



**BLACKETT
MAGUIRE+
GOLDSMITH**

BCA ASSESSMENT REPORT

**LAHC – 67-69 Pioneer Road,
28-30 Bramsen Street, Bellambi**

Prepared for:



**NSW Land and Housing
Corporation**

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REPORT STATUS

DATE	REVISION	STATUS	AUTHOR	REVIEWED
26.02.2021	0	Draft BCA Report for review by Client	DM	DB
29.06.2021	1	Draft BCA Report for review by design team based on the initial Gate 2 plans.	DM	DB
6.07.2021	2	Draft BCA Report for review by design team based on the latest Gate 2 plans dated 30.06.2021.	DM	DB
4.08.2021	3	Draft BCA Report for review by design team based on the latest Gate 2 plans dated 30.06.2021 and revised Plan No. A602E	DM	DB
2.12.2021	4	BCA Report based on latest architectural design	DM	DB
6.12.2021	5	BCA Report based on latest architectural design	DM	DB
29.04.2022	6	BCA Report prepared for REF application	DM	DB

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1.0 INTRODUCTION

1.1 PROPOSAL

Blackett Maguire + Goldsmith Pty Ltd (BM+G) have been commissioned by Land and Housing Corporation to undertake a National Construction Code – Building Code of Australia (BCA) 2019, Amendment 1 assessment of the proposed residential housing development located at 67-69 Pioneer Road 28-30 Bramsen Street, Bellambi.

1.2 REPORT AIM

The aim of this report is to:

- + Undertake an assessment of the proposed development against the deemed-to-satisfy provisions of the BCA;
- + Identify matters that require plan amendments in order to achieve compliance with the BCA;
- + Identify matters that are to be required to be addressed by Performance Solutions;
- + Enable the certifying authority to satisfy its statutory obligations under Clause 143(1)(3) of the Environmental Planning and Assessment Regulation, 2000
- + Enable the certifying authority to satisfy its statutory obligations under Clause 145 of the Environmental Planning and Assessment Regulation, 2000.
- + Enable the Public Authority to satisfy its statutory obligations under Section 6.28 of the Environmental Planning and Assessment Act, 1979

1.3 PROJECT TEAM

The following BM+G Team Members have contributed to this Report:

- + David Martin – Project Coordinator Registered Certifier / Building Surveyor
- + David Blackett – Project Crown Certifier/Peer Review (Director) | Registered Certifier / Building Surveyor (Unrestricted)

1.4 REFERENCED DOCUMENTATION

The following documentation has been reviewed, referenced and/or relied upon in the preparation of this report:

- + Building Code of Australia Volume 1 2019, Amendment 1, Building Code of Australia Volume 2 2019, Amendment 1,
- + The Guide to the Building Code of Australia Volume 1 2019 (BCA).
- + Architectural Drawings referenced and prepared by McIntosh & Phelps:

DRAWING No.	REVISION	DATE	DRAWING No.	REVISION	DATE
A001	1	06.12.2021	A002	1	06.12.2021
A003	1	06.12.2021	A004	1	06.12.2021
A005	1	24.01.2022	A101	1	09.02.2022
A102	1	06.12.2021	A103	1	06.12.2021
A201	1	06.12.2021	A202	1	06.12.2021
A203	1	06.12.2021	A204	1	09.02.2022
A301	1	06.12.2021	A302	1	06.12.2021
A303	1	06.12.2021	A401	1	06.12.2021
A501	1	06.12.2021	A502	1	06.12.2021
A503	1	06.12.2021	A504	1	06.12.2021
A505	1	06.12.2021	A506	1	06.12.2021
A507	1	06.12.2021	A601	1	09.02.2022
A602	1	09.02.2022	A603	1	06.12.2021
A701	1	06.12.2021	A702	1	09.02.2022
A703	1	24.01.2022			

1.5 REGULATORY FRAMEWORK

Pursuant to clause 145 of the Environmental Planning and Assessment (EPA) Regulation 2000 all new building work must comply with the current BCA however the existing features of an existing building need not comply with the BCA unless upgrade is required by other clauses of the legislation.

The assessment has been undertaken in accordance with Clause 24 and 25 of the Building and Development Certifiers Act 2020.



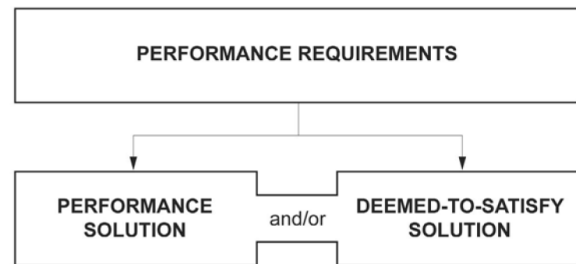
1.6 COMPLIANCE WITH THE NATIONAL CONSTRUCTION CODE

Compliance with the NCC is achieved by complying with—

- + the Governing Requirements of the NCC; and
- + the Performance Requirements.

Performance Requirements are satisfied by one of the following, as shown in the Figure below:

- + A Performance Solution.
- + A Deemed-to-Satisfy Solution.
- + A combination of the above two options.



1.7 ASSESSMENT METHODOLOGY

Pursuant to S6.28 of the Environmental Planning and Assessment Act 1979, the proposed building is subject to compliance with the relevant requirements of the BCA as in force at the time of the date of invitation for tenders to carry out the Crown building work. The current BCA is in force is BCA 2019 Amendment 1, with BCA 2022 coming in to force September 2022. As the invitation to tender is likely to be / has been lodged prior September 2022, this report assesses the design against compliance with the requirements of BCA 2019 Amendment 1.

Re-assessment against the new BCA 2022 provisions will be required should the invitation to tender not be able to be lodged in time.

1.8 LIMITATIONS AND EXCLUSIONS

The limitations and exclusions of this report are as follows:

- + No assessment has been undertaken with respect to the Disability Discrimination Act 1992 (DDA). The building owner needs be satisfied that their obligations under the DDA have been addressed.

Please note that whilst the BCA specifies a minimum standard of compliance with AS1428 (Parts 1-3) and Part D3 of the BCA for access and facilities for people with disabilities, compliance with such requirements may not necessarily preclude the possibility of a future complaint made under the DDA 1992. The DDA is a complaint based legislation and is presently not identified by the State Building Codes and Regulations. In this regard the building owner should be satisfied that their obligations under the DDA have been addressed.
- + No complete assessment has been undertaken with respect to SEPP 65 Design Quality of Residential Apartment Development / Apartment Design Guide, SEPP Affordable Rental Housing 2009 or SEPP (Housing for Seniors or People with a Disability) 2004. It is understood that suitably qualified consultants will be engaged to determine the relevance of any Council planning requirements or SEPP requirements and provided detailed assessment reports were applicable. Where relevant to this development it is assumed that these assessments will be undertaken by others.
- + BM+G has not undertaken an assessment of any Performance Solution Reports at the time of the preparation of this report.
- + This report does not consider BCA Part G (Volume 1) or Part 3.7.4 (Volume 2) Specifically Clause G5.2 which makes provision for construction of buildings in bushfire-prone areas, therefore no assessment has been undertaken in consideration of ASS3959. Where Part G or Part 3.7.4 are applicable to this site then it is recommended that assessment/due diligence is undertaken by a specialist consultant to verify compliance.
- + The Report does not address matters in relation to the following Local Government Act and Regulations:
 - i. Work Health and Safety Act and Regulations.
 - ii. Work Cover Authority requirements.
 - iii. Water, drainage, gas, telecommunications and electricity supply authority requirements.
 - iv. Disability Discrimination Act 1992.
- + Blackett Maguire + Goldsmith Pty Ltd cannot guarantee acceptance of this report by Local Council, Fire & Rescue NSW or other approval authorities.
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1.9 REPORT TERMINOLOGY

Accredited Practitioner Fire Safety – Accredited Practitioner Fire Safety is a person who has been accredited by an approved industry organisation to undertake functions outlined in recent amendments to the Environmental Planning and Assessment Regulation 2000 (the EP&A Regulation). The EP&A Regulation requires that an Accredited Practitioner Fire Safety performs the following functions:

- (a) Endorsing plans and specifications for relevant fire safety systems;
- (b) Endorsing fire safety Performance Solution reports;
- (c) Endorsing exemptions to the Building Code of Australia (BCA) for minor works to existing relevant fire safety systems; and
- (d) Undertaking the annual fire safety statement assessment of buildings.

Building Code of Australia – Document published on behalf of the Australian Building Codes Board. The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia and is adopted in NSW under the provisions of the Environmental Planning & Assessment Act & Regulation.

Climatic Zone – Is an area defined in BCA Figure A1.1 and in Table A1.1 for specific locations, having energy efficiency provisions based on a range of similar climatic characteristics.

Construction Certificate – Building Approval issued by the Certifying Authority pursuant to Part 4A of the EP&A Act 1979.

Construction Type – The construction type is a measure of a buildings ability to resist a fire. The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1, except as allowed for—

- (i) certain Class 2, 3 or 9c buildings in C1.5; and
- (ii) a Class 4 part of a building located on the top storey in C1.3(b); and
- (iii) open spectator stands and indoor sports stadiums in C1.7.

Note: Type A construction is the most fire-resistant and Type C the least fire-resistant of the types of construction.

Deemed-to-Satisfy (DTS) Provisions of the BCA – Means the prescriptive provisions of the BCA which are deemed to satisfy the performance requirements.

Effective Height – The 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).

Exit – Any, or any combination of the following if they provide egress to a road or open space;

- + An internal or external stairway.
- + A ramp.
- + A fire-isolated passageway.
- + A doorway opening to a road or open space.

Fire Compartment – The total space of the building; or when referred to in

- + The Performance Requirements – any part of a building separated from the remainder by barriers to fire such as walls and/or floors having an appropriate resistance to the spread of fire with any openings adequately protected; or
- + The Deemed-to-Satisfy Provisions – any part of a building separated from the remainder by walls and/or floors each having an FRL not less than that required for a fire wall for that type of construction and where all openings in the separating construction are protected in accordance with the Deemed-to-Satisfy Provisions of the relevant part.

Fire Resistance Level (FRL) – The grading periods in minutes for the following criteria-

- (a) structural adequacy; and
- (b) integrity; and
- (c) insulation,

and expressed in that order

Fire Source Feature (FSF) - The far boundary of a road adjoining the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

National Construction Code Series (NCC) – The NCC was introduced 01 May 2011 by the Council of Australian Governments. The BCA Volume One (Class 2 to 9 Buildings) is now referenced as the National Construction Code Series Volume One — BCA.

Occupation Certificate (OC) – Building Occupation Approval issued by the Principal Certifying Authority pursuant to Part 4A of the EPA Act 1979.

Open Space – Means a space on the allotment, or a roof or other part of the building suitably protected from fire, open to the sky and connected directly with a public road.

Performance Requirements of the BCA – A Building Solution will comply with the BCA if it satisfies the Performance Requirements. A Performance requirement states the level of performance that a Building Solution must meet.



Compliance with the Performance Requirements can only be achieved by-

- (a) complying with the Deemed-to-Satisfy Provisions; or
- (b) formulating an Alternative Solution which-
 - (i) complies with the Performance Requirements; or
 - (ii) is shown to be at least equivalent to the Deemed-to-Satisfy Provisions; or
- (c) a combination of (a) and (b).

Performance Solution – A Building Solution which complies with the Performance Requirements other than by reason of satisfying the DtS Provisions.

Primary building element – for the purpose of termite protection, means a member of a building designed specifically to take part of the building loads and includes roof, ceiling, floor, stairway or ramp and wall framing members including bracing members designed for the specific purpose of acting as a brace to those members

Relevant Fire Safety System - means any of the following:

- (a) a hydraulic fire safety system comprising a fire hydrant system, or a fire hose reel system, or a sprinkler system (including a wall-wetting sprinkler or drencher system), or any type of automatic fire suppression system of a hydraulic nature.
- (b) a fire detection and alarm system.
- (c) a mechanical ducted smoke control system.

Note: This is resulting from the new regulations that came into effect on 1 October 2017, including the requirement for fire safety statement assessments to be carried out by an Accredited Practitioner Fire Safety.

Rise in Storeys – The greatest number of storeys calculated in accordance with C1.2.

Safe Place means— (a) a place of safety within a building— (i) which is not under threat from a fire; and (ii) from which people must be able to safely disperse after escaping the effects of an emergency to a road or open space.

Sole Occupancy Unit – means a room or other part of a building for occupation by one or joint owner, lessee, tenant, or other occupier to the exclusion of any other owner, lessee, tenant, or other occupier and can include a dwelling and/or office suite.



2.0 BUILDING CHARACTERISTICS

2.1 PROPOSED DEVELOPMENT

The proposed development comprises demolition of existing dwelling houses, consolidation of lots and construction of a two (2) storey residential building containing 18 x Class 2 apartments (comprising 8 x 1 bed and 10 x 2 bed), with on grade carparking (16 spaces) to the North-West and associated landscaping and external works with communal open space/recreational space of circa 226m².

The subject site is bound by residential properties to the North and East, Bramsen Street to the East and Pioneer Road to the West.



Figure 1 – Site Plan

The building has been classified as follows:

BCA CLASSIFICATION:	Class 2 – Apartments/SOU's 1-18 and Class 10b – Associated structures/retaining walls/open-to-the-sky carpark
RISE IN STOREYS: (CLASS 2)	Two (2)
EFFECTIVE HEIGHT (CLASS 2)	Less than 12m
TYPE OF CONSTRUCTION: (CLASS 2)	Type B Construction
MAX. FIRE COMPARTMENT SIZE:	C2.2 N/A for residential sole occupancy units E1.3 fire compartment max compartment size circa 723m ² (<1,000m ²)
TOTAL FLOOR AREA:	Circa 1,300m ²
CLIMATE ZONE:	Zone 5
IMPORTANCE LEVEL:	2*

* To be confirmed at Crown Certificate stage by NER/MIE Structural Engineer.

2.2 DISTANCES TO FIRE SOURCE FEATURES

The distances from the nearest Fire Source Features (boundaries and/or buildings situated on the same allotments) are noted as follows:

Elevation	Fire Source Feature	Distance
North	Side boundary	>3m
East	Side boundary	>3m
West	Far side of the road	>6m
South	Far side of the road	>6m

Note: Fire Source Feature (FSF) – The far boundary of a road adjoining the allotment; or a side or rear boundary of the allotment; or an external wall of another building on the allotment which is not a Class 10 building.

Note: The above assessment assumes no internal allotment boundaries i.e. all three lots will be consolidated and the plan of consolidation will be provided with the Completion Certificate application.



3.0 SUMMARY OF KEY COMPLIANCE ISSUES

The following comprises a summary of the key compliance issues identified under the clause-by-clause assessment in APPENDIX 1 of this report that will be addressed prior to the BCA Certification for the project.

3.1 MATTERS REQUIRING REDESIGN OR ADDITIONAL INFORMATION AT CROWN CERTIFICATE STAGE:

It is noted that the proposed building generally complies with the deemed-to-satisfy provisions of the BCA. Notwithstanding, the below is a preliminary list of matters that based on the current design documentation require further verification, consideration for design changes at the Crown Certificate Stage:

A. CLASS 2 UNITS – MATTERS REQUIRING REDESIGN OR ADDITIONAL INFORMATION AT CROWN CERTIFICATE STAGE:

BCA (DtS) CLAUSE	DESCRIPTION
1. Cl. B1.4	Provide specification on any proposed termite resistant primary timber elements proposed for the development to ensure compliance with AS 3660.1-2014. Note combustible elements such as timber are not permissible within external walls and internal non-loadbearing fire resisting walls requiring an FRL for a building of Type B Construction.
2. Cl. C1.1, Spec. C1.1	All fire-resistant bounding walls and fire resisting ceiling / floor systems are to be tested systems which are suitable in accordance with BCA Cl. A2.2. The minimum FRL's are also to be provided on the section plans to verify compliance with Spec. C1.1. Continuity of fire-resisting internal walls and floors must be achieved into cavity areas, voids, concealed area and common areas. Note: Fire-resistant tested systems / products are to be provided to encapsulate framing / studwork or steel columns supporting floors/slabs. Refer to APPENDIX 3 for minimum required fire resisting construction requirements for this building.
3. Cl. C1.1 / Spec. C1.1 (Cl. 4)	<ul style="list-style-type: none"> + All loadbearing walls must be concrete or masonry and all internal loadbearing walls and slabs are to achieve an FRL of 60/60/60 FRL. + Loadbearing supports/columns to balconies must achieve an FRL of 60/-/-. + Non-loadbearing walls separating apartments from common areas or other apartments must be provided with an FRL of -/60/60. + It appears that the external walls of the building are located <18m from fire souse feature (far side of a road or side/rear boundary) as such, any load bearing external walls or columns within the external walls must have an FRL of not less than FRL of 90/30/- or 90/30/30 where the FSF is within 3-9m from the external loadbearing element, as per Table 4 of Spec C1.1. + All non-loadbearing walls appear to be >3m from a FSF therefore do not require a fire rating. Confirmation is to be provided as to whether the James Hardie Scyon Cladding is loadbearing or not and whether this is capable of being fire-resisting to satisfy Type B Construction requirements.
4. C1.9	<p>For a building of Type B Construction provide details of all ancillary elements to be included the design for review at Crown Certificate stage:</p> <ul style="list-style-type: none"> + All external walls and internal non-loadbearing fire resisting walls requiring an FRL must be non-combustible (including the components of the wall) therefore the below building elements need to be verified as being non-combustible or addressed under a Fire Engineered Performance Solution: <ul style="list-style-type: none"> o Use of any timber packing in association with window/door openings, o Use of timber/ply noggings within walls which are intended to be stiffened or supported for future grabrails and mounting of appliances etc. o Plastic packers used with the external wall, o Acoustic installation/dampener or mechanical grill or internal fire resisting wall composition/assembly. o Bundles of insulated AC condenser services. o Renders used in associated with the external wall or an ancillary element are products which are non-combustible. + All finishes to the external walls need to be reviewed for compliance with this requirement including lightweight cladding products and finishes such as renders which need to be non-combustible. <p>The external finished plans indicate the use of James Hardie Scyon Cladding. Registered Testing Authority reports / data to be provided for the respective products to verify non-combustibility or deemed non-combustibility for a Building of Type B Construction.</p>



BCA (DtS) CLAUSE		DESCRIPTION
5.	C1.14	<p>For a building of Type B Construction provide details of all ancillary elements to be included the design for review at Crown Certificate stage:</p> <ul style="list-style-type: none"> + Ancillary elements (i.e. elements attached to the external wall but which do not form part of the external wall) such as any awning structure or decorative panels/fins are to be non-combustible and comply with BCA Clause C1.14 or comply with the concession under BCA Clause C1.9(e). + Any ancillary attachments associated with any awning structure at ground level must achieve a Spread-of-flame index no greater than 9 and a Smoke-Development-Index no greater than 8 (if the Spread-of-flame is more than 5).
6.	D2.8	Where electrical enclosures are located directly under the stairs common stairways these enclosures need to be provided with an FRL of 60/60/60, with a self-closing -/60/30 door.
7.	D2.16	Details of balustrades suggest heights are greater than 1m however climbable elements are to be located further then 900mm from climbable balustrades / barriers.
8.	Part D3	<p>A report from the Project Accredited Access Consultant is required which confirms the proposed design complies with the relevant access provisions of the BCA, AS 1428.1-2009 and any applicable SEPP or DCP requirements.</p> <p>All accessible features are to be provided to the required common area ramps and stairway systems; it is understood that all stairways are to be made accessible regardless of the location of adaptable apartments or the absence of a passenger lift.</p>
9.	Part E1.3	<p>APFS has provided sweep / coverage diagrams verifying that street and/or feed hydrants can achieve the desired pressure/flow/coverage under AS2419.1-2005 in lieu of an onsite hydrant system and booster however it is understood that a BCA Cl. C2.7 compliant 90/90/90 FRL fire wall(s) need to be implemented in attendance with the APFS's advice to ensure the total floor area of the building is <1,000m² which will permit only 1 hydrant flowing at 10L/s at 150kPa (not 20L/s at 150 kPa).</p> <p>Note 1: Any hydrant design is to be certified by the wet fire APFS with the Crown Certificate application and rely on a current (within 6 months) pressure and flow enquiry by Sydney Water, coverage / sweep diagrams and fire wall(s)/compartmentalisation of the building.</p> <p>Note 2: Implementing fire wall(s)/compartmentalisation of the building may allow dispensation to the flow requirement under AS2419.1-2005 however careful consideration needs to be given regarding future-proofing the building should the Water Agency drop the pressures and flows in the Towns Main.</p>
10.	Part E1.6	Portable Fire Extinguishers (PFE)'s must be shown on plan on the Class 2 levels, 2.5kg ABE PFEs must be located on each level so that no SOU door exceeds 10m from an extinguisher. A review of the plans suggests that only a few PFE's are provided, locations need further consideration with the final revision to satisfy E1.6 & 2444 – 2001.
11.	PR FP1.4	A Performance Solution evidence is to be provided to demonstrate that the roof and external walls (including openings around windows and doors) comply with the weatherproofing requirements of Performance Requirement FP1.4.
12.	F1.4	<p>Where a door entrance above ground level needs to be flush between external and internal areas, and the sub-sill is recessed, then AS4654 requires that a grate is to be provided before the sub-sill to mitigate water ingress into the building.</p> <p>All sub-sills / membranes to all doorways leading to wet areas (including sanitary facilities and external balcony areas) must be design and constructed in strict compliance with AS4654-2012 Parts 1 and 2 to mitigate water leakage in construction.</p>
13.	F2.1	Ensure to provide a washtub and space for clothes washing machine as per F2.1. Note BASIX may require over-and-above requirements as part of the BASIX Certificate commitments. BASIX Commitments TBC early in design and reviewed by BM+G.
14.	F6.3	Details and certification by the Architect to be provided verifying compliance with the condensation management requirements under F6. It is understood that the mechanical exhaust has been detailed by the Mechanical Consultant to meet these requirements.

B. CLASS 2 UNITS – MATTERS REQUIRING FIRE SAFETY ENGINEERED PERFORMANCE SOLUTIONS:

BCA (DtS) CLAUSE		DESCRIPTION
1.	C1.1 / Spec. C1.1 / C1.9 / C1.14	In the absence of two exits serving the top storey the building must be designated Type B Construction, should the design of the building be rationalised to Type C Construction this will require further assessment by a Fire Safety Engineer with the Crown Certificate application.



BCA (DTS) CLAUSE		DESCRIPTION
2.	C3.3/C3.4	There are portions of external wall within adjoining fire compartments which are located within 4m (diagonally) and 6m (opposing) therefore require protection as per BCA Clause C3.3/C3.4 or need to be addressed under the FER which may rationalise treatment to one side only.

C. CLASS 2 UNITS – OTHER MATTERS REQUIRING PERFORMANCE SOLUTIONS:

BCA (DTS) CLAUSE		DESCRIPTION
1.	D3 / AS1428.1-2009	To be confirmed by Access Consultant with their Crown Certificate Access report.
2.	PR FP1.4	Provide a Performance Solution (including Test Reports / Codemark Certification or other suitable evidence) by the Architect or Façade Engineer at Construction Certificate stage to satisfy BCA Performance Requirement FP1.4 – Design for weatherproofing of roofing and external walls.

4.0 CONCLUSION

The proposed development comprises demolition of existing dwelling houses, consolidation of lots and construction of a two (2) storey residential building containing 18 x Class 2 apartments, with on grade carparking (16 spaces) to the North-West and associated landscaping and external works and public space/recreational space at 67-69 Pioneer Road 28-30 Bramsen Street, Bellambi.

Arising from the assessment, key compliance issues have been identified that require further resolution, either by way of Performance Solutions by Accredited Consultants or plan amendments prior to the Crown Certification stage.

Notwithstanding the above, it is considered that the proposed development can readily achieve compliance with the BCA subject to resolution of the matters identified under Section 3 & APPENDIX 1 of this report.



APPENDIX 1 – NCC/BCA ASSESSMENT VOLUMES 1

LEGEND:

+ <u>Complies</u>	The referenced plans show compliance with this clause
+ <u>Compliance Readily Achievable</u>	The referenced plans do not show sufficient information to establish compliance with this clause. Design certification, should be submitted with the application for the Construction Certificate.
+ <u>Further Information Required</u>	The referenced plans do not show sufficient information to establish compliance with this clause. Further details, should be submitted with the application for the Construction Certificate.
+ <u>Performance Solution Required</u>	The referenced plans do not comply with this clause and an Performance Solution is required/proposed to demonstrate compliance with the Performance Requirements
+ <u>Noted</u>	Provisions contained within this BCA clause are provided for guidance, or are to be read in conjunction with other BCA clauses
+ <u>Not applicable</u>	This clause is not applicable or not critical to the proposed development. A portion of these clauses have been removed from the assessment table below where they have no relevance.
+ <u>Does Not Comply</u>	The proposal does not comply with this clause and redesign is required.

4.1 NCC/BCA VOLUME 1 – APARTMENT No's. 1-18 & COMMUNITY RECREATIONAL SPACE

NCC/BCA VOLUME 1 – APARTMENT No's. 1-18		
CLAUSE	REFERENCE	COMMENT
SECTION B	STRUCTURE	
Part B1	Structural Provisions	
B1.2 Determination of individual actions	Structural engineering details prepared by an appropriately qualified structural engineer to be provided to demonstrate compliance with Part B1 in relation to the new structural elements of the building.	<p><u>Compliance Readily Achievable</u></p> <p>Design Statement is to be provided confirming that the design achieves compliance with the following is required at the time of the Crown Certificate application, inclusive of reference to the following Australian Standards (where relevant):</p> <ul style="list-style-type: none"> + AS 1170.0 – 2002 General Principles + AS 1170.1 – 2002, including certification for balustrading (dead and live loads) + AS 1170.2 – 2011, Wind loads + AS 1170.3 – 2003, Snow loads. + AS 1170.4 – 2007, Earthquake loads + AS 1288 – 2006, Glass in buildings + AS/NZS 1664.1-1997 and AS/NZS 1664.2-1997 Aluminium construction + AS 2047 – 1999, Windows in buildings + AS2327-2017, Composite structures — Composite steel concrete construction in buildings + AS 3700 – 2018, Masonry code + AS 3600 – 2018 Concrete code + AS3660.1-2014 (new buildings) and/or AS3660.2-2017 (Alterations to existing buildings) Termite Risk Management + AS 4100 – 1998, Steel Structures and/or + AS/NZS 4505-2012, Garage doors and other large access doors + AS 4600 – 2018, Cold formed steel. + AS 4773.1-2015 & AS4773.2-2015, Masonry in small buildings + AS 5146.1-2015, Reinforcement autoclave aerated concrete – structure



NCC/BCA VOLUME 1 – APARTMENT No's. 1-18		
CLAUSE	REFERENCE	COMMENT
		+ AS 5216-2018, Post-installed and cast-in fastenings in concrete
B1.4 Determination of structural resistance of materials	Materials & Forms of Construction	<p>Compliance Readily Achievable</p> <p>Detail and design certification to be provided at the Crown Certificate stage.</p> <p>With the Crown Certificate application, we are to receive specification on any proposed termite resistant primary timber elements proposed for the development to ensure compliance with AS3660.1-2014 where subterranean termites apply to this site.</p> <p>Note: The following timber types which form primary timber elements are not deemed to be subject to termite attack under Clause B1.4(i):</p> <ul style="list-style-type: none"> a) Naturally termite resistant timber in accordance with Appendix C of AS 3660.1; OR b) Preservative treated timber in accordance with Appendix D of AS 3660.1. <p>Note combustible elements such as timber are not permissible within external walls and internal non-loadbearing fire resisting walls requiring an FRL for a building of Type B Construction.</p>
SECTION C	FIRE RESISTANCE	
Part C1	Fire Resistance and Stability	
C1.1 Type of construction required	The minimum type of fire-resisting construction of a building must be that specified in Table C1.1 and Specification C1.1 except as allowed for in this clause.	<p>Further Information Required/ Performance Solution</p> <p>Type B Construction applies to Units 1-18 in accordance with BCA Volume 1.</p> <p>Refer to Spec C1.1 & Appendix 3 for the table of FRLs which may apply to the Units</p>
C1.3 Buildings of multiple classification	In a building of multiple classifications, the type of construction required for the building is the most fire-resisting type resulting from the application of Table C1.1 on the basis that the classification applying to the top storey applies to all storeys.	<p>Not Applicable</p> <p>Each building is provided with only one classification.</p>
C1.5 – Two storey Class 2, 3 or 9c buildings	<p>A building having a rise in storeys of 2 may be of Type C construction if—</p> <p>(a) it is a Class 2 or 3 building or a mixture of these classes and each sole-occupancy unit has—</p> <ul style="list-style-type: none"> (i) access to at least 2 exits; or (ii) its own direct access to a road or open space; or <p>it is a Class 9c building protected throughout with a sprinkler system complying with Specification E1.5 and complies with the maximum compartment size specified in Table C2.2 for Type C construction.</p>	<p>Further Information Required/ Performance Solution</p> <p>As Class 2 parts on level 1 only have access to a single exit.</p> <p>In the absence of two exits serving the top storey the building must be designated Type B Construction, should the design of the building be rationalised to Type C Construction this will require further assessment by a Fire Safety Engineer with the Crown Certificate application.</p>



NCC/BCA VOLUME 1 – APARTMENT No's. 1-18

CLAUSE	REFERENCE	COMMENT
C1.8 – Lightweight construction	Lightweight construction must comply with Specification C1.8 if used in a wall system in accordance with sub-clauses (a) & (b).	<p>Compliance Readily Achievable:</p> <p>Lightweight construction used in a wall system must comply with Specification C1.8.</p> <p>Lightweight construction used as a fire-resisting covering of a steel column or the like, and where the covering is not in continuous contact with the column must have the voids filled to a height of not less than 1.2m above the floor and where the column is liable to be damaged must be protected by steel or other suitable material.</p> <p>If lightweight construction is used in the proposed development, then details demonstrating required FRL and compliance with this clause must be provided prior to the issue of a Crown Certificate.</p>
C1.9 Non-combustible building elements	<p>In a building of Type A or B construction, the following building elements and their components must be non-combustible.</p> <ul style="list-style-type: none"> + External walls and common walls, including all components incorporated in them, including the façade covering, framing and insulation. + The flooring and floor framing of lift pits. + Non-loadbearing internal walls where they are required to be fire-resisting. <p>This clause contains provisions for combustible materials that may be used wherever a non-combustible material is required under the BCA.</p>	<p>Further Information Required/ Performance Solution</p> <p>Documentation is required to be provided as relevant to:</p> <ul style="list-style-type: none"> + Any external wall claddings. + Any framing or integral formwork systems. I.e. timber framing, sacrificial formwork, etc. + Any external linings or trims. I.e. external UPVC window linings, timber window blades, etc. + Any sarking or insulation contained within the wall assembly. <p>This is not an exhaustive list, and any element incorporated within any external wall assembly must be identified and provided for review. Any departures from non-combustibility or deemed non-combustible materials under this clause (C1.9[e]) are to be advised.</p> <p>The external finished plans indicate the use of hardwood timber Battens on steel frame for Option 2 Terrace. Note that this would not be deemed non-combustible for Option 1 as such would not comply for a Building of Type B Construction.</p> <p>Verification to be provided whether any combustible supports/stiffening is intended to internal non-loadbearing fire resisting walls, this is not permitted for a Building of Type B Construction.</p>

BUILDING ELEMENT	TYPE B CONSTRUCTION
External wall	Non-combustible
Common wall	Non-combustible
Floor and floor framing of lift pit	Non-combustible
All loadbearing internal walls (including those of shafts)	Concrete, masonry or fire-protected timber
Loadbearing fire walls	Concrete, masonry or fire-protected timber
Non-Loadbearing Internal Walls Required to be Fire-Resistant	Non-combustible
Non-loadbearing lift, ventilating, pipe, garbage and the like shafts which do not discharge hot products of combustion.	Non-combustible (subject to conditions outlined in C1.9(b))



C1.10 - Early fire hazard properties	The fire hazard properties of the outlined linings, materials and assemblies in a Class 2 and 7 building must comply with Specification C1.10.	<p>Compliance Readily Achievable</p> <p>The selection of materials will need to consider compliance with Spec C1.10 in regards to its fire hazard properties. Detail to be provided at the Construction Certificate stage as follows:</p> <p><u>Class 2 areas:</u></p> <ul style="list-style-type: none"> + Public Corridors - Minimum group rating of 1, 2 or 3 for wall and ceiling linings + SOUs - Minimum group rating of 1, 2 or 3 for wall and ceiling linings <p><u>Class 2 areas:</u></p> <ul style="list-style-type: none"> + A critical radiant flux of net less than 1.2kw/m2 <p>Copies of AS ISO 9239.1-2003 Test Reports are required to verify that the proposed floor lining assemblies comply with the above requirements prior to installation.</p> <p><i>Note: Insulation in all fire rated walls is to be non-combustible. A copy of the AS 1530.1-1994 Test Report is required for any such insulation to verify that it is "Not deemed combustible" in accordance with Clause 3.4 of AS 1530.1-1994.</i></p>
C1.14 Ancillary Elements	<p>An ancillary element must not be fixed, installed or attached to the internal parts or external face of an external wall that is required to be non-combustible unless it is one of the following:</p> <ul style="list-style-type: none"> + Gutter/downpipe/other plumbing fixture + A flashing. + A grate/grille <2m² associated with a building service. + An electrical switch/GPO/cover plate, or the like. + A light fitting. + A required sign. + A combustible non-required sign may be permitted if achieving a Group Number of 1 or 2 and not extending beyond one storey or fire compartment. + A combustible awning, sunshade, canopy, blind, or shading hood may be permitted at ground storey or a storey immediately above ground storey if complying as relevant to fire hazard properties and not affecting a required exit. + A part of a security, intercom or announcement system. + Wiring. + A paint, lacquer or a similar finish. + A gasket, caulking, sealant, or adhesive associated with the above ancillary elements. 	<p>Further Information Required:</p> <p>Detail of all ancillary elements to be included the design for review at Crown Certificate stage.</p> <p>Note: Textured paint (albeit not a flat paint finish) is commonly used as a final layer or coating to a wall. C1.14(l) does not specify the types of paint that may or may not be permitted. As such, textured paint is a permitted ancillary element.</p>
Part C2	Fire Compartmentation & Separation	
C2.2 General floor area limitations	Limitations on the area and volume of fire compartments in buildings as required by sub-clauses (a), (b) & (c) must be adhered to unless excepted by Clause C2.3.	<p>Complies</p> <p>All parts of the building comply and are within compartment limitations.</p>
C2.6 Spandrels	<p>In a non-sprinkler protected building of Type A construction, openings above other openings within 450mm of a vertical plane must be separated by:</p> <ul style="list-style-type: none"> + A spandrel of not less than 900mm in height (extending minimum 600mm above floor level) of non-combustible construction achieving an FRL of 60/60/60; or + A horizontal projection extending from the external face of the wall no less than 1100mm, extending laterally 450mm beyond each side of the openings, and of non-combustible construction achieving an FRL of 60/60/60. 	<p>Not applicable</p> <p>The buildings are Type B Construction and therefore spandrels are not applicable.</p>



C2.12 Separation of equipment	<p>Equipment as listed below must be separated from the remainder of the building with construction that achieves an FRL of 120/120/120 and doorways being self-closing -/120/30 fire doors:</p> <ul style="list-style-type: none"> + Lift motors and lift control panels; or + Emergency generators used to sustain emergency equipment operating in the emergency mode; or + Central smoke control plant; or + Boilers; or + A battery or batteries installed in the building that has a total voltage of 12 volts or higher and a storage capacity of 200kWh or higher. <p>Separation of on-site fire pumps must comply with the requirements of AS 2419.1.</p>	<p>Further Information Required</p> <p>Any emergency generators, lift motor equipment, boilers where the water is boiled to greater than 100 degrees Celsius, or battery storage enclosures are required to be fire separated from the remainder of the building by construction having a minimum FRL of 120/120/120. Doors to the enclosure are to be self-closing -/120/30 fire</p> <p>Confirmation will be required from the Electrical Consultant as to whether any batteries or UPS used within the building will be contained in an enclosure and be equivalent to or exceed the limitations under Cl. C2.12 i.e. total voltage of 12 volts or higher and a storage capacity of 200kWh or higher. Where this occurs, the relevant enclosure will require 120/120/120 FRL separation from the remainder of the building and incorporate a self-closing fire door of minimum FRL -/120/30. Any services which pass through the enclosures containing this equipment must be treated in accordance with BCA Cl. C3.15 (below).</p>
C2.13 Electricity supply system	<p>An electrical substation located within a building or a main switch room which sustains emergency equipment, must:</p> <ul style="list-style-type: none"> + Be separated from the building by construction achieving an FRL of 120/120/120. <p>Have any doorway protected with a self-closing fire door achieving an FRL of -/120/30.</p>	<p>Further Information Required</p> <p>Any main switch room or substation be separated from the remainder of the building by construction with an FRL of not less than 120/120/120 and any doorways in that construction protected with a self-closing -/120/30 fire door.</p> <p>Confirmation is to be provided as to where the main switch room will be located. Where located within the building, the architectural Plans and wall/door type drawings are to specify an FRL of 120/120/120 and doors consist of self-closing -/120/30 fire doors.</p>
C2.14 Public corridors in Class 2 and 3 buildings	<p>In a Class 2 or 3 building, a public corridor, if more than 40 m in length, must be divided at intervals of not more than 40 m with smoke-proof walls complying with Clause 2 of Specification C2.5 which also requires that smoke-proof construction must only have doorways which are fitted with smoke doors complying with Specification C3.4.</p>	<p>Complies</p> <p>It is noted that the public corridors within the residential parts do not exceed 40m.</p>
Part C3		
Protection of Openings		
C3.1 Application of part	<p>Openings listed in C3.1(a) need not comply with the Deemed-to-Satisfy Provisions of Part C3.</p>	<p>Note</p>
C3.2 Protection of openings in external walls	<p>Openings in an external wall required to have an FRL must be protected in accordance with C3.4 if the opening is less than:</p> <ul style="list-style-type: none"> + 3m from a side or rear boundary; or + 6m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or + Less than 6m from another building on the allotment that is not Class 10. <p>An opening required to be protected under this part must not occupy more than 1/3 of the area of the external wall of the storey in which it is located.</p>	<p>Further Information Required:</p> <p>Compliance readily achieved such that openings do not need protection; setbacks to be documented with the next revision of the architectural plans.</p>



C3.3

Separation of External Walls and Associated Openings in Different Fire Compartments

The distance between parts of external walls and any openings within them in different fire compartments separated by a fire wall must be at least that set out in Table C3.3 unless-

- + Those parts of each wall have an FRL of at least 60/60/60; and
- + Any openings protected in accordance with C3.4.

Method of measurement between adjoining fire compartments is set out below: -

Angle between walls	Min. Distance
0° (walls opposite)	6m
More than 0° to 45°	5m
More than 45° to 90°	4m
More than 90° to 135°	3m
More than 135° to 180°	2m
0° or more	Nil

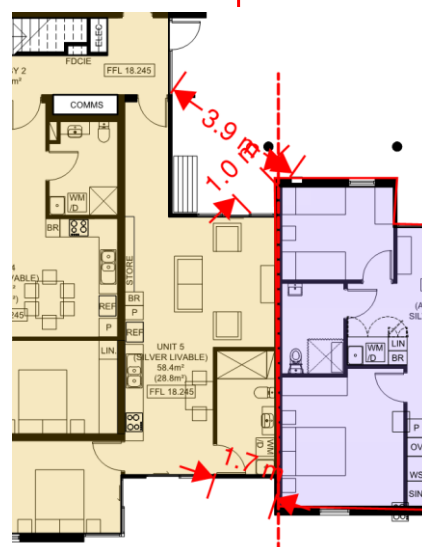
Further Information Required / Performance Solution:

Fire walls achieving a fire rating of 90/90/90 FRL are to be utilised to compartmentalise the building so that the building contains fire compartments are less than 1,000m² as required by BCA Cl. E1.3 & AS2419.1-2005 Table 2.1 which has been specified by the APFS wet Fire to rationalise the number of hydrants required to flow.

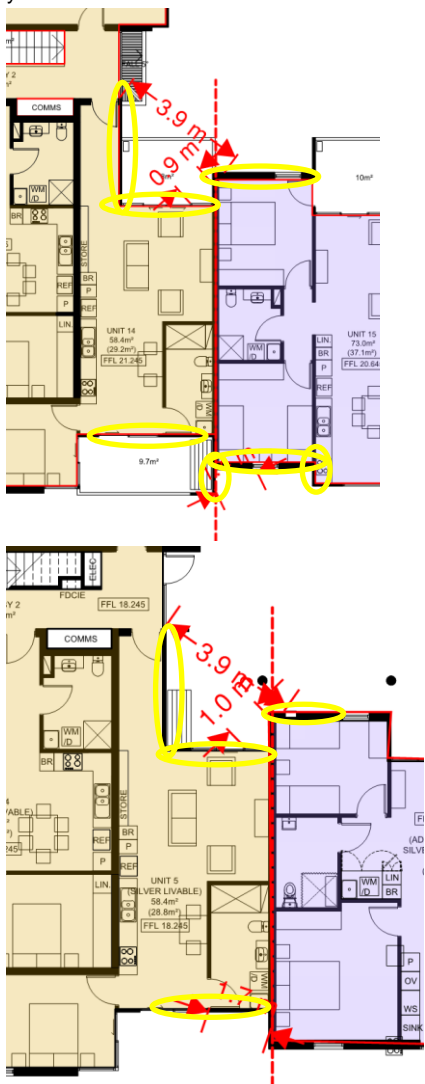
In this regard the fire compartment max compartment size within the building is circa 723m². Once a fire wall is implemented BCA Cl. C3.3 requires assessment of adjoining fire compartments which may require portions of wall (or openings therein) are protected as per BCA Cl. C3.4.

Where exposed, a DTS solution would require the separate fire compartments to be protected with the portions of the external wall (both sides) to achieve 60/60/60 FRL and openings protected as per C3.4 with external drenchers (and fixed in the closed position) and fire dampers achieving -/60/- FRL.

The following portions of external wall are closer than 6m (directly opposite) or closer than 4m (diagonally) which require protection as per BCA Clause C3.3/C3.4:





		<p>The below mark-up identifies the portions of external wall /openings exposed; refer to circled yellow areas:</p>  <p>It is understood that a Fire Engineered Performance Solution could assess the protection only of one side and not both sides. In this regard the Fire Engineered Solution would consider upgrading the fire wall and external (on one side only) to 120/120/120 FRL (double DTS) and look to not protect the other side i.e. the blank walls could be specified as 120/120/120 FRL to alleviate protection of the side which may contain window openings.</p>
<p>C3.4 Acceptable methods of protection</p>	<p>Where protection is required, doorways, windows and other openings must be protected as follows:</p> <ul style="list-style-type: none"> + Doorways – <ul style="list-style-type: none"> (a) Internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or (b) -/60/30 fire doors that are self-closing or automatic closing. + Windows – <ul style="list-style-type: none"> (a) Internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or (b) -/60/- automatic closing fire shutters. + Other openings – <ul style="list-style-type: none"> (a) Excluding voids – internal or external wall-wetting sprinklers, as appropriate; or (b) Construction having FRL not less than -/60/-. 	<p>Compliance Readily Achievable</p> <p>Refer above.</p>



C3.11 Bounding construction	<p>A doorway in a Class 2/3 building must be protected by a self-closing, -/60/30 fire door if it provides access from a SOU to:</p> <ul style="list-style-type: none"> + A public corridor, lobby, or the like; or + A room not within a SOU; or + The landing of an internal non-fire-isolated required stairway; or + Another SOU. <p>And if it provides access from a room not within a SOU to:</p> <ul style="list-style-type: none"> + A public corridor, lobby, or the like; or + The landing of an internal non-fire-isolated required stairway. 	<p>Further Information Required/ Compliance Readily Achievable</p> <p>Each apartment or any other room (that is not a Sole Occupancy Unit) is to be provided with an entry door which is protected by a self-closing, tight fitting, solid core door, not less than 35 mm thick.</p> <p>A door schedule is to be provided with the Crown Certificate application verifying the same.</p>
C3.12 / C3.13 Openings in floors and ceiling for services / and openings in shafts	<p>(a) Where a service passes through—</p> <p>(i) a floor that is required to have an FRL with respect to integrity and insulation; or</p> <p>(ii) a ceiling required to have a resistance to the incipient spread of fire, the service must be installed in accordance with (b).</p> <p>(b) A service must be protected—</p> <p>(i) in a building of Type A construction, by a shaft complying with Specification C1.1; or</p> <p>(ii) in a building of Type B or C construction, by a shaft that will not reduce the fire performance of the building elements it penetrates; or</p> <p>(iii) in accordance with C3.15.</p> <p>(c) Where a service passes through a floor which is required to be protected by a fire-protective covering, the penetration must not reduce the fire performance of the covering.</p>	<p>Compliance Readily Achievable</p> <p>Architect to document the fire separating construction around the service shafts on the compartmentation plan accordingly.</p> <p>Any services or shafts that pass through a building element required to have an FRL with regards to integrity and insulation, fire resistance covering or a ceiling required to have a resistance to the incipient spread of fire, must not reduce the fire performance of the building elements it penetrates or be protected in accordance with C3.15.</p>



C3.15 Openings for service installations	<p>When a service penetrates a building element that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire, that penetration must:</p> <ul style="list-style-type: none"> + Be identical to a tested prototype assembly, tested in accordance with AS 4072.1-2005 and AS 1530.4-2014. + In the case of ventilating or air-conditioning ducts/equipment, the installation must comply with AS 1668.1-2015 	<p>Compliance Readily Achievable/ Further Information Required.</p> <p>Where service installations penetrate the walls, floors, fire resistance covering, or a ceiling required to have a resistance to the incipient spread of fire, or fire-resistant ceiling system required to have an FRL with respect to integrity and insulation they are to be protected by fire seals (fire stopping system) having an FRL of the building element concerned.</p> <p><u>Note:</u> Where a fire resistant or incipient spread ceiling is provided and a sacrificial non-fire-rated ceiling next below this arrangement could minimise the number of fire seals to services. In the absence of a sacrificial non-fire-rated ceiling, which could be utilised to run services, all services which pass through the fire resisting ceiling element are to be treated in accordance with C3.15.</p> <p>Fire Seals are to comply with the requirements of BCA Clause C3.15 and Specification C3.15 noting the following:</p> <p>Fire seals needs to have been tested on the substrate it has been used on i.e. concrete, masonry, fire rated plasterboard, Hebel etc. – a fire stopping system tested in masonry cannot be relied upon for use in Hebel.</p> <ul style="list-style-type: none"> + The maximum size of the services and the penetrations cannot exceed those tested for the fire stopping system + The fire stopping system needs to be used in the same orientation that it has been tested on i.e. floor or wall. A fire stopping system tested through a wall only cannot be relied upon when used for a service penetrating a floor. + The fire stopping system needs to have been tested on the service it is used to seal i.e. metal pipes, UPVC/PVC pipes, conduits, electrical cables etc. A fire stopping system tested on a PVC pipe cannot be relied upon for cables. + The test fire stopping system needs to include all elements specified to achieve the required FRL i.e. intumescent wraps are commonly required/used to achieve the insulation value (when required) for metal pipes, cable trays and large bundles of cables. + Where the mechanical ventilation system penetrates floors or walls that require an FRL, the installation is to comply with AS/NZS 1668.1 - 2015. <p>Proposed fire stopping systems are to be reviewed in detail and approved prior to installation.</p>
C3.16 Construction joints	<p>Construction joints, spaces and the like in and between building elements required to be fire-resisting with respect to integrity and insulation must be protected in a manner identical with a prototype tested in accordance with AS 1530.4 to achieve the required FRL.</p>	<p>Compliance Readily Achievable</p> <p>Details to be included into the design.</p>
C3.17 Columns protected with lightweight construction to achieve an FRL	<p>A column protected by lightweight construction to achieve an FRL which passes through a building element that is required to have an FRL or a resistance to the incipient spread of fire, must be installed using a method and materials identical with a prototype assembly of the construction which has achieved the required FRL or resistance to the incipient spread of fire.</p>	<p>Further Information Required</p> <p>Any proposed columns must be protected in accordance with the identical tested prototype. Details to be included into the design.</p> <p><u>Note:</u> Further Fire Engineering assessment is required where a column is being encapsulated within the party wall and not technically provided with a fire-resisting product which is tested for a column i.e. the column is not encapsulated by a product which is tested on all four sides to achieve its fire-resistance.</p>



Spec.	Specifications
Spec C1.1 Fire-resisting construction	<p>The new building works are required to comply with the requirements detailed under Clause 4 of Specification C1.1 for Type B Construction.</p> <p>Compliance Readily Achievable/ Further Information Required:</p> <p>All building elements are to achieve the required FRL in accordance with Table 4 in BCA Specification C1.1 for Type B Construction as applicable to the Class 2 residential parts (See APPENDIX 3). In this regard the following is noted with respect to our assessment of the development:</p> <ul style="list-style-type: none"> + Further detail is to be provided of the fire resisting bounding walls and how they interface with the fire resisting ceiling / floor next above. The fire-resisting ceiling must extend the full width of the building including cavities, eave voids and voids within balcony/roof/breezeways overhangs. The tested system and product to be used is to be included within the specification or noted on the plan. + Fire resisting construction bounding residential apartments (or SOU's), or rooms not within an SOU which connect with common residential areas, are required to achieve a fire rating of 60/60/60 FRL or loadbearing and -/60/60 for non-loadbearing. + All loadbearing walls must be concrete or masonry and all internal loadbearing walls and slabs are to achieve an FRL of 60/60/60 FRL. + Non-loadbearing walls separating apartments from common areas or other apartments must be provided with an FRL of -/60/60. + It appears that the external walls of the building are located <18m from fire souse feature (far side of a road or side/rear boundary) as such, any load bearing external walls or columns within the external walls must have an FRL of not less than FRL of 90/30/- or 90/30/30 where the FSF is within 3-9m from the external loadbearing element, as per Table 4 of Spec C1.1. + Loadbearing supports/columns to balconies must achieve an FRL of 60/-/-. + All non-loadbearing walls appear to be >3m from a FSF therefore do not require a fire rating.
SECTION D	ACCESS AND EGRESS
Part D1	Provisions for Escape
D1.2 Number of exits required	<p>In addition to horizontal exits, following buildings/areas are required to be provided with two exits-</p> <ul style="list-style-type: none"> + Class 2: Each storey if the building has an effective height >25m. <p>Complies</p> <p>The current architectural plans show two or more exits are provided from each level and each building part.</p>
D1.3 When fire isolated exits are required	<p>In a Class 2 building, every stair serving as a required exit must be fire isolated unless the stair passes through or connects no more than-</p> <ul style="list-style-type: none"> + 3 consecutive storeys in a Class 2 building and one extra storey may be added if: + It is only used for the accommodation of motor vehicles or other ancillary purposes; or + The building is sprinkler protected; or + The required exit does not provide access or egress from the extra storey by construction as follows: <p>Complies:</p> <p>Building contains a rise in storeys of 2 and as such does not require a fire isolated exit.</p>



D1.4 Exit travel distances	<p>This clause specifies the permitted travel distances allowable from Class 2 to Class 9 buildings, specifying the maximum distances for the various uses in each Class of building. With respect to Buildings RL3 and RL4, the following maximum travel distances apply:</p> <p><u>Class 2 part:</u></p> <ul style="list-style-type: none"> + The entrance of any SOU must be not more than: <ul style="list-style-type: none"> - 6m from an exit or from a point which travel in 2 different directions to 2 exits is available; or - 20m from a single exit serving the storey at the level of egress to a road or open space. + No point on the floor of a room which is not within a SOU must be more than 20m to an exit, or a point from which travel in different directions to 2 exits is available. 	<p><u>Complies:</u></p> <p>The stairways are constructed as non-fire-isolated stairway systems and therefore occupant exit travel distances are to be measured to the top most riser within the stairway system.</p> <p>In this regard exit travel distance appear to be less than 6m to the exit however this is to be confirmed with dimensions on the next revision of the architectural plans.</p>
D1.5 Distances between alternative exits	<p>Exits that are required as alternative means of egress must be:</p> <ul style="list-style-type: none"> + Distributed as uniformly as practical within the storey served: + Located so that alternative paths of travel do not converge <6m. + Located no close than 9m and no further than 45m apart in the Class 2 parts + Located no close than 9m and no further than 60m apart in the Class 7a carpark 	<p><u>Complies</u></p> <p>The current architectural plans indicate that the design complies.</p>
D1.6 Dimensions of exits	<p>The unobstructed height throughout a required exit must not be less than 2m and not less than 1,980mm for a doorway.</p> <p>For Class 2, 6, or 7a buildings:</p> <p>The unobstructed width of paths of travel must be not less than 1m (this width dimension is measured clear of any obstructions such as handrails and joinery) however pathways required for persons with a wheelchair require larger circulation at doorsets, turning areas and the like e.g. 1540 x 2070mm circulation zone is to be provided within 2m of the ends of each corridor to facilitate a 180deg turn.</p> <p>The doorways in the building must have a minimum unobstructed <u>clear</u> opening of 850mm with appropriate circulation space in accordance with BCA Clause D3.3 and AS 1428.1-2009.</p> <p>Sub-clause (c) outlines unobstructed width for buildings accommodating 100-200 persons, (d) outlines for more than 200 persons, (e) outlines for spectator stands accommodating more than 2000 persons.</p>	<p><u>Compliance Readily Achievable</u></p> <p>Ensure doorways and paths of travel to exits comply with the requirements of this part.</p>
D1.9 Travel by non-fire isolated stairways or ramps	<p>A non-fire isolated stairway or ramp serving as a required exit must provide a continuous means of travel by its own flights and landings from every storey served to the level at which egress to a road or open space is available. This clause sets out the prescribed travel distances to be provided in required exits of Class 2 to 9 buildings and Class 4 parts of buildings, and also maximum total distances to be taken into account for the various uses in each Class of building.</p> <p>Class 2 building – maximum total distance travelled in a Type A Construction building is 60m. Maximum distance to a door leading to open space from the stair is 15m (or 30m to one of 2 such doorways if travel to each of them from the stair or ramp is in opposite directions).</p>	<p><u>Complies</u></p> <p>No more than 30m is provided from the most disadvantaged unit to a road or open space.</p> <p>Discharge if stair is not more than 15m from doorway provide access to open space.</p>
D1.10 Discharge from exits	<p>The path of travel to the road from a required exit leading to open space must have an unobstructed exit width of that of the required exit, or if larger, 1m.</p> <p>Furthermore, if the discharge point of the exit is at a different level from the road, a stairway or ramp achieving no more than 1:14 must be provided.</p> <p>The discharge point of alternative exits must be located as far apart as practical and be suitably protected from vehicles potentially blocking the exit.</p>	<p><u>Compliance Readily Achievable</u></p> <p>Ensure exit discharges and paths of travel to open space comply with the requirements of this part.</p>
PART D2		
Construction of Exits		
D2.1 Application of part	<p>With the exception of specified clauses in this part the Deemed-to-Satisfy Provisions of this Part do not apply to the internal parts of sole-occupancy units Class 2 buildings and parts of buildings.</p>	Noted.



D2.3 Non-fire-isolated stairways and ramps	<p>This clause requires that required non-fire-isolated stairways and ramps must be either constructed in accordance with D2.2 or the alternative options set out in D2.3 (a) to (c).</p> <p>In a building with a rise in storeys of more than 2, required non-fire-isolated stairways and ramps must be either constructed in accordance with D2.2 or –</p> <ul style="list-style-type: none"> + Reinforced or prestressed concrete; or + Steel at least 6mm thick at all points; or + Timber that has a finished thickness of at least 44mm, has an average density of at least 800 kg/m³ at a moisture content of 12% and has not been joined by means of glue unless it has been laminated and glued with resorcinol/phenol formaldehyde. 	<p>Compliance Readily Achievable</p> <p>Architect and Structural Engineer to ensure the above requirements are documented in the Crown Certificate design drawings and/or schedules where stairways are intended to be non-fire-isolated.</p>
D2.7 Installations in exits and paths of travel	<p>If installed in a path of travel to an exit, electrical distribution boards, communication cupboards and the like containing motors, etc. are to be enclosed with non-combustible construction, and doors are to be provided with smoke seals to the perimeter.</p>	<p>Compliance Readily Achievable</p> <p>Electrical boards and the like are to be located within and enclosed by non-combustible construction or have a fire-protective covering with the doorway suitably sealed against smoke spreading from the enclosure.</p> <p>All cupboards are to be smoke separated from corridors where they facilitate occupant egress.</p>
D2.8 Enclosure of space under stairs and ramps	<p>The space below a required fire-isolated stairway or ramp in a fire-isolated shaft must not be enclosed to form a cupboard or other enclosed space.</p> <p>If the required stairway or ramp is non-fire-isolated, (including an external stairway) any cupboard underneath must have an FRL of 60/60/60, with a self-closing -/60/30 door.</p>	<p>Compliance Readily Achievable</p> <p>Where electrical enclosures are located directly under the stairs common stairways these enclosures need to be provided with an FRL of 60/60/60, with a self-closing -/60/30 door.</p>
D2.13 Goings and risers	<p>The stairs must comply with the tread, riser and going dimensions of this clause and the nosing of the stairs must be provided with a non-slip treads and meet the provisions of AS1428.1-2009.</p> <p>The following will apply in relation to the construction of all stairways:</p> <ul style="list-style-type: none"> + Stairway must have not more than 18 and not less than 2 risers in each flight. + Goings and risers within the stair flights must be constant throughout. + Risers must be solid construction with no gaps and treads must have non-slip finishes and stair nosing's. + Goings and risers are to be in accordance with BCA Table D2.13 	<p>Compliance Readily Achievable</p> <p>All stairs are to have solid risers, and are to have contrast nosing's throughout in accordance with Clause 11.1 of AS1428.1-2009 (see diagram in Part D3 below).</p>

	RISER (R)	GOING (G)	QUANTITY (2R+G)
Minimum	115	250	550
Maximum	190	355	700

Figure 2 – BCA Table D2.13

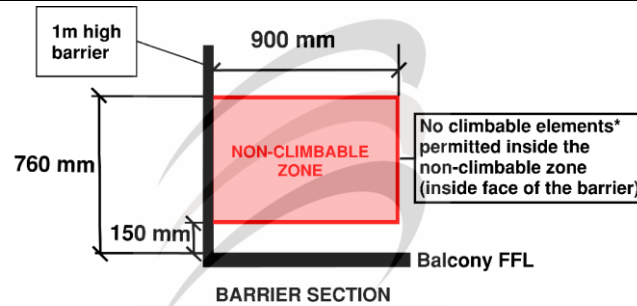
D2.14 Landings	<p>In a stairway –</p> <ul style="list-style-type: none"> + Landings must be a minimum of 750mm long, and where it involves a change of direction the length is measured 500mm from the inside edge of the landing + Have a slip resistance of the surface of the nosing strip in accordance with Table D2.14 and tested in accordance with AS 4586. <p>In addition to the slip resistance ratings detailed within the table, the slip resistance ratings are required throughout the building as detailed within the HB 198 – 2014 Guidebook for Slip Resistance Ratings are provided below</p>	<p>Compliance Readily Achievable</p> <p>Details to be included into the design.</p> <p>On site slip testing will be required at the completion stage</p>
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APPLICATION	SURFACE CONDITIONS	
	DRY	WET
Ramps steeper than 1:14	P4/R11	P5/R12
Ramp steeper than 1:20 but not steeper than 1:14	P3/R10	P4/R11
Tread or landing surface	P3/R10	P4/R11
Nosing or landing strip	P3	P4

Figure 3 – BCA Table D2.14 - Minimum slip resistance ratings for stairs and ramps

D2.15 Thresholds	<p>The threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless –</p> <ul style="list-style-type: none"> + In a part of the building required to be accessible, be provided with a threshold or step ramp to comply with AS 1428.1-2009. + In parts not required to be accessible (i.e. discharge of fire-isolated stairway), the door sill is not more than 190mm above the outside FFL. + In other cases, the doorway opens to a road or open space, external stair or balcony and the door sill is a max. of 190mm above FGL. 	<p>Compliance Readily Achievable</p> <p>Details to be included into the design.</p>
D2.16 Required Balustrades / Barriers	<p>This clause details where balustrades are required to be provided and sets out in specific detail the construction requirements. Typically, the following will apply:</p> <ul style="list-style-type: none"> + Balustrades are required where the fall to the level below is more than 1m in height. The minimum height of a balustrade is 1m above the floor of the landing, walkway or the like; and 865mm above the floor of a stairway or a ramp. + For a fall of more than 4m to the surface level below, a window sill must be a minimum of 865mm in height above the height of the floor surface. + Where the floor is more than 4m above the surface beneath the balustrade any horizontal or near horizontal members between 150mm and 760mm above the floor must not facilitate climbing. + Balustrades must be constructed so as to not permit a sphere of 125mm diameter to pass through. The exception to this is within fire isolated exits within the building, or within a Class 7 or 8 building, where the rails can be positioned a maximum of 460mm apart, so long as a bottom rail is located so a sphere of 150mm cannot pass through the opening between the nosing of the stair treads and the rail or between the floor of the landing, balcony or the like. 	<p>Further Information Required</p> <p>The referenced Architectural details suggest that the minimum balustrade height of 1m is achieved from FFL at landings and balconies however details of balustrades are requested for review to ensure that all horizontal or near horizontal members do not occur within the zone of 150mm to 760mm above the FFL where the fall below is 4m or more.</p> <p>Details are requested for review to ensure that no climbable elements are present in proximity to balustrades i.e.:</p> <ul style="list-style-type: none"> + No climbable elements within 150-760mm above FFL zone on the face of the balustrade / barrier. + All climbable elements such as AC condenser units, GPOs, gas bayonets or taps etc. are located a minimum 900mm away from the inside face of the balustrade / barrier. Coordination with service consultants is required in this regard. <p>Note: A climbable element is any indentation or protrusion >10mm from the vertical surface.</p> <p>The below detail reflects this arrangement with regards to balustrade / barrier minimum clearances & setbacks to non-climbable elements.</p> <p>All required balustrades / barriers are to be designed in accordance with AS1170.1 (and AS1288-2006 where glazed balustrades are to be utilised) with respect to likely loadings and signed off by a qualified NER / MIE Structural Engineer with the Occupation Certificate application.</p>



**Note: A climbable element is any opening/aperture greater than 10mm which is sloped less than 60° to the horizontal plane that provides a hand or foothold.*

Figure 4 – Required Balustrade/Barrier Detail with Minimum Clearances & Setbacks to Non-climbable Elements

<p>D2.17 Handrails</p>	<p>Handrails must be located along at least one side of a ramp or flight unless the width is 2m or more requiring handrails on both sides.</p> <p>Handrails in a Class 2, 3 or 4 must –</p> <ul style="list-style-type: none"> + Be located along at least one side; and + Be located along the full length, except where it is associated with a barrier; and + Have the top surface of the handrail a minimum of 865mm above the stairs or floor; and + Have no obstruction on or above that may break a handhold, except for newel posts, stanchions or the like. <p>These requirements do not apply to handrails referred to in D2.18, a stairway or ramp providing a change in elevation of less than 1m, a land or a winder where a newel post is installed to provide a handhold.</p>	<p>Compliance Readily Achievable</p> <p>Handrails are to be provided to all stairway and ramp systems in accordance with BCA Cl. D2.17 and Part D3 / Table D3.1.</p> <p>Where located in an area required to be accessible all required common area / circulation stairways and ramps require accessible features such as extensions/turndowns/TGSI's etc.</p> <p>For all common and egress stairway systems the internal handrail must be continuous and consistent in height between flights and landings as such it is recommended the top most nosing for the flight next below should be recessed back one tread width as per Figure 28 from AS1428.1-2009 as shown in the below detail.</p> <p><i>Note: we understand that the Access Consultant has provided advice that the stairways do not need to be provided with accessible features under BCA Table D3.1 based on 1) No adaptable units proposed on the first floor areas, 2) no ramp or lift proposed to serve the first floor areas, 3) the common areas on the first floor being the same as those areas on ground floor.</i></p> <p><i>It is understood that the end user would prefer for all stairways and ramps to be accessible and we support this position given that there is always the possibility of a DDA complaint if someone with an ambulant disability has difficulty navigating the stairway system to reach one of the first floor apartments.</i></p> <p>For a stairway which is utilised strictly for egress purposes a single handrail will suffice, noting that the internal handrail must be continuous and consistent in height between landings from one flight to the flight next below.</p> <p>With reference to the architectural details the proposed handrail arrangement comply with this requirement.</p>
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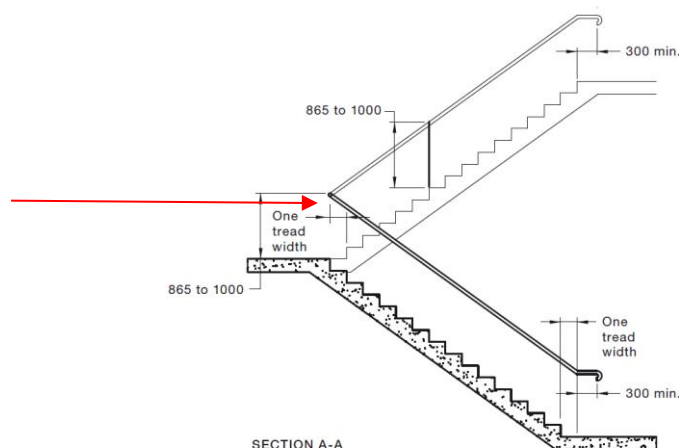


Figure 5 – Stairway Handrail Extension at Landings Showing One Tread Recess vs Handrail Arrangement

D2.18 Fixed platforms, walkways stairways and ladders	A fixed platform, walkway, stairway, ladder, any going and riser, any balustrade or other barrier attached thereto may comply with AS 1657 if it only serves a machinery or plant room or non-habitable part of a sole-occupancy unit in a Class 2 building.	Compliance Readily Achievable: Details demonstrating compliance with this clause are to be incorporated into the architectural drawings/Specification prior to the issue of a Crown Certificate.
D2.19 Doorways & Doors	This clause applies to all doorways and refers to the types of doors that cannot be used in buildings of prescribed uses, the use of power operated doors and the force required to operate sliding doors. A doorway in a required exit (e.g. the doors leading to a fire isolated exit, or the doors leading directly to open space) must not be fitted with a sliding door unless it leads to a road or open space; and the door is able to be opened manually under a force of not more than 110N. If the door is also power operated, it must be opened manually under a force of not more than 110N if there is a malfunction or failure to the power source; or upon the activation of a fire or smoke alarm anywhere in the fire compartment served by the door.	Compliance Readily Achievable: Details demonstrating compliance with this clause are to be incorporated into the architectural drawings/Specification prior to the issue of a Crown Certificate.
D2.20 Swinging doors	A swinging door forming part of a required exit must not encroach the required width of a required exit by way of the swing of the door, or the door itself including associated hardware whilst in the open position e.g. a swinging door must not encroach at any part of its swing by more than 500 mm on the required width (including any landings) of a required stairway; or ramp; or passageway, if it is likely to impede the path of travel of the people already using the exit; and when fully open, by more than 100 mm on the required width of the required exit. Also, must not swing against the direction of egress unless permitted to do so under sub-clause (b).	Complies: All exit doors swing in the direction of egress and this is documented on the next revision of the Architectural details.
D2.21 Operation of latch	A door forming part of a required exit must be readily openable via the provision of single downward lever action hardware located between 900mm and 1.1m from FFL in area required to be accessible, otherwise single pushing action hardware between 900mm and 1.2m from FFL is permitted. The requirements of sub-clause (a) do not apply to the items listed under sub-clause (b) providing concessions for high-security areas, SOUs, fail-safe devices, and the like.	Compliance Readily Achievable: The latch of a door in a required exit, forming part of a required exit or in the path of travel is to be readily openable without a key from the side of that faces a person seeking egress. It is to have a single downward action or pushing action and to be located between 900mm and 1,100mm from the floor. Compliance with this clause can be by-way of accessible 'D' type handles or a doorset provided with a fail-face devices which automatically unlocks the door upon activation of a sprinkler head or detector within the building.

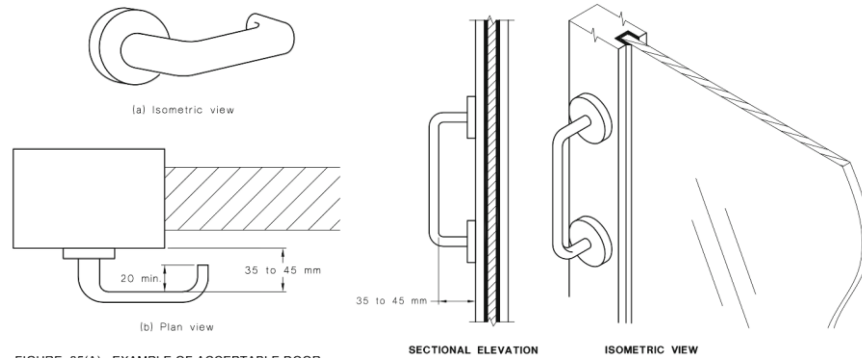


FIGURE 35(A) EXAMPLE OF ACCEPTABLE DOOR
HARDWARE FOR HINGED DOORS

FIGURE 35(B) EXAMPLE OF ACCEPTABLE DOOR HARDWARE FOR SLIDING DOORS

Figure 6 – Required 'D' Type Handles to Accessible Doorset



<p>D2.24 Protection of openable windows</p>	<p>In a Class 2 building, a window must be provided with protection if the floor below the window is 2m or more above the surface beneath.</p> <p>Where the lowest level of the window opening is less than 1.7m above the floor, a window opening must be protected in accordance with sub-clause (b).</p> <p>A barrier no less than 865mm is required to an openable window when a child resistant release mechanism is required, as well as when the floor below the window is >4m above the surface beneath.</p> <p>A barrier required by this part is to comply with sub-clause (d) & (e).</p>	<p>Compliance Readily Achievable</p> <p>Where applicable, all window openings throughout the development must be provided with protection, if the floor below the window is 2m or more above the surface beneath is a Class 2 building.</p> <p>Where the lowest level of the window opening is less than 1.7m above the floor, the operable portion of the window must be protected with a device capable of restricting the window opening or a screen with secure fittings.</p> <p>A device or screen must:</p> <ul style="list-style-type: none"> + Not permit a 125mm sphere to pass through the window opening or screen; + Resist an outward horizontal action of 250N against the window restraining device or screen protecting the opening; and + Have a child restraint release mechanism if the screen or device is able to be removed, unlocked or overridden. <p>A barrier with a height not less than 865mm above the floor is required to an openable window in addition to window protection, when a child resistant release mechanism is required and where the floor below the window is 4m or more above the surface beneath if the window is not provided with protection. The barrier must not permit a 125mm sphere to pass through it and must not contain any horizontal or near horizontal elements between 150mm and 760mm above the floor that facilitate climbing.</p> <p><i>Note: ABCB has issued guidance notes in August 2016 which clarify compliance with openable windows where natural ventilation and the window barrier/restrictor provisions apply under Code. The Explanatory information in NCC Volume Two states that "the ventilating area of a window is measured as the size of the openable sash of the window, i.e. whether it is an awning, casement or sliding window and irrespective of the restrictions on the openable sash". In other words, even with a window restricting device, whether the device has a child resistant release mechanism or not, the window sash is still capable of being fully opened and thus the ventilating area is measured as the size of the sash.</i></p> <p>Details demonstrating compliance with this clause is to be incorporated into the architectural drawings and/or certification prior to the issue of a Crown Certificate.</p>
<p>PART D3</p>	<p>Access for People with Disabilities</p>	
<p>D3.1 General building access requirements</p>	<p>The extent of access required depends on the classification of the building. Buildings and parts of buildings must be accessible as set out in Table D3.1 unless exempted by Clause D3.4.</p> <p>A building, or part thereof, must comply with the requirements of BCA Part 3 if accessibility is deemed to be applicable under Table D3.1, unless otherwise exempted under Clause D3.4.</p>	<p>Compliance Readily Achievable</p> <p>Access for a person with a disability is required to be provided to and within the building as follows:</p> <ul style="list-style-type: none"> + To the entrance doorway of each sole occupancy unit on each level of the building, + To each of the communal spaces provided throughout the building including the communal open space provided on the roof level of the building,



		<ul style="list-style-type: none"> + As this building is to incorporate adaptable units under Affordable Rental Housing SEPP or Councils DCP, each adaptable unit is to incorporate two set of plans, one showing the general layout and the other showing the adaptable layout as per AS4299-1995. + To and within the Recreational and open space area. <p>Design statement to be provided at Construction Certificate stage. We understand an access consultant has been engaged to confirm compliance in this regard.</p>
D3.2 Access to buildings	<p>Accessways must be provided to accessible buildings from the main points of pedestrian entry at the allotment boundary and any accessible car parking space or accessible associated buildings connected by a pedestrian link.</p> <p>Access must be provided to and within all areas normally used by occupants (as required by Clause D3.1) within this building from the main points of pedestrian entry at the allotment boundary; from another accessible building connected by a pedestrian link; and any accessible car parking space.</p> <p>Accessways are to be provided to accessible buildings from the main points of pedestrian entry at the allotment boundary and any accessible car parking space or accessible</p>	<p>Compliance Readily Achievable</p> <p>It is considered that compliance is readily achievable.</p> <p>Access is required to be provided from the main points of pedestrian entry at the allotment boundary to the main building entry, and from the accessible car parking spaces provided.</p> <p>Further information regarding the accessible path of travel from the allotment boundary Design statement to be provided at Crown Certificate stage. We understand an Access Consultant has been engaged to confirm compliance in this regard.</p>
D3.3 Parts of buildings to be accessible	<p>In a building <u>required</u> to be <u>accessible</u>—</p> <ul style="list-style-type: none"> + Access from the street to the principal pedestrian entrance of the building is to be provided in accordance with AS1428.1-2009. + All new doors to and within the building are required to have a clear width of not less than 850mm and comply with the circulation space requirements under AS 1428.1 - 2009. + Where an entry door is proposed to have multiple door leaves (except an automatic opening door) one of the door leaves must have a clear width of not less than 850mm. + The door thresholds to external areas cannot contain any step or change in level exceeding 3mm. + 30% luminance contrasts are to be provided to all new doorways e.g. contrasting between door leaf & jamb; or door leaf & wall; or architrave & wall; or door leaf & architrave and/or door jamb & adjacent wall. + All frameless glass panels or fully glazed doors on an accessway are to be clearly marking in accordance with AS 1428.1/AS1288. In this instance, all frameless glass panel or fully glazed doors, including glazing capable of being mistaken for a doorway or opening, shall be marked with a full width solid non-transparent contrast line not less than 75mm wide is + Walking surfaces to be slip resistant and certification in respect to the slip resistance of any tiles and vinyl will be required at the Occupation Certificate stage to verify compliance with AS/NZS 4586. + Every accessible stairway in the building is required to satisfy requirements under Clause 11 of AS 1428.1 – 2009. This includes, contrast stair nosing's between 50 and 75mm deep across the full width of the path of travel. The strip may be set back 15mm from the front of the nosing and must possess a minimum luminance contrast of 30% to the background. The strip must not extend down the riser more than 10mm. This includes the fire EXIT stairs. + Handrails are required to both sides of non-fire isolated stairs with 300mm extensions (top) and 1 tread width +300mm extensions (bottom) and full 180 degree turn downs in accordance with Section 11 of AS1428.1-2009. + Tactile Ground Surface Indicators are to be provided to all stairs in a building (with the exception of fire isolated exit stairs) required to be accessible. In addition, tactile 	<p>Further Information Required:</p> <p>We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Construction Certificate.</p> <p>Note comments under Cl. F1.4, where the door entrance needs to be flush between external and internal areas and the sub-sill is recessed then AS4654 may require that a grate is to be provided before the sub-sill to mitigate water ingress into the building.</p>



	<p>indicators will need to be provided to an accessway meeting a vehicular way adjacent to a pedestrian entry if there is no kerb or kerb ramp.</p> <ul style="list-style-type: none"> + All door hardware, light switches and GPO's controls are to comply with Sections 13 and 14 of AS1428.1-2009 respectively. + Braille tactile signage is to be provided to all exits. 	
D3.4 Concessions	<p>The following areas, and any path of travel providing access <u>only</u> to these areas, are not required to be accessible:</p> <ul style="list-style-type: none"> + An area deemed inappropriate to access due to the areas particular use + An area that would pose a health or safety risk for people with a disability. 	<p>Compliance Readily Achievable:</p> <p>There are no parts of the building where this concession could readily be applied with the exception of the maintenance areas, plan areas, rainwater storage enclosure areas and maintenance WC.</p>
D3.5 Accessible Carparking	<p>Unless otherwise exempt under sub-clause (b) & (d), accessible carparking spaces are required to be provided in accordance with Table D3.5 and AS 2890.1 in a Class 7a carpark or carparking area required to be accessible.</p>	<p>Compliance Readily Achievable:</p> <p>The provision of accessible car parking spaces and/or adaptable carparking spaces are to be provided for persons with a disability based on a total number of car parking spaces.</p> <p>All accessible car parking spaces including the shared zone are required to be designed in accordance with AS2890.6.</p> <p>We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Crown Certificate.</p>
D3.6 Signage	<p>In a building required to be accessible, braille and tactile signage must be provided to all:</p> <ul style="list-style-type: none"> + Required accessible sanitary facilities + Spaces with hearing augmentation + Ambulant sanitary facilities + Non-accessible pedestrian entrances + Each door required to be provided with an exit sign <p>Braille and tactile signage is to comply with sub-clause (a) and Specification 3.6.</p>	<p>Compliance Readily Achievable:</p> <p>It is considered that compliance is readily achievable for the proposed development. We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Crown Certificate.</p>



- + The DTS Provisions requires Braille signage for egress systems from the building. In this instance the following is required to be provided:-
 - Identify each door required by **E4.5** (door to be provided with exit signs) to be provided with an exit sign and state – **“Exit”**; and **“Level”** followed by the floor number
 - Signs identifying a door required by E4.5 to be provided with an exit sign must be located:
 - a. On the side that faces a person seeking egress; and
 - b. On the wall on the latch side of the door with the leading edge of the sign located between 50mm and 300mm from the architrave; and
 - c. Where (ii) is not possible, the sign may be placed on the door itself.

The provision of Braille and tactile exit signage with the message, *for example*. **“Exit - Level 1”** assists people with vision impairment to orientate themselves in case of an emergency situation and to find an exit and evacuate the area in a safe and equitable manner.
- + **Signage Specification:-**
 The signage is to be:-
 Located between 1200-1600mm above FFL
 - Signs with single lines of characters are to have the line of the tactile characters between 1250mm-1350mm above FFL
 - Signage tactile characters must be raised or embossed to a height between 1mm-1.5mm
 - Upper case letter to be between 20mm-55mm
 Signage is to be contrasting & is to comply with BCA Specification E3.6.
- + **Signage Locations:**
 The Braille & tactile egress signage is to be located adjacent or on (see above) each door that:-
 - Provides direct egress into a fire isolated stairway
 - Provides direct discharge from the storey into a passageway or lobby (airlock) associated with the fire isolated stairway
 - Provide direct discharge from a fire isolated stairway to open space (discharge door)
 - Forms part of a horizontal exit.

The below signage is an *example* of what is required -





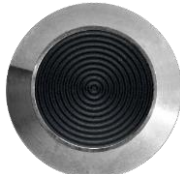
D3.8 Tactile indicators	Tactile ground surface indicators must be provided to: <ul style="list-style-type: none"> + A stairway, other than a fire-isolated stairway; and + An escalator or passenger conveyor; and + A ramp other than a fire-isolated ramp; and + In the absence of a suitable barrier- <ul style="list-style-type: none"> a) An overhead obstruction <2m above floor level; and b) An accessway meeting a vehicular way adjacent to any pedestrian entrance to a building including a pedestrian entrance serving an area referred to in D3.4, if there is no kerb or kerb ramp at that point. 	<p>Compliance Readily Achievable:</p> <p>It is considered that compliance is readily achievable for the proposed development. We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Crown Certificate.</p> <p><u>Note:</u> Crown Certificate plans are to ensure that TGSI's are shown at the top and bottom landing at all accessible ramp systems. It appears that design development maybe required to the internal accessible ramp on upper ground floor.</p>
<p style="text-align: center;">Integrated TGSIs</p>  <p style="text-align: center;">Require 30% luminance contrast to the floor they are installed on</p>	<p style="text-align: center;">Discrete TGSIs</p>  <p style="text-align: center;">45% luminance contrast to the floor they are installed on</p>	<p style="text-align: center;">Composite TGSIs</p>  <p style="text-align: center;">Require 60% luminance contrast to the floor they are installed on</p>

Figure 7 – Types of TGSIs and luminance contrast levels required



D3.11 Ramps	Ramps may be used as part of an accessway where there is a change of level and must comply with the requirements set out in AS1428.1	<u>Compliance Readily Achievable:</u> It is considered that compliance is readily achievable for the proposed development. We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Crown Certificate.
D3.12 Glazing on an accessway	This part requires the provision of a contrasting strip, chair rail, handrail or transom across all frameless or fully glazed doorways and surrounding glazing capable of being mistaken for an opening. The decal must be at least 75mm thick, solid and non-transparent in a colour contrasting 30% to the background and be placed 900-1000mm above the FFL for the full width of the glazing.	<u>Compliance Readily Achievable:</u> It is considered that compliance is readily achievable for the proposed development. We understand an access consultant has been engaged to confirm compliance in this regard. Accordingly, detailed documentation demonstrating compliance with the above provisions together with a Design Statement from the Access Consultant will be required prior to issue of the Crown Certificate.



SECTION E	SERVICES AND EQUIPMENT
Part E1	Fire Fighting Equipment
<p>E1.3 Fire hydrants</p>	<p>A Hydrant system is required to be installed in accordance with AS 2419.1 – 2005 given the total floor area of the building exceeding 500m². Any required Fire Hydrant Booster assembly that is required must be affixed to the external wall and protected by a radiant heat shield that has an FRL of 90/90/90 located 2 metres either side and 3 metres above the outlets. Alternatively, the booster needs to be located at least 10m away from the building and any high voltage power supply.</p> <p>Any Internal Hydrants are to be located within the fire isolated exits or within 4m of the top riser of the non-fire isolated exits (external stairs in lieu of fire stairs). In addition, if floor coverage cannot be achieved supplementary fire hydrants may be provided to suit the operational requirements of the NSW Fire Brigades.</p> <p>External attack hydrants are required to be located not less than 10 metres from the building or protected by construction having an FRL of not less than 90/90/90 and extending 2 metres each side of the hydrant outlets and extending 3 metres above ground level. In addition, Hydrants must be located not less than 10 metres from high voltage main electrical distribution equipment or liquefied petroleum gas.</p> <p>Further Information Required/ Performance Solution</p> <p>Where Street hydrant(s) are being reviewed by CFSP they are to be certified for pressures/flows/coverage as per AS2419.1-2005. Note they must be treated as external hydrants so they are to be setback at least 10m from the building.</p> <p>Details and a Design Certificate will be required by a qualified Hydraulic Fire Services Engineer / Accredited Practitioner Fire Safety prior to the issue of a Crown Certificate.</p> <ul style="list-style-type: none"> + APFS has provided sweep / coverage diagrams verifying that street and/or feed hydrants can achieve the desired pressure/flow/coverage under AS2419.1-2005 in lieu of an onsite hydrant system and booster however it is understood that a BCA Cl. C2.7 compliant 90/90/90 FRL fire wall(s) need to be implemented in accordance with the APFS's advice to ensure the total floor area of the building is <1,000m² which will permit only 1 hydrant flowing at 10L/s at 150kPa (not 20L/s at 150 kPa). In this regard street or onsite feed hydrants may only be necessary. + Any hydrant design is to be certified by the wet fire APFS with the Crown Certificate application and rely on a current (within 6 months) pressure and flow enquiry by Sydney Water, coverage / sweep diagrams and fire wall(s)/ compartmentalisation of the building. + Implementing fire wall(s)/ compartmentalisation of the building may allow dispensation to the flow requirement under AS2419.1-2005 however careful consideration needs to be given regarding future-proofing the building should the Water Agency drop the pressures and flows in the Towns Main. <p>Where applicable, further Information required on the proposed location of Fire Hydrant Booster in order to review for compliance.</p> <p>If required, a Fire hydrant Booster location may require a Fire Engineered Performance Solution due to the multiple main entrances to the building.</p>

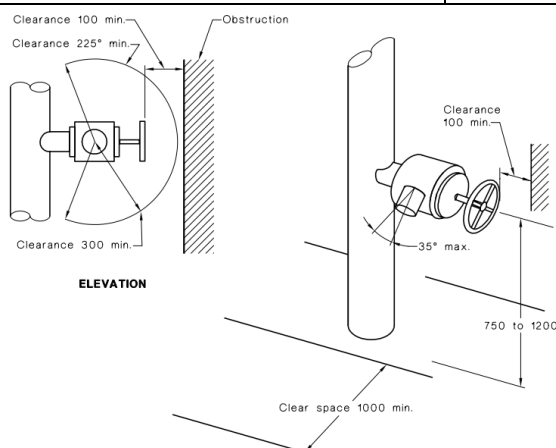


Figure 8 – Fire hydrant accessibility and clearance



E1.5 Sprinklers	A sprinkler system must be installed in a building or part of a building when required by Table E1.5 and comply with Specification E1.5. Sprinkler alarm valves must be located in a secure room or enclosure which has direct egress to a road or open space. Table E1.5 sets out which types of building occupancies and Classes which require having sprinkler systems installed in them.	Further Information Required: Although not required under the DTS provisions of the BCA as the building is <4 storeys, please provide confirmation if sprinkler system is proposed.
E1.6 Portable fire extinguishers	Portable fire extinguishers must be provided as listed in Table E1.6 and must be selected, located and distributed in accordance with Sections 1, 2, 3 and 4 of AS 2444	Compliance Readily Achievable Portable fire extinguishers are required to comply with clause E1.6 and AS 2444-2001 and are also required to cover; <ul style="list-style-type: none"> + In a class 2 building, portable fire extinguishers must be a min. 2.5kg ABE type fire extinguisher; located so that on each storey so that the distance from the entrance doorway of any SOU to a fire extinguisher is not more than 10m. + Class AE or E fire risks associated with emergency services switchboards. + Class A fire risks in normally occupied fire compartments less than 500m² not provided with fire hose reels (excluding open deck carparks) i.e. community area. The location of portable extinguishers is to be shown on the architectural plans.

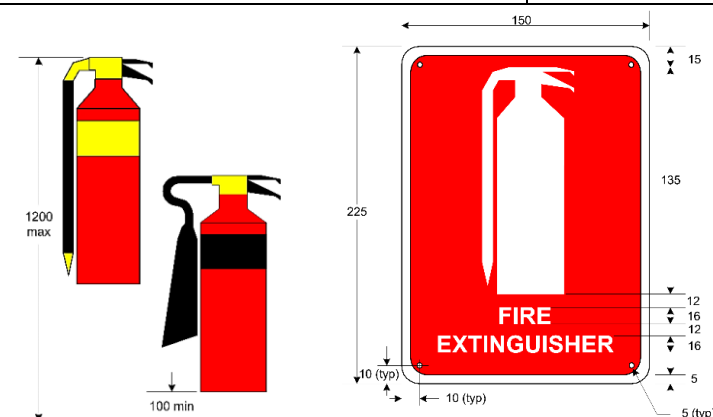


Figure 9 – Portable Fire Extinguisher Mounting Height and signage requirements

E1.9 Fire precautions during construction	In buildings under construction at least one fire extinguisher to suit Class A, B and C fires and electrical fires must be provided at all times on each storey adjacent to a required exit and if the building has reached an effective height of 12m the required hydrant and hose reel systems must be installed, as set out in (b)(ii) and be operational and any required booster connections must be installed.	Compliance Readily Achievable: Contractor to Note with regards to construction stage Portable Fire Extinguishers.
Part E2	Smoke Hazard Management	
E2.2 General requirements for smoke hazard management (including Tables E2.2a & E2.2b)	Buildings must comply with the provisions of Table E2.2a, as applicable to Class 2 to 9 buildings and Table E2.2b as applicable to Class 6 and 9b buildings. Class 2 building: A smoke alarm system is required throughout the building as per Clause 3 of Specification E2.2a of the BCA and the relevant provisions of AS 3786 - 2014.	Compliance Readily Achievable: An Automatic Fire Detection & Alarm System is required to be installed throughout the building in accordance with. Clause 3 or 4 of Specification of BCA Specification E2.2a & AS 1670.1 – 2018 and/or AS 3786 – 2014. Details and a Design Certificate will be required by a qualified Electrical Engineer / Accredited Practitioner Fire Safety prior to the issue of a Crown Certificate.
E2.3 Provision for special hazards	Additional smoke hazard management measures may be necessary due to the nature of a buildings special characteristic, its use, the nature of materials being stored in them and special mix of classifications.	Noted



Part E4		
Emergency Lighting, Exit Signage and Warning Systems		
E4.2 Emergency lighting	This clause details when emergency lighting must be installed in Class 2 to 9 buildings. The requirements for buildings and parts of buildings are detailed in sub-clauses (a) to (i) and each sub-clause must be considered as more than one may apply to any single building.	<p>Compliance Readily Achievable:</p> <p>Emergency lighting shall be provided throughout the building in accordance with the requirements of Clause E4.4 of the BCA and AS 2293.1-2018.</p> <p>Details and design certification to be required by a suitably qualified Electrical Engineer / Accredited Practitioner Fire Safety prior to the issue of the Crown Certificate</p>
E4.3 Measurement of distances	Distance, other than vertical rise, must be measured along the shortest path of travel whether by straight lines, curves or a combination of both.	Noted
E4.4 Design and operation of emergency lighting	Every required emergency lighting system must comply with AS2293.1	<p>Compliance Readily Achievable:</p> <p>Emergency lighting shall be provided throughout the building in accordance with the requirements of Clause E4.4 of the BCA and AS 2293.1-2018.</p> <p>Details and design certification to be required by a suitably qualified Electrical Engineer / Accredited Practitioner Fire Safety prior to the issue of the Crown Certificate</p>
E4.5 Exit signs	An exit sign must be clearly visible to persons approaching the exit and must be installed on, above or adjacent to each door providing egress from a building. Sub-clauses (a) to (d) set out the situations where exit signs are required to be installed.	<p>Compliance Readily Achievable:</p> <p>Exit signs must be clearly visible to person approaching the exit and must be installed on, above or adjacent to:</p> <ul style="list-style-type: none"> + A door providing direct egress from a storey to a stairway, passageway or ramp serving as a required exit. + A door from an enclosed stairway, passageway or ramp at every level of discharge to a road or open space. + A door serving as or forming part of a required exit in a storey required to be provided with emergency lighting. <p>Design statement to be provided at the Crown Certificate stage by the Accredited Practitioner Fire Safety.</p>
E4.6 Direction signs	If an exit is not readily apparent to persons occupying or visiting the building then exit signs must be installed in appropriate positions in corridors, hallways, lobbies, and the like, indicating the direction to a required exit.	<p>Compliance Readily Achievable:</p> <p>Design statement to be provided at the Crown Certificate stage by the Accredited Practitioner Fire Safety.</p>
E4.8 Design and operation of exit signs	Every required exit sign must comply with AS/NZS 2293.1 and be clearly visible at all times when the building is occupied by any person having the legal right of entry into the building.	<p>Compliance Readily Achievable:</p> <p>Design statement to be provided at the Crown Certificate stage by the Accredited Practitioner Fire Safety.</p>
SECTION F		
HEALTH AND AMENITY		
Part F1		
Damp & Weather Proofing		
Performance Requirement FP1.4 Damp and Weatherproofing	<p>A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause</p> <ul style="list-style-type: none"> + Unhealthy or dangerous conditions, or loss of amenity for occupants; and + Undue dampness or deterioration of building elements. 	<p>Performance Solution Required:</p> <p>Compliance for roof coverings can be demonstrated by complying with the requirements of Clause F1.5. However, there are no Deemed-to-Satisfy provisions for this Performance Requirement with respect to External Walls. Accordingly, a Performance Solution is to be provided with the Construction Certificate application, either by using the Verification Methods in Clause FV1 or by way of Expert Judgement.</p>
F1.1 Stormwater drainage	Stormwater drainage must comply with AS/NZ 3500.3	<p>Compliance Readily Achievable:</p> <p>Stormwater drainage engineering detail and Design Certification is to be prepared by an appropriately qualified engineer and are to be submitted with the application for Crown Certificate and are to comply with AS 3500-2018 series & Consent Authority requirements where applicable.</p>



F1.4 External above ground membranes	Waterproofing membranes for external above ground use must comply with AS 4654 Parts 1 and 2.	<p>Compliance Readily Achievable:</p> <p>Design statement to be provided at the Crown Certificate stage.</p> <p>In particular, it is noted that all sub-sills / membranes to all doorways leading to wet areas (including sanitary facilities and external balcony areas) must be design and constructed in strict compliance with AS4654-2012 Parts 1 and 2.</p> <p>There are various factors (e.g. requirement for an accessible pathway or wind class of a particular region) which dictates the step dimensions between the finished floor of the wet area or balcony vs the finished floor of a habitable area / apartment.</p> <p>Where the door entrance needs to be flush between external and internal areas and the sub-sill is recessed then AS4654 may require that a grate is to be provided before the sub-sill to mitigate water ingress into the building.</p>
F1.5 Roof coverings	This clause details the materials and appropriate standards, with which roofs must be covered with. The roofing requirements are set out in sub-clauses (a), (b), (c), (d), (e) & (f) which set out the types of materials that may be used and the adopted Australian Standards that apply to their quality and installation.	<p>Compliance Readily Achievable:</p> <p>Design statement to be provided at the Crown Certificate stage.</p>
F1.6 Sarking	Sarking-type materials used for weatherproofing of roofs must comply with AS/NZS 4200 parts 1 and 2	<p>Compliance Readily Achievable:</p> <p>Details to be included into the design and will need to be referenced as part of the Performance Solution addressing Performance Requirement FP1.4.</p> <p>Note: Refer to Clause C1.9 regarding the need for sarking to comply with Clause C1.9(e).</p>
F1.7 Waterproofing of wet areas in buildings	This clause requires that wet areas in Class 2 to 9 buildings must be waterproofed. It prescribes the standards to which the work must be carried on the construction of rooms containing urinals and their installation.	<p>Compliance Readily Achievable:</p> <p>Water proofing of new wet areas to comply shower enclosure surfaces, floor surfaces in bathrooms, shower rooms, slop hoppers, sink compartments, laundry and sanitary compartments are required to be waterproofed in accordance with AS3740-2010.</p> <p>Design statement to be provided at the Crown Certificate stage.</p>
F1.9 Damp-proofing	<p>Moisture from the ground must be prevented from reaching:</p> <ul style="list-style-type: none"> + The lowest floor timbers and the walls above the lowest floor joists; and + The walls above the damp-proof course; and + The underside of a suspended floor constructed of a material other than timber, and the supporting beams or girders. <p>Where a damp-proof course is provided, it must consist of:</p> <ul style="list-style-type: none"> + A material that complies with AS 2904; or + Impervious sheet material in accordance with AS 3660.1. 	<p>Compliance Readily Achievable:</p> <p>Details to be included into the design.</p>
F1.10 Damp-proofing of floors on the ground	If the floor of a room is laid on the ground or on fill, moisture from the ground must be prevented from reaching the upper surface of the floor and adjacent walls by the insertion of a vapour barrier in accordance with AS 2870. Damp-proofing need not be provided if weatherproofing is not required or the floor is the base of a stair, lift or similar shaft which is adequately drained by gravitation or mechanical means.	<p>Compliance Readily Achievable:</p> <p>Details to be included into the design.</p>
F1.13 Glazed assemblies	Glazed assemblies in an external wall must comply with AS2047 requirements for resistance to water penetration for windows, sliding doors with a frame, adjustable louvres, shop fronts and windows with one piece framing	<p>Compliance Readily Achievable:</p> <p>Details to be included into the design.</p>



Part F2	Sanitary & Other Facilities	
F2.1 Facilities in residential buildings	In a Class 2 building: + Each residential sole occupancy unit is required to be provided with a kitchen sink with facilities for cooking, a bath or shower, a closet pan and washbasin, a washtub and a space for a washing machine and drier.	Further Information Required: The referenced Architectural Drawings indicate that compliance is readily achievable. Sanitary and other facilities are provided as per Table F2.1, where sole-occupancy units are required have kitchen facilities, bath or shower, closet pan, washbasin and laundry facilities in accordance with this part. Ensure to provide a washtub and space for a clothes washing machine as per F2.1. Note BASIX may require over-and-above requirements as part of the BASIX Certificate commitments. BASIX Commitments TBC early in design and reviewed by BM+G.
F2.5 Construction of sanitary compartments	Sanitary compartments must have doors and partitions that separate adjacent compartments and extend – + from floor level to the ceiling in the case of a unisex facility; or + a height of not less than 1.5m above the floor if primary school children are the principal users; or + 1.8m above the floor in all other cases. The door to a fully enclosed sanitary compartment must open outwards; or slide: or be readily removable from the outside of the sanitary compartment, unless there is a clear space of at least 1.2m, measured in accordance with Figure F2.5 between the closet pan within the sanitary compartment and the doorway.	Compliance Readily Achievable: Doors to the toilets within SOUs (or not within SOC's) are to open outwards, be readily removable from the outside of the sanitary compartment unless there is a clear space of at least 1.2m between the closet pan within the sanitary compartment and the nearest part of the doorway. Details to be included into the design.
Part F3	Room Sizes	
F3.1 Height of rooms and other spaces.	The ceiling heights are prescribed and should be checked for all classes and parts during assessment or the design process. The minimum ceiling heights for the Class 2 parts are as follows: + Storage, laundry, corridors, passageways or the like – 2.1m + A habitable room not within a residential apartment: 2.4m excluding a kitchen. + A habitable room is generally 2.4m unless other Environmental Planning Instrument or planning based legislation takes precedence. The minimum ceiling heights in the Class 10b open area community Recreational structure part are as follows: + Corridor, passageways, or the like - 2.1m. + Other than the areas - 2.4m	Compliance Readily Achievable: Design statement to be provided at Crown Certificate stage. Ensure the prescriptive heights of this clause are met within the design and shown on the Crown Certificate plans. Ceiling heights may need to exceed the minimum requirements above as the client's preference is for habitable areas to be designed to SEPP 65 which requires 2.7m clear heights. Although not required under BCA these ceiling heights are superior to Clause F3.1.
Part F4	Light & Ventilation	
F4.1 Natural lighting	Natural lighting must be provided in: Class 2 buildings – to all habitable rooms.	Further Information Required: Natural light (min. 10% of the floor area of the room) is required for all habitable rooms which the BCA defines as: (a) room used for normal domestic activities, and— (b) includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre and sunroom; but (c) excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes-drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods'



F4.2/F4.3 Method and extent of achieving natural lighting	Windows or the like are to have an aggregate light transmitting area of not less than 10% of the floor area of the room.	Compliance Readily Achievable: Details and design certification to be provided by Architect prior to the issue of the Crown Certificate
F4.4 Artificial lighting	Artificial lighting must be provided: <ul style="list-style-type: none"> + To required stairways, passageways, and ramps and where natural light is insufficient. + To all rooms that are frequently occupied, all spaces required to be accessible, all corridors, lobbies, internal stairways, other circulation spaces and paths of egress The artificial lighting system must comply with AS/NZS 1680.0-2009.	Compliance Readily Achievable: Details and design certification to be provided by Electrical Engineer prior to the issue of the Crown Certificate
F4.5 Ventilation of rooms	A habitable room, office, shop, factory, workroom, sanitary compartment, bathroom, shower room, laundry and any other room occupied by a person for any purpose must have natural ventilation complying with F4.6 or a mechanical or air-conditioning system complying with AS1668.2 and AS/NZS 3666.1. <u>Note:</u> NSW F4.5(b) a mechanical ventilation or air-conditioning system complying with AS 1668.2 – the reference to AS/NZS 2666.1 is deleted from the BCA in NSW as the need to comply with this standard is regulated under the relevant section of the Public Health Act 1991.	Compliance Readily Achievable: Details and design certification to be provided by the Mechanical Engineer prior to the issue of the Crown Certificate <u>Note:</u> 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 compartment to another must be designed to operate a smoke control system in accordance with AS 1668.1-2015 or incorporate smoke dampers where the air-handling ducts pass any separating element to another fire compartment and shutdown and the smoke dampers are activated to close automatically via smoke detectors complying with clause 4.10 of AS 1668.1-2015.
F4.6 Natural ventilation	Natural ventilation must consist of openings, windows, doors or other devices which can be opened— with a ventilating area not less than 5% of the floor area of the room required to be ventilated. Additionally, open to a suitably sized space open to the sky or an adjoining room in accordance with F4.7.	Compliance Readily Achievable: Design statement to be provided at the Crown Certificate.
Part F5	Sound Transmission and Insulation	
F5.3 Determination of impact sound insulation ratings	A floor must have the required value for weighted normalised impact sound pressure level with spectrum adaptation term ($L_{n,w}$) determined in accordance with AS ISO 717.2 using results from laboratory measurements, or comply with Specification F5.2. The walls within the Class 2 Residential part of the building that are required to have an impact sound insulation rating must be of discontinuous construction. Note: Discontinuous construction means a wall having a minimum 20mm cavity between 2 separate leaves, and for masonry, wall ties are of a resilient type. For all other construction there is no mechanical link between leaves except at the periphery.	Compliance Readily Achievable: Detail to be included in the design. Design certification to be provided by the Acoustic Engineer at Crown Certificate stage.
F5.4 Sound insulation rating of floors	A floor in a Class 2 or 3 building must have an R_w+C_{tr} (airborne) not less than 50 and an $L_{n,w}$ (impact) not more than 62 if it separates— <ul style="list-style-type: none"> + Sole-occupancy units; or + A sole-occupancy unit from a plant room, lift shaft, stairway, public corridor, public lobby or the like, or parts of a different classification. 	Compliance Readily Achievable: Detail to be included in the design. Design certification to be provided by the Acoustic Engineer at Crown Certificate stage.
F5.5 Sound insulation rating of walls	A wall must have an R_w not less than 45 if it separates SOUs, or a SOU from a kitchen, bathroom, sanitary compartment (excluding an ensuite), laundry, plant room, or utilities room. Where a wall is required to have sound insulation and has a floor or roof above, the wall must continue to the underside of the floor or roof above, or a ceiling that provides the sound insulation required for the wall.	Compliance Readily Achievable: Detail to be included in the design. Design certification to be provided by the Acoustic Engineer at Crown Certificate stage.



F5.6 Sound insulation rating of internal services	<p>If a duct, soil, waste or water supply pipe, including a duct or pipe that is located in a wall or floor cavity, serves or passes through more than one SOU, the duct or pipe must be separated from the rooms of an SOU by construction with a $R_w + C_{tr}$ (airborne) not less than-</p> <ul style="list-style-type: none"> + 40 if the adjacent room is a habitable room (other than a kitchen); or + 25 if the adjacent room is a kitchen or non-habitable room. <p>If a storm water pipe passes through a SOU, it must also be separated in accordance with this clause.</p>	<p>Compliance Readily Achievable:</p> <p>Detail to be included in the design. Design certification to be provided by the Acoustic Engineer at Crown Certificate stage.</p>
F5.7 Sound isolation of pumps	A flexible coupling must be used at the point of connection between the service pipes in a building and any circulating or other pump.	<p>Compliance Readily Achievable:</p> <p>Detail to be included in the design. Design certification to be provided by the Acoustic Engineer at Crown Certificate stage.</p>
Part F6	Condensation Management	
F6.2 Pliable Building Membrane	<p>(a) Where a pliable building membrane is installed in an external wall, it must—</p> <ul style="list-style-type: none"> (i) comply with AS/NZS 4200.1; and (ii) be installed in accordance with AS 4200.2; and (iii) be a vapour permeable membrane for climate zones 6, 7 and 8; and (iv) be located on the exterior side of the primary insulation layer of wall assemblies that form the external envelope of a building. <p>(b) Except for single skin masonry or single skin concrete, where a pliable building membrane is not installed in an external wall, the primary water control layer must be separated from water sensitive materials by a drained cavity.</p>	<p>Compliance Readily Achievable:</p> <p>Detail to be included in the design. Design certification to be provided by the Architect at Crown Certificate stage.</p>
F6.3 Flow Rate and Discharge of Exhaust Systems	<p>(a) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a minimum flow rate of—</p> <ul style="list-style-type: none"> (i) 25 L/s for a bathroom or sanitary compartment; and (ii) 40 L/s for a kitchen or laundry. <p>(b) Exhaust from a kitchen must be discharged directly or via a shaft or duct to outside air.</p> <p>(c) Exhaust from a bathroom, sanitary compartment, or laundry must be discharged—</p> <ul style="list-style-type: none"> (i) directly or via a shaft or duct to outdoor air; or (ii) to a roof space that is ventilated in accordance with F6.4. 	<p>Compliance Readily Achievable:</p> <p>Detail to be included in the design. Design certification to be provided by the Mechanical Consultant at Crown Certificate stage.</p> <p><i>Note the provision for kitchen exhaust and the requirement that it must be discharged directly or via a shaft or duct to outside air. This applies to Class 2 apartments only and not Class 1a villas apartments.</i></p>
F6.4 Ventilation of Roof Spaces	<p>(a) Where an exhaust system covered by Cl. F6.3 discharges into a roof space, the roof space must be ventilated to outdoor air through evenly distributed openings.</p> <p>(b) Openings required by (a) must have a total unobstructed area of 1/300 of the respective ceiling area if the roof pitch is more than 22°, or 1/150 of the respective ceiling area if the roof pitch is not more than 22°.</p> <p>(c) 30% of the total unobstructed area required by (b) must be located not more than 900 mm below the ridge or highest point of the roof space, measured vertically, with the remaining required area provided by eave vents.</p>	<p>Compliance Readily Achievable:</p> <p>Detail to be included in the design. Design certification to be provided by the Mechanical Consultant at Crown Certificate stage.</p>
SECTION G	ANCILLARY PROVISIONS	
NSW G1.101 Provision for cleaning of windows	<p>A building must provide for a safe manner of cleaning any windows located 3 or more storeys above ground level.</p> <p>A building satisfies this requirement where the windows can be cleaned wholly from within the building; or provision is made for the cleaning of the windows by a method complying with the Occupational Health and Safety Act 2000 and regulations made under that Act.</p>	<p>Compliance Readily Achievable:</p> <p>Details to be included into the design with appropriate O&M or management-in-use plan including strategy for safe window cleaning with the Completion Certificate application.</p>
SECTION J	ENERGY EFFICIENCY	



Section J	<p>A BASIX certificate is to be provided with the Construction Certificate application in which the requirements of the certificate are to be documented on the Construction Certificate drawings. However, the following will Section J NSW variations apply for residential parts:</p> <p><u>NSW Part J (A)2.1 – Building Sealing</u></p> <ul style="list-style-type: none"> + Clause J3.3 (Roof lights) + Clause J3.4 (External doors and windows); + Clause J3.5 (Exhaust fans); + Clause J3.6 (Construction of roofs walls and floors); and + Clause J3.7 (Evaporative coolers) <p><u>NSW Part J (A)3 – Air Conditioning and Ventilating Systems</u></p> <ul style="list-style-type: none"> + Clause J5.2 (Air-conditioning and ventilating systems) + Clause J5.3 (Mechanical ventilation systems); + Clause J5.4 (Miscellaneous exhaust systems) <p><u>NSW Part J (A)4 – Hot Water Supply</u></p> <ul style="list-style-type: none"> + Clause J7.2 (Heated Water Supply) <p><u>NSW Part J (A)5 – Access for Maintenance</u></p> <ul style="list-style-type: none"> + Clause J8.3 (Facilities for energy monitoring) 	<p>Compliance Readily Achievable:</p> <p>The Energy Efficiency provisions are applicable as follows:</p> <p>Class 2 Residential parts:</p> <ul style="list-style-type: none"> + BCA (NSW) Sub-section J(A) + BASIX Certificate commitments in accordance with ESD Consultants requirements. <p>Design certification referencing the appropriate Section J assessment to be provided at the Crown Certificate stage.</p>
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GENERAL REQUIREMENTS																					
Sanitary drainage, liquid trade waste drainage systems	<p>Compliance Readily Achievable:</p> <p>Design certification to be provided at the Crown Certificate stage.</p> <p>All sanitary drainage, liquid trade waste drainage systems or stormwater drainage systems onsite are to be designed and implemented in accordance with NCC / BCA Volume 3, AS3500-2018 series, any Development Consent requirements, and Council and/or Water NSW technical requirements.</p>																				
Slip Resistance of building elements / assemblies	<p>Compliance Readily Achievable:</p> <p>It is noted also that certification in respect to the slip resistance of any pedestrian walking finishes, treatments, flooring (including epoxy finishes, tiles and vinyl) throughout the development will be required at the Occupation Certificate stage to verify compliance with HB Handbook 198-2014 and AS/NZS 4586.</p> <p>In addition to the slip resistance ratings detailed under D2.13/D2.14 and Table D2.14, the following slip resistance ratings are required throughout the building as detailed within the HB 198 – 2014 Guidebook for Slip Resistance Ratings:</p> <table border="1" data-bbox="751 1361 1466 1877"> <thead> <tr> <th>Location</th><th>Minimum Slip Resistance</th></tr> </thead> <tbody> <tr> <td>Undercover Car Park</td><td>P3 or R10</td></tr> <tr> <td>Plant areas, Loading Docks Undercover and Wash Bays</td><td>P5 or R12</td></tr> <tr> <td>External walkways and Breezeway etc.</td><td>P4 or R11</td></tr> <tr> <td>Building Entry (wet area)</td><td>P3 or R10</td></tr> <tr> <td>Building Entry (transitional area)</td><td>P3 or R10</td></tr> <tr> <td>Building Entry (dry area)</td><td>P2 or R9</td></tr> <tr> <td>Restaurant, Cafes & Resident Dining Areas & corridor areas with wash basins</td><td>P3 or R10</td></tr> <tr> <td>Bathrooms and ensuites</td><td>P3 or R10</td></tr> <tr> <td>Corridors throughout the remainder of the building which are not associated with the above locations</td><td>P2 or R9</td></tr> </tbody> </table> <p>Note: our experience with laboratory test results/reports suggesting that slip resistance, verified within laboratory conditions, are based on a strict set of parameters / specification for each specimen or product. As such an in-situ onsite test may not achieve this minimum requirement if the product is not installed within these strict parameters or specification or if the installation is a different batch to the product tested in the laboratory.</p> <p>In some instance, we have been privy to floor finishes that have been cleaned or treated in a manner which departed from the laboratory test</p>	Location	Minimum Slip Resistance	Undercover Car Park	P3 or R10	Plant areas, Loading Docks Undercover and Wash Bays	P5 or R12	External walkways and Breezeway etc.	P4 or R11	Building Entry (wet area)	P3 or R10	Building Entry (transitional area)	P3 or R10	Building Entry (dry area)	P2 or R9	Restaurant, Cafes & Resident Dining Areas & corridor areas with wash basins	P3 or R10	Bathrooms and ensuites	P3 or R10	Corridors throughout the remainder of the building which are not associated with the above locations	P2 or R9
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	<p>specimen and subsequently has reduced the slip rating once onsite testing has occurred.</p> <p>This should be considered when selecting finishes or treatments which determined slip resistance for each floor finish. Onsite slip resistance testing by an Accredited Slip Consultant should be considered with the OC application to supplement compliance certification by the manufactures and installers.</p>
Carpark Area Requirements	<p><u>Compliance Readily Achievable:</u></p> <p>All carpark areas are required to comply with the AS2890 series.</p> <p>Traffic consultant to sign-off the completed traffic arrangements (including signage, sealing, line marking etc.) as per any RMS, DA, requirements, AS2890.1 and AS2890.6.</p>



APPENDIX 2 - FIRE SAFETY SCHEDULE

The following table is a list of the required fire safety measures within the building. These measures may be subject to further change pending the outcomes of the final Fire Safety Engineering with the Crown Certificate application:

CLASS 2 UNITS 1-18

STATUTORY FIRE SAFETY MEASURE	DESIGN / INSTALLATION STANDARD
Access Panels, Doors & Hoppers	BCA Clause C3.13 & AS 1530.4 – 2014 and Manufacturer's specifications
Automatic Fire Detection & Alarm System	BCA Spec. E2.2a & AS 1670.1 – 2018, AS 3786-2014
Building Occupant Warning System activated by detection system	BCA Spec. E1.5 Clause 8 and/or Clause 3.22 of AS 1670.1 – 2018
Emergency Lighting	BCA Clause E4.2 & E4.4 & AS 2293.1 – 2018
Exit Signs	BCA Clause E4.5, E4.6 & E4.8 & AS 2293.1 – 2018
Fire Dampers	BCA Clause C3.15, AS 1668.1 – 2015 & AS 1682.1 & 2 – 1990 and manufacturer's specification
Fire Hydrant Systems	BCA Clause E1.3, AS 2419.1 – 2005
Lightweight Construction	BCA Clause C1.8, AS 1530.3 – 1999 & AS1530.4-2014
Loadbearing Internal walls (masonry or concrete)	Spec C1.1 of the BCA
Paths of Travel	EP & A Regulation Clause 186
Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
Smoke Alarms	BCA Volume 1 Clause E2.2 & AS3786-2014
Solid Core Doors	BCA Clause C3.11
Warning & Operational Signs	Section 183 of the EP&A Regulation 2000 & BCA Clause D3.6
Fire Engineered Performance Solution Report	TBC with Crown certificate Application



APPENDIX 3 - FRL OF BUILDING ELEMENTS – TYPE B CONSTRUCTION

Building element	Class of building—FRL: (in minutes)			
	<i>Structural adequacy/Integrity/Insulation</i>			
	2, 3 or 4 part	5, 7a or 9	6	7b or 8
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any <i>fire-source feature</i> to which it is exposed is—				
For <i>loadbearing</i> parts—				
less than 1.5 m	90/90/90	120/120/120	180/180/180	240/240/240
1.5 to less than 3 m	90/60/30	120/ 90/ 60	180/120/ 90	240/180/120
3 to less than 9 m	90/30/30	120/30/ 30	180/90/ 60	240/ 90/ 60
9 to less than 18 m	90/30/—	120/30/—	180/ 60/—	240/ 60/—
18 m or more	—/—/—	—/—/—	—/—/—	—/—/—
For <i>non-loadbearing</i> parts—				
less than 1.5 m	—/ 90/ 90	—/120/120	—/180/180	—/240/240
1.5 to less than 3 m	—/ 60/ 30	—/ 90/ 60	—/120/ 90	—/180/120
3 m or more	—/—/—	—/—/—	—/—/—	—/—/—
EXTERNAL COLUMN not incorporated in an <i>external wall</i> , where the distance from any <i>fire-source feature</i> to which it is exposed is—				
For <i>loadbearing</i> columns—				
less than 18 m	90/—/—	120/—/—	180/—/—	240/—/—
18 m or more	—/—/—	—/—/—	—/—/—	—/—/—
For <i>non-loadbearing</i> columns—				
	—/—/—	—/—/—	—/—/—	—/—/—
COMMON WALLS and FIRE WALLS—	90/90/90	120/120/120	180/180/180	240/240/240
INTERNAL WALLS—				
<i>Fire-resisting lift and stair shafts—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Fire-resisting stair shafts—</i>				
<i>Non-loadbearing</i>	—/ 90/ 90	—/120/120	—/120/120	—/120/120
Bounding <i>public corridors</i> , <i>public lobbies</i> and the like—				
<i>Loadbearing</i>	60/ 60/ 60	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
Between or bounding <i>sole-occupancy units—</i>				
<i>Loadbearing</i>	60/ 60/ 60	120/—/—	180/—/—	240/—/—
<i>Non-loadbearing</i>	—/ 60/ 60	—/—/—	—/—/—	—/—/—
OTHER LOADBEARING INTERNAL WALLS and COLUMNS—	60/—/—	120/—/—	180/—/—	240/—/—
ROOFS	—/—/—	—/—/—	—/—/—	—/—/—



Additional Notes / Requirements

Note 1: Where a combustible material is used as a finish or lining to an external wall or roof, or sunscreen, or awning, to a building element required to have an FRL, the material must be exempted or comply with the fire hazard properties prescribed under C1.10 and it must not otherwise constitute an undue risk of fire spread via the façade of the building.

Note 2: All external walls and common walls are to be non-combustible construction pursuant to AS1530.1. Also, where there are external feature linings or attachments these are to comply with BCA Spec C1.1 Clause 2.4 and BCA Cl/spec.C1.10.

Note 3: All fire resisting walls are to be non-combustible and achieve an FRL in both directions.

Note 4: All internal fire resisting walls are to extend to the underside of the floor next above, the underside to a non-combustible roof or if on the top storey a ceiling with an incipient spread of fire.

Note 5: All load bearing internal walls including loadbearing shaft walls and fire walls are to be concrete or masonry.

Note 6: All internal columns or external columns (not located in the external wall) are to achieve an FRL of 90/-/-.

Note 7: For a building of Type B Construction that contains a Class 2 use, a floor separating storeys, or above a space for the accommodation of motor vehicles or used for storage or any other ancillary purpose, must be constructed so that it:

- a) is at least of the standard achieved by a floor/ceiling system incorporating a ceiling which has a resistance to the incipient spread of fire to the space above itself of not less than 60 minutes; OR*
- b) has an FRL of at least 30/30/30; OR*
- c) has a fire-protective covering on the underside of the floor, including beams incorporated in it, if the floor is combustible or of metal.*

This requirement regarding floors also relates to beams which will need to be considered to the new and existing floor systems to achieve compliance with the above requirement.

It is assumed that the fire rated columns are not provided with vertical or lateral support from the floor/beam arrangement otherwise they may require a fire rating of 90/90/90 FRL.

Note 8: The walls to fire rated shafts must achieve the fire rating from both directions i.e. from inside and outside the shaft. Services shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL similar to the shaft.

Where a services shaft is provided to meet the requirements of Cl. C3.12 that shaft is not to reduce the fire performance of the building elements it penetrates. This applies to any shaft which passes by a floor which is required to achieve a fire rating e.g. 30/30/30 for a floor separating a Class 2 part in a building of Type B Construction.

Note 9: Fire-isolated stair and lift shafts are required to be enclosed at the top of the shaft with fire rated construction having an FRL similar to the shaft e.g. 120/120/120 FRL (loadbearing building elements) serving a building with Class 5 and Class 9b uses.

Note 10: The lintels within any walls required to be fire rated will achieve the same fire rating as the walls within which they are located. This is not applicable if the opening is less than 3m wide and the masonry is non-load bearing or less than 1.8m wide of the masonry is loadbearing.

Note 11: All designers are to review BCA Specification C1.1 for further clarifications regarding required Fire Resistance Levels & FRL's are to be clearly noted on Crown Stage details/plans/specifications.