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BCA Assessment Report

Report 2017/2489 R2.3

Prepared for The University of Newcastle

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Disclaimer:

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 design of the proposed design of the Bioresources building at The University if Newcastle 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 Performance Solution to satisfy the Performance Requirements of the BCA.

Summary of BCA Parameters:

Building Use:	Laboratories and storage
Class of Occupancy	Class 7b and 8
Type of Construction Required	Type C
Rise Storeys:	2
Number of Storeys:	3
Effective Height:	9m

The following are the main issues requiring amendment to the plans (refer to Section 9.1)

1. A hose reel is to be provided within 4m of the SE exit on level 1 and additional hose reels are required on level 2. It may need to be addressed in the fire engineering report.
2. The accessible and ambulant toilets do not comply with the detailed requirements of AS1428.1

The following are the main issues to be addressed by a Performance Solution (refer to Section 9.3):

Fire Engineered Performance Solutions

3. Exit travel distances exceeding 40m on level 2
4. Distance between alternative exits exceeding 60m on levels 1 and 2
5. The discharge of the fire stair requiring occupants to pass within 6m of the external wall of the building and is more than 6m to reach open space.
6. The level 2 plant room having a ladder as an exit.
7. The hydrant booster not being located within sight of the main entrance and the external hydrants not being protected in accordance with AS2419.1.

Weatherproofing Performance Solutions

1. Waterproofing of external walls. Weatherproofing of external wall systems must be in accordance with BCA Verification Method FV1. There are no DTS provisions that satisfy weatherproofing of external walls.

Refer to section 9.1 of this report items which require further details to be able to make an appropriate assessment for schematic design stage.

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

Further detailed regulatory reviews will need to be progressively undertaken as designs advance and

become more resolved to ensure compliance is achieved.

Whilst not precluding the issue of a Construction Certificate, it is noted that many detailed design issues are not indicated on the drawings. These issues are designated “Compliance Readily Achievable” in the “Status” column of the assessment in Section 13 of the report and should be resolved prior to construction.

Key issues which require additional details have been listed under Section 9.1 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 an assessment undertaken of the proposed design of the Bioresources building at The University of Newcastle against the Deemed-to-Satisfy (DtS) provisions of Building Code of Australia (BCA) 2016 amendment 1.

It has been prepared by Steve Watson and Partners for The University of Newcastle

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, certification to be issued under Part 4 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 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. National Construction Code 2016 Amendment 1 –Volume 1: Building Code of Australia Class 2 to Class 9 Buildings

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

to achieve compliance. The Performance Requirements can only be satisfied by a Performance Solution, Deemed-to-Satisfy (DTS) solution or a combination of both.

5. Performance Solutions

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

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

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

6. Statutory Framework

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

Issue	Legislative reference	Comment
Existing building fire safety	EPAR 94	Council may require upgrading in some circumstances
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. Development by the crown

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

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

7. Methodology

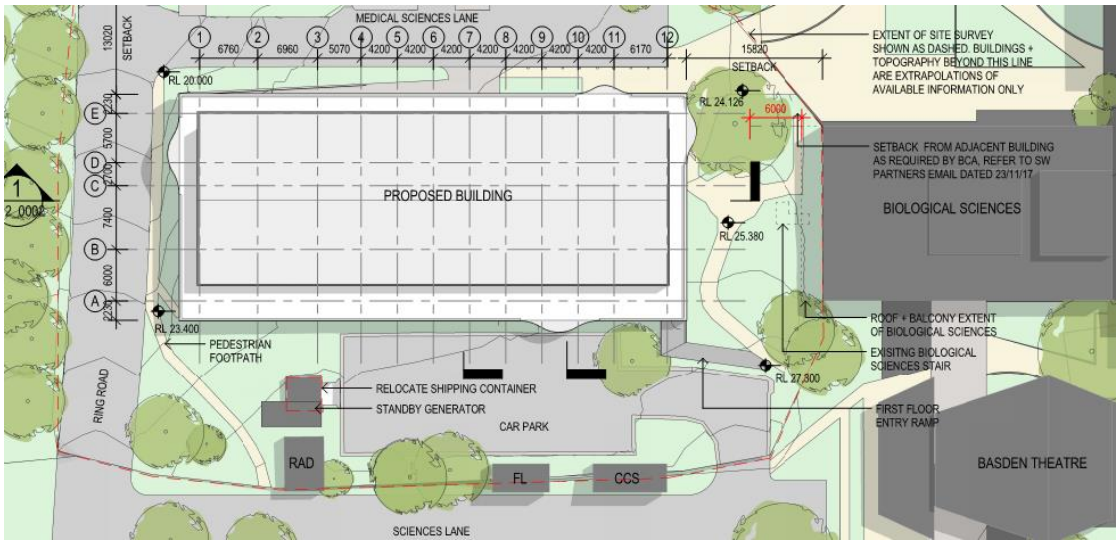
6.1. Process adopted

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

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

8. Description of Proposed Development

Proposed development involves the construction of a new 3 storey Bioresources Facility (BRF) at The University of Newcastle. The building will consist of laboratories and storage located on ground and level 1, with administration and meeting rooms on ground floor. Level 2 consists of plant rooms only. The building is bound by Ring Road to the West, Medical Sciences Lane to the North, Sciences Lane to the South and Biological Sciences building to the East.



9. Assessment Data Summary

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

8.1. Assumptions

Assumptions made in the preparation of this report are listed below:

1. For the calculation of population on level 2 plant it is assumed 75% of the floor area is occupied by plant and equipment.

8.2. Interpretations

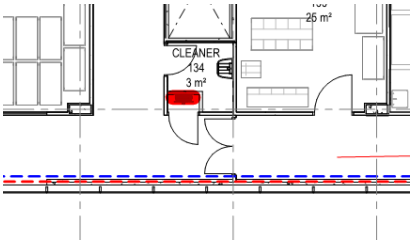
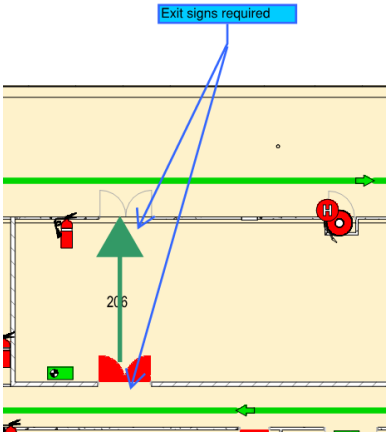
A number of issues within the BCA are recognised to be interpretive in nature. Where these issues are encountered, interpretations are made that are consistent with Standard Industry Practise and/or Steve Watson & Partners policy formulated in regard of each issue.

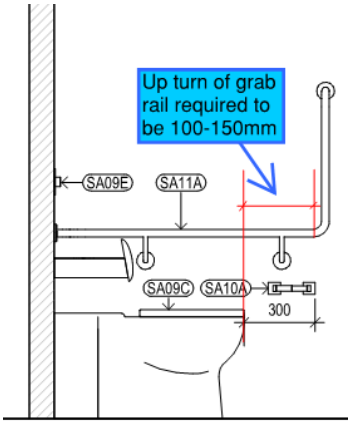
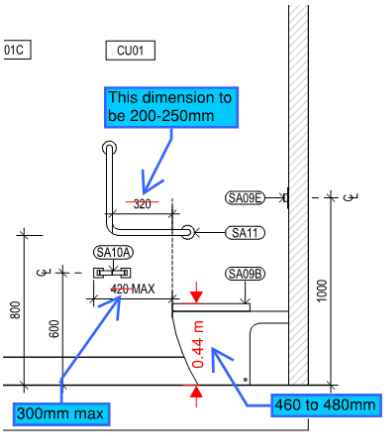
1. Level 02 is plant rooms only and although it is considered a storey it is not counted in the calculation of rise in storeys in accordance with Clause C1.2 of the BCA.

10. Issues Requiring Resolution

9.1. Issues requiring amendments to plans

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

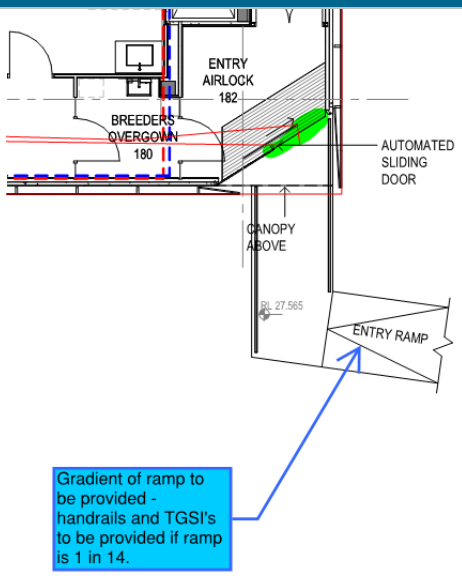
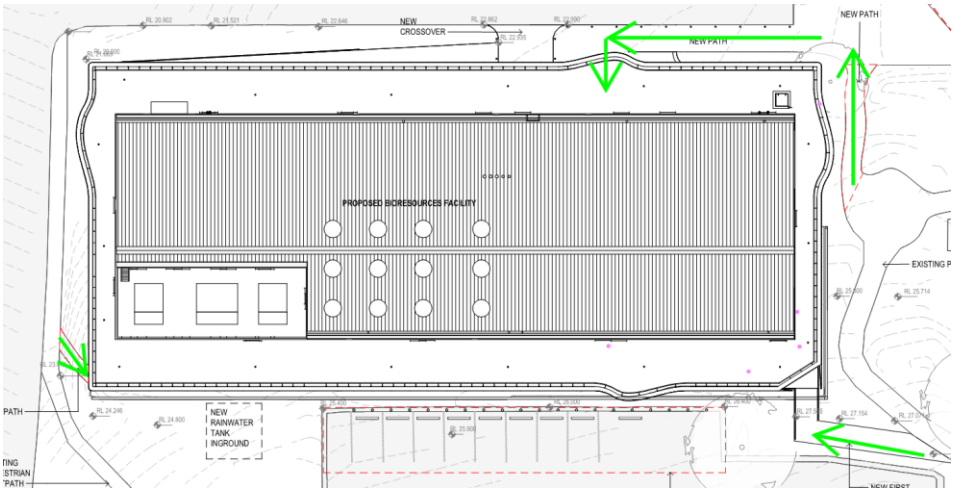
Item	DTS Clause	Description of Non-compliance	Requirement to Satisfy BCA
1.	E1.4	The hose reel adjacent the cleaners rooms on level 1 is further then 4m from an exit but there is no hose reel within 4m of the SW exit. Supplementary hose reels are permitted but only where coverage is not achieved by hose reels located within 4m of each exit. 	An additional hose reel is to be provided within 4m of the SE exit or a Performance Solution obtained from the Fire Safety Engineer.
2.	E4.6	The location of exit signs does not capture all the required egress paths to ensure compliant travel distances.	Additional exit signs are required to direct occupants through enclosed plant 206 as it is required to ensure egress distances comply 

Item	DTS Clause	Description of Non-compliance	Requirement to Satisfy BCA
3.	F2.4	Some of the dimension shown for both the accessible and ambulant toilets are incorrect. Grab rails, widths and pan dimensions, toilet roll holder locations etc are to be in accordance with AS1428.1. Also the accessible shower does not have all the required fittings and grabrails. Refer to AS1428.1 or Appendix D2	The accessible and ambulant toilets are to be detailed indicating full compliance with AS1428.1 The vertical grab rail to the accessible toilet is to be 100-150mm from the edge of the pan  The vertical grab rail to the ambulant toilet is to be 200-250mm from the edge of the pan The end of the toilet roll holder in the ambulant toilet is to be 300mm max from the edge of the pan. The ambulant pan is to be 460-480mm high. 

9.2. Items requiring additional details or documentation

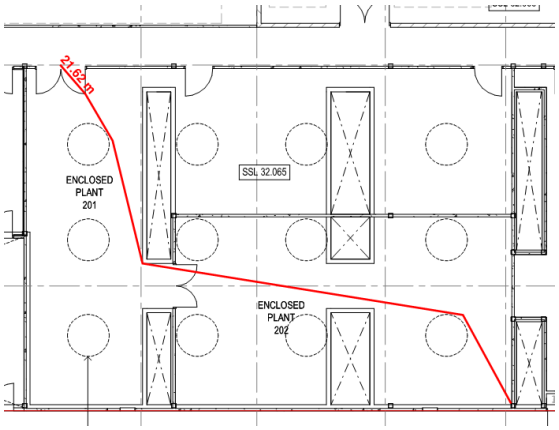
The following items have been identified which require further details or documentation to be provided to ensure compliance is achieved before issuing the Construction Certificate.

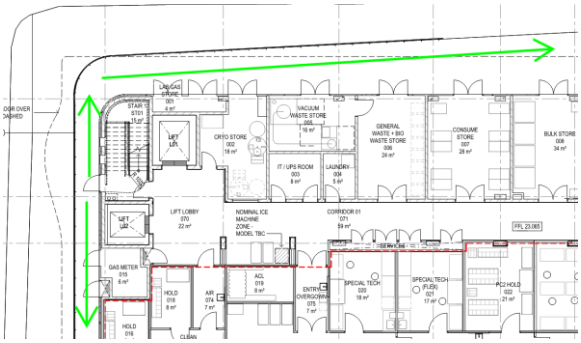
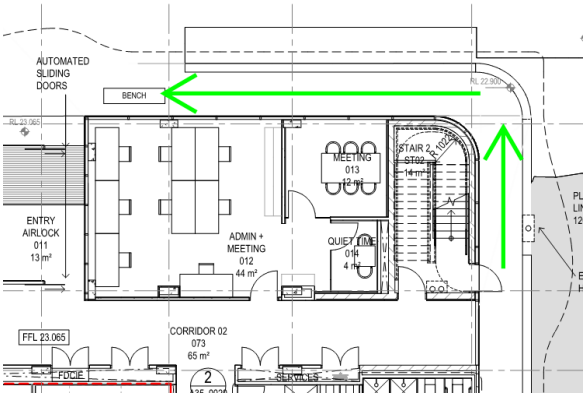
Item	DTS Clause	Description	Requirement to Satisfy BCA
1.	D3.2	Access must be provided from the car park at the southern side to the building. An access strategy may need to be developed on how occupants are able to enter the building on level 1 from the car park and then obtain access to ground floor through secure areas.	Further detail on how access through the building will be providing taking into consideration of secure areas.

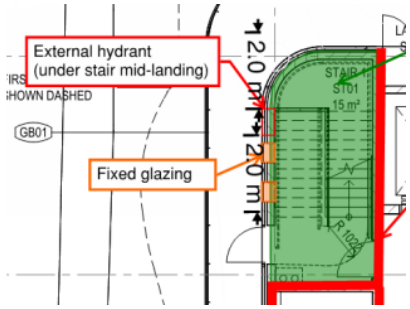
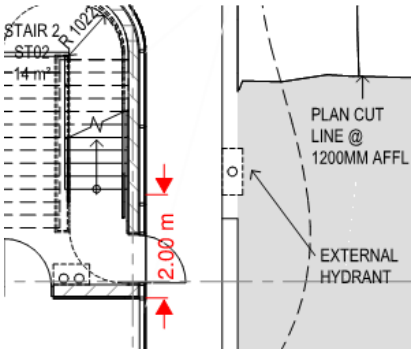
Item	DTS Clause	Description	Requirement to Satisfy BCA
			
		Gradient of the new paths are to be provided for assessment for access. 	

9.3. Performance solutions required

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

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
1.	Exit travel distances	D1.4	The exit travel distances on the level 2 plant rooms is approximately 65m to an exit taking into consideration possible plant layouts The distance to a point of choice on level 2 plant room is approximately 22m. 	DP4 and EP2.2
2.	Distance between alternative exits	D1.5	The following areas have been identified with distances between alternative exits exceeding 60m: 1. Level 1: Approximately 65m worst case 2. Level 2: Approximately 90m worst case	DP4 and EP2.2

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
3.	Travel via fire-isolated exits	D1.7	Stair 1 is a required fire isolated stair if the building is not sprinkler protected. The discharge point of the stair is within a covered area and requires passing within 6m of the external wall of the building and is more than 6m to open space.  Stair 2 if it is extended from level 1 is also required to be fire isolated if the building is not sprinkler protected. The discharge point is to a covered area and is more than the maximum permitted of 6m. The path of travel also requires passing within 6m of the external wall of the building. 	DP5
4.	Plant rooms and lift machine rooms: concession	D1.16	The level 2 plant room level is served by a fire isolated stairway and ladder leading into the fire stair on level 1. The plant room level is over 200m^2 which is the limit for the area of a plant room to allow for a ladder to be used as an exit.	DP4

Item	Non-Compliance	DTS Clause	Description	Performance Requirement
5.	Fire hydrants	E1.3	The hydrant booster is not located within sight of the main entrance of the building. The external hydrants are not provided with fully compliant protection in accordance with AS2419.1 which requires 90/90/90 construction 2m either side of the hydrant outlets and to a height of 3m. The hydrant adjacent stair 1 has fixed glazing to the fire stair which does not achieve an FRL of 90/90/90.  The hydrant adjacent stair 2 has the doorway opening into the fire stair located in the 2m zone which will not achieve an FRL of 90/90/90 	EP1.3
6.	Water proofing of external walls	F1.0	Weatherproofing of external wall systems must be in accordance with BCA Verification Method FV1. There are no DTS provisions that satisfy weatherproofing of external walls. A test report on the proposed wall system is to be provided. The test report must include the following information: (vii) 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.	FP1.4

11. Statutory Fire Safety Measures

All fire/essential safety measures installed within the building are required required to be certified upon completion of the project and prior to occupation of the building by the owner of the building, by issuing a

Final Fire Safety Certificate under the Act.

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

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

12. Conclusion

The design is capable of complying with the requirements of the relevant sections of the of the Act and EPAR and the BCA 2016 amendment 1 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 amendment 1. In addition, requirements of the Premises Standards (PS) are covered as relevant.	Noted
Section A: General Provisions			
A3.2	**Classification and Usage** Usage on each level of the building is as follows: **LEVEL** / **USE** / **CLASS** Ground / Storage / 7b Laboratories / 8 Level 1 / Storage / 7b Laboratories / 8 Level 2 / Plant / N/A	(The admin/meeting is a minor classification being less than 10% of the floor area of the storey	Noted
A2.1	**Suitability of Materials** Every part of a building must be constructed in an appropriate manner to achieve the requirements of the BCA, using materials that are fit for the purpose for which they are intended.	The builder is responsible to adopt and install appropriate proprietary accredited building products and is to ensure that those products/assemblies are fit for the purpose they are intended and are installed in accordance with the manufacturer's specifications/ requirements for that system.	Compliance readily achievable
Section B: Structure			
B1.1	**Resistance to actions** The resistance of the building must be greater than the most critical action effect resulting from different combinations of actions	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage	Compliance readily achievable
B1.2	**Determination of individual actions** The magnitude of individual actions must be determined in accordance with Clause B1.2 of the BCA.	Certification from a qualified structural engineer will need to be provided at Construction Certificate stage	Compliance readily achievable
B1.3	-	This Clause has deliberately been left blank	-
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**	-	Noted

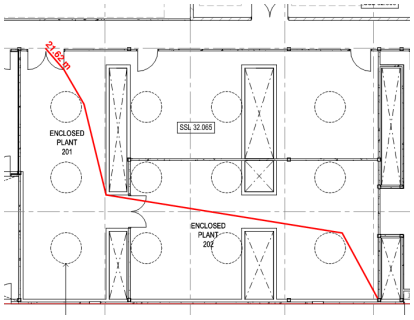
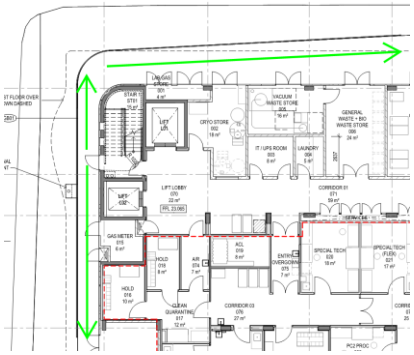
Clause	Description	Comment	Status
	Structural software used in computer aided design of a building or structure that uses design criteria based on DTS provisions of the BCA must comply with the ABCB Protocol for Structural Software.		
B1.6	**Construction of buildings in flood hazard areas**	-	Noted
Part B	**Structure and Importance Level** Assessment of the building structure will be required for dead, live, wind, earthquake, fire and other loads required by current day AS Codes. The design of the structure must be based on the appropriate 'Importance Level' under BCA Table B1.2a.	The building is determined to be ***importance level 2*** in accordance with Clause B1.2a and based on examples provided in the Guide to the BCA 2016 amendment 1.	Compliance readily achievable
Section C: Fire Resistance			
Part C1 – Fire Resistance and Stability			
C1.1	**Type of Construction Required** **Type C Construction** BCA Type C fire resisting construction is required. The following fire ratings apply: **Building Element** — **Required FRL** Walls bounding fire isolated stairs — 60/60/60 FRL Floors separating fire compartments — 90/90/90 FRL Walls separating fire compartments — 90/90/90 FRL Structural elements providing support to a fire rated floor — 90/90/90 FRL	The floor are required to have an FRL equivalent to a fire wall to ensure that the fire compartment size does not exceed the maximum permitted of 2000m^2 for Type C construction.	Compliance readily achievable
Spec C1.1	**Fire resisting construction** *Support of another part* Where a part of a building required to have an FRL depends upon direct vertical or lateral support from another part to maintain its FRL, that supporting part must have an FRL not less than that required for the part if supports and be non-combustible. *Attachments* The method of attaching or installing a finish, lining, ancillary element or service to a building element must not reduce the fire resistance of that element. *Enclosure of shafts* Shafts required to have an FRL must be enclosed at the top and bottom by construction have an FRL not less than that required for the walls of the shaft. Shafts, other than one enclosing a fire isolated stairway or ramp, do not require an FRL at the top if the shaft extends beyond the roof covering.		Compliance readily achievable
C1.2	**Calculation of rise in storeys** **Effective Height / Calculation of rise in storeys**.	The following parameters apply: Rise in storeys: 2 storeys Effective Height: 9m	Noted

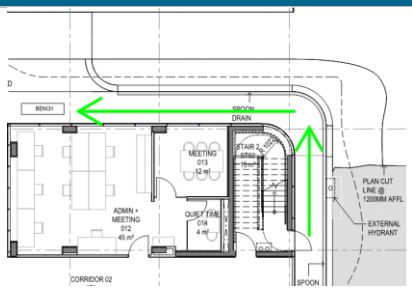
Clause	Description	Comment	Status
	Rise in storeys is a defined BCA term addressing the number of main building levels excluding basements. Effective height is defined under the BCA as vertical distance between the floor of the lowest storey included in the calculation of rise in storeys and the floor of the topmost storey (excluding the topmost storey if it contains only heating, ventilating, lift or other equipment, water tanks or similar service units). These parameters influence the BCA provisions applicable to the building.	The plant room on level 2 is not counted in the rise in storeys.	
C1.3	**Buildings of multiple classification**		Noted
C1.4	**Mixed types of construction**		N/A
C1.5	**Two storey Class 2, 3 or 9c buildings**	The building is able to be constructed in Type C construction.	N/A
C1.6	**Class 4 parts of buildings**		N/A
C1.7	**Open spectator stands and indoor sports stadiums**		N/A
C1.8	**Lightweight construction** Lightweight construction used in a wall system must comply with Specification C1.8. Lightweight construction used as a fire-resisting covering of a steel column or the like, and where the covering is not in continuous contact with the column must have the voids filled to a height of not less than 1.2m above the floor and where the column is liable to be damaged must be protected by steel or other suitable material.	Details of the proposed systems to be installed must be in accordance with a tested prototype.	Compliance readily achievable
C1.9	**Non-combustible building elements**	Applicable to Type A and B buildings only	N/A
C1.10	**Fire Hazard Properties** Floor materials, floor coverings and wall and ceiling lining materials need to comply with prescribed fire hazard properties. Refer to Appendix C1.10.	Compliance assumed and will require verification test data for all timber and other combustible linings and materials, including: • Carpets • Vinyls (walling and flooring) • Timber flooring and wall linings • Veneered wall panelling • Spray-on insulation material • Other combustible finishes • Carpark soffit insulation fire test reports, based on 'room fire testing' will be required to meet fire brigade consent conditions if applicable.	Compliance readily achievable
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. The structural engineer is required to provide design certification and details confirming compliance	Compliance readily achievable

Clause	Description	Comment	Status
C1.12	-	This Clause has deliberately been left blank	-
C1.13	**Fire-protected timber: Concession** *Fire-protected timber* in a Class 2, 3 or 5 building may be used wherever an element is *required* to be *non-combustible*,		N/A
C1.14	**Ancillary Elements**		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 C construction)** The floor area and volume limitations are: Class 7b and 8: 2,000m^2 and 12,000m^3	The floor area and volume of Lower Ground and Ground floor levels are within the maximum limitations outlined by Table C2.2. Ground: Approximately 1,230m^2 and 5,200m^3 Level 1: Approximately 1,590m^2 and 6,300m^3 Level 2: Approximately 1,000m^2 and 3,500m^3	Complies
C2.3	**Large isolated buildings**		N/A
C2.4	**Perimeter Vehicular Access**		N/A
C2.5	**Class 9a and 9c buildings**		N/A
C2.6	**Vertical separation of openings in external walls** Only applicable to a building of Type A Construction, which is not sprinkler protected.		N/A
C2.7	**Separation by Fire Walls** A fire wall must extend to the underside of a floor having an FRL required for a fire wall or the roof covering.	Walls separating different fire compartments must achieve an FRL not less than 90/90/90.	Complies
C2.8	**Separation of classifications in the same storey**	Under Type C construction the FRL requirements for building elements are the same for all classifications	N/A
C2.9	**Separation of classifications in different storeys**	Under Type C construction the FRL requirements for building elements are the same for all classifications requiring an FRL of 90/90/90	Complies
C2.10	**Separation of Lift Shafts** Openings for lift landing doors and services must be protected in accordance with the DTS provisions of Part C3 of the BCA	The lift is required to be in a fire rated shaft with an FRL not less than 90/90/90.	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: • lift motor rooms	Any UPS system with a voltage exceeding 24 volts and a capacity exceeding 10 amp hours must be fire separated.	Complies

Clause	Description	Comment	Status
	• emergency generators sustaining emergency equipment operating in emergency mode • central mechanical smoke control plant • boilers • 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.		Complies
C2.14	**Corridors in Class 2 & 3 Building**		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: • 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.		N/A
C3.3	**Separation of external walls and associated 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.		N/A
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.		Complies
C3.6	**Sliding Fire Doors**		N/A

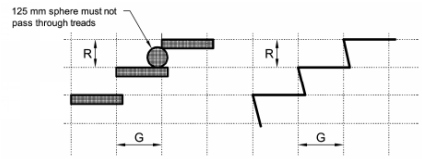
Clause	Description	Comment	Status
C3.7	**Protection of doorways in horizontal exits**		N/A
C3.8	**Openings in Fire Isolated Exits** -/60/30 self-closing fire doors are required to doorways providing access to fire isolated stairways.		Complies
C3.9	**Service Penetrations in Fire Isolated Exits** Service 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 35,000mm2 (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**		N/A
C3.14	-	This Clause has deliberately been left blank	-
C3.15	**Openings for service installation** Methods and materials used are to be identical to tested prototypes and in accordance with AS4072.1 and AS1530.4, and having achieved the required FRL or resistance to the incipient spread of fire or other specified method.	Any system used must be a certified system and installed in accordance with the tested method. Specifications of the methods of fire sealing need to be provided	Compliance readily achievable
C3.16	**Construction Joints** Construction joints in elements required to have a fire resistance with respect to integrity and insulation must be protected.	Construction joints are to be installed in accordance with a tested prototype in accordance with AS1530.4.	Compliance readily achievable
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**		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	Fire stairs serving ground to level 2 are required to be fire isolated if the building is not sprinkler protected.	Complies

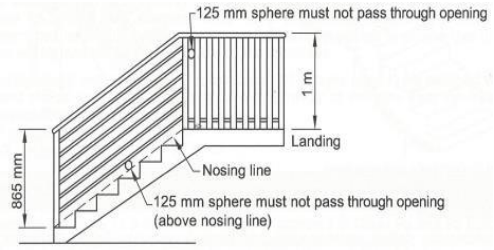
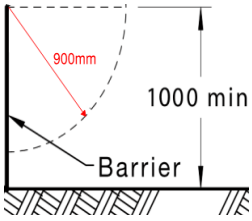
Clause	Description	Comment	Status
	storeys in a non-sprinkler protected building.		
D1.4	**Exit Travel Distances** No point on the floor must be more than 20m to an exit or a point in which travel in different directions to 2 exits is available, in which case, the maximum distance to 1 exit cannot exceed 40m.	Travel distances to an exit complies on ground floor and level 1. The exit travel distances on the level 2 plant rooms is approximately 65m to an exit taking into consideration possible plant layouts The distance to a point of choice on level 2 plant room is approximately 22m. 	Performance Solution
D1.5	**Distance between alternative exits** The following travel distance limits apply: • ≤ 60m travel distance between alternative exits and not less than 9m between alternative exits; • 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: • Level 1: Approximately 65m worst case • Level 2: Approximately 90m worst case	Performance solution
D1.6	**Dimensions of exits**		Complies
D1.7	**Travel via fire-isolated exits**	Stair 1 is a required fire isolated stair if the building is not sprinkler protected. The discharge point of the stair is within a covered area and requires passing within 6m of the external wall of the building and is more than 6m to open space.  Stair 2 if it is a required fire isolated stairway. The discharge point is to a covered area and is more than the maximum permitted of 6m. The path of travel also requires passing within 6m of the external wall of the building.	Performance solution

Clause	Description	Comment	Status
			
D1.8	**External stairways in lieu of fire-isolated exits**		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.		Complies
D1.11	**Horizontal Exits**		N/A
D1.12	**Non-required stairs, ramps or escalators**		N/A
D1.13	**Number of persons accommodated**		Noted

Level	*Use*	*Population*	
		area @ m²/person	*Population*
Ground	Laboratories / storage / office	295m² @ 10m² / person	30
Level 1	Laboratories / storage	250m2 @ 10m² / person	25
Level 2	Plant – assume 75% of floor area taken up by plant and equipment	Approx 200m² @ 30m² / person	7

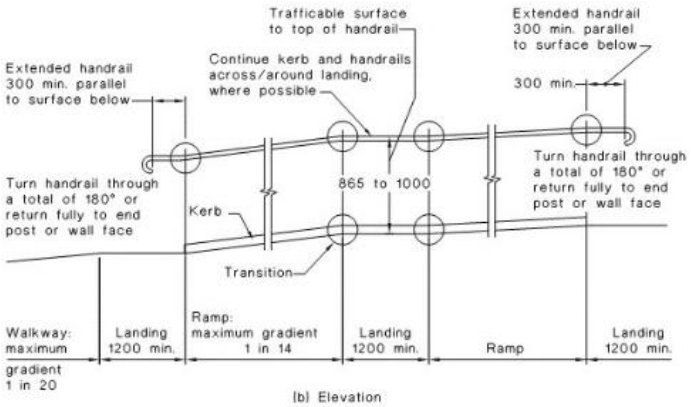
D1.15	**Method of measurement**		Noted
D1.16	**Plant rooms and lift machine rooms: Concession**	The level 2 plant room level is served by a fire isolated stairway and ladder leading into the fire stair on level 1. The plant room level is over 200m² which is the limit for the area of a plant room to allow for a ladder to be used as an exit.	Performance solution
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**		Complies
D2.3	**Non Fire Isolated Stairways and Ramps**		N/A
D2.4	**Separation of Rising and Descending Stair Flights**		N/A
D2.5	**Open access ramps and balconies**		N/A
D2.6	**Smoke lobbies**		N/A
D2.7	**Installations in Exits and Paths of Travel** Electrical 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. No openings to ducts conveying hot products of combustion permitted in required exits.	Install non-combustible linings to the internal walls, ceiling and doors of relevant cupboards and install smoke seals to the doors.	Complies

Clause	Description	Comment	Status
	Gas or fuel services not permitted in required exits. Electric or services equipment in paths of travel to exits must be within a non-combustible and smoke sealed enclosure.		
D2.8	**Enclosure of Space Beneath Stairs** 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. 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.		Complies
D2.9	**Width of stairways**		N/A
D2.10	**Pedestrian ramps**.		N/A
D2.11	**Fire-isolated passageways**		N/A
D2.12	**Roof as open space**		N/A
D2.13	**Going and Risers** *(NSW variation for Entertainment Venues)* To provide safe passage, stairways must comply with the following: • 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. • Riser gaps and step openings that do not exceed 125mm. • Non-slip treads and non-skid tread nosing Riser (R) / Going (G) [2] / Quantity (2R+G) Max / Min / Max / Min / Max / Min Public stairways 190 115 355 250 700 550 Private stairways[1] 190 115 355 240 700 550  	Further detail of the stairs will need to be provided to confirm compliance	Compliance Readily Achievable
D2.14	**Landings** Ramps Surfaces, stair tread surfaces or nosing strips, and stair landing surfaces, or landing nosing strips to a flight below, must achieve slip-resistance classifications to AS4586-2013 as follows: **Application** / **Dry Surface Conditions** / **Wet Surface Condition** 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 — P3 or R10 — P4 or R10	Certification / test reports on the slip resistance of the surfaces will need to be provided on constructed elements.	Compliance readily achievable

Clause	Description	Comment	Status
	Landing Surface Nosing Strip or Landing Strip P3 P4		
D2.15	**Thresholds** Steps should not occur at doorways without a threshold landing except as follows: • A single 190mm step is permitted (other than in health or aged care buildings) at doors leading to the exterior.	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	**Barriers to Prevent Falls** 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.  Where the level of the surface below is 4m or more, a balustrade or other barrier must not facilitate climbing of horizontal elements between 150mm and 760mm above the floor. Climbable elements cannot be located within 900mm of the top rail of each balustrade where the fall is greater than 4m. This measurement is taken in an arc as seen in the extract below  		Compliance readily achievable
D2.17	**Handrails** 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: • Handrails not to obstruct circulation space • 30-50mm diameter • 865-1000mm above nosing line of stairs • 865-1000mm above ramps and landings • Consistent height throughout • 50mm grip clearance and no obstructions to handhold	Handrail details to be confirmed by the access consultant	Compliance readily achievable

Clause	Description	Comment	Status
	• Continuous at internal (return) landings • Provided with handrail extensions and 180 degree curled ends		

Ramps

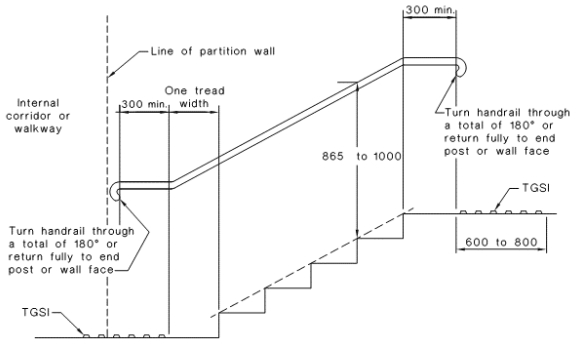


(b) Elevation

DIMENSIONS IN MILLIMETRES

FIGURE 14 RAMP HANDRAILS

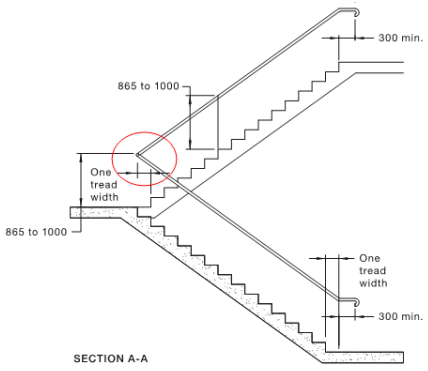
Stairways



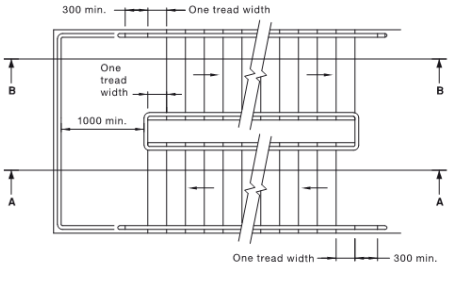
SECTIONAL VIEW

DIMENSIONS IN MILLIMETRES

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



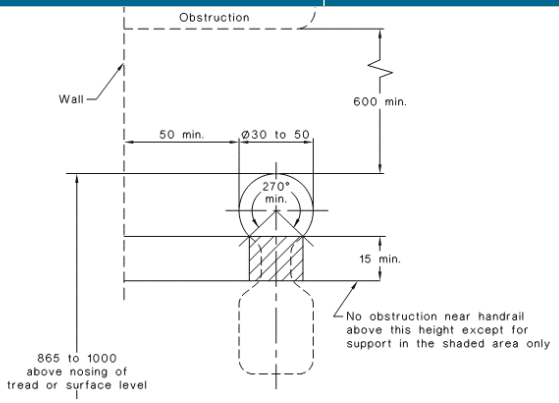
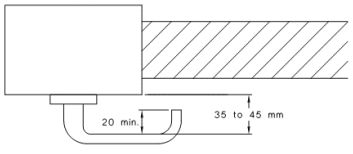
SECTION A-A



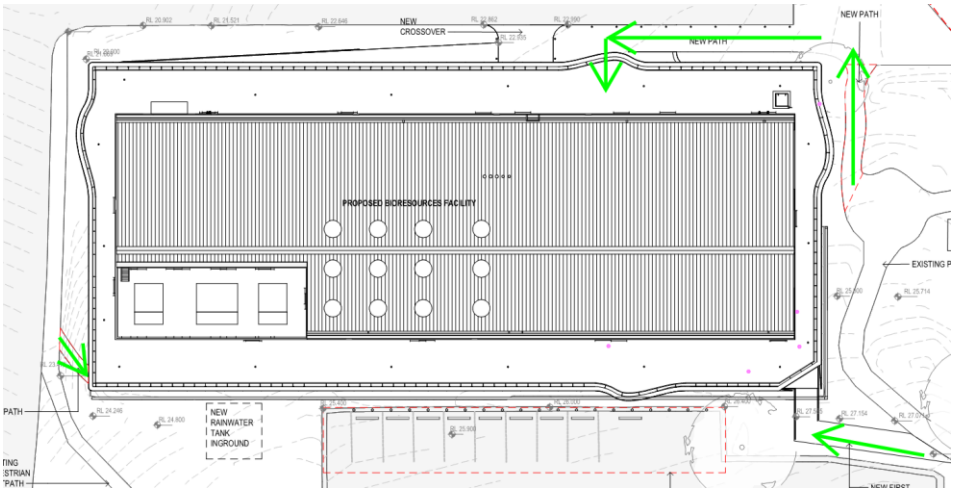
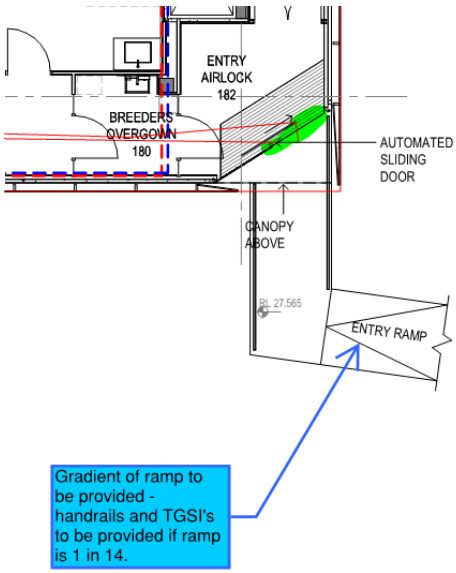
(a) Plan

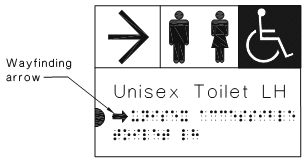
DIMENSIONS IN MILLIMETRES

Handrail Profile

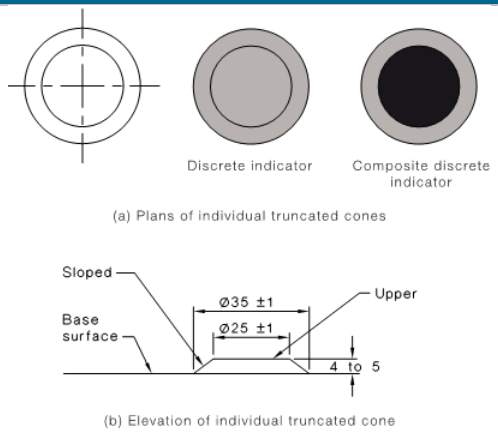
Clause	Description	Comment	Status
			
D2.18	**Fixed Platforms, Walkways, Stairways and Ramps** Platforms, walkways, stairs, ladders and the like that give access to and around plant and equipment, machine rooms, attic spaces and other low use areas of the building are permitted provided that construction details are to AS1657.		Noted
D2.19	**Doorways and doors** Must not be revolving door, roller shutter or tilt door. Can be fitted with a sliding door if it leads directly to open space and can be opened manually under a force of not more than 110N and be fitted with a fail-safe device if the door is power operated.	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.		Complies
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.  (a) Isometric view  (b) Plan view	All exit doors and doors in the path of travel must comply.	Compliance readily achievable
D2.22	**Re-Entry from Fire-Isolated Exits**		N/A
D2.23	**Signage to Fire Safety Doors** An automatic door held open by an automatic hold-open device: **FIRE SAFETY DOOR DO NOT OBSTRUCT** Or for a self-closing door	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	Compliance readily achievable

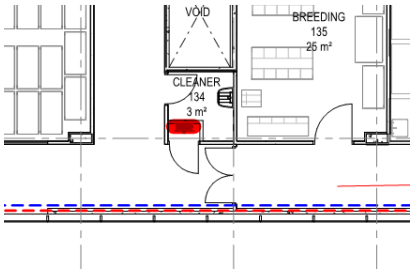
Clause	Description	Comment	Status
	FIRE SAFETY DOOR **DO NOT OBSTRUCT** **DO NOT KEEP OPEN** or for a door discharging from a fire-isolated exit **FIRE SAFETY DOOR DO NOT OBSTRUCT**	"**OFFENCES RELATING TO FIRE EXITS**" are to be provided in letters at least 8mm high and the remaining words are to be at least 2.5mm high. The notice is to state the following: OFFENCES RELATING TO FIRE EXITS It is an offence under the Environmental Planning and Assessment Act 1979: a) to place anything in or near this fire exit that may obstruct persons moving to 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
D2.25	**Timber stairways: Concession**		N/A
NSW D2.101	**Doors in the Path of Travel in an Entertainment Venue**		N/A
Part D3 – Access for People with Disabilities			
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 except level 2 which is plant rooms.	Compliance readily achievable
D3.2	**Access to Buildings** External access to the building for people with a disability must be provided: • From main pedestrian entry points at the allotment boundary. • Through the principle pedestrian entrance. • Through at least 50% of all pedestrian entries. • 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.	Access is provided from Ring road to the building entry point at the northern side of the building. Access must be provided from the car park at the southern side to the building. An access strategy may need to be developed on how occupants are able to enter the building on level 1 from the car park and then obtain access to ground floor through secure areas. Access is required to be provided from the building to other access buildings on the same allotment. Complaint paths should be provided to any existing paths leading to the existing buildings. An upgrade of the existing paths would only be required where an upgrade to those buildings were to be undertaken.	Additional details required

Clause	Description	Comment	Status
	 Gradient of the new paths are to be provided for assessment for access. 		
D3.3	**Parts of the Building to be Accessible** All parts of the building must be accessible to people with a disability except for areas where access would be inappropriate due to the particular use or areas that would pose a health or safety risk to people with a disability. Every ramp, except a fire isolated ramp, must comply with Clause 10 if AS 1428.1. Every stairway, except a fire isolated stairway, must comply with Clause 11 of AS 1428.1. A fire isolated stairway must comply with Clause 11(f) and (g) of AS 1428.1. Every passenger lift must comply with Clause E3.6. Access ways must have passing spaces and turning spaces complying with AS 1428.1. 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 200m^2.	Generally access is provided through all corridors. A number of rooms throughout do not have the required door clearances mainly due to fixtures and equipment. A review of each room will be required to determine what equipment is within the circulation area or whether the room may be exempt from access under Clause D3.4. A lot of the equipment is on wheels and is moveable. UoN is to manage areas and modify the layout to allow access to rooms as required for any person in a wheel chair. Note that all doorways are to have a luminance contrast of 30% (minimum width of 50mm) between: • Door leaf and jamb • Door leaf and adjacent wall • Architrave and wall	Compliance readily achievable.

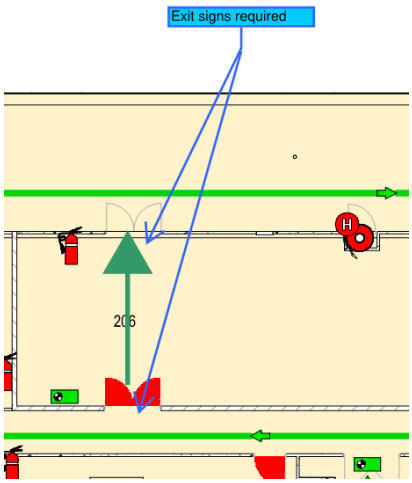
Clause	Description	Comment	Status
	Pile height or pile thickness of carpets shall comply with the requirements of this Clause and AS 1428.1.	• Door leaf and architrave or • Door jamb and adjacent wall	
D3.4	**Exemptions** Buildings required to be accessible must have travel paths, facilities and details which comply with AS1428.1. – 2009.	A review of each room will need to be undertaken with the University to determine the exact nature and use to determine whether access is deemed inappropriate.	Noted
D3.5	**Accessible Car Parking** The accessible parking spaces must comply with AS/NZS 2890.6 – 2009. General requirements are: • 2.4m x 5.4m. • 2.2m head clearance for access and egress routes to and from accessible car spaces. • 2.5m head clearances over accessible car spaces. • Flat even surfaces. • Designated and sign posted for disabled users.	The car park adjacent the building is existing	N/A
D3.6	**Signage** Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access or deafness in accordance with AS1428.1 must identify every accessible sanitary facility and space with a hearing augmentation system. Every doorway required to be provided with an exit sign under Clause E4.5 is to be provided with braille and tactile signage that states "**EXIT**" and identify the floor level "**LEVEL #**".  Signage must be provided within a room containing hearing augmentation identifying the type of hearing augmentation, the area covered in the room and if receivers are being used and where the receivers can be obtained. Signage identifying ambulant accessible sanitary facilities in accordance with AS 1428.1 must be located on the door of the facility.   	Signage details must be in accordance with AS1428.1 - 2009 and Specification D3.6 of the BCA.	Compliance readily achievable

Clause	Description	Comment	Status
	Where the pedestrian entrance is not accessible, directional signage in accordance with AS 1428.1 must be provided to direct a person to the location of the nearest accessible pedestrian entrance. Where a bank of sanitary facilities is not provided with an accessible unisex sanitary facility, directional signage must be placed at the location of the sanitary facilities that are not accessible, to direct a person to the location of the nearest accessible unisex sanitary facility.		
D3.7	**Hearing Augmentation** A hearing augmentation system must be provided where an inbuilt amplification system, other than one used only for emergency warning, is installed— 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 An induction loop must be provided to not less than 80% of the floor area of the room or space served by the inbuilt amplification system; or A system requiring the use of receivers or the like, it must be available to not less than 95% of the floor area of the room or space served by the inbuilt amplification system, and the number of receivers provided must not be less than— A) if the room or space accommodates up to 500 persons, 1 receiver for every 25 persons or part thereof, or 2 receivers, whichever is the greater	If the meeting room has an inbuilt amplification system then a hearing augmentation system will be required.	Compliance readily achievable
D3.8	**Tactile Indicators (TGSIs)** Tactile indicators are to be provided to all stairways, ramps and escalators must be provided to warn people who are blind or have a vision impairment that they are approaching: • a stairway, other than a fire-isolated stairway, • 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: ○ obstruction less than 2 m above floor level, other than a doorway ○ an access way meeting a vehicular way adjacent to any pedestrian entrance to a building, excluding a pedestrian entrance serving an area referred to in D3.4, if there is no kerb or kerb ramp at that point Tactile ground surface indicators must comply with sections 1 and 2 of AS/NZS 1428.4.1	TGSI's are to be provided to all stairs and ramps with the exception of fire isolated stairways	Compliance readily achievable

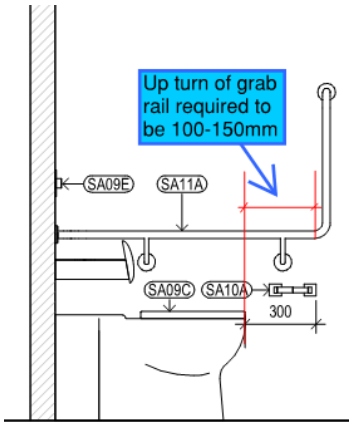
Clause	Description	Comment	Status
			
D3.9	**Wheelchair seating spaces in Class 9b assembly buildings**		N/A
D3.10	**Swimming Pools**		N/A
D3.11	**Ramps** On an access way a series of connected ramps must not have a combined vertical rise of more than 3.6m. A landing for a step ramp must not overlap a landing of another step ramp or ramp.		Compliance readily achievable
D3.12	**Glazing on an Access Way** 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.	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	**Fire Hydrants** Fire hydrant cover is required throughout to AS2419.1 from hydrants located externally, within fire stairs or at other approved locations. The hydrant booster is required to be located in accordance with Clause 7.3 of AS2419.1 within sight of the main entrance of the building.	The hydrant booster is not located within sight of the main entrance of the building. The external hydrants are not provided with fully compliant protection in accordance with AS2419.1 which requires 90/90/90 construction 2m either side of the hydrant outlets and to a height of 3m. The hydrant adjacent stair 1 has fixed glazing to the fire stair which does not achieve an FRL of 90/90/90. The hydrant adjacent stair 2 has the doorway opening into the fire stair located in the 2m zone which will not achieve an FRL of 90/90/90	Performance solution
E1.4	**Fire Hose Reels** Fire hose reel cover to AS2441-2005 is required	The hose reel adjacent the cleaners rooms on level 1 is further then 4m from an exit	Does not comply

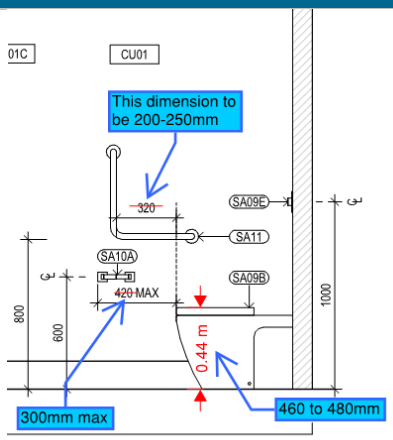
Clause	Description	Comment	Status
	throughout via hose reels located adjacent to stairs and exits. Hoses are not permitted to pass through fire or smoke doors to achieve hose reel cover.	but there is no hose reel within 4m of the SW exit. Supplementary hose reels are permitted but only where coverage is not achieved by hose reels located within 4m of each exit. 	
E1.5	**Sprinklers**		N/A
E1.6	**Portable Fire Extinguishers** Portable Fire Extinguishers are required be installed to Table E1.6 and AS 2444 requirements, at: • 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**		N/A
E1.9	**Fire Services During Construction**		N/A
E1.10	**Provisions for special hazards**		N/A
Part E2 – Smoke Hazard Management			
E2.1	**Applicable of Part**	Part is not applicable to • open deck car parks • open spectator stands • a Class 8 electricity network substation with a floor area not more than 200m^2 • storerooms, etc. less than 30m^2 • sanitary compartments • plant rooms or the like	Noted
E2.2	**General Requirements**	Any air handling system which recycles air from one fire compartment to another or operates in a manner that may unduly contribute to the spread of smoke from one fire compartments to another must automatically shut down on the activation of smoke detectors complying with Clause	Compliance readily achievable

Clause	Description	Comment	Status
		7.5 of AS1670.1 As the building has a rise in storeys of 2 there are no requirements for any smoke hazard management provisions.	
E2.3	**Provisions of special hazards**		N/A
Part E3 – Lift Installations			
E3.1	**Lift Installations** Electric and electrohydraulic lifts must comply with the design requirements of BCA Specification E3.1.	Certification of lift design to be provided	Compliance readily achievable
E3.2	**Stretcher Capacity Lifts**		N/A
E3.3	**Warning Against Use of Lift in Fire** Warning signage is required at lift doors advising that lifts should not be used in the event of a fire.	Signage to be installed.	Compliance readily achievable
E3.4	**Emergency Lifts**		N/A
E3.5	**Landings**		Complies
E3.6	**Passenger lifts** Every passenger lift must be one of the types identified in Table E3.6a, have accessible features in accordance with Table E3.6b and not reply on a constant pressure device for its operation if the lift car is fully enclosed.		Compliance readily achievable
E3.7	**Fire Service Control**		N/A
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	-
E4.2,	**Emergency Lighting requirements** Emergency lighting is to be provided throughout the building.	Emergency lighting is to be provided in: • every fire-isolated stairway, fire-isolated ramp or fire-isolated passageway. • Every passageway, hallway, corridor or the like, that is part of the path of travel to an exit. • In every room having a floor area more than 100m^2 that does not open to a	Compliance readily achievable

Clause	Description	Comment	Status
		corridor or space that has emergency lighting or to a road or open space. • In any room having a floor area more than 300m^2. • In every required non-fire isolated stairway	
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; 1. A door providing direct egress from a storey to a stairway, passageway or ramp serving as a required exit. 2. A door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space. 3. A horizontal exit 4. 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	Additional exit signs are required to direct occupants through enclosed plant 206 as it is required to ensure egress distances comply 	Does not comply
E4.7	**Class 2 and 3 buildings and Class 4 parts: Exemptions**		N/A
E4.8	**Design and operation of exit signs** Exit signs are to operate in accordance with AS 2293.1. Photo luminescent exit sign are to comply with Specification E4.8		Compliance readily achievable
E4.9	**Sounds systems and intercom systems for emergency purposes**		N/A

Clause	Description	Comment	Status
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.	Performance solution
F1.1	**Stormwater Drainage** Stormwater drainage must comply with AS/NZS 3500.3.	Hydraulic drawings and design certification to be provided at Construction Certificate stage.	Compliance readily achievable
F1.2	-	This clause has deliberately been left blank	-
F1.3	-	This clause has deliberately been left blank	-
F1.4	**External above ground membranes** External waterproofing membrane systems for roofs, decks, balconies and the like must comply with AS4654 Parts 1 and 2.	The standard membrane detailing for waterproofing including minimum upturn termination lengths, requirements for stepped balcony details at doorways and windows and provision of continuous grates where stepping does not occur.	Compliance readily achievable
F1.5	**Roof coverings** 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	-
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 dam proof course and the underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders. Damp proof course must consist of a material that complies with AS/NZS 2904 or an impervious termite		Compliance readily achievable

Clause	Description	Comment	Status
	shield in accordance with AS 3660.1.		
F1.10	**Damp-proofing of floors on the ground** A vapour barrier in accordance with AS2870 is to be provided beneath the basement floor slab.		Compliance readily achievable
F1.11	**Provision of Floor Wastes**		N/A
F1.12	**Sub-floor ventilation**		N/A
F1.13	**Glazed assemblies** Windows, sliding doors with a frame, adjustable louvres, shopfronts and window walls with one piece framing in an external wall must comply with AS 2047 requirements for resistance to water penetration.		Compliance readily achievable
Part F2 – Sanitary and Other Facilities			
F2.1	**Facilities in Residential buildings**		N/A
F2.2	**Calculation of number of occupants and fixtures**		Noted
F2.3	**Sanitary Facilities** Toilet facilities are required in appropriate numbers based on the number of persons accommodated.	Refer to appendix F2.3 of this report.	Additional details required
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.	The dimension shown for both the accessible and ambulant toilets are incorrect. Grab rails, widths and pan dimensions, toilet roll holder locations etc are to be in accordance with AS1428.1. Also the accessible shower does not have all the required fittings and grabrails. Refer to AS1428.1 or Appendix D2 	Does not comply

Clause	Description	Comment	Status
			
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
F2.7	-	NSW - Deleted	-
F2.8	**Waste Management**		N/A
Part F3 – Room Heights			
F3.1	Height of rooms and other spaces Generally, a minimum ceiling height of 2.4m is required throughout.		Compliance readily achievable
Part F4 – Light and Ventilation			
F4.1	**Provisions of natural Light** Natural lighting aggregating 10% of room floor area is required as follows: • 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	**Artificial lighting** The artificial lighting system must comply with AS/NZS 1680.0.		Compliance readily achievable
F4.5	**Ventilation of rooms** Ventilation shall be provided throughout the building in by means of natural ventilation complying with Clause F4.6 or mechanical ventilation complying with the requirements of AS1668.2 as required by Clause F4.5 of the BCA.	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

Clause	Description	Comment	Status
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	**Carparks**		N/A
F4.12	**Kitchen Local Exhaust Ventilation**		N/A
Part F1 – Sound Transmission and Insulation			
F5.1	**Application of Part** Applicable only to the Class 2 and 3 portions on Levels 1 to 20		Noted
F5.1	**Determination of airborne sound insulation ratings**		N/A
F5.3	**Determination of impact sound insulation ratings**		N/A
F5.4	**Sound insulation rating of floors**		N/A
F5.5	**Sound insulation rating of walls**		N/A
F5.6	**Sound insulation rating of internal services**		N/A
F5.7	**Sound isolation pumps**		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**		N/A
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.		N/A
Part G2 - Boilers, pressure vessels, heating appliances, fire places, chimneys and flues			
G2.1	-	This clause has intentionally been left blank	-
G2.2	**Installation of appliances**		N/A
G2.3	**Open fireplaces**		N/A
G2.4	**Incinerator rooms**		N/A
Part G3 - Atrium Construction			
G3.1	**Application of Part**		Noted
G3.2	**Dimensions of atrium well**		N/A

Clause	Description	Comment	Status
G3.3	**Separation of atrium by bounding walls**		N/A
G3.4	**Construction of bounding walls**		N/A
G3.5	**Construction of balconies**		N/A
G3.6	**Separation at roof**		N/A
G3.7	**Means of egress**		N/A
G3.8	**Fire and smoke control systems**		N/A
Part G4 - Construction in Alpine Areas			
G4.1	**Application of Part**		N/A
G4.2	-	This clause has deliberately been left blank.	-
G4.3	**External doorways**		N/A
G4.4	**Emergency lighting**		N/A
G4.5	**External ramps**		N/A
G4.6	**Discharge of exits**		N/A
G4.7	**External trafficable structures**		N/A
G4.8	**Fire-fighting services and equipment**		N/A
G4.9	**Fire orders**		N/A
Part G5 - Construction in Bushfire Prone Areas			
G5.1	**Application of Part**		N/A
G5.2	**Protection** *(NSW variation for bushfire prone area)*		N/A
Section H: Special Use Buildings – Auditoriums, Public Halls, Public Transport Buildings			
Part H1 - Class 9b Buildings			
H1.1	**Application of Part**		N/A
H1.2	**Separation**		N/A
H1.3	**Proscenium wall construction**		N/A
H1.4	**Seating area**	N/A	N/A
H1.5	**Exit from stages**	N/A	N/A
H1.6	**Access to platforms and lofts**	N/A	N/A
H1.7	**Aisle lights**	N/A	N/A
NSW Part - H101 Entertainment Venues other than Temporary Structures and Drive-In Theatres			
H101.1	**Application of Part** This Part applies to every entertainment venue as described in the Environmental Planning and Assessment Regulation 2000.	Entertainment Venue is defined as a building used as a cinema, theatre or concert hall or an indoor sports stadium.	N/A
H101.2	**Fire Separation**		N/A
H101.3	**Foyer Space**		N/A
H101.4	**Sprinkler systems for common foyers**		N/A

Clause	Description	Comment	Status
H101.5	Conventional stages		N/A
H101.6	Non-conventional stages		N/A
H101.7	Flying scenery		N/A
H101.8	Load notice		N/A
H101.9	-	This clause has deliberately been left blank.	-
H101.10	Safety curtains		N/A
H101.11	Seating in rows		N/A
H101.12	Continental seating		N/A
H101.13	Provision of guardrails		N/A
H101.14	Guardrails		N/A
H101.15	Dressing rooms		N/A
H101.16	Storerooms		N/A
H101.17	Projection suites		N/A
H101.18	Basement storeys		N/A
H101.19	Electric mains installation		N/A
H101.20	Lighting		N/A
H101.21	-	This clause has deliberately been left blank.	-
H101.22	Automatic smoke and heat vents for Stages		N/A
H101.23	Solid fuel burning stoves and open fire places		N/A
H101.24	Fuel gas cylinders		N/A
NSW Part - H102 Temporary Structures			**N/A**
NSW Part - H103 Drive-In Theatres			**N/A**
Part H2 - Public Transport Buildings			**N/A**
Part H3 - Farm Building and Farm Sheds			**N/A**
NSW Section J: Energy Efficiency Energy Efficiency for buildings requires buildings to reduce greenhouse gas emissions by efficiently using energy. A building's services must have features that facilitate the efficient use of energy. The discipline of Energy Efficiency with the BCA has become a specialised field where compliance with BCA Section J is to be certified with the issue of a Certificate of Compliance – Design from the relevant Services Engineer/Consultant. The purpose of this section is to provide a brief explanation of which areas are to achieve compliance with BCA Section J – Energy Efficiency during design and construction. The BCA should be referenced for exact requirements, clarification and further explanation.			
Section J	**Energy Efficiency Measures** Energy efficiency measures are prescribed for the following building elements to limit energy consumption:- • Building fabric • External glazing • Building sealing • Air movement. • Air-conditioning and ventilation systems. • Artificial lighting and power • Hot water supply	Compliance assumed, although further information is required to confirm compliance. A performance based BCA JV3 assessment may be adopted for the project if compliance with BCA deemed to satisfy provisions are problematic.	Compliance readily achievable

Clause	Description	Comment	Status
	• Access for maintenance		
NSW Subsection J(B) Energy Efficiency - Class 3 and Class 5 to 9 Buildings			
NSW J(B)1 - Compliance with BCA Provisions.	Class 3 and Class 5 to 9 buildings must comply with all of the provisions of the national **Section J** that are applicable to the relevant classifications, except as varied by **NSW J3.1** Application of Part.		**Noted**
Part J0 - Energy Efficiency			
J0.1	**Application of Part**		Noted
J0.2	**Heating and cooling loads of sole-occupancy units of a Class 2 building or a Class 4 part**		N/A
J0.3	**Ceiling fans** Required ceiling fans must be permanently installed and have a speed controller		Compliance readily achievable
Part J1 - Building Fabric			
J1.1	**Application of Part**		Noted
J1.2	**Thermal Construction – General** Insulation must comply with AS/NZS 4859.1 and be installed in accordance with Clause J1.2. Insulation must abut or overlap adjoining insulation, form a continuous barrier with ceilings, walls, bulkheads, floors or the like and not affect the safe or effective operation of services.		Compliance readily achievable
J1.3	**Roof and ceiling construction** A roof or ceiling that is part of the envelope must achieve the Total R-Value specified in Table J1.3 for the direction of heat flow. A roof that - i. is required to achieve a minimum *Total R-Value;* and ii. has metal sheet roofing fixed to metal purlins, metal rafters or metal battens; and iii. does not have a ceiling lining or ha a ceiling lining fixed directly to those metal purlins, metal rafters or metal battens (see specification J1.3 Figure 2(c) and (f), must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the metal roofing and its supporting metal purlins, metal rafters or metal battens.	The minimum total R-Value required for roofs or ceilings are specified in Appendix J1.	Compliance readily achievable
J1.4	**Roof lights** Roof lights, including any associated shaft and diffuser, that form part of the envelope must, if the roof lights are not required for compliance with Part F4, comply with Table J1.4. If the roof lights are required for compliance with Part F4 they must have an area not more than 150% of the minimum area required by F4.6; and have transparent and translucent elements, including any imperforate ceiling diffuser, with a combined performance of not more than 0.29 Total System SHGC; and 2.9 Total System U-Value.		Compliance readily achievable

Clause	Description	Comment	Status
J1.5	**Walls** Each part of an external wall that is part of the envelope must satisfy one of the options in Table J1.5a or Table J1.5b except as specified in Clause J1.5. A wall that - i. is required to achieve a minimum *Total R-Value;* and ii. has lightweight external cladding such as weatherboards, fibre cement or metal sheeting fixed to a metal frame; and iii. does not have a wall lining or has a wall lining that is fixed directly to the same metal frame, must have a thermal break, consisting of a material with an *R-Value* of not less than R0.2, installed between the external cladding and the metal frame.	Refer to Appendix J1 for required minimum R-Values and other requirements.	Compliance readily achievable
J1.6	**Floors** Floors are required to achieve a minimum R-Value in accordance with Table J1.6. A concrete slab-on-ground with an in-slab heating or cooling system; or located in climate zone 8 must have insulation installed around the vertical edge of its perimeter. The insulation must have an R-Value of not less than 1.0, be water resistant and be continuous from the adjacent finished ground level to a depth of not less than 300 mm or for the full depth of the vertical edge of the concrete slab-on-ground	Refer to Appendix J1 for minimum R-Values for floors	Compliance readily achievable
Part J2 - Glazing			
J2.1	**Application of Part**		Noted
J2.2	-	This Clause has deliberately been left blank	-
J2.3	-	This Clause has deliberately been left blank	-
J2.4	**Glazing** The glazing in each storey including a mezzanine must be assessed separately in accordance with Clause J2.4(b) and (c) for- i) *glazing* in the external *fabric* facing each orientation; and ii) *glazing* in the internal *fabric* using the south orientation sector energy constants in Table J2.4b and shading multipliers in Table J2.4c and Table J2.4d. The aggregate *air-conditioning* energy value attributable to the *glazing* must not exceed the allowance obtained by multiplying the facade area that is exposed to the *conditioned space* for the orientation by the energy index in Table J2.4a.	The glazing calculator must be completed and submitted with the Construction Certificate application as evidence of compliance.	Compliance readily achievable
J2.5	**Shading**		Compliance readily achievable

Clause	Description	Comment	Status
	Where shading is required to comply with Clause J2.4, it must; a) be provided by an external permanent projection, such as a verandah, balcony, fixed canopy, eaves or shading hood which i. extends horizontally on both sides of the glazing for the same projection distance P in figure J2.4 of the BCA, or ii. provides the equivalent shading to that above with a reveal or the like, or b) be provided an external shading device such as a blind, vertical or horizontal building screen with blades, battens or slats, which i. is capable of restricting at least 80% of summer solar radiation, and **ii.** if adjustable is operated automatically in response to the level of solar radiation.		
Part J3 - Building Sealing			
J3.1	**Application of Part** *(NSW variation for building sealing)*	Applies to elements forming the envelope of a Class 3, and Class 5 to 9 building other than as specified.	Noted
J3.2	**Chimneys and flues**		N/A
J3.3	**Roof lights**		N/A
J3.4	**Windows and doors** A seal to restrict air infiltration must be fitted to each edge of an external door, openable external window or the like when serving a conditioned space.		Compliance readily achievable
J3.5	**Exhaust fans** A miscellaneous exhaust fan must be fitted with a sealing device such as a self-closing damper or the like when serving a conditioned space.		Compliance readily achievable
J3.6	**Construction of roofs, walls and floors** Roofs, walls, floors and any opening must be constructed to minimise air leakage in accordance with Clause J3.6(b) when forming part of the external fabric of a conditioned space. These requirements do not apply to openings, grilles and the like required for smoke hazard management.		Compliance readily achievable
J3.7	**Evaporative coolers** An evaporative cooler must be fitted with a self-closing damper or the like when serving a heated space.		Compliance readily achievable
Part J4 - This Part has deliberately been left blank			
Part J5 - Air-conditioning and Ventilation Systems			
J5.1	**Application of Part**		Noted
J5.2	**Air-conditioning systems** An air-conditioning system must be capable of being deactivated when the building or part of a building served by that system is not occupied.	The mechanical engineer is to design and certify the A/C system to comply with the requirements under this Clause.	Compliance readily achievable

Clause	Description	Comment	Status
	An air-conditioning system must comply with requirements specified under this Clause which relate to controls, fans, pumps, insulation and time switches. Space heating must comply with Specification J5.2d. Energy efficiency ratios must comply with Specification J5.2e		
J5.3	**Mechanical ventilation systems** The mechanical ventilation system must comply with the requirements specified under this clause which relate to controls, fans and time switches.	The mechanical engineer is to design and certify the mechanical ventilation system to comply with the requirements under this Clause.	Compliance readily achievable
J5.4	**Miscellaneous exhaust systems** A miscellaneous exhaust system with an air flow rate of more than 1000 L/s, that is associated with equipment having a variable demand, must be capable of stopping the motor when the system is not needed and have a variable speed fan or the like.		Compliance readily achievable
Part J5 - Artificial Lighting and Power			
J6.1	**Application of Part**		Noted
J6.2	**Artificial lighting** In a Class 5, 6, 7, 8, 9a or 9b the artificial lighting must not exceed the sum of the allowances obtained by multiplying the area of each space by the maximum power density in Table J6.2a.		Compliance readily achievable
J6.3	**Interior artificial lighting and power control** The power control for artificial interior lighting must comply with the requirements of Clause J6.3. Artificial lighting of a room or space must be individually operated by a switch or other control device in accordance with Specification J6.		Compliance readily achievable
J6.4	**Interior decorative and display lighting** Interior decorative and display lighting, such as for foyer mural or art displays, must be controlled separately from other artificial lighting as specified in Clause J6.4. Window display lighting must be controlled separately from other display lighting.		Compliance readily achievable
J6.5	**Artificial lighting around the perimeter of a building** Artificial lighting around the perimeter of a building must be controlled by a daylight sensor or time switch as specified in Clause J6.5.		Compliance readily achievable
J6.6	**Boiling water and chilled water storage units** Power supply to a boiling water or chilled water storage unit must be controlled by a time switch in accordance with Specification J6.		Compliance readily achievable
Part J7 - Heated Water Supply and Swimming Pool and Spa Pool Plant			
J7.1	-	This Clause has deliberately been left blank	-
J7.2	**Heated water supply** A hot water supply system for food preparation and sanitary purposes, other than a solar hot water supply system in climate zones 1, 2 and 3 must be designed		Compliance readily achievable

Clause	Description	Comment	Status
	and installed in accordance with Section 8 of AS/NZS 3500.4		
J7.3	**Swimming pool hearing and pumping**		N/A
J7.4	**Spa pool heating and pumping**		N/A
Part J8 - Facilities for Energy Monitoring			
J8.1	**Application of Part**		Noted
J8.2	-	This Clause has deliberately been left blank	-
J8.3	**Facilities for energy monitoring** A building or sole-occupancy unit with a floor area of more than 500m^2 must have the facility to record the consumption of gas and electricity. A building with a floor area of more than 2,500m^2 must have the facility to record individually the energy consumption of: I. air-conditioning plant including, where appropriate, heating plant, cooling plant and air handling fans; and II. artificial lighting; and III. appliance power; and IV. central hot water supply; and V. internal transport devices including lifts, escalators and travelators where there is more than one serving the building; and VI. other ancillary plant.	An energy monitoring facility is required for the building.	Compliance 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
A01_0100	Site Plan	D4	03/10/2018	Denton Corker Marshall
A05_0000	Evacuation Diagram – Ground Floor	D1	03/10/2018	Denton Corker Marshall
A05_0100	Evacuation Diagram – Level 1	D1	03/10/2018	Denton Corker Marshall
A05_0200	Evacuation Diagram – Level 2	D1	03/10/2018	Denton Corker Marshall
A10_0000	Ground Level - Overall Plan	D4	03/10/2018	Denton Corker Marshall
A10_0100	Level 01 – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A10_0200	Level 02 – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A10_0300	Roof Plan – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A11_0000	GA Elevations - North	D4	03/10/2018	Denton Corker Marshall
A11_0001	GA Elevations – South	D4	03/10/2018	Denton Corker Marshall
A11_0002	GA Elevations – East	D4	03/10/2018	Denton Corker Marshall
A11_0003	GA Elevations - West	D4	03/10/2018	Denton Corker Marshall
A12_0000	GA Sections - Sheet 00	D4	03/10/2018	Denton Corker Marshall
A12_0001	GA Sections - Sheet 01	D4	03/10/2018	Denton Corker Marshall
A12_0002	GA Sections - Sheet 02	D4	03/10/2018	Denton Corker Marshall
A12_0003	GA Sections - Sheet 03	D2	03/10/2018	Denton Corker Marshall
A12_0004	GA Sections - Sheet 04	D2	03/10/2018	Denton Corker Marshall
A25_0000	Reflected Ceiling Ground Level – Plan	D4	03/10/2018	Denton Corker Marshall
A25_0100	Reflected Ceiling Level 01 – Plan	D4	03/10/2018	Denton Corker Marshall
A25_0200	Reflected Ceiling Level 02 – Plan	D4	03/10/2018	Denton Corker Marshall
A25_0300	Reflected Ceiling Plan Legend	D2	03/10/2018	Denton Corker Marshall
A29_0000	Fire Compartment Ground Level – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A29_0100	Fire Compartment Level 01 – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A29_0200	Fire Compartment Level 02 – Overall Plan	D4	03/10/2018	Denton Corker Marshall
A35_0000	Line of Heights – Sheet 00	D4	03/10/2018	Denton Corker Marshall
A35_0010	Female Amenities Ground Floor – Sheet 00	D4	03/10/2018	Denton Corker Marshall
A35_0020	Male and DDA Amenities Ground Floor – Sheet 00	D4	03/10/2018	Denton Corker Marshall
A35_0040	Male and Female Amenities Level 01 – Sheet 00	D4	03/10/2018	Denton Corker Marshall

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
Emergency lighting	BCA2016 Clause E4.2, E4.4 and AS 2293.1 – 2005
Exit signs	BCA2016 Clause E4.5, NSW E4.6, E4.8 and AS 2293.1 – 2005
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. *[Note: Systems tested to AS 1530.4 prior to 1 January 1995 need not be retested to comply with the provisions in AS 4072.1]*
Hose reel system	BCA2016 Clause E1.4 and AS 2441 – 2005
Lightweight construction	BCA2016 Specification C1.8, Clause A2.3 and AS 1530.4-2005
Mechanical air handling system *(automatic shutdown of air-handling system)*	BCA2016 Clause E2.2 and AS/NZ 1668.1-2015
Portable fire extinguishers	BCA2016 Clause E1.6 and AS 2444 – 2001
Smoke detectors and heat detectors *(detectors for the automatic closing operation of fire doors to fire isolated exits)*	BCA2016 Clause C3.8 and AS 1670.1 – 2015
Warning and operational signs	BCA2016 Clauses D2.23, D3.6, E3.3, E3.9, E3.10 and Specification E3.1

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

16. Appendix C1.1 – Fire Rating Requirements

Type C 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-				
less than 1.5m	90/90/90	90/90/90	90/90/90	90/90/90
1.5 to less than 3 m	-/-/-	60/60/60	60/60/60	60/60/60
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 1.5 m	90/ - / -	90/ - / -	90/ - / -	90/ - / -
1.5 or less than 3 m	- / - / -	60/ - / -	60/ - / -	60/ - / -
3 m or more	- / - / -	- / - / -	- / - / -	- / - / -
COMMON WALLS and FIRE WALLS	90/90/90	90/90/90	90/90/90	90/90/90
INTERNAL WALLS-				
Bounding public corridors, public lobbies and the like-				
	60/60/60	- / - / -	- / - / -	- / - / -
Between or bounding sole-occupancy units-				
	60/60/60	-/ - / -	-/ - / -	-/ - / -
Bounding a stair if required to be rated-				
	60/60/60	- / - / -	- / - / -	- / - / -
ROOFS	- / - / -	- / - / -	- / - / -	- / - / -

17. Appendix D1.4 – Exits

The exits from the building are set out below:

Exit No	Location	Type	Grid Ref	No of storeys connected / passed by	Comments
1.	Ground floor	Fire stair	1/D	3	Stair 1
2.	Ground floor	External door	4/A	1	
3.	Ground floor	External door	8/A	1	
4.	Ground floor	Fire stair	12/D	3	Stair 2
5.	Level 1	Fire stair	1/D	3	Stair 1
6.	Level 1	Fire stair	12/D	3	Stair 2
7.	Level 1	External door	12/A	-	
8.	Level 2	Fire stair	1/D	3	Stair 1
9.	Level 2	Hatch into fire stair	12/D	3	Stair 2

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

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

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

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

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

Other than above, construction materials generally need to achieve as1530.3 early fire hazard 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

19. Appendix D3 – Significant Accessibility Requirements

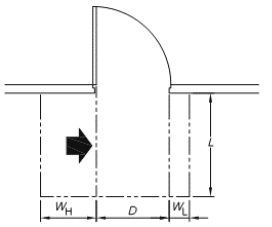
Access for wheelchair users and people with disabilities generally must be to AS1428.1-2009. Principle requirements are:

- 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:

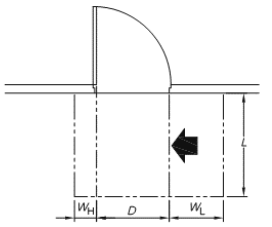
- Unisex facility.
- ~1.9 x 2.7m or 2.3 x 2.4m minimum room dimensions depending on arrangements. (~2.2m x 1.6m if AS1428.1-2001 concession applies).
- 30-40mm grab rails with 50-60mm clearances.
- Doors with appropriate clearances and circulation spaces and able to be operated externally in emergencies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

Required door circulation



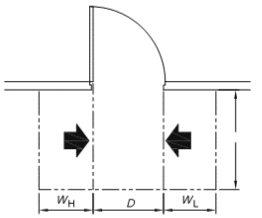
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1220	560	340
900	1185	510	340
950	1160	460	340
1000	1140	410	340

(a) Hinge-side approach, door opens away from user



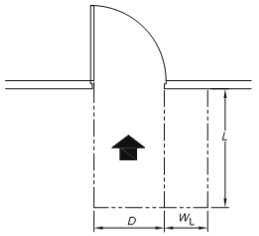
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1240	240	660
900	1210	190	660
950	1175	140	660
1000	1155	90	660

(b) Latch-side approach, door opens away from user



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1240	560	660
900	1210	510	660
950	1175	460	660
1000	1155	410	660

(c) Either side approach, door opens away from user

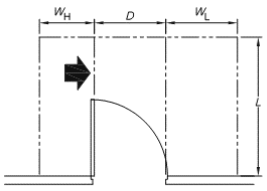


Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1450	0	510
900	1450	0	510
950	1450	0	510
1000	1450	0	510

(d) Front approach, door opens away from user

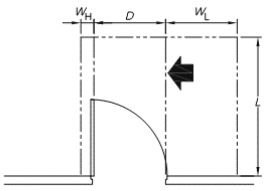
LEGEND:
D = Clear opening of width of doorway
L = Length
W_H = Width—hinge side
W_L = Width—latch side
➡ = Direction of approach
----- = Circulation space

DIMENSIONS IN MILLIMETRES



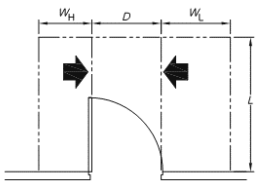
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1670	660	900
900	1670	610	900
950	1670	560	900
1000	1670	510	900

(e) Hinge-side approach, door opens towards user



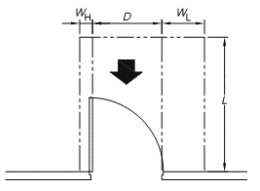
Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1670	110	900
900	1670	110	900
950	1670	110	900
1000	1670	110	900

(f) Latch-side approach, door opens towards user



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1670	660	900
900	1670	610	900
950	1670	560	900
1000	1670	510	900

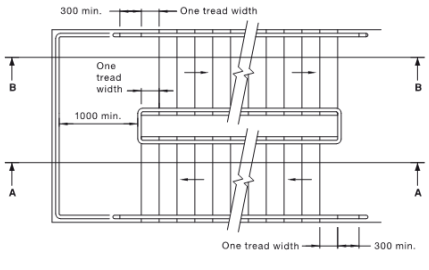
(g) Either side approach, door opens towards user



Dimension D	Dimension L	Dimension W_H	Dimension W_L
850	1450	110	530
900	1450	110	530
950	1450	110	530
1000	1450	110	530

(h) Front approach, door opens towards user

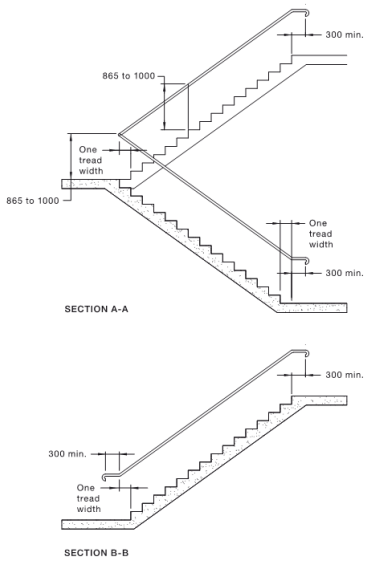
Stairway and handrails requirements



(a) Plan

DIMENSIONS IN MILLIMETRES

FIGURE 28 (in part) HANDRAILS TO STAIRS WITH INTERMEDIATE LANDINGS



(b) Sections

DIMENSIONS IN MILLIMETRES

FIGURE 28 (in part) HANDRAILS TO STAIRS WITH INTERMEDIATE LANDINGS

Accessible and ambulant sanitary compartments

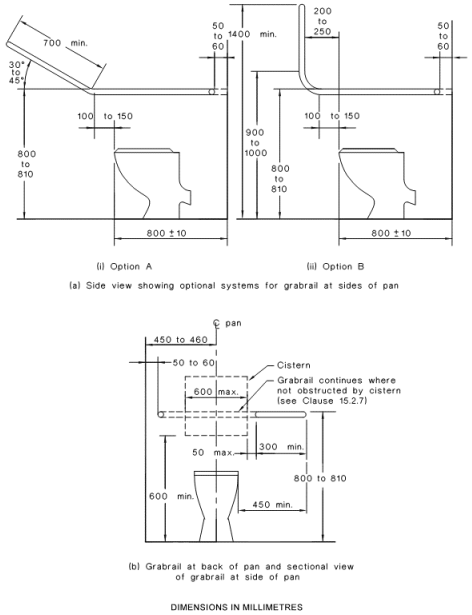


FIGURE 42 POSITIONS OF GRABRAILS IN WATER CLOSETS

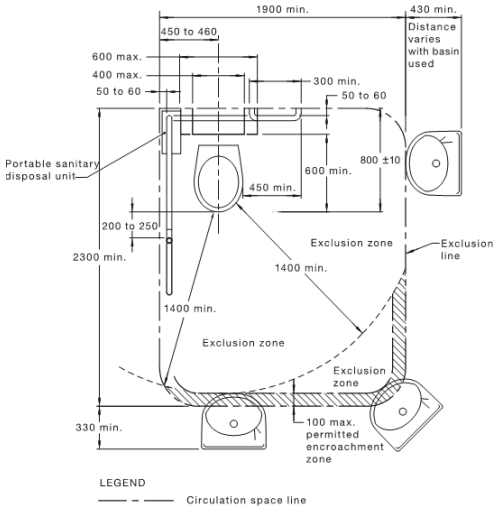


FIGURE 43 CIRCULATION SPACE FOR WC PAN—RIGHT-HAND TRANSFER (LEFT-HAND TRANSFER IS MIRROR REVERSED)

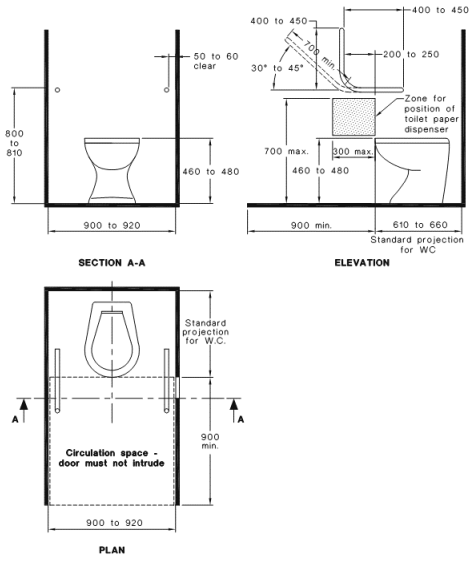


FIGURE 53(A) SANITARY COMPARTMENT FOR PEOPLE WITH AMBULANT DISABILITIES—PLAN AND ELEVATION

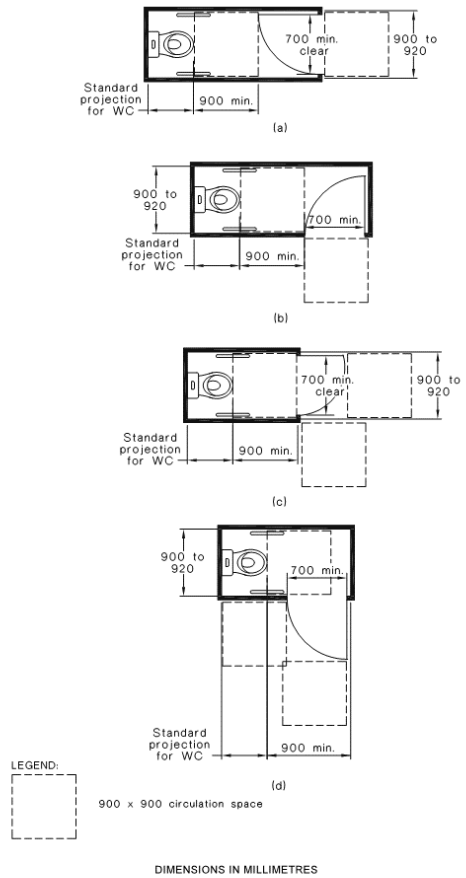
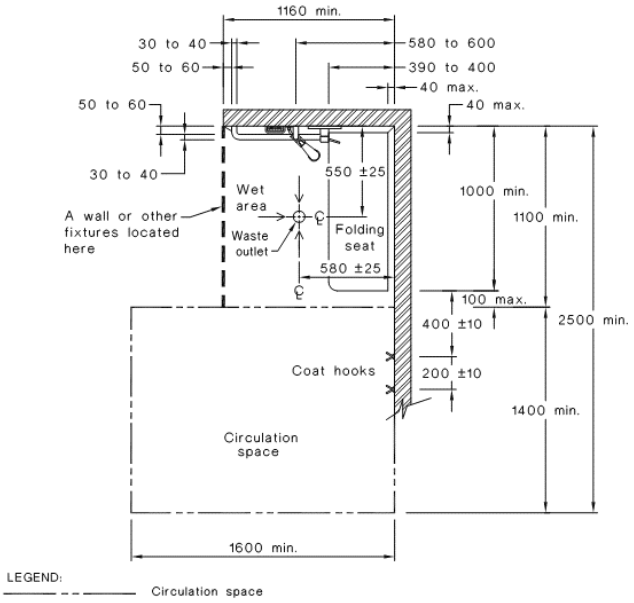
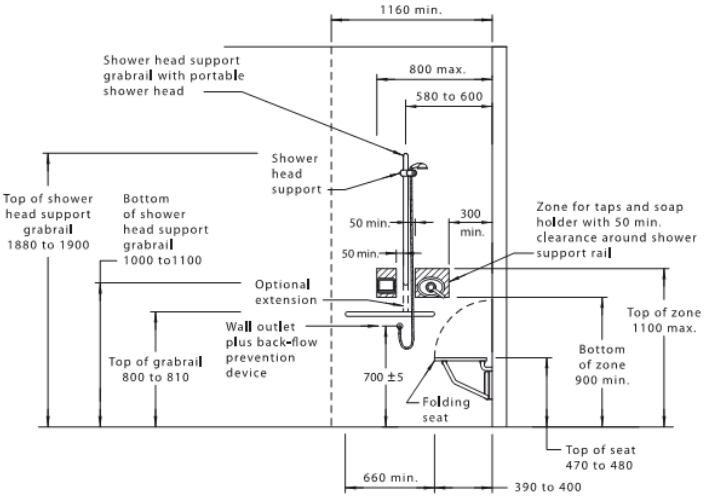


FIGURE 53(B) SANITARY COMPARTMENT FOR PEOPLE WITH AMBULANT DISABILITIES—DOORWAY OPTIONS



(b) Shower recess with a third side provided by a wall or other fixtures

FIGURE 47 (in part) SHOWER RECESS AND CIRCULATION SPACE—PLAN



DIMENSIONS IN MILLIMETRES

FIGURE 48 SHOWER RECESS FITTINGS—ELEVATION

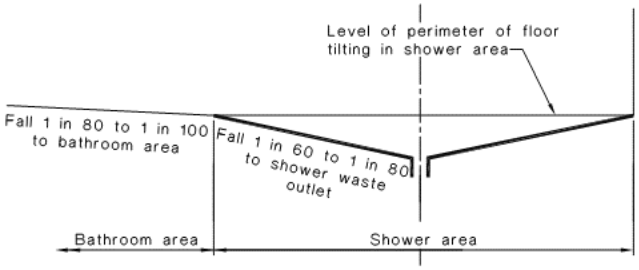


FIGURE 49 GRADES FOR BATHROOM AND SHOWER FLOORS

20. Appendix F2.3 – Requirements for Sanitary Facilities

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

Class	Use	Occupant Numbers			WC Required / Provided		Urinal Required / Provided		Basin Required / Provided	
		Total								
7b / 8	Staff	55	Male	27	2		2		2	
			Female	27	2		N/A		2	
			Unisex Disabled				N/A			

Notes:

1. A common unisex accessible facility may be counted once for both male and female facilities in accordance with Clause F2.2(c) of the BCA;
2. At least one ambulant sanitary compartment must be provided within each the male and female facilities complying with Section 16 of AS1428.1 – 2009.
3. A WC is able to be used in place of a urinal.

21. Appendix J1 – Energy Efficiency R-Values

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

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

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

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

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

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

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

Notes:

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

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

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

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

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

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

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

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

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

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