
D2.13	<p>Going and Risers</p> <p>To provide safe passage, stairways must comply with the following:</p> <ul style="list-style-type: none"> • minimum 2 risers / maximum 18 in each flight • risers 115mm min 190 mm max - going 250mm min 355mm max - 2R+G 550mm min 700mm max. • Risers and goings that are consistent in a flight and within a prescribed range of dimensions. 	Further detail of the stairs will need to be provided to confirm compliance	Compliance Readily Achievable

Clause	Description	Comment	Status															
	<ul style="list-style-type: none">Riser gaps and step openings that do not exceed 125mm.Non-slip treads and non-skid tread nosing																	
D2.14	<p>Landings</p> <p>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:</p> <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>	<u>Application</u>	<u>Dry Surface Conditions</u>	<u>Wet Surface Condition</u>	1:14 or steeper ramps	P4 or R11	P5 or R12	Ramps of 1:14 to 1:20	P3 or R10	P4 or R11	Tread or Landing Surface	P3 or R10	P4 or R10	Nosing Strip or Landing Strip	P3	P4	Certification / test reports on the slip resistance of the surfaces will need to be provided on constructed elements.	Compliance readily achievable
<u>Application</u>	<u>Dry Surface Conditions</u>	<u>Wet Surface Condition</u>																
1:14 or steeper ramps	P4 or R11	P5 or R12																
Ramps of 1:14 to 1:20	P3 or R10	P4 or R11																
Tread or Landing Surface	P3 or R10	P4 or R10																
Nosing Strip or Landing Strip	P3	P4																
D2.15	<p>Thresholds</p> <p>Steps should not occur at doorways without a threshold landing except as follows:</p> <ul style="list-style-type: none">A single 190mm step is permitted (other than in health or aged care buildings) at doors leading to the exterior.	Note that where access for people with disabilities is required it is not permitted to have a step at the threshold of a doorway	Compliance readily achievable															
D2.16	<p>Barriers to Prevent Falls</p> <p>Requirements apply to the provision and design of barriers at locations where a person could fall 1m or more. Generally, 125mm maximum gap size limits apply between balusters or rails and a 1m minimum height applies, with alternate dimensions permitted in fire isolated stairs and industrial areas.</p> <p>Climbable balustrade elements are prohibited where a person could fall 4m or more.</p> <p>Minimum sill heights apply at openable windows where people could fall more than 4m.</p>		Additional details required															
D2.17	<p>Handrails</p> <p>Handrails to exits including parts of fire isolated exit serving an area required to be accessible to people with disabilities must comply with Clause 12 of AS1428.1, viz:</p> <ul style="list-style-type: none">Handrails not to obstruct circulation space30-50mm diameter865-1000mm above nosing line of stairs865-1000mm above ramps and landingsConsistent height throughout50mm grip clearance and no obstructions to handholdContinuous at internal (return) landings	Handrail details to be confirmed by the access consultant	Compliance readily achievable															

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> Provided with handrail extensions and 180 degree curled ends 		
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.	Auto sliding doors at the entries into the building must comply with these requirements	Compliance readily achievable
D2.20	Swinging doors 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.		Additional details required
D2.21	Operation of latch Exit doors should be provided with "free handle" egress via a downward or pushing action and, if serving an area accessible to people with disabilities, must have non-slip "D" pull handles with 35-45mm hand clearances.	All exit doors and doors in the path of travel must comply.	Compliance readily achievable
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. In such cases, the doors to fire isolated stairs must not be able to be locked to prevent escape from within the stair back into any level unless the doors are linked to a failsafe device that opens upon activation of a fire alarm. On at least every fourth storey, the doors should not be locked at all and should be sign posted that re-entry is available at that level. Alternatively, an intercommunication or audible/visual alarm system is required within the stair to assist persons who may accidentally be locked within the stair.		Additional details required
D2.23	Signage to Fire Safety Doors An automatic door held open by an automatic hold-open device: <p style="text-align: center;">FIRE SAFETY DOOR DO NOT OBSTRUCT</p> Or for a self-closing door <p style="text-align: center;">FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN</p> or for a door discharging from a fire-isolated exit	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.	Compliance readily achievable

Clause	Description	Comment	Status
	FIRE SAFETY DOOR DO NOT OBSTRUCT	The notice is to state the following: OFFENCES RELATING TO FIRE EXITS It is an offence under the Environmental Planning and Assessment Act 1979: a) to place anything in or near this fire exit that may obstruct persons moving to and from the exit, or b) interfere with or obstruct the operation of any fire doors, or c) to remove, damage or otherwise interfere with this notice.	
D2.24	Protection of Openable Windows Windows serving a residential bedroom or serving an early childhood centre must be protected where the floor is 2m or more above the external surface below. Where the window sill is below 1.7m above floor level, window restrictors or secure screens limiting openings and gaps to 125mm are required. Release devices must be child resistant. Where the fall distance from the floor to the surface below is 4m or more or where a release device occurs to a required screen, an additional barrier at 865mm above floor level is required and must be non-climbable with gaps no greater than 125mm between elements.		N/A
NSW D2.101	Doors in the Path of Travel in an Entertainment Venue		N/A
Part D3 – Access for People with Disabilities			
An Access Report is being prepared for a detailed access assessment. Any issues that will not meet the DTS Provisions must be addressed by an alternative solution and endorsed under a CC			
D3.1	General Building Access Requirements Access is generally required for persons with a disability throughout all areas unless specifically exempted.	Access is required throughout. Consultation with the access consultant is required. A full review is to be undertaken by the access consultant with the provisions of a report to be submitted to the Certifying Authority	Compliance readily achievable
D3.2	Access to Buildings External access to the building for people with a disability must be provided: <ul style="list-style-type: none"> From main pedestrian entry points at the allotment boundary. Through the principle pedestrian entrance. Through at least 50% of all pedestrian entries. From accessible car parking spaces. For buildings over 500m², so that an accessible entry occurs within 50m of any non-accessible entry. From any another accessible building on the site. 	Refer to access consultant's report.	Alternative Solution
D3.3,	Parts of the Building to be Accessible All parts of the building must be accessible to people with a disability except for areas where access would be inappropriate due to the particular use or	Refer to access consultant's report.	Alternative Solution

Clause	Description	Comment	Status
	<p>areas that would pose a health or safety risk to people with a disability.</p> <p>Every ramp, except a fire isolated ramp, must comply with Clause 10 of AS 1428.1.</p> <p>Every stairway, except a fire isolated stairway, must comply with Clause 11 of AS 1428.1.</p> <p>A fire isolated stairway must comply with Clause 11(f) and (g) of AS 1428.1.</p> <p>Every passenger lift must comply with Clause E3.6.</p> <p>Access ways must have passing spaces and turning spaces complying with AS 1428.1.</p> <p>A ramp or passenger lift need not be provided to serve a storey or level other than the entrance storey of a class 5, 6, 7b or 8 building containing not more than 3 storeys and with a floor area of each storey, excluding the entrance floor, of not more than 200m².</p> <p>Pile height or pile thickness of carpets shall comply with the requirements of this Clause and AS 1428.1.</p>		
D3.4	<p>Exemptions</p> <p>Buildings required to be accessible must have travel paths, facilities and details which comply with AS1428.1. – 2009.</p>		Noted
D3.5	<p>Accessible Car Parking</p> <p>The accessible parking spaces must comply with AS/NZS 2890.6 – 2009.</p> <p>General requirements are:</p> <ul style="list-style-type: none"> • 2.4m x 5.4m. • 2.2m head clearance for access and egress routes to and from accessible car spaces. • 2.5m head clearances over accessible car spaces. • Flat even surfaces. • Designated and sign posted for disabled users. 		N/A
D3.6	<p>Signage</p> <p>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.</p> <p>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 #”.</p> <p>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.</p> <p>Signage identifying ambulant accessible sanitary facilities in accordance with AS 1428.1 must be located on the door of the facility.</p> <p>Where the pedestrian entrance is not accessible, directional signage in accordance with AS 1428.1</p>	Signage details must be in accordance with AS1428.1 - 2009 and Specification D3.6 of the BCA.	Compliance readily achievable

Clause	Description	Comment	Status
	<p>must be provided to direct a person to the location of the nearest accessible pedestrian entrance.</p> <p>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.</p>		
D3.7	<p>Hearing Augmentation</p> <p>A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed—</p> <ul style="list-style-type: none"> i) in a room in a Class 9b building; or ii) in an auditorium, conference room, meeting room or room for judicatory purposes; or iii) at any ticket office, teller's booth, reception area or the like, where the public is screened from the service provider <p>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</p> <p>A system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than—</p> <ul style="list-style-type: none"> 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; and 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; and 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. 	Refer to access consultant's report.	Compliance readily achievable
D3.8	<p>Tactile Indicators (TGSIs)</p> <p>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:</p> <ul style="list-style-type: none"> • a stairway, other than a fire-isolated stairway, • an escalator, passenger conveyor or moving walk, • a ramp other than a fire-isolated ramp, step ramp, kerb ramp or swimming pool ramp, or • in the absence of a suitable barrier an overhead: <ul style="list-style-type: none"> ○ obstruction less than 2 m above floor level, other than a doorway 	Refer to access consultant's report.	Additional details required

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> 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 <p>Tactile ground surface indicators must comply with sections 1 and 2 of AS/NZS 1428.4.1</p>		
D3.9	<p>Wheelchair seating spaces in Class 9b assembly buildings</p> <p>Where fixed seating is provided in a Class 9b assembly building, wheelchair seating spaces comply with AS 1428.1 must be provided in accordance with Table D3.9.</p> <p>In an assembly building, with not more than 300 seats — wheelchair seating spaces must not be located in the front row of seats. In a cinema with more than 300 seats — not less than 75% of required wheelchair seating spaces must be located in rows other than the front row of seats.</p> <p>The location of wheelchair seating is to be representative of the range of seating provided.</p>	Refer to access consultant's report.	Compliance readily achievable
D3.10	Swimming Pools		N/A
D3.11	<p>Ramps</p> <p>On an access way a series of connected ramps must not have a combined vertical rise of more than 3.6m.</p> <p>A landing for a step ramp must not overlap a landing of another step ramp or ramp.</p>	Refer to access consultant's report.	Compliance readily achievable
D3.12	<p>Glazing on an Access Way</p> <p>On an access way, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.</p>	Glazed shopfronts will need to have decals installed in accordance with AS 1428.1	Compliance readily achievable
Section E: Services and Equipment			
Part E1 – Fire Fighting Equipment			
E1.1	-	This Clause has deliberately been left blank	
E1.2	-	This Clause has deliberately been left blank	
E1.3	<p>Fire Hydrants</p> <p>Fire hydrant cover is required throughout to AS2419.1 from hydrants located externally, within fire stairs or at other approved locations.</p>	<p>Full compliance with AS2419.1 will be required unless varied via fire brigade approval.</p> <p>The hydrants booster is located within 10m of the building and is not within sight of the main entrance to the building. It is proposed to address the issue via an alternative solution.</p>	Additional details required / Alternative solution
E1.4	<p>Fire Hose Reels</p> <p>Fire hose reel cover to AS2441-2005 is required throughout via hose reels located adjacent to stairs and exits.</p>	The hose reels are not located in a readily accessible location.	Additional details required

Clause	Description	Comment	Status
	Hoses are not permitted to pass through fire or smoke doors to achieve hose reel cover.		
E1.5	<p>Sprinklers</p> <p>Fire sprinkler protection to AS2118.1-1999, AS2118.4-1995 or 2012 and AS2118.6-2012 as relevant is a mandatory requirement for the project if:-</p> <ul style="list-style-type: none"> The building effective height exceeds 25m. (If any part of the development exceeds 25m effective height, all parts of the complex require sprinklers.) The building is defined as a large isolated building (Refer to BCA Ref C2.3 above). Occupancies of "excessive hazard" that occur in fire compartments over 2,000m² or 12,000m³. (Refer definition below) <p>Sprinkler pumps and valves must be accessible from the street.</p> <p>Sprinkler system activation must be linked to an audible occupant warning system.</p> <p>Sprinkler hazard Class under AS2118 needs to be agreed where uncertainty of usage under Appendix 1 of the Code occurs.</p> <p>"Excessive hazard" means:</p> <p>(a) Hazardous process risks including the following:</p> <ul style="list-style-type: none"> (i) Aircraft hangars (ii) Electrical/electronic manufacturing and assembly (predominantly plastic components. (iii) Fire-lighter manufacturing. (iv) Fireworks manufacturing. (v) Flammable liquid spraying. (vi) Foam plastic goods manufacturing and/or processing. (vii) Foam rubber goods manufacturing and/or processing. (viii) Hydrocarbon based sheet product manufacturing. (ix) Nitrocellulose and nitrocellulose goods manufacturing. (x) Paint and varnish works, solvent based. (xi) Plastic goods manufacturing and/or processing works. (xii) Resin and turpentine manufacturing. (xiii) Vehicle repair shops. <p>(b) Combustible goods with an aggregate volume exceeding 2,000m³ and stored to a height greater than 4m such as the following:</p> <ul style="list-style-type: none"> (i) Aerosol packs with flammable contents. 	<p>Design certification of the sprinkler design is to be provided.</p> <p>Any non-sprinkler protected areas and other AS2118 departures need to be identified, included in the fire engineering review (EP1.4), and advised to the MFB. These areas need to be confirmed but could include:</p> <ul style="list-style-type: none"> Apartment balconies. External under croft areas Radiation therapy bunkers PC3 laboratories Chemical stores Dangerous goods stores Flammable liquids stores MRI/PET areas Server rooms Operating theatres (TBC) Data centres and related UPS Bridge links to adjacent buildings Shower recesses or low risk bathroom areas or the like Residential - Apply AS2118.4 concessions within apartments? 	Additional details required / Alternative solution

Clause	Description	Comment	Status
	(ii) Cartons and associated packing material excluding cartons with densely packed non-combustible content.		
E1.6	Portable Fire Extinguishers Portable Fire Extinguishers are required be installed to Table E1.6 and AS 2444 requirements, at: <ul style="list-style-type: none"> • emergency services switchboards • kitchens • flammable liquid stores • at nurses' stations • special risk areas • where fire hose reels are not installed • Class 2, 3 or 4 residential areas are to be protected by 2.5kg ABE type fire extinguishers located in common areas on the storey served and located not more than 10m from each sole occupancy unit entry door. 		Compliance readily achievable
E1.7	-	This Clause has deliberately been left blank	
E1.8	Fire Control Centre A fire control centre for Fire Indicator, Fire Fans Control and Emergency Intercom panels is required for buildings of over 25m in effective height or buildings over 18,000m ² in area, at a location readily available for firefighting operations and located at or near the main building entry.		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: <ul style="list-style-type: none"> • 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. 	Further discussion required with builder to determine that this is included in their program. 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		Additional details required / Alternative Solution
Part E2 – Smoke Hazard Management			
E2.1	Applicable of Part	Part is not applicable to <ul style="list-style-type: none"> • open deck car parks • open spectator stands • a Class 8 electricity network substation with a floor area not more than 200m² 	Noted

Clause	Description	Comment	Status
		<ul style="list-style-type: none"> storerooms, etc. less than 30m² sanitary compartments plant rooms or the like 	
E2.2	<p>General requirements Residential Buildings</p> <p>The following smoke hazard management systems are required for the complex:</p> <ul style="list-style-type: none"> Stair pressurisation for fire isolated stairs serving a storey over 25m effective height. Stair pressurisation for stairs serving multiple basements. Zone smoke control is required in buildings over 25m effective height. <p>The following general requirements apply:</p> <ul style="list-style-type: none"> Stair pressurisation and air-handling shutdown activation must be via smoke detectors located per AS1668.1 and within 3m of the lift doors at each level. The system should also be linked to the building occupant audible alarm system. <p>Public Assembly Buildings</p> <p>The following smoke hazard management systems are required:-</p> <ul style="list-style-type: none"> Automatic smoke detection and alarm system to "extending spacing" requirements of AS1668.1. Sprinkler protection throughout. Stairwell pressurisation is required for fire isolated stairs serving atrium areas or serving multiple basement levels with activation on fire alarm and via smoke detectors located per AS1668.1 and within 3m of the lift doors at each level. The smoke detectors need to be a separate dedicated system with control, indicating and alarm verification facility to AS1603.4. The system should also be linked to the building occupant audible alarm system. 	It is proposed to sprinkler protect the building throughout. AS 1670.1 smoke detection system is proposed as part of the proposed alternative solutions.	Additional details required / Alternative solution
E2.3	Provisions of special hazards		N/A
Part E3 – Lift Installations			
E3.1	<p>Lift Installations</p> <p>Electric and electrohydraulic lifts must comply with the design requirements of BCA Specification E3.1.</p>	Certification of lift design to be provided	Compliance readily achievable
E3.2	<p>Stretcher Capacity Lifts</p> <p>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.</p>	Ensure a suitably sized lift serves each level.	Compliance readily achievable
E3.3	<p>Warning Against Use of Lift in Fire</p> <p>Warning signage is required at lift doors advising that lifts should not be used in the event of a fire.</p>	Signage to be installed.	Compliance readily achievable
E3.4	<p>Emergency Lifts</p> <p>Emergency lifts of prescribed size, operation and fire isolation are required in buildings where:</p>		N/A

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> the building has an effective height over 25m, or a patient care area occurs in a health care building at a level that does not have direct access to a road or open space. <p>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.</p> <p>The following requirements apply to an emergency lift:</p> <ul style="list-style-type: none"> Must serve all storeys served by a passenger lift. Must be contained in a fire rated shaft. If the building effective height exceeds 75m, must have a 600kg rating if not provided with a stretcher facility or a 900kg rating if stretcher facility is provided. 		
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 rely 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: <ul style="list-style-type: none"> A fire service control switch is required for each lift or lift group. A lift car fire service drive control is required for each lift. 	Certification of lift design to be provided	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.	Certification of lift design to be provided	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.	Certification of lift design to be provided	Compliance readily achievable
Part E4 – Emergency Lighting, Exit and Warning Systems			
E4.1	-	This clause has been intentional left blank	-

Clause	Description	Comment	Status
E4.2,	Emergency Lighting requirements Emergency lighting is to be provided throughout the building.	Emergency lighting is to be provided in: <ul style="list-style-type: none"> every fire-isolated stairway, fire-isolated ramp or fire-isolated passageway. Every passageway, hallway, corridor or the like, that is part of the path of travel to an exit. In every room having a floor area more than 100m² that does not open to a corridor or space that has emergency lighting or to a road or open space. In any room having a floor area more than 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: <ul style="list-style-type: none"> 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. 	Compliance readily achievable
E4.3	Measurement of distances		Noted
E4.4	Design and operation of emergency lighting Emergency lighting must comply with to AS2293.1		Compliance readily achievable
E4.5	Exit signs Exit signs are to be provided in accordance with Clause E4.5 of the BCA.	Exit signs must be clearly visible to person approaching the exit and must be installed on, above or adjacent to; <ol style="list-style-type: none"> A door providing direct egress from a storey to a stairway, passageway or ramp serving as a required exit. A door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space. A horizontal exit A door serving as or forming part of a required exit in a storey required to be provided with emergency lighting. 	Compliance readily achievable
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		Compliance readily achievable
E4.7	Class 2 and 3 buildings and Class 4 parts: Exemptions		N/A
E4.8	Design and operation of exit signs Exit signs are to operate in accordance with AS 2293.1.		Compliance readily achievable

Clause	Description	Comment	Status
	Photo luminescent exit sign are to comply with Specification E4.8		
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. The test report must include the following information: (i) Name and address of the person supervising the test. (ii) Test report number. (iii) Date of the test. (iv) Cladding manufacturer's name and address. (v) Construction details of the test specimen, including a description, and drawings and details of the components, showing modifications, if any. (vi) Test sequence with the pressures used in all tests. (vii) For each of the static and cyclic pressure tests, full details of all leakages, including position, extent and timing.	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 Metal sheet roofing complying with AS 1562.1		Compliance readily achievable
F1.6	Sarking Sarking type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.		Compliance readily achievable
F1.7	Water Proofing of Wet Areas in Buildings Water proofing of wet areas within a building to comply with AS 3740.		Compliance readily achievable
F1.8	-	This clause has deliberately been left blank	-

Clause	Description	Comment	Status
F1.9	Damp-proofing Moisture from the ground must be prevented from reaching the lowest floor timber and the walls above the lowest floor joists, the walls above the damp 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.		Compliance readily achievable
F1.10	Damp-proofing of floors on the ground A vapour barrier in accordance with AS2870 is to be provided beneath the basement floor slab.		Compliance readily achievable
F1.11	Provision of Floor Wastes The floor of each bathroom and laundry in each sole occupancy of the Class 2 and 3 building portions must have a floor waste and the floor graded to the floor waste to permit drainage of water.		N/A
F1.12	Sub-floor ventilation The lower ground sub floor space is to be cleared of all building debris and vegetation and be cross ventilated in accordance with Table F1.12 by evenly distributed openings provided in the external walls Additionally the sub floor space is to contain no dead air spaces and be graded to prevent water ponding under the building.		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	Sanitary Facilities Toilet facilities are required in appropriate numbers based on the number of persons accommodated.	Refer to section Error! Reference source not found. 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. Facilities should be constructed to AS1428.1 – 2009 although an existing WC facility that fully complies with AS1428.1 – 2001 may substitute as a concession.	Refer to access consultant's report	Compliance readily achievable / Alternative Solutions
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.		Complies
F2.6	Interpretation: Urinals and washbasins		Noted

Clause	Description	Comment	Status
F2.7	-	NSW - Deleted	-
F2.8	Waste Management		N/A
Part F3 – Room Heights			
F3.1	<p>Height of rooms and other spaces</p> <p>Generally, a minimum ceiling height of 2.4m is required throughout.</p> <p>In a Class 9b building in a school classroom or other assembly building with more than 100 persons — 2.4 m;</p> <p>A theatre, public hall or other assembly building with more than 100 persons — 2.7 m</p> <p>In a corridor that serves an assembly building with not more than 100 persons — 2.4 m</p> <p>In a corridor that serves an assembly building with more than 100 persons — 2.7 m;</p>		Complies
Part F4 – Light and Ventilation			
F4.1	<p>Provisions of natural Light</p> <p>Natural lighting aggregating 10% of room floor area is required as follows:</p> <ul style="list-style-type: none"> To all habitable rooms in residential buildings. In bedrooms and dormitories of hotels, motels and the like. To rooms used for sleeping in health care and aged care buildings. To school classrooms and early childhood centres. 		N/A
F4.2	Methods and extent of natural lighting		N/A
F4.3	Natural Light borrowed from adjoining room		N/A
F4.4	<p>Artificial lighting</p> <p>The artificial lighting system must comply with AS/NZS 1680.0.</p>		Compliance readily achievable
F4.5	<p>Ventilation of rooms</p> <p>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.</p>	Design details and certification from a mechanical engineer is required	Compliance readily achievable
F4.6	Natural ventilation		N/A
F4.7	Ventilation borrowed from adjoining room		N/A
F4.8	Restrictions on position of water closets and urinals		Complies
F4.9	Airlocks		N/A
F4.10	-	This clause has intentionally been left blank	-
F4.11	<p>Carparks</p> <p>Basement carparks must be provided with a system of mechanical ventilation complying with AS 1668.2</p>		N/A
F4.12	Kitchen Local Exhaust Ventilation		N/A

Clause	Description	Comment	Status
	<p>A commercial kitchen must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 and AS 1668.2, where:</p> <ul style="list-style-type: none"> 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. 		
Part F1 – Sound Transmission and Insulation			N/A
Section G: Ancillary Provisions			
Part G1- Minor Structures and components			
G1.1	Swimming pools (NSW variation for swimming pools)		N/A
G1.2	Refrigerated chambers, strong rooms and vaults		
G1.3	Outdoor play spaces Any outdoor play space in a Class 9b early childhood centre must be enclosed on all sides with a barrier which complies with AS 1926.1.		N/A
G1.101	Provision for cleaning windows A safe manner of cleaning windows is to be provided as windows are located 3 or more storeys above ground level.	The windows must either be able to be cleaned wholly from within the building, or a method complying with the Construction Safety Act 1912 and Regulations is required.	Compliance readily achievable
Part G2 - Boilers, pressure vessels, heating appliances, fire places, chimneys and flues			N/A
Part G3 - Atrium Construction			
G3.1	Application of Part		Noted
G3.2	Dimensions of atrium well Minimum 6m diameter atrium well is required.		Alternative solution
G3.3	Separation of atrium by bounding walls An atrium well is required to be separated from the remainder of the building by bounding walls not more than 3.5m from the perimeter of the atrium well, except in the case of 3 consecutive storeys.		Alternative solution
G3.4	Construction of bounding walls Bounding walls must have an FRL not less than 60/60/60 or constructed of fixed toughened safety glass or wired safety glass in non-combustible frames protected with wall wetting sprinklers in accordance with Specification G3.8.		Alternative solution
G3.5	Construction of balconies If a bounding wall separating an <i>atrium</i> from the remainder of the building is set back from the <i>atrium well</i> , an imperforate and non-combustible barrier not less than 1 m high		Alternative solution

Clause	Description	Comment	Status
	must be provided.		
G3.6	Separation at roof The atrium roof must have an FRL not less than that prescribed in Table 3 of Specification C1.1 or the roof structure and membrane are to be protected by a sprinkler system complying with Specification E1.5 and G3.8		Alternative solution
G3.7	Means of egress All areas within the atrium must have at least 2 means of egress.		Complies
G3.8	Fire and smoke control systems Sprinklers are to be provided throughout in accordance with Specification E1.5 and G3.8. A smoke control system complying with AS/NZS1668.1 and Specification G3.8 is required throughout. An automatic fire detection and alarm system must comply with AS1670.1 and Specification G3.8. A sound system and intercom system for emergency purposes must be provided in accordance with AS1670.4 and must incorporate visual warning devices that operate on alarm and display the words "EVACUATE" in red letters. A suitable alternative power supply (emergency generator) must be provided to operate "required" safety systems in the building in accordance with Specification G3.8. Fire isolated stairways are required to be provided automatic air pressurisation in accordance with AS/NZS1668.1.		Alternative solution
Part G4 - Construction in Alpine Areas			N/A
Part G5 - Construction in Bushfire Prone Areas			N/A
Section H: Special Use Buildings – Auditoriums, Public Halls, Public Transport Buildings			N/A
Part H1 - Class 9b Buildings			N/A
NSW Part - H101 Entertainment Venues other than Temporary Structures and Drive-In Theatres			N/A
NSW Part - H102 Temporary Structures			N/A
NSW Part - H103 Drive-In Theatres			N/A
Part H2 - Public Transport Buildings			N/A
NSW Section J: Energy Efficiency Energy Efficiency for buildings requires buildings to reduce greenhouse gas emissions by efficiently using energy. A building's services must have features that facilitate the efficient use of energy. The discipline of Energy Efficiency with the BCA has become a specialised field where compliance with BCA Section J is to be certified with the issue of a Certificate of Compliance – Design from the relevant Services Engineer/Consultant. The purpose of this section is to provide a brief explanation of which areas are to achieve compliance with BCA Section J – Energy Efficiency during design and construction. The BCA should be referenced for exact requirements, clarification and further explanation.			
Section J	Energy Efficiency Measures	Compliance assumed, although further	Compliance

Clause	Description	Comment	Status
	<p>Energy efficiency measures are prescribed for the following building elements to limit energy consumption:-</p> <ul style="list-style-type: none"> • Building fabric • External glazing • Building sealing • Air movement. • Air-conditioning and ventilation systems. • Artificial lighting and power • Hot water supply • Access for maintenance 	<p>information is required to confirm compliance.</p> <p>A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.</p>	readily achievable

14. Appendix A – Referenced Documentation

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

Drawing No.	Title	Issue	Date	Drawn By
A-DA-2101A	Floor plan – level 01 (sheet 01 of 02)	C	31/01/18	Cox
A-DA-2101B	Floor plan – level 01 (sheet 02 of 02)	C	31/01/18	Cox
A-DA-2102	Floor plan – level 02	C	31/01/18	Cox
A-DA-2103	Floor plan – level 03	C	31/01/18	Cox
A-DA-2104	Floor plan – level 04	C	31/01/18	Cox
A-DA-2105	Floor plan – level 05	C	31/01/18	Cox
A-DA-2106	Floor plan – level 06	C	31/01/18	Cox
A-DA-2107	Floor plan – level 07	C	31/01/18	Cox
A-DA-2108	Floor plan – level 08	C	31/01/18	Cox
A-DA-2109	Floor plan – level 09	C	31/01/18	Cox
A-DA-2110	Floor plan – level 10	C	31/01/18	Cox
A-DA-2111	Floor plan – level 11	C	31/01/18	Cox

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 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 Clauses D2.19 and D2.21.
Automatic fire detection and alarm system (smoke detection system)	BCA2016 Specification E2.2a, AS 1670.1 – 2015 and AS 3786 – 2014 or 1993 [Note: The 1993 edition has been retained for a transitional period ending on 30 April 2017]
Automatic fire detection and alarm system (within atriums)	BCA2013 Specification G3.8 and AS 1670.1 – 2015
Automatic fire detection and alarm system (smoke detection system to operate zone smoke control or stair pressurisation system)	BCA2016 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 or smoke detection system to activate smoke exhaust system or smoke and heat vents)	BCA2016 Clause 5 and 7 of Specification E2.2a and AS/NZS 1668.1 – 2015

Measure	Standard of Performance
Automatic fire suppression systems (Sprinklers)	BCA2013 Specification E1.5 and AS 2118.1 – 1999
Automatic fire suppression systems (<i>Combined sprinkler and hydrant system</i>)	BCA2013 Specification E1.5 and AS 2118.6-2012 (combined sprinkler and hydrant systems in multistorey buildings)
Emergency lifts	BCA2016 Clause E3.4
Emergency lighting	BCA2016 Clause E4.2, E4.4 and AS 2293.1 – 2005
Sound System and Intercommunication System for Emergency Purposes (aka EWIS)	BCA2016 Clause E4.9, Specification G3.8 and AS 1670.4 – 2015
Exit signs	BCA2016 Clause E4.5, NSW E4.6, E4.8 and AS 2293.1 – 2005
Fire control room / centre	BCA2016 Specification E1.8
Fire dampers	BCA2016 Clause C3.15 and AS/NZS 1668.1 – 2015 (AS 1682.1-1990 and AS 1682.2-1990)
Fire doors	BCA2016 Specification C3.4 and AS 1905.1 – 2015
Fire hydrants systems	BCA2016 Clause E1.3 and AS 2419.1 – 2005
Fire seals protecting opening in fire resisting components of the building	BCA2016 Clause C3.15, Specification C3.15 and AS 1530.4 –2014 and AS 4072.1 – 2005 and installed in accordance with the tested prototype. <i>[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]</i>
Fire shutters	BCA2016 Specification C3.4 and AS 1905.2 – 2005
Fire windows	BCA2016 Specification C3.4 and AS 1530.4 – 2014
Hose reel system	BCA2016 Clause E1.4 and AS 2441 – 2005
Mechanical air handling system (<i>automatic shutdown of air-handling system</i>)	BCA2016 Clause E2.2 and AS/NZ 1668.1-2015
Mechanical air handling system (<i>automatic air pressurisation system</i>)	BCA2016 Table E2.2a and Specification G3.8 and AS/NZ 1668.1-2015
Mechanical air handling system (<i>zone smoke control system</i>)	BCA2016 Table E2.2a and AS/NZ 1668.1-2015
Mechanical air handling system (<i>automatic smoke exhaust system</i>)	BCA2016 Table E2.2b, Specification E2.2b and G3.8, and AS/NZ 1668.1-2015
Perimeter vehicle access for emergency vehicles	BCA2016 Clause C2.4
Portable fire extinguishers	BCA2016 Clause E1.6 and AS 2444 – 2001
Stand-by power systems	BCA2016 Clause 6 of Specification G3.8
Wall wetting sprinkler and drencher systems	BCA2016 Clause C3.4 Specification G3.8 and AS 2118.2 – 1995
Warning and operational signs	BCA2016 Clauses C3.6, D1.17, NSW D2.19, D2.23, D3.6, E3.3, E3.9, E3.10 G4.3, NSW H101.8 and NSW H101.10 and Specifications D1.12, E1.8, E3.1 and G3.8

Note the fire safety schedule will need to be amended subject to the inclusion of a fire engineered alternative 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 therein) 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, where the distance from any fire-source feature to which it is exposed is-				
less than 3 m	90/ - / -	120/ - / -	180/ - / -	240/ - / -
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
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 250m²/g.

Other than above, construction materials generally need to achieve as1530.3 early fire hazard indice 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 D1.13 – Populations/Exit Width Assessment

Level	Population	Aggregate Exit Width required (m)	Exit width provided (m)
1	28	1	2
2	200	2	2
3	40	1	4
4	340	3.5	4
5	183	2	2
6	204	2.5	2
7	190	2	2
8	183	2	2
9	104	2	2
Total	1472	N/A	N/A

19. 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

20. 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 <u>Total R-Value</u> 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 <u>Total R-Value</u> 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 <u>Total R-Value</u> 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 <u>R-Value</u> of ceiling insulation <u>required</u> to satisfy J1.3(a) is between the values stated, interpolation may be used to determine the adjusted minimum <u>R-Value</u> .											

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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.57	Not more than 0.43	Not more than 0.34
	<i>Total System U-Value</i>	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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.72	Not more than 0.54	Not more than 0.43
	<i>Total System U-Value</i>	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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.83	Not more than 0.69	Not more than 0.55
	<i>Total System U-Value</i>	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
2.5 and more	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.83	Not more than 0.83	Not more than 0.83
	<i>Total System U-Value</i>	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	<p>(a) (i) Achieve a minimum <i>Total R-Value</i> of 3.3. (ii) The minimum <i>Total R-Value</i> in (i) is reduced (A) for a wall with a surface density of not less than 220 kg/m², 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.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
4, 5 and 6	<p>(a) (i) Achieve a minimum <i>Total R-Value</i> of 2.8. (ii) The minimum <i>Total R-Value</i> in (i) is reduced - (A) for a wall with a surface density of not less than 220 kg/m², 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.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
7	<p>(a) Achieve a minimum <i>Total R-Value</i> of 2.8.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
8	<p>(a) Achieve a minimum <i>Total R-Value</i> of 3.8.</p> <p>(b) Where the wall is an earth retaining wall or earth-berm, achieve a minimum <i>Total R-Value</i> of 2.0.</p>

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- <i>conditioned space</i> 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) <i>roof lights</i> 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- <i>conditioned space</i> 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- <i>conditioned space</i> 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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SYDNEY | MELBOURNE | BRISBANE | CANBERRA

University of Sydney
Engineering and Technology precinct

DRAFT BCA Assessment Report

Report 2016 / 2529 R1.3

Prepared for the University of Sydney
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SWP Quality System

Job Number/Ref: Client Name
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Revision History

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Date: 1 February 2018
Revision Details: DA Report – Updated plans & comments
Author: Andrew Rys
Verifier: Steve Watson

Disclaimer:

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

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



Executive Summary

An assessment of the proposed design of the University of Sydney Engineering and Technology precinct 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 that require either amendments to plans or an Alternative Solution to satisfy the Performance Requirements of the BCA.

Summary of BCA Parameters:

Building Use:	Research and education centre
Class of Occupancy	Class 5, 8 & 9b
Type of Construction Required	Type A
Rise Storeys:	9
Number of Storeys:	8
Effective Height:	26.78 m

The following are the main issues that will be addressed during design resolution:

1. Staged occupation of the premises.
2. Travel distance to a point of choice is excessive and beyond what could be justified by an Alternative Solution the following areas must be redesigned:
 - a. Level 1 research lab over 33 m
 - b. Level 2 teaching lab over 30 m
 - c. Typical level teaching labs over 35 m
3. Travel between exits is up to 85 m on typical floors
4. The doors to the western stair must be widened to accommodate the full width of the stair;
5. The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings.

The following are the main fire safety issues proposed to be addressed by the Fire Safety Engineer via an Alternative Solution:

1. FRLs
 - (a) The reduction of laboratory FRLs should be investigated;
 - (b) Existing structure FRLs must be established.
2. Large isolated building without compliant perimeter vehicular access
3. Travel distance and distance between exits as above (Fire Engineer to establish parameters)
4. In sufficient egress width is provided for the proposed population
5. Travel by various stairs due to change in levels creates non-complaint egress as egress by a single stair is not provided.
6. The horizontal exits proposed are not compliant



7. Some discharge point require travel over parts of the building below and do not achieve a FRL of at least 120/120/120
8. Location fire control centre not within 300 mm of roadway;
9. Atrium:
 - (a) Dimensions of atrium well
 - (b) Separation of atrium by bounding walls
 - (c) Construction of bounding walls
 - (d) Construction of balconies
 - (e) Separation at roof
 - (f) Means of egress
 - (g) Fire and smoke control systems

The following are the main non-fire safety issues proposed to be addressed by the Fire Safety Engineer via an Alternative Solution:

1. Equitable access is required to and throughout the premises.
2. A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.

Subject to the resolution of the issues identified above 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. 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 0 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 the Engineering and Technology precinct at the University of Sydney against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016.

It has been prepared by Steve Watson and Partners for the University of Sydney

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 4A 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 4A of The Act. This means the design has been assessed to be capable of complying with the BCA without necessarily having all the details required to issue a Building Permit 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. Alternative Solutions (Performance Based)

Further development of the BCA has introduced provisions to allow 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.



Alternative 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, an alternative 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.

5. 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
Existing building fire safety	EPAR 94	Council may require upgrading in some circumstances
Alts and adds – change in building use	143(1)	Fire safety to be upgraded in affected part of building Structural adequacy to be signed off Category 1 fire safety provisions to be upgraded. (Hydrants, sprinklers, fire control centres, smoke detection, smoke hazard management, emergency lifts.)
Alts and adds – no change in use	EPAR 143(3)	No reduction in the level of safety permitted
New Work	EPAR 145	All new works must comply
Access to premises	Disability (Access to Premises — Buildings) Standards 2010	Upgrade of the “Affected Part” to provide access for people with disabilities
Development by the Crown	Section 109R 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 Environmental Planning and Assessment Regulation 2000 (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 Consent authority may require building to be upgraded

When determining a development application, a Consent Authority (Council) is required to assess fire safety in an existing building under Clause 94 of the EPAR.

The assessment must consider whether the measures contained in a building are inadequate

- (i) to protect persons using the building and facilitate their egress in the event of a fire or



- (ii) to restrict the spread of fire between buildings.

In determining a development application, the consent authority is to take into consideration whether it would be appropriate for the building to be brought into total or partial conformity with the BCA. Normally this discretionary power would only be enacted in the following circumstances:

- the proposed scope of works encompasses a large portion of the building so that a total building upgrade would not be considered an onerous requirement (ie ½ the total volume of the building including other works undertaken in the last 3 years) ;
- the upgrading measure(s) significantly increase the level of safety and are able to be cost-effectively incorporated into the proposed works so that they would not be considered an onerous requirement
- the existing level of safety is so deficient that the council consider a upgrade is necessary irrespective of the scope of works proposed.

5.3 No change of building use - structural strength and fire safety

Clause 143 (3) of the Environmental Planning and Assessment Regulation 2000 (EPAR) prevents a certifying authority from issuing a construction certificate if the proposed new work will result in a reduction to the fire protection and structural capacity of the building.

5.4 Change of building use - structural strength and fire safety

If a change in use is involved under the application, Clause 143 (1) of the EPAR requires that the fire protection (egress), structural capacity and Category 1 Fire Safety provisions must be applicable to the new use of the building.

5.5 Access to premises

The Disability (Access to Premises – Buildings) Standards came into force via BCA2011 throughout Australia on 01 May 2011, and with it introduced a higher standard of access to that required by previous versions of the BCA. In prescribed circumstances, the legislation requires upgrade of access and facilities for persons with disabilities when building work is proposed. In particular, unless works are undertaken by a lessee who does not lease the entire building, proposed building work anywhere in the building could trigger a need for enhanced access at the main building pedestrian entry and from that entry to all areas of the building that are subject to the building work.

5.6 Development by the crown

Development by the Crown is regulated by Part 4 Division 4 and Part 4A Division 2 of the EP&A Act. Section 109R 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.

6. 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. (**Alternative Solution**);
 8. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is not exacerbated by the new works. (**No Reduction in Safety**);
 9. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is being exacerbated by the new works. (**Reduction in Safety**);
 10. In the event the report is intended to address Council’s discretionary upgrading responsibility, the existing feature of the building does not comply and is recommended to be upgraded to provide adequate safety. (**Upgrade Required**) This status may be concurrent with the status of the proposed new work.
 11. In the event of a change of building use, the existing feature of the building does not comply and must be upgraded to provide safety adequate to the new use (**Upgrade Required**) This status may be concurrent with the status of the proposed new work.
 12. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is not exacerbated by the new works. (**No Reduction in Safety**)
 13. In the event of alterations and extensions to an existing building, a base building non-compliance may exist which is being exacerbated by the new works. (**Reduction in Safety**)
- 3) Nominate the status of the design against each BCA requirement;
- 4) Provide comments against each BCA requirement as appropriate.

7. Description of Proposed Development

Proposed development involves the refurbishment and renewal of the existing Electrical Engineering Building, Rex Vowels Theatre and associated landscaping. The existing EEB_CRM houses the School of Electrical Engineering and Telecommunications and contains a mixture of lectures theatres, teaching labs, research labs and office space.

8. Assessment Data Summary

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

8.1 Assumptions

The following assumptions have been made in the preparation of this report.



1. Occupation of the existing portion of the premises during is subject to the resolution of fire safety and egress strategy approved by the Fire Safety Engineer and other relevant parties.

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.

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.	D1.4	Exit travel distances	Access to and location of the following exits needs to be re-designed: <ul style="list-style-type: none">▪ L1 research lab over 33 m▪ L2 teaching lab over 30 m▪ Typical level teaching labs over 35 m
2.	D1.6	In sufficient egress width is provided for the proposed population	The door to the western stair must be widened.
3.	D1.7	The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings	Protect opening as required

9.2 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.	C1.1	External cladding conformity	Detailed review of the external cladding should be undertaken to ensure that there are no combustible materials and non-complaint claddings have not been nominated that could increase the risk of fire spread via the external façade.
2.	E1.3 & E1.4	Hydrant and hose reel coverage	Additional hydrant and hose reels beyond the one associated with the fire stairs will be required to achieve coverage
3.	E2.2	Smoke hazard management	Details of measures to be installed are required
4.	D2.21	Paths of travel will have to be activated by fail safe devices	



9.3 Alternative solutions required

It is proposed to satisfy the following non-compliances by alternative solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	FRLs	C1.1	Reduction of FRL (where possible)	
2.	Large isolated building without compliant perimeter vehicular access	C2.2, C2.3 & C2.4	The premises is affectively a large isolated building without compliant perimeter vehicular access	
3.	Separation of openings in different fire compartments	C3.3		
4.	Travel distance and distance between exits	D1.4 & D1.5	The following travel distance limits are exceeded: <ul style="list-style-type: none"> • 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; 	
5.	Egress width	D1.6	In sufficient egress width is provided for the proposed population	
6.	Discharge of fire isolated stair	D1.7	The eastern stair discharges to a space that is not sufficiently open and exposed to adjacent openings.	
7.	Discontinuous travel	D1.9	Travel by various stairs due to change in levels creates non-complaint egress as egress by a single stair is not provided.	
8.	Horizontal exits	D1.11	The horizontal exits proposed are not compliant	
9.	Roof as open space	D2.12	Some discharge point require travel over parts of the building below and do not achieve a FRL of at least 120/120/120	
10.	Location fire control centre	E1.8		
11.	Atrium	Part G3	<ul style="list-style-type: none"> ▪ Dimensions of atrium well ▪ Separation of atrium by bounding walls ▪ Construction of bounding walls ▪ Construction of balconies ▪ Separation at roof ▪ Means of egress ▪ Fire and smoke control systems 	

It is proposed to satisfy the following non-fire non-compliances by alternative solutions:

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Access to and throughout the premises	Part D3	Equitable access is required to and throughout the premises.	
2.	Energy Efficiency	Part J	A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.	



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 alternative 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 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 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. 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: <table><thead><tr><th>LEVEL</th><th>USE</th><th>CLASS</th></tr></thead><tbody><tr><td rowspan="2">Level 1</td><td>Laboratories</td><td>8</td></tr><tr><td>Storage</td><td>7b</td></tr><tr><td rowspan="2">Level 2</td><td>Teaching</td><td>9b</td></tr><tr><td>Laboratories</td><td>8</td></tr><tr><td>Level 3</td><td>Library</td><td>9b</td></tr><tr><td rowspan="2">Level 4</td><td>Teaching</td><td>9b</td></tr><tr><td>Laboratories</td><td></td></tr><tr><td>Level 5</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 6</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 7</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 8</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 9</td><td>Teaching</td><td>9b</td></tr><tr><td></td><td>Laboratories</td><td></td></tr><tr><td>Level 10</td><td>Roof plant</td><td>9b</td></tr></tbody></table>	LEVEL	USE	CLASS	Level 1	Laboratories	8	Storage	7b	Level 2	Teaching	9b	Laboratories	8	Level 3	Library	9b	Level 4	Teaching	9b	Laboratories		Level 5	Teaching	9b		Laboratories		Level 6	Teaching	9b		Laboratories		Level 7	Teaching	9b		Laboratories		Level 8	Teaching	9b		Laboratories		Level 9	Teaching	9b		Laboratories		Level 10	Roof plant	9b		Noted
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Level 10	Roof plant	9b																																																							
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																																																						

Clause	Description	Comment	Status
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	Compliance readily achievable
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.	Noted	Compliance readily achievable
Section C: Fire Resistance			
Part C1 – Fire Resistance and Stability			
C1.1	Type of Construction Required BCA Type A fire resisting construction is required.	Details of the proposed construction and how it will achieve the required FRL is to be provided. Investigation and certification from a structural engineer will be required for all existing FRL's of all structural elements.	Additional details required
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. Combustible materials are not permitted to be located near or directly above a required exit so as to make the exit unusable in a fire. The following materials may be used where non-combustible materials are required: <ul style="list-style-type: none"> • Plasterboard. • Perforated gypsum. • Fibrous-plaster sheeting to AS 2185. • Fibre-reinforced cement sheeting. • Pre-finished metal sheeting. 	Architect and Structural engineer to make provisions for this requirement in the design. Detailed review of the external cladding should be undertaken to ensure that there are no combustible materials and non-complaint claddings have not been nominated that could increase the risk of fire spread via the external façade. Ensure all façade materials have a current Certificate of Conformity or a current Certificate of Accreditation, or the like to determine their acceptance by the Fire Brigade.	Additional details required / Compliance readily achievable

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> Bonded laminated materials. As determined by testing to AS 1530.1 An appropriately BCA accredited product or system 		
C1.2	<p>Calculation of rise in storeys</p> <p>Effective Height / Calculation of rise in storeys.</p> <p>Rise in storeys is a defined BCA term addressing the number of main building levels excluding basements.</p> <p>Effective height is defined under the BCA as vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units).</p> <p>These parameters influence the BCA provisions applicable to the building.</p>	<p>The following parameters apply:</p> <p>Rise in storeys: 8 storeys</p> <p>Effective Height: 26.78m</p>	Noted
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 9b	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	<p>Lightweight construction</p> <p>Lightweight construction used in a wall system must comply with Specification C1.8.</p> <p>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.</p>	Details of the proposed systems to be installed must be in accordance with a tested prototype.	Compliance readily achievable
C1.9	-	This Clause has deliberately been left blank	-
C1.10	<p>Fire Hazard Properties</p> <p>Floor materials, floor coverings and wall and ceiling lining materials need to comply with prescribed fire hazard properties. Refer to Appendix C1.10.</p>	<p>Compliance assumed and will require verification test data for all timber and other combustible linings and materials, including:</p> <ul style="list-style-type: none"> Carpets Vinyls (walling and flooring) Timber flooring and wall linings Veneered wall panelling Spray-on insulation material Other combustible finishes 	Compliance readily achievable

Clause	Description	Comment	Status
		<ul style="list-style-type: none"> Carpark soffit insulation fire test reports, based on 'room fire testing' will be required to meet fire brigade consent conditions if applicable. 	
C1.11	Performance of external walls in fire	Concrete external walls that could collapse as complete panels are to be designed in accordance with Specification C1.11 to minimise the likelihood of external walls collapsing outwards in the event of a fire and separating from supporting members.	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 <i>Fire-protected timber</i> in a Class 2, 3 or 5 building may be used wherever an element is <i>required</i> to be <i>non-combustible</i> ,		N/A
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 and 9b: 8,000m ² and 48,000m ³ Class 8: 5,000m ² and 30,000m ³ <u>Note:</u> <ul style="list-style-type: none"> The BCA does not require Class 2 and 3 parts of the building to be considered The basement carpark levels are not required to be considered as they're provided with a sprinkler system throughout 	The floor area and volume of Lower Ground and Ground floor levels are within the maximum limitations outlined by Table C2.2.	Alternative Solution
C2.3	Large isolated buildings Where the building exceeds the limitations under Clause C2.2 above but not more than 18,000m ² nor 108,000m ³ : Class 7 or 8: <ul style="list-style-type: none"> Contains no more than 2 storeys, and Is provided with 18m wide open space complying with Clause C2.4(a) Class 5, 6, 7, 8 or 9: <ul style="list-style-type: none"> Sprinkler protection throughout 6m wide perimeter vehicular access complying with Clause C2.4(b) Where the building exceeds 18,000m ² or 108,000m ³ : <ul style="list-style-type: none"> Sprinkler protection throughout A 6m wide perimeter vehicular access complying with Clause C2.4(b) Refer to Clause E2.2 for smoke hazard management requirements		Alternative Solution

Clause	Description	Comment	Status
C2.4	Perimeter Vehicular Access Vehicular access / open space is provided from the public road for emergency vehicular access and is not to be used for the storage or processing of materials and must not be built upon except for guard houses and service structures as long as they do not unduly impede firefighting. Vehicular access must have a loadbearing capacity and unobstructed height to permit the operation and passage of fire brigade vehicles. Vehicular access must be capable of providing <u>continuous</u> access for emergency vehicles to enable travel in a <u>forward</u> direction from the public road around the entire building.		Alternative Solution
C2.5	Class 9a and 9c buildings		N/A
C2.6	Vertical separation of openings in external walls Only applicable to a building of Type A Construction, which is not sprinkler protected.	The building is proposed to be sprinkler protected.	Complies
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.	Separation of new work from existing to be investigated and addressed.	Additional details required
C2.8	Separation of classifications in the same storey As the building has parts of different classifications located alongside one another in the same storey each building element must have the higher FRL prescribed in Specification C1.1 of the BCA or the parts must be separated by a fire wall.		Compliance readily achievable
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.	An alternative solution has been proposed to reduce the FRL's down to 2 hours throughout. Floors are required to have an FRL not less than 120/120/120. Confirmation that the existing structure achieves an FRL of 120/120/120 is required from the structural engineer	Compliance readily achievable
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		Complies
C2.11	Stairs and Lift in One Shaft	The lift is within its own shaft	Complies
C2.12	Separation of Equipment Two-hour fire enclosure is required for: <ul style="list-style-type: none"> lift motor rooms emergency generators sustaining emergency equipment operating in emergency mode central mechanical smoke control plant boilers 	Any UPS system with a voltage exceeding 24 volts and a capacity exceeding 10 amp hours must be fire separated.	Additional details required

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> batteries with voltage over 24 volts and a capacity exceeding 10 ampere hours. (Batteries within an electricity network substation are exempt.) 		
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.		Compliance readily achievable
C2.14	Corridors in Class 2 & 3 Building Public corridors must be divided at intervals of not more than 40m by smoke-proof walls complying with Clause 2 of Specification C2.5.		N/A
Part C3 – Protection of Openings			
C3.1	Application of Part		Noted
C3.2	Protection of Opening in External Walls Openings in the external walls of the building are to be protected in accordance with C3.4, being fire rated windows, external sprinklers or the like, if: <ul style="list-style-type: none"> less than 3m to side or rear boundary, less than 6m from the far boundary of a road or lane, Less than 6m from another building on the same allotment. Openings that require protection should not occupy more than one third of the storey in which they occur.	Separation from adjacent buildings and Fire Compartments required.	Additional details required
C3.3	Separation of Openings in Different Fire Compartments External walls within the distances specified in Table C3.3 of the BCA are to be protected by construction with an FRL not less than 60/60/60 and the associated openings protected in accordance with Clause C3.4 of the BCA.	Separation from adjacent buildings and Fire Compartments required.	Additional details required
C3.4	Acceptable method of protection Window openings that are required to be protected are to be protected by wall wetting sprinklers with windows that are automatic closing or permanently fixed in the closed position, -/60/- fire windows or -/60/60 automatic fire shutters. Doorways are to be protected by wall wetting sprinklers used with doors that are self-closing or automatic closing, or -/60/30 self-closing or automatic closing fire doors.		Noted
C3.5	Doorways in fire walls 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

Clause	Description	Comment	Status
C3.7	Protection of doorways in horizontal exits Doorways in horizontal exits are to be protected by a fire door, which 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
C3.8	Openings in Fire Isolated Exits -/60/30 self-closing fire doors are required to doorways providing access to fire isolated stairways.		Compliance readily achievable
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.		Compliance readily achievable
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 35,000mm ² (175 X 200 mm).	Certification from the lift supplier is required for the installation of the new lift	Compliance readily achievable
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.	Services penetrations of fire rated structure generally need to be fire-stopped and/or located in fire rated riser shafts. Openings in fire rated elements need to be fire resisting to maintain the function of the elements.	Compliance readily achievable
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: <ul style="list-style-type: none"> • If it is a sanitary compartment - a door or panel which together with its frame, is non-combustible or has an FRL of not less than - /30/30, or • A self-closing -/60/30 fire door or hopper, or • An access panel with an FRL of not less than - /60/30, or • If the shaft is a garbage shaft - a door or hopper of non-combustible construction. 		Compliance readily achievable
C3.14	-	This Clause has deliberately been left blank	-
C3.15	Openings for service installation Methods and materials used are to be identical to tested prototypes and in accordance with AS4072.1 and AS1530.4, and having achieved the required FRL or resistance to the incipient spread of fire or other specified method.	Any system used must be a certified system and installed in accordance with the tested method. Specifications of the methods of fire sealing need to be provided	Compliance readily achievable

Clause	Description	Comment	Status
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: <ul style="list-style-type: none"> • High rise buildings over 25m in effective height • Each basement level • Class 9 buildings of more than 6 storeys • Class 9 storeys accommodating more than 50 persons. 		Complies
D1.3	When Fire Isolated Exits Are Required Every stair in a Class 5 to 9 building must be fire isolated unless it does not connect or pass through more than 3 consecutive floors in a sprinkler protected building, or 2 storeys in a non-sprinkler protected building.		Complies
D1.4	Exit Travel Distances No point on the floor must be more than 20m to an exit or a point in which travel in different directions to 2 exits is available, in which case, the maximum distance to 1 exit cannot exceed 40m.	The nominated exits in the building are listed in appendix D1.4 of the report. The following areas have been identified with distances exceeding 20m to a point of choice: <ol style="list-style-type: none"> 1. Level 1 research lab over 33 m 2. Level 2 teaching lab over 30 m 3. Typical level teaching labs over 35 m These distances are beyond a distance that can be addressed by an Alternative Solution. The following areas have been identified with exit travel distances exceeding 40m: <ol style="list-style-type: none"> 1. Typical floors 	Does Not Comply / Alternative solution
D1.5	Distance between alternative exits The following travel distance limits apply: <ul style="list-style-type: none"> • ≤ 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. 	The following areas have been identified with distances between alternative exits exceeding 60m: <ol style="list-style-type: none"> 1. Typical floors are up to 85 m. This will be dependent on an Alternative Solution for travel to a point of choice	Alternative solution
D1.6	Dimensions of exits		Alternative

Clause	Description	Comment	Status
			Solution
D1.7	Travel via fire-isolated exits	The eastern fire stair discharges to a space that is not open for 1/3 of its perimeter. Further the discharge of this stair is exposed to opening in the adjacent building.	Complies
D1.8	External stairways in lieu of fire-isolated exits External stairs or ramps may be used instead of fire-isolated stairs to a building under 25m in effective height, subject to: <ul style="list-style-type: none"> Stair to be non-combustible construction. Exit doors onto the stair to be 1-hour fire rated. Exit paths via the stair must be shielded if within 6m of openings in external wall of building. 		N/A
D1.9	Travel by non-fire-isolated stairways or ramps		N/A
D1.10	Discharge from exits An exit must not be blocked nor be capable of being blocked at its point of discharge.		Compliance readily achievable
D1.11	Horizontal Exits Horizontal exits must have a clear area on the side of the fire wall, to which the occupants are evacuating, to accommodate the total number of persons serviced by the horizontal exit of not less than 0.5m ² per person in any other case		Compliance readily achievable
D1.12	Non-required stairs, ramps or escalators Non-required stairs are permitted to connect up to 3 consecutive levels in a sprinklered building if one of the levels has direct access to open space		Compliance readily achievable
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		Compliance readily achievable
D1.17	Access to lift pits Access requirements apply to lift pits over 3m in depth.	Lift consultant to confirm.	Compliance readily achievable
Part D2 – Construction of Exits			
D2.1	Application of Part		Noted
D2.2	Fire Isolated Stairs or Ramps		Compliance readily achievable
D2.3	Non Fire Isolated Stairways and Ramps		Compliance readily achievable
D2.4	Separation of Rising and Descending Stair Flights		Complies
D2.5	Open access ramps and balconies		N/A

Clause	Description	Comment	Status
D2.6	Smoke lobbies		N/A
D2.7	<p>Installations in Exits and Paths of Travel</p> <p>Electrical meters and motors, distribution boards and telecommunication boards must not be accessed from fire isolated exits and, if located in corridors leading to exits, should occur in non-combustible or fire protective smoke sealed enclosures.</p> <p>No openings to ducts conveying hot products of combustion permitted in required exits.</p> <p>Gas or fuel services not permitted in required exits.</p> <p>Electric or services equipment in paths of travel to exits must be within a non-combustible and smoke sealed enclosure.</p>	Install non-combustible linings to the internal walls, ceiling and doors of relevant cupboards and install smoke seals to the doors.	Compliance readily achievable
D2.8	<p>Enclosure of Space Beneath Stairs</p> <p>If the space below a fire-isolated stairway is within the fire isolated shaft it must not be enclosed to form a cupboard or similar enclosed space.</p> <p>The space below non fire-isolated stairs must not be enclosed to form a cupboard or similar enclosed space unless the enclosing walls have an FRL of not less than 60/60/60 and any doorway to the enclosed space is fitted with a self-closing -/60/30 fire door.</p>		Compliance readily achievable
D2.9	<p>Width of stairways</p> <p>A stairway more than 2m in width is only counted as having a width of 2m unless it is divided by a continuous handrail or balustrade between landings and each division is less than 2m wide.</p>		Compliance readily achievable
D2.10	<p>Pedestrian ramps</p> <p>Ramps serving as required exit must have a gradient not less steep than 1:8. If the ramp is required for disabled access under Part D3 it must comply with AS1428.1.</p> <p>The surface of the ramp must have a non-slip finish.</p>		Compliance readily achievable
D2.11	<p>Fire-isolated passageways</p> <p>Fire isolated passageways are to have an FRL equivalent to the fire resisting stair shaft as specified in Specification C1.1 when tested from the outside</p>		N/A
D2.12	<p>Roof as open space</p> <p>The roof is required to have an FRL of not less than 120/120/120 and not incorporate any roof lights or other openings within 3m of the path of travel.</p>	The accessible research roof deck may need to be treated as open space to ensure egress works on roof level.	Compliance readily achievable
D2.13	<p>Going and Risers</p> <p>To provide safe passage, stairways must comply with the following:</p> <ul style="list-style-type: none"> • minimum 2 risers / maximum 18 in each flight • risers 115mm min 190 mm max - going 250mm min 355mm max - 2R+G 550mm min 700mm max. • Risers and goings that are consistent in a flight and within a prescribed range of dimensions. 	Further detail of the stairs will need to be provided to confirm compliance	Compliance Readily Achievable

Clause	Description	Comment	Status															
	<ul style="list-style-type: none">Riser gaps and step openings that do not exceed 125mm.Non-slip treads and non-skid tread nosing																	
D2.14	<p>Landings</p> <p>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:</p> <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>	<u>Application</u>	<u>Dry Surface Conditions</u>	<u>Wet Surface Condition</u>	1:14 or steeper ramps	P4 or R11	P5 or R12	Ramps of 1:14 to 1:20	P3 or R10	P4 or R11	Tread or Landing Surface	P3 or R10	P4 or R10	Nosing Strip or Landing Strip	P3	P4	Certification / test reports on the slip resistance of the surfaces will need to be provided on constructed elements.	Compliance readily achievable
<u>Application</u>	<u>Dry Surface Conditions</u>	<u>Wet Surface Condition</u>																
1:14 or steeper ramps	P4 or R11	P5 or R12																
Ramps of 1:14 to 1:20	P3 or R10	P4 or R11																
Tread or Landing Surface	P3 or R10	P4 or R10																
Nosing Strip or Landing Strip	P3	P4																
D2.15	<p>Thresholds</p> <p>Steps should not occur at doorways without a threshold landing except as follows:</p> <ul style="list-style-type: none">A single 190mm step is permitted (other than in health or aged care buildings) at doors leading to the exterior.	Note that where access for people with disabilities is required it is not permitted to have a step at the threshold of a doorway	Compliance readily achievable															
D2.16	<p>Barriers to Prevent Falls</p> <p>Requirements apply to the provision and design of barriers at locations where a person could fall 1m or more. Generally, 125mm maximum gap size limits apply between balusters or rails and a 1m minimum height applies, with alternate dimensions permitted in fire isolated stairs and industrial areas.</p> <p>Climbable balustrade elements are prohibited where a person could fall 4m or more.</p> <p>Minimum sill heights apply at openable windows where people could fall more than 4m.</p>		Additional details required															
D2.17	<p>Handrails</p> <p>Handrails to exits including parts of fire isolated exit serving an area required to be accessible to people with disabilities must comply with Clause 12 of AS1428.1, viz:</p> <ul style="list-style-type: none">Handrails not to obstruct circulation space30-50mm diameter865-1000mm above nosing line of stairs865-1000mm above ramps and landingsConsistent height throughout50mm grip clearance and no obstructions to handholdContinuous at internal (return) landings	Handrail details to be confirmed by the access consultant	Compliance readily achievable															

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> Provided with handrail extensions and 180 degree curled ends 		
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.	Auto sliding doors at the entries into the building must comply with these requirements	Compliance readily achievable
D2.20	Swinging doors 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.		Additional details required
D2.21	Operation of latch Exit doors should be provided with "free handle" egress via a downward or pushing action and, if serving an area accessible to people with disabilities, must have non-slip "D" pull handles with 35-45mm hand clearances.	All exit doors and doors in the path of travel must comply.	Compliance readily achievable
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. In such cases, the doors to fire isolated stairs must not be able to be locked to prevent escape from within the stair back into any level unless the doors are linked to a failsafe device that opens upon activation of a fire alarm. On at least every fourth storey, the doors should not be locked at all and should be sign posted that re-entry is available at that level. Alternatively, an intercommunication or audible/visual alarm system is required within the stair to assist persons who may accidentally be locked within the stair.		Additional details required
D2.23	Signage to Fire Safety Doors An automatic door held open by an automatic hold-open device: <p style="text-align: center;">FIRE SAFETY DOOR DO NOT OBSTRUCT</p> Or for a self-closing door <p style="text-align: center;">FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN</p> or for a door discharging from a fire-isolated exit	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.	Compliance readily achievable

Clause	Description	Comment	Status
	FIRE SAFETY DOOR DO NOT OBSTRUCT	The notice is to state the following: OFFENCES RELATING TO FIRE EXITS It is an offence under the Environmental Planning and Assessment Act 1979: a) to place anything in or near this fire exit that may obstruct persons moving to and from the exit, or b) interfere with or obstruct the operation of any fire doors, or c) to remove, damage or otherwise interfere with this notice.	
D2.24	Protection of Openable Windows Windows serving a residential bedroom or serving an early childhood centre must be protected where the floor is 2m or more above the external surface below. Where the window sill is below 1.7m above floor level, window restrictors or secure screens limiting openings and gaps to 125mm are required. Release devices must be child resistant. Where the fall distance from the floor to the surface below is 4m or more or where a release device occurs to a required screen, an additional barrier at 865mm above floor level is required and must be non-climbable with gaps no greater than 125mm between elements.		N/A
NSW D2.101	Doors in the Path of Travel in an Entertainment Venue		N/A
Part D3 – Access for People with Disabilities			
An Access Report is being prepared for a detailed access assessment. Any issues that will not meet the DTS Provisions must be addressed by an alternative solution and endorsed under a CC			
D3.1	General Building Access Requirements Access is generally required for persons with a disability throughout all areas unless specifically exempted.	Access is required throughout. Consultation with the access consultant is required. A full review is to be undertaken by the access consultant with the provisions of a report to be submitted to the Certifying Authority	Compliance readily achievable
D3.2	Access to Buildings External access to the building for people with a disability must be provided: <ul style="list-style-type: none"> From main pedestrian entry points at the allotment boundary. Through the principle pedestrian entrance. Through at least 50% of all pedestrian entries. From accessible car parking spaces. For buildings over 500m², so that an accessible entry occurs within 50m of any non-accessible entry. From any another accessible building on the site. 	Refer to access consultant's report.	Alternative Solution
D3.3,	Parts of the Building to be Accessible All parts of the building must be accessible to people with a disability except for areas where access would be inappropriate due to the particular use or	Refer to access consultant's report.	Alternative Solution

Clause	Description	Comment	Status
	<p>areas that would pose a health or safety risk to people with a disability.</p> <p>Every ramp, except a fire isolated ramp, must comply with Clause 10 of AS 1428.1.</p> <p>Every stairway, except a fire isolated stairway, must comply with Clause 11 of AS 1428.1.</p> <p>A fire isolated stairway must comply with Clause 11(f) and (g) of AS 1428.1.</p> <p>Every passenger lift must comply with Clause E3.6.</p> <p>Access ways must have passing spaces and turning spaces complying with AS 1428.1.</p> <p>A ramp or passenger lift need not be provided to serve a storey or level other than the entrance storey of a class 5, 6, 7b or 8 building containing not more than 3 storeys and with a floor area of each storey, excluding the entrance floor, of not more than 200m².</p> <p>Pile height or pile thickness of carpets shall comply with the requirements of this Clause and AS 1428.1.</p>		
D3.4	<p>Exemptions</p> <p>Buildings required to be accessible must have travel paths, facilities and details which comply with AS1428.1. – 2009.</p>		Noted
D3.5	<p>Accessible Car Parking</p> <p>The accessible parking spaces must comply with AS/NZS 2890.6 – 2009.</p> <p>General requirements are:</p> <ul style="list-style-type: none"> • 2.4m x 5.4m. • 2.2m head clearance for access and egress routes to and from accessible car spaces. • 2.5m head clearances over accessible car spaces. • Flat even surfaces. • Designated and sign posted for disabled users. 		N/A
D3.6	<p>Signage</p> <p>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.</p> <p>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 #”.</p> <p>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.</p> <p>Signage identifying ambulant accessible sanitary facilities in accordance with AS 1428.1 must be located on the door of the facility.</p> <p>Where the pedestrian entrance is not accessible, directional signage in accordance with AS 1428.1</p>	Signage details must be in accordance with AS1428.1 - 2009 and Specification D3.6 of the BCA.	Compliance readily achievable

Clause	Description	Comment	Status
	<p>must be provided to direct a person to the location of the nearest accessible pedestrian entrance.</p> <p>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.</p>		
D3.7	<p>Hearing Augmentation</p> <p>A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed—</p> <ul style="list-style-type: none"> i) in a room in a Class 9b building; or ii) in an auditorium, conference room, meeting room or room for judicatory purposes; or iii) at any ticket office, teller's booth, reception area or the like, where the public is screened from the service provider <p>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</p> <p>A system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than—</p> <ul style="list-style-type: none"> 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; and 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; and 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. 	Refer to access consultant's report.	Compliance readily achievable
D3.8	<p>Tactile Indicators (TGSIs)</p> <p>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:</p> <ul style="list-style-type: none"> • a stairway, other than a fire-isolated stairway, • an escalator, passenger conveyor or moving walk, • a ramp other than a fire-isolated ramp, step ramp, kerb ramp or swimming pool ramp, or • in the absence of a suitable barrier an overhead: <ul style="list-style-type: none"> ○ obstruction less than 2 m above floor level, other than a doorway 	Refer to access consultant's report.	Additional details required

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> 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 <p>Tactile ground surface indicators must comply with sections 1 and 2 of AS/NZS 1428.4.1</p>		
D3.9	<p>Wheelchair seating spaces in Class 9b assembly buildings</p> <p>Where fixed seating is provided in a Class 9b assembly building, wheelchair seating spaces comply with AS 1428.1 must be provided in accordance with Table D3.9.</p> <p>In an assembly building, with not more than 300 seats — wheelchair seating spaces must not be located in the front row of seats. In a cinema with more than 300 seats — not less than 75% of required wheelchair seating spaces must be located in rows other than the front row of seats.</p> <p>The location of wheelchair seating is to be representative of the range of seating provided.</p>	Refer to access consultant's report.	Compliance readily achievable
D3.10	Swimming Pools		N/A
D3.11	<p>Ramps</p> <p>On an access way a series of connected ramps must not have a combined vertical rise of more than 3.6m.</p> <p>A landing for a step ramp must not overlap a landing of another step ramp or ramp.</p>	Refer to access consultant's report.	Compliance readily achievable
D3.12	<p>Glazing on an Access Way</p> <p>On an access way, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1.</p>	Glazed shopfronts will need to have decals installed in accordance with AS 1428.1	Compliance readily achievable
Section E: Services and Equipment			
Part E1 – Fire Fighting Equipment			
E1.1	-	This Clause has deliberately been left blank	
E1.2	-	This Clause has deliberately been left blank	
E1.3	<p>Fire Hydrants</p> <p>Fire hydrant cover is required throughout to AS2419.1 from hydrants located externally, within fire stairs or at other approved locations.</p>	<p>Full compliance with AS2419.1 will be required unless varied via fire brigade approval.</p> <p>The hydrants booster is located within 10m of the building and is not within sight of the main entrance to the building. It is proposed to address the issue via an alternative solution.</p>	Additional details required / Alternative solution
E1.4	<p>Fire Hose Reels</p> <p>Fire hose reel cover to AS2441-2005 is required throughout via hose reels located adjacent to stairs and exits.</p>	The hose reels are not located in a readily accessible location.	Additional details required

Clause	Description	Comment	Status
	Hoses are not permitted to pass through fire or smoke doors to achieve hose reel cover.		
E1.5	<p>Sprinklers</p> <p>Fire sprinkler protection to AS2118.1-1999, AS2118.4-1995 or 2012 and AS2118.6-2012 as relevant is a mandatory requirement for the project if:-</p> <ul style="list-style-type: none"> The building effective height exceeds 25m. (If any part of the development exceeds 25m effective height, all parts of the complex require sprinklers.) The building is defined as a large isolated building (Refer to BCA Ref C2.3 above). Occupancies of "excessive hazard" that occur in fire compartments over 2,000m² or 12,000m³. (Refer definition below) <p>Sprinkler pumps and valves must be accessible from the street.</p> <p>Sprinkler system activation must be linked to an audible occupant warning system.</p> <p>Sprinkler hazard Class under AS2118 needs to be agreed where uncertainty of usage under Appendix 1 of the Code occurs.</p> <p>"Excessive hazard" means:</p> <p>(a) Hazardous process risks including the following:</p> <ul style="list-style-type: none"> (i) Aircraft hangars (ii) Electrical/electronic manufacturing and assembly (predominantly plastic components. (iii) Fire-lighter manufacturing. (iv) Fireworks manufacturing. (v) Flammable liquid spraying. (vi) Foam plastic goods manufacturing and/or processing. (vii) Foam rubber goods manufacturing and/or processing. (viii) Hydrocarbon based sheet product manufacturing. (ix) Nitrocellulose and nitrocellulose goods manufacturing. (x) Paint and varnish works, solvent based. (xi) Plastic goods manufacturing and/or processing works. (xii) Resin and turpentine manufacturing. (xiii) Vehicle repair shops. <p>(b) Combustible goods with an aggregate volume exceeding 2,000m³ and stored to a height greater than 4m such as the following:</p> <ul style="list-style-type: none"> (i) Aerosol packs with flammable contents. 	<p>Design certification of the sprinkler design is to be provided.</p> <p>Any non-sprinkler protected areas and other AS2118 departures need to be identified, included in the fire engineering review (EP1.4), and advised to the MFB. These areas need to be confirmed but could include:</p> <ul style="list-style-type: none"> Apartment balconies. External under croft areas Radiation therapy bunkers PC3 laboratories Chemical stores Dangerous goods stores Flammable liquids stores MRI/PET areas Server rooms Operating theatres (TBC) Data centres and related UPS Bridge links to adjacent buildings Shower recesses or low risk bathroom areas or the like Residential - Apply AS2118.4 concessions within apartments? 	Additional details required / Alternative solution

Clause	Description	Comment	Status
	(ii) Cartons and associated packing material excluding cartons with densely packed non-combustible content.		
E1.6	Portable Fire Extinguishers Portable Fire Extinguishers are required be installed to Table E1.6 and AS 2444 requirements, at: <ul style="list-style-type: none"> • emergency services switchboards • kitchens • flammable liquid stores • at nurses' stations • special risk areas • where fire hose reels are not installed • Class 2, 3 or 4 residential areas are to be protected by 2.5kg ABE type fire extinguishers located in common areas on the storey served and located not more than 10m from each sole occupancy unit entry door. 		Compliance readily achievable
E1.7	-	This Clause has deliberately been left blank	
E1.8	Fire Control Centre A fire control centre for Fire Indicator, Fire Fans Control and Emergency Intercom panels is required for buildings of over 25m in effective height or buildings over 18,000m ² in area, at a location readily available for firefighting operations and located at or near the main building entry.		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: <ul style="list-style-type: none"> • 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. 	Further discussion required with builder to determine that this is included in their program. 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		Additional details required / Alternative Solution
Part E2 – Smoke Hazard Management			
E2.1	Applicable of Part	Part is not applicable to <ul style="list-style-type: none"> • open deck car parks • open spectator stands • a Class 8 electricity network substation with a floor area not more than 200m² 	Noted

Clause	Description	Comment	Status
		<ul style="list-style-type: none"> storerooms, etc. less than 30m² sanitary compartments plant rooms or the like 	
E2.2	<p>General requirements Residential Buildings</p> <p>The following smoke hazard management systems are required for the complex:</p> <ul style="list-style-type: none"> Stair pressurisation for fire isolated stairs serving a storey over 25m effective height. Stair pressurisation for stairs serving multiple basements. Zone smoke control is required in buildings over 25m effective height. <p>The following general requirements apply:</p> <ul style="list-style-type: none"> Stair pressurisation and air-handling shutdown activation must be via smoke detectors located per AS1668.1 and within 3m of the lift doors at each level. The system should also be linked to the building occupant audible alarm system. <p>Public Assembly Buildings</p> <p>The following smoke hazard management systems are required:-</p> <ul style="list-style-type: none"> Automatic smoke detection and alarm system to “extending spacing” requirements of AS1668.1. Sprinkler protection throughout. Stairwell pressurisation is required for fire isolated stairs serving atrium areas or serving multiple basement levels with activation on fire alarm and via smoke detectors located per AS1668.1 and within 3m of the lift doors at each level. The smoke detectors need to be a separate dedicated system with control, indicating and alarm verification facility to AS1603.4. The system should also be linked to the building occupant audible alarm system. 	It is proposed to sprinkler protect the building throughout. AS 1670.1 smoke detection system is proposed as part of the proposed alternative solutions.	Additional details required / Alternative solution
E2.3	Provisions of special hazards		N/A
Part E3 – Lift Installations			
E3.1	<p>Lift Installations</p> <p>Electric and electrohydraulic lifts must comply with the design requirements of BCA Specification E3.1.</p>	Certification of lift design to be provided	Compliance readily achievable
E3.2	<p>Stretcher Capacity Lifts</p> <p>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.</p>	Ensure a suitably sized lift serves each level.	Compliance readily achievable
E3.3	<p>Warning Against Use of Lift in Fire</p> <p>Warning signage is required at lift doors advising that lifts should not be used in the event of a fire.</p>	Signage to be installed.	Compliance readily achievable
E3.4	<p>Emergency Lifts</p> <p>Emergency lifts of prescribed size, operation and fire isolation are required in buildings where:</p>		N/A

Clause	Description	Comment	Status
	<ul style="list-style-type: none"> the building has an effective height over 25m, or a patient care area occurs in a health care building at a level that does not have direct access to a road or open space. <p>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.</p> <p>The following requirements apply to an emergency lift:</p> <ul style="list-style-type: none"> Must serve all storeys served by a passenger lift. Must be contained in a fire rated shaft. If the building effective height exceeds 75m, must have a 600kg rating if not provided with a stretcher facility or a 900kg rating if stretcher facility is provided. 		
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 rely 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: <ul style="list-style-type: none"> A fire service control switch is required for each lift or lift group. A lift car fire service drive control is required for each lift. 	Certification of lift design to be provided	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.	Certification of lift design to be provided	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.	Certification of lift design to be provided	Compliance readily achievable
Part E4 – Emergency Lighting, Exit and Warning Systems			
E4.1	-	This clause has been intentional left blank	-

Clause	Description	Comment	Status
E4.2,	Emergency Lighting requirements Emergency lighting is to be provided throughout the building.	Emergency lighting is to be provided in: <ul style="list-style-type: none"> every fire-isolated stairway, fire-isolated ramp or fire-isolated passageway. Every passageway, hallway, corridor or the like, that is part of the path of travel to an exit. In every room having a floor area more than 100m² that does not open to a corridor or space that has emergency lighting or to a road or open space. In any room having a floor area more than 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: <ul style="list-style-type: none"> 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. 	Compliance readily achievable
E4.3	Measurement of distances		Noted
E4.4	Design and operation of emergency lighting Emergency lighting must comply with to AS2293.1		Compliance readily achievable
E4.5	Exit signs Exit signs are to be provided in accordance with Clause E4.5 of the BCA.	Exit signs must be clearly visible to person approaching the exit and must be installed on, above or adjacent to; <ol style="list-style-type: none"> A door providing direct egress from a storey to a stairway, passageway or ramp serving as a required exit. A door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space. A horizontal exit A door serving as or forming part of a required exit in a storey required to be provided with emergency lighting. 	Compliance readily achievable
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		Compliance readily achievable
E4.7	Class 2 and 3 buildings and Class 4 parts: Exemptions		N/A
E4.8	Design and operation of exit signs Exit signs are to operate in accordance with AS 2293.1.		Compliance readily achievable

Clause	Description	Comment	Status
	Photo luminescent exit sign are to comply with Specification E4.8		
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. The test report must include the following information: (i) Name and address of the person supervising the test. (ii) Test report number. (iii) Date of the test. (iv) Cladding manufacturer's name and address. (v) Construction details of the test specimen, including a description, and drawings and details of the components, showing modifications, if any. (vi) Test sequence with the pressures used in all tests. (vii) For each of the static and cyclic pressure tests, full details of all leakages, including position, extent and timing.	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 Metal sheet roofing complying with AS 1562.1		Compliance readily achievable
F1.6	Sarking Sarking type materials used for weatherproofing of roofs and walls must comply with AS/NZS 4200 Parts 1 and 2.		Compliance readily achievable
F1.7	Water Proofing of Wet Areas in Buildings Water proofing of wet areas within a building to comply with AS 3740.		Compliance readily achievable
F1.8	-	This clause has deliberately been left blank	-

Clause	Description	Comment	Status
F1.9	Damp-proofing Moisture from the ground must be prevented from reaching the lowest floor timber and the walls above the lowest floor joists, the walls above the damp 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.		Compliance readily achievable
F1.10	Damp-proofing of floors on the ground A vapour barrier in accordance with AS2870 is to be provided beneath the basement floor slab.		Compliance readily achievable
F1.11	Provision of Floor Wastes The floor of each bathroom and laundry in each sole occupancy of the Class 2 and 3 building portions must have a floor waste and the floor graded to the floor waste to permit drainage of water.		N/A
F1.12	Sub-floor ventilation The lower ground sub floor space is to be cleared of all building debris and vegetation and be cross ventilated in accordance with Table F1.12 by evenly distributed openings provided in the external walls Additionally the sub floor space is to contain no dead air spaces and be graded to prevent water ponding under the building.		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	Sanitary Facilities Toilet facilities are required in appropriate numbers based on the number of persons accommodated.	Refer to section Error! Reference source not found. 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. Facilities should be constructed to AS1428.1 – 2009 although an existing WC facility that fully complies with AS1428.1 – 2001 may substitute as a concession.	Refer to access consultant's report	Compliance readily achievable / Alternative Solutions
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.		Complies
F2.6	Interpretation: Urinals and washbasins		Noted

Clause	Description	Comment	Status
F2.7	-	NSW - Deleted	-
F2.8	Waste Management		N/A
Part F3 – Room Heights			
F3.1	<p>Height of rooms and other spaces</p> <p>Generally, a minimum ceiling height of 2.4m is required throughout.</p> <p>In a Class 9b building in a school classroom or other assembly building with more than 100 persons — 2.4 m;</p> <p>A theatre, public hall or other assembly building with more than 100 persons — 2.7 m</p> <p>In a corridor that serves an assembly building with not more than 100 persons — 2.4 m</p> <p>In a corridor that serves an assembly building with more than 100 persons — 2.7 m;</p>		Complies
Part F4 – Light and Ventilation			
F4.1	<p>Provisions of natural Light</p> <p>Natural lighting aggregating 10% of room floor area is required as follows:</p> <ul style="list-style-type: none"> To all habitable rooms in residential buildings. In bedrooms and dormitories of hotels, motels and the like. To rooms used for sleeping in health care and aged care buildings. To school classrooms and early childhood centres. 		N/A
F4.2	Methods and extent of natural lighting		N/A
F4.3	Natural Light borrowed from adjoining room		N/A
F4.4	<p>Artificial lighting</p> <p>The artificial lighting system must comply with AS/NZS 1680.0.</p>		Compliance readily achievable
F4.5	<p>Ventilation of rooms</p> <p>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.</p>	Design details and certification from a mechanical engineer is required	Compliance readily achievable
F4.6	Natural ventilation		N/A
F4.7	Ventilation borrowed from adjoining room		N/A
F4.8	Restrictions on position of water closets and urinals		Complies
F4.9	Airlocks		N/A
F4.10	-	This clause has intentionally been left blank	-
F4.11	<p>Carparks</p> <p>Basement carparks must be provided with a system of mechanical ventilation complying with AS 1668.2</p>		N/A
F4.12	Kitchen Local Exhaust Ventilation		N/A

Clause	Description	Comment	Status
	<p>A commercial kitchen must be provided with a kitchen exhaust hood complying with AS/NZS 1668.1 and AS 1668.2, where:</p> <ul style="list-style-type: none"> 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. 		
Part F1 – Sound Transmission and Insulation			N/A
Section G: Ancillary Provisions			
Part G1- Minor Structures and components			
G1.1	Swimming pools (NSW variation for swimming pools)		N/A
G1.2	Refrigerated chambers, strong rooms and vaults		
G1.3	Outdoor play spaces Any outdoor play space in a Class 9b early childhood centre must be enclosed on all sides with a barrier which complies with AS 1926.1.		N/A
G1.101	Provision for cleaning windows A safe manner of cleaning windows is to be provided as windows are located 3 or more storeys above ground level.	The windows must either be able to be cleaned wholly from within the building, or a method complying with the Construction Safety Act 1912 and Regulations is required.	Compliance readily achievable
Part G2 - Boilers, pressure vessels, heating appliances, fire places, chimneys and flues			N/A
Part G3 - Atrium Construction			
G3.1	Application of Part		Noted
G3.2	Dimensions of atrium well Minimum 6m diameter atrium well is required.		Alternative solution
G3.3	Separation of atrium by bounding walls An atrium well is required to be separated from the remainder of the building by bounding walls not more than 3.5m from the perimeter of the atrium well, except in the case of 3 consecutive storeys.		Alternative solution
G3.4	Construction of bounding walls Bounding walls must have an FRL not less than 60/60/60 or constructed of fixed toughened safety glass or wired safety glass in non-combustible frames protected with wall wetting sprinklers in accordance with Specification G3.8.		Alternative solution
G3.5	Construction of balconies If a bounding wall separating an <i>atrium</i> from the remainder of the building is set back from the <i>atrium well</i> , an imperforate and non-combustible barrier not less than 1 m high		Alternative solution

Clause	Description	Comment	Status
	must be provided.		
G3.6	Separation at roof The atrium roof must have an FRL not less than that prescribed in Table 3 of Specification C1.1 or the roof structure and membrane are to be protected by a sprinkler system complying with Specification E1.5 and G3.8		Alternative solution
G3.7	Means of egress All areas within the atrium must have at least 2 means of egress.		Complies
G3.8	Fire and smoke control systems Sprinklers are to be provided throughout in accordance with Specification E1.5 and G3.8. A smoke control system complying with AS/NZS1668.1 and Specification G3.8 is required throughout. An automatic fire detection and alarm system must comply with AS1670.1 and Specification G3.8. A sound system and intercom system for emergency purposes must be provided in accordance with AS1670.4 and must incorporate visual warning devices that operate on alarm and display the words "EVACUATE" in red letters. A suitable alternative power supply (emergency generator) must be provided to operate "required" safety systems in the building in accordance with Specification G3.8. Fire isolated stairways are required to be provided automatic air pressurisation in accordance with AS/NZS1668.1.		Alternative solution
Part G4 - Construction in Alpine Areas			N/A
Part G5 - Construction in Bushfire Prone Areas			N/A
Section H: Special Use Buildings – Auditoriums, Public Halls, Public Transport Buildings			N/A
Part H1 - Class 9b Buildings			N/A
NSW Part - H101 Entertainment Venues other than Temporary Structures and Drive-In Theatres			N/A
NSW Part - H102 Temporary Structures			N/A
NSW Part - H103 Drive-In Theatres			N/A
Part H2 - Public Transport Buildings			N/A
NSW Section J: Energy Efficiency Energy Efficiency for buildings requires buildings to reduce greenhouse gas emissions by efficiently using energy. A building's services must have features that facilitate the efficient use of energy. The discipline of Energy Efficiency with the BCA has become a specialised field where compliance with BCA Section J is to be certified with the issue of a Certificate of Compliance – Design from the relevant Services Engineer/Consultant. The purpose of this section is to provide a brief explanation of which areas are to achieve compliance with BCA Section J – Energy Efficiency during design and construction. The BCA should be referenced for exact requirements, clarification and further explanation.			
Section J	Energy Efficiency Measures	Compliance assumed, although further	Compliance

Clause	Description	Comment	Status
	<p>Energy efficiency measures are prescribed for the following building elements to limit energy consumption:-</p> <ul style="list-style-type: none"> • Building fabric • External glazing • Building sealing • Air movement. • Air-conditioning and ventilation systems. • Artificial lighting and power • Hot water supply • Access for maintenance 	<p>information is required to confirm compliance.</p> <p>A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.</p>	readily achievable

14. Appendix A – Referenced Documentation

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

Drawing No.	Title	Issue	Date	Drawn By
A-DA-2101A	Floor plan – level 01 (sheet 01 of 02)	C	31/01/18	Cox
A-DA-2101B	Floor plan – level 01 (sheet 02 of 02)	C	31/01/18	Cox
A-DA-2102	Floor plan – level 02	C	31/01/18	Cox
A-DA-2103	Floor plan – level 03	C	31/01/18	Cox
A-DA-2104	Floor plan – level 04	C	31/01/18	Cox
A-DA-2105	Floor plan – level 05	C	31/01/18	Cox
A-DA-2106	Floor plan – level 06	C	31/01/18	Cox
A-DA-2107	Floor plan – level 07	C	31/01/18	Cox
A-DA-2108	Floor plan – level 08	C	31/01/18	Cox
A-DA-2109	Floor plan – level 09	C	31/01/18	Cox
A-DA-2110	Floor plan – level 10	C	31/01/18	Cox
A-DA-2111	Floor plan – level 11	C	31/01/18	Cox

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 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 Clauses D2.19 and D2.21.
Automatic fire detection and alarm system (smoke detection system)	BCA2016 Specification E2.2a, AS 1670.1 – 2015 and AS 3786 – 2014 or 1993 [Note: The 1993 edition has been retained for a transitional period ending on 30 April 2017]
Automatic fire detection and alarm system (within atriums)	BCA2013 Specification G3.8 and AS 1670.1 – 2015
Automatic fire detection and alarm system (smoke detection system to operate zone smoke control or stair pressurisation system)	BCA2016 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 or smoke detection system to activate smoke exhaust system or smoke and heat vents)	BCA2016 Clause 5 and 7 of Specification E2.2a and AS/NZS 1668.1 – 2015

Measure	Standard of Performance
Automatic fire suppression systems (Sprinklers)	BCA2013 Specification E1.5 and AS 2118.1 – 1999
Automatic fire suppression systems (<i>Combined sprinkler and hydrant system</i>)	BCA2013 Specification E1.5 and AS 2118.6-2012 (combined sprinkler and hydrant systems in multistorey buildings)
Emergency lifts	BCA2016 Clause E3.4
Emergency lighting	BCA2016 Clause E4.2, E4.4 and AS 2293.1 – 2005
Sound System and Intercommunication System for Emergency Purposes (aka EWIS)	BCA2016 Clause E4.9, Specification G3.8 and AS 1670.4 – 2015
Exit signs	BCA2016 Clause E4.5, NSW E4.6, E4.8 and AS 2293.1 – 2005
Fire control room / centre	BCA2016 Specification E1.8
Fire dampers	BCA2016 Clause C3.15 and AS/NZS 1668.1 – 2015 (AS 1682.1-1990 and AS 1682.2-1990)
Fire doors	BCA2016 Specification C3.4 and AS 1905.1 – 2015
Fire hydrants systems	BCA2016 Clause E1.3 and AS 2419.1 – 2005
Fire seals protecting opening in fire resisting components of the building	BCA2016 Clause C3.15, Specification C3.15 and AS 1530.4 –2014 and AS 4072.1 – 2005 and installed in accordance with the tested prototype. <i>[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]</i>
Fire shutters	BCA2016 Specification C3.4 and AS 1905.2 – 2005
Fire windows	BCA2016 Specification C3.4 and AS 1530.4 – 2014
Hose reel system	BCA2016 Clause E1.4 and AS 2441 – 2005
Mechanical air handling system (<i>automatic shutdown of air-handling system</i>)	BCA2016 Clause E2.2 and AS/NZ 1668.1-2015
Mechanical air handling system (<i>automatic air pressurisation system</i>)	BCA2016 Table E2.2a and Specification G3.8 and AS/NZ 1668.1-2015
Mechanical air handling system (<i>zone smoke control system</i>)	BCA2016 Table E2.2a and AS/NZ 1668.1-2015
Mechanical air handling system (<i>automatic smoke exhaust system</i>)	BCA2016 Table E2.2b, Specification E2.2b and G3.8, and AS/NZ 1668.1-2015
Perimeter vehicle access for emergency vehicles	BCA2016 Clause C2.4
Portable fire extinguishers	BCA2016 Clause E1.6 and AS 2444 – 2001
Stand-by power systems	BCA2016 Clause 6 of Specification G3.8
Wall wetting sprinkler and drencher systems	BCA2016 Clause C3.4 Specification G3.8 and AS 2118.2 – 1995
Warning and operational signs	BCA2016 Clauses C3.6, D1.17, NSW D2.19, D2.23, D3.6, E3.3, E3.9, E3.10 G4.3, NSW H101.8 and NSW H101.10 and Specifications D1.12, E1.8, E3.1 and G3.8

Note the fire safety schedule will need to be amended subject to the inclusion of a fire engineered alternative 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 therein) 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, where the distance from any fire-source feature to which it is exposed is-				
less than 3 m	90/ - / -	120/ - / -	180/ - / -	240/ - / -
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
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 250m²/g.

Other than above, construction materials generally need to achieve as1530.3 early fire hazard indice 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 D1.13 – Populations/Exit Width Assessment

Level	Population	Aggregate Exit Width required (m)	Exit width provided (m)
1	28	1	2
2	200	2	2
3	40	1	4
4	340	3.5	4
5	183	2	2
6	204	2.5	2
7	190	2	2
8	183	2	2
9	104	2	2
Total	1472	N/A	N/A

19. 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

20. 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 <u>Total R-Value</u> 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 <u>Total R-Value</u> 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 <u>Total R-Value</u> 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 <u>R-Value</u> of ceiling insulation <u>required</u> to satisfy J1.3(a) is between the values stated, interpolation may be used to determine the adjusted minimum <u>R-Value</u> .											

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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.57	Not more than 0.43	Not more than 0.34
	<i>Total System U-Value</i>	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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.72	Not more than 0.54	Not more than 0.43
	<i>Total System U-Value</i>	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	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.83	Not more than 0.69	Not more than 0.55
	<i>Total System U-Value</i>	Not more than 8.5	Not more than 5.7	Not more than 4.3	Not more than 3.4
2.5 and more	<i>Total System SHGC</i>	Not more than 0.83	Not more than 0.83	Not more than 0.83	Not more than 0.83
	<i>Total System U-Value</i>	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	<p>(a) (i) Achieve a minimum <i>Total R-Value</i> of 3.3. (ii) The minimum <i>Total R-Value</i> in (i) is reduced (A) for a wall with a surface density of not less than 220 kg/m², 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.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
4, 5 and 6	<p>(a) (i) Achieve a minimum <i>Total R-Value</i> of 2.8. (ii) The minimum <i>Total R-Value</i> in (i) is reduced - (A) for a wall with a surface density of not less than 220 kg/m², 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.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
7	<p>(a) Achieve a minimum <i>Total R-Value</i> of 2.8.</p> <p>(b) Where the only space for insulation is provided by a furring channel, top hat section, batten or the like (i) achieve a minimum <i>Total R-Value</i> of 1.4; and (ii) satisfy <i>glazing</i> energy index Option B of Table J2.4a.</p>
8	<p>(a) Achieve a minimum <i>Total R-Value</i> of 3.8.</p> <p>(b) Where the wall is an earth retaining wall or earth-berm, achieve a minimum <i>Total R-Value</i> of 2.0.</p>

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- <i>conditioned space</i> 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- <i>conditioned space</i> 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- <i>conditioned space</i> 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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