3 Quarry Road
Dural, NSW

Thelem Consulting Pty Ltd

BCA Compliance Report

Holmes Fire

Version C
4 June 2018
135697.CBCA001c

Holmes Fire

Holmes Fire LP

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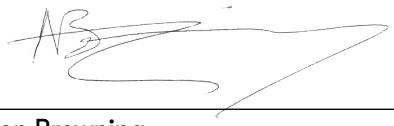
A	29 March 2018	Preliminary Issue for Review	AZB / EXC	LL
B	4 May 2018	Secondary Issue	EXC	LL
C	4 June 2018	Final Issue	EXC	LL

Version	Extent of Revision
B	Revised report based on updated drawings, including revising design to 3 storeys in lieu of 4 storeys generally.
C	Amended report following design progression, including revised RL's, smoke-proof area sizes, and travel distances.

Written By:



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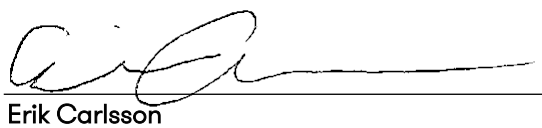

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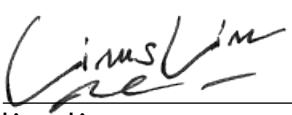

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About Holmes Fire

Holmes Fire is a professional engineering consultancy specialising in the field of fire and safety engineering, including performance based fire engineering, Building Code of Australia assessments and human behaviour analysis. These services are provided for all building classifications, both new and existing, and infrastructure projects.

As the largest specialist fire engineering firm in Australasia, with offices in Sydney, Brisbane, Christchurch, Wellington, Hawke's Bay, and Auckland, as well as Los Angeles and San Francisco, Holmes Fire has extensive experience in delivering performance based fire engineering designs; having completed projects throughout Australia, New Zealand, the United States of America and the Middle East.

Holmes Fire is committed to providing superior service and value to our clients. This is done by finding innovative safety solutions that complement the architectural designs of buildings and meet the needs of Clients, Emergency Services, Approval Authorities and the building users. Holmes Fire believes in communicating effectively with all stakeholders and establishing ongoing relationships.

Executive Summary

This document constitutes a Building Code of Australia 2016 (BCA) assessment report for the proposed retirement village and residential aged care development located at 3 Quarry Road, Dural, NSW.

This assessment has been undertaken based on preliminary architectural drawings (23 May 2018), and has identified the following fire safety compliance issues and possible Performance Solution opportunities:

- Reduced fire-resistance levels of the Ground Level facility areas within Building A and Building D;
- Smoke proof area sizes within the residential aged care building;
- Door swing direction;
- Length of public corridors without smoke separation;
- Travel distance to an exit in the Class 3 areas;
- Travel distance to a point of choice and to an exit (Ground Floor facilities and Basement Levels);
- Travel distance between alternative exits within the Basement Levels;
- Travel distance to a point of choice in the RAC building;
- Travel past openings from discharge of fire-isolated stairways;
- Revolving doors used for egress;
- Location and protection of the fire hydrant booster assembly;
- Stretcher facilities in lifts; and
- Fire service lift control, recall control switch, and drive control switches to lifts serving storeys above 12 m.

A list of the issues of non-compliance, together with recommendations of the method of addressing the issues, be it via a Performance Solution or compliance with the BCA Deemed-to-Satisfy Provisions, is provided within Section 3 of this report.

Where suitable and beneficial to the project, non-compliances are recommended to be amended to comply with the BCA Deemed-to-Satisfy Provisions. However, Holmes Fire is able to offer Performance Solutions for those solutions listed in Section 1.2.

This report is provided in accordance with the fee proposal (135697.F001b, dated 7 February 2018) and 'Agreement for the Provision of Consulting Engineering Services', dated 19 February 2018, as well as Variation Request 001 (135697.FPV001, Version A, dated 1 May 2018), as executed between Holmes Fire LP and the Client. Holmes Fire LP is a New Zealand limited partnership formed under the New Zealand Limited Partnerships Act 2008. No obligations in contract exist between Holmes Fire LP and any other party.

It is assumed that the assumptions and limitations of this report are read and understood. Holmes Fire should be contacted if there are any queries in regards to the content. Holmes Fire takes no responsibility for the misinterpretation by others.

This assessment presents Holmes Fire's interpretation of the Deemed-to-Satisfy Provisions of the BCA. Others may have a differing interpretation.

Contents

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1 INTRODUCTION

1.1 Report Purpose

This report provides an assessment of the level of compliance for the proposed residential seniors living and aged care development, to be located at 3 Quarry Road, Dural, NSW, against the Deemed-to-Satisfy Provisions of Sections C, D (excluding Part D3), and E of the Building Code of Australia (BCA), Volume One of the National Construction Code of Australia 2016, Amendment 1[1].

This assessment has been undertaken based on the preliminary drawings that have been provided to Holmes Fire at the time of this assessment. There are aspects of the building where a definitive assessment cannot be provided due to the preliminary nature of the design at the time of this assessment. There are also areas of the design which appear to be non-compliant due to the preliminary nature of the design, but could be made to comply as design progresses. Where areas of Deemed-to-Satisfy non-compliance are identified, alternatives for compliance have been given.

An inspection was not undertaken due to the proposed nature of the works.

1.2 Potential Performance Solutions

Non-compliances with the BCA Deemed-to-Satisfy Provisions have been identified. Holmes Fire may be able to provide Performance Solutions in relation to the issues identified in Table 1-1.

Table 1-1: Potential Performance Solutions

Issue	BCA Clause	Description	Performance Requirement
1.	C1.1, C2.7, C2.8 and Spec. C1.1	The Class 6 areas are required to be fire separated from the remainder of the building by fire rated construction achieving a Fire Resistance Level (FRL) of at least (180)/180/180. Due to the size of ancillary space (Class 9b – Cinema and Library) the entirety of the Ground Level Facilities areas may require an FRL of 180/180/180. *Holmes Fire may be able to provide a Performance Solution in order to reduce the required FRL of the entirety of the Ground Level to (120)/120/120.*	CP1 and CP2

1 Australian Building Codes Board, National Construction Code Series 2016, Amendment 1, Volume 1, Building Code of Australia, Class 2 to Class 9 Buildings. Australian Building Codes Board, CAN, Australia, 2016.

Issue	BCA Clause	Description	Performance Requirement
2.	C2.5(b)(i)	The residential aged care building is required to be divided into areas not more than 500 m^2 by smoke proof walls. *Holmes Fire may be able to provide a Performance Solution to allow for a rationalised smoke separation strategy with oversized smoke proof areas. Note that it is recommended that smoke proof areas do not exceed 600 m^2.*	CP3
3.	C2.5(b)(i), Spec. C3.4 (Sub-Clause 3.2)	Doors in smoke proof walls must either swing in the direction of egress or in both directions. The residential aged care building has doors in smoke proof walls that do not swing in the direction of egress. *Holmes Fire can provide a Performance Solution to address doors swinging against the direction of egress. However, it is considered to be more cost-effective to re-swing the doors, or have them as dual swing, therefore not requiring a Performance Solution.*	DP2
4.	C2.14	Multiple class 3 building public corridors are connected on multiple levels by way of non-fire-isolated stairways, resulting in excessive corridor lengths. *A Performance Solution may be possible to justify longer public corridors (up to approximately 60 m) without smoke separation.*	EP2.2
5.	D1.4(a)(i)(A)	In Class 3 areas, the entrance doorway of a sole-occupancy unit must be no greater than 6 m from a single exit or from a point of choice of alternative exits, other than on ground level where this distance may be 20 m. This distance is exceeded on above ground levels, being up to approximately 12 m. *Holmes Fire can provide a Performance Solution to address the extended travel distances.*	DP4 and EP2.2

Issue	BCA Clause	Description	Performance Requirement
6.	D1.4(c)(i)	In Class 6, 7a, 9b, and 9c areas, every point on a floor must be located no more than 20 m from a single exit or to a point of choice of exits, to which the maximum travel to the nearest exit shall be no greater than 40 m. ▪ Travel distances within the basement carpark exceed 20 m to appoint of choice and 40 m to an exit (see Appendix C). *Holmes Fire can provide a Performance Solution to address the extended travel distances.* ▪ Travel distance within the Ground Floor facility areas exceed 20 m to a point of choice and 40 m to an exit (see Appendix C). *Holmes Fire can provide a Performance Solution to address the extended travel distances within the Ground Floor Facility areas.* ▪ Travel distance in the RAC building, on storeys above ground, exceed 20 m to a point of choice, being up to approximately 33 m (see Appendix C). *Holmes Fire can provide a Performance Solution to address the extended travel distances within the RAC building. However, it is considered to be more cost effective to provide secondary doors swinging in the direction of egress in the smoke walls, as indicated in* Appendix C. *The travel distance to a point of choice, when addressed through a Performance Solution, is recommended to not exceed 30 m, and the travel distance to the nearest exit to not exceed 60 m.*	DP4 and EP2.2
7.	D1.5(c)(ii)	In a Class 7a building the maximum travel distance between alternative exits must be no greater than 60 m. Additional stairs are required throughout the basement carpark, see Appendix C. *Holmes Fire can provide a Performance Solution to permit an increased distance between alternative exits within the basement levels, thereby reducing the number of stairways and increasing usable floor space.*	DP4 and EP2.2

Issue	BCA Clause	Description	Performance Requirement
8.	D1.7(c)	A path of travel from a fire-isolated exit discharge must not pass within 6 m of unprotected openings, measured at right angles to the path of travel, in the building's external walls. Fire-isolated stairs serving the basements and the RAC building discharge such that occupants are required to travel within 6 m of openings. *If the subject openings are not proposed to be protected internally by drenchers or similar, Holmes Fire can provide a Performance Solution to address unprotected openings within 6 m of the path of travel.*	DP5
9.	D2.19	Revolving doors are not permitted for egress. *A Performance Solution is possible to justify the use of the Ground Floor revolving doors for exit purposes.*	DP2
10.	E1.3	It is noted that the hydrant booster assembly is required to be protected and located in accordance with AS 2419.1-2005. However, a *Performance Solution may be possible to justify departures from these requirements.*	EP1.3
11.	E3.2	Stretcher facilities are required in lifts serving storeys at an effective height of more than 12 m, and within Class 9c aged care buildings. *A performance solution may be possible to omit stretcher facilities from Class 3 blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	EP3.1
12.	E3.7, E3.9 & E3.10	Building has an effective height of more than 12 m. Therefore, fire service lift control including recall and drive control switches are required to any lift serving a storey at an effective height of more than 12 m. *A performance solution may be possible to omit these fire service lift provisions from blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	EP3.2

1.3 Relevant Stakeholders

The relevant stakeholders for the subject project are listed in Table 1-2.

Table 1-2: Relevant Stakeholders

Name	Company	Role
Enrique Blancodecordova	Marchese Partners	Architect
Nathan Grice	Thelem Consulting Pty Ltd	Project Manager / Client
Erik Carlsson	Holmes Fire	BCA Consultant / Fire Engineer

1.4 Assumptions

This BCA assessment has been prepared based upon information provided to Holmes Fire. Holmes Fire has not verified the accuracy or completeness of this information and assumes that the information provided is accurate and complete. Holmes Fire shall not be responsible for any errors or omissions which may be incorporated into this report as a result.

It is assumed that the limitations and assumptions of this report are read and understood. The author of this report should be contacted if there are any queries in regards to the content. Holmes Fire takes no responsibility for the misinterpretation by others.

1.5 Limitations

A number of issues within the BCA are recognised to be interpretive. Where these issues are encountered, interpretations have been made consistent with Holmes Fire policy which is believed to be in accordance with standard industry practice.

Unless specifically requested by the client or stated in this report, issues above and beyond the BCA fire safety requirements have not been considered. This may include, but not be limited to, property protection, business continuance, egress for persons with disabilities and extent or availability of insurance. This report does not include review of the subject building against the following documents and provisions:

1) The detailed requirements of each Australia Standard referenced within the BCA that has been cited as being relevant to this development;
2) Requirements of Energy Australia for substations;
3) The Disability Discrimination Act, Work Health & Safety legislation and Dangerous Goods; and
4) The Deemed-to-Satisfy Provisions of Section B “Structure” (this Section includes structural requirements for the building that would need to be reviewed by a structural engineer); Part D3 (Access for People with Disabilities); Section F (Health & Amenity); and Section J (Energy Efficiency).

2 BUILDING AND OCCUPANT CHARACTERISTICS

2.1 Description of Building

The proposed development is a residential seniors living facility. The facility comprises multiple three storey structures atop of three stories of basement carpark. The facility will also comprise restaurant, bar, café, library, cinema and residential aged care areas throughout, with a wellness centre and communal areas on the site. The wellness centre is a standalone building with a floor area of less than 500 m².

It is noted that all fire compartments are less than 2,000 m² but the total floor area of the development is greater than 6,000 m², which constitutes a trigger for referral to Fire & Rescue NSW (FRNSW) for certain Performance Solutions. The building will be fully sprinkler protected.

The various structures on the site are as indicated below and in the legend in Figure 2-1. Note that Basement 1, 2 and 3 are all Class 7a carparking storeys connecting all buildings except the wellness centre.

- **Building A –** 3 storeys. Facilities (Class 3, 6, and 9b) at Ground Floor, Class 3 on Level 1 and 2.
- **Building B** – 3 storeys. Class 3 throughout.
- **Building C** – 3 storeys. Class 3 throughout.
- **Building D** – 3 storeys. Facilities (Class 3, 6, and 9b) at Ground Floor, Class 3 on Level 1 and 2.
- **Building E** – 3 storeys. Class 3 throughout.
- **Building F** – 3 storeys. Class 3 throughout.
- **Building G** – 3 storeys. Class 3 throughout.
- **Building H** – 3 storeys. Class 3 throughout.
- **RAC Building** – 4 storeys. Class 7a in Basement 1, Class 9c above.
- **Wellness** – 1 storey. Class 9b (gym / spa and associated facilities) and 10b (swimming pool).

Note that the RAC Building is technically considered 4 storeys, as the basement beneath the RAC building has external walls with a height of more than 1 m above the ground next to it. Therefore, the basement storey in this area does not meet the exception provided in BCA Clause C1.2(b)(ii), resulting in this portion of the building having a rise in storeys of 4 (Basement 1 to Level 2). Refer to Appendix A for guidance on the calculation of Rise in Storeys.

Additionally, the RAC building is split between a south portion and a north portion, with the RL's listed below and indicated in Figure 2-2:

- Basement 2 = 196.45 m
- North Basement 1 / South Ground Floor = 199.35 m
- North Ground Floor / South Level 1 = 203.3 m
- North Level 1 / South Level 2 = 207.3 m
- North Level 2 = 210.4 m

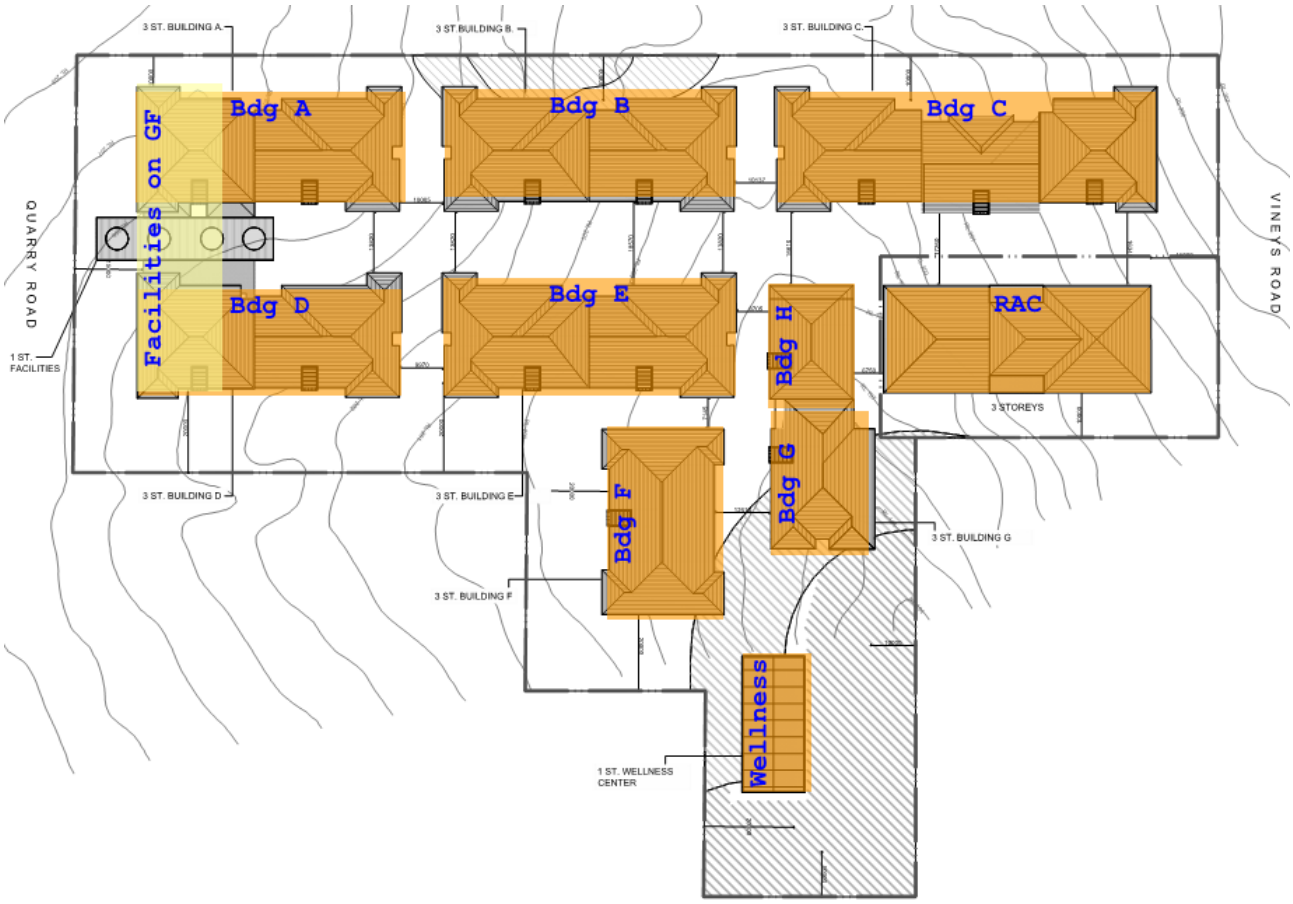


Figure 2-1: Building Legend

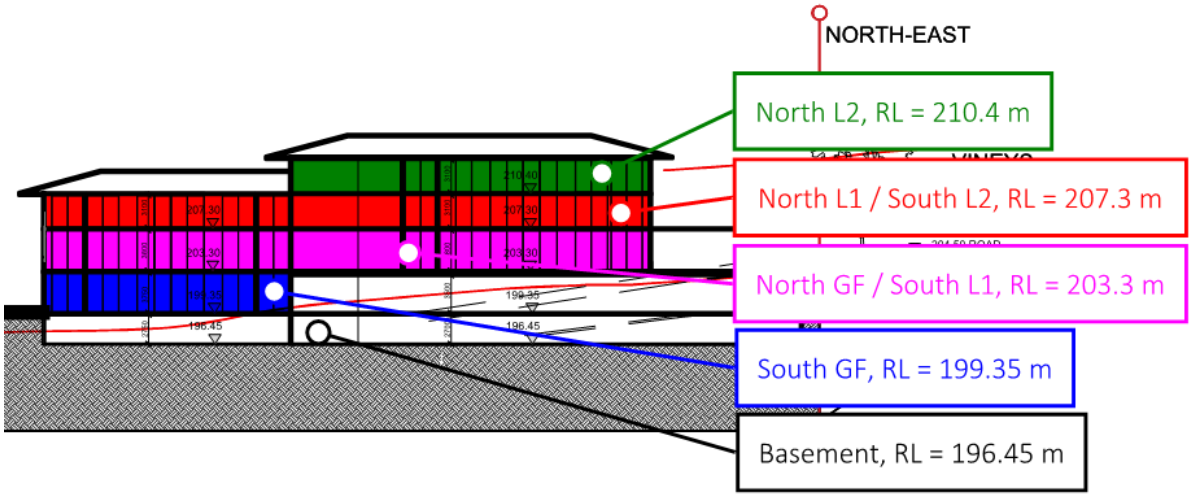
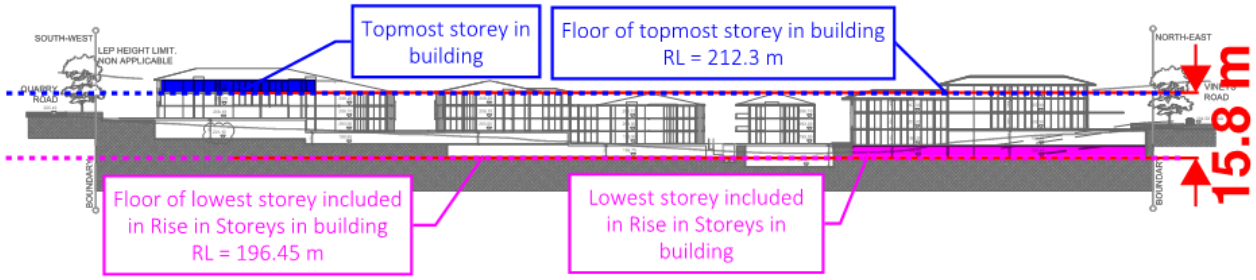


Figure 2-2: Section through RAC Building - Floor Levels

2.2 Building Code of Australia Summary

Table 2-1 provides a general description of the building under the Deemed-to-Satisfy Provisions of the BCA.

Table 2-1: BCA General Description

BCA Clause	Description
A1.1 Effective Height[2]	Less than 25 m, but more than 12 m (~ 15.85 m, see Figure 2-3)
 Figure 2-3: Effective Height	
A3.2 Classification	Class 3 – Residential accommodation for the aged Class 6 – Restaurant / Café / Bar *(GF of Building A & D)* Class 7a – Basement carpark Class 9b – Library / Cinema *(GF of Building A & D)* & Gym / Spa *(Wellness Centre)* Class 9c – Aged care *(RAC Building)* Class 10b – Swimming Pool
C1.1 Type of Construction Required	Type A construction
C1.2 Rise in Storeys	4, with 6 storeys contained

[2] The effective height is the distance from the lowest floor included in the rise in storeys, to the topmost floor irrespective of whether that top floor is included in the calculation of rise in storeys, in accordance with the definition of 'Effective Height' in the BCA.

<table>
<tr><th>BCA Clause</th><th>Description</th></tr>
<tr><td>C2.2
Floor Area and Volume Limitations</td><td>
<table>
<tr><th></th><th>Class 9b, 9c</th><th>Class 6</th></tr>
<tr><td>Maximum floor area:</td><td>8,000 m²</td><td>5,000 m²</td></tr>
<tr><td>Maximum volume:</td><td>48,000 m³</td><td>30,000 m³</td></tr>
</table>
Area and volume limitations do not apply to Class 3 buildings or to a carpark provided with a sprinkler system.
</td></tr>
<tr><td>C2.5
Class 9c Buildings</td><td>Smoke-proof areas: 500 m²
Each storey in the Class 9c RAC building is currently approximately 1,400 m². The greatest smoke-proof areas appear to exceed 500 m², being up to approximately:
South GF (RL 199.35) - 570 m²
South L1 (RL 203.3) – 625 m²
North GF (RL 203.3) – 510 m²
South L2 (RL 207.3) – 625 m²
North L1 (RL 207.3) – 570 m²
North L2 (RL 210.4) – 605 m²</td></tr>
</table>

2.3 Occupant Characteristics

Occupants within the apartments are expected to be mainly elderly occupants. Occupants may be from a wide range of cultural, educational, demographic and religious backgrounds. The diversity in backgrounds can result in different behaviours and actions in the event of a fire. People with disabilities may also be present to the same proportion as expected within the general population. The occupancy of the building is sufficiently large and uncensored to assume that there will be a mix of abilities amongst the individuals.

Based on the occupant densities specified within Table D1.13 of the BCA, and assuming 2 persons/bedroom for the residential areas, the approximate occupant load is provided within Table 2-2. Note that for the facilities lobby spaces, an occupant load of 10 m²/person has been assumed, akin to that for office use. The occupant numbers are approximate only for illustrative purposes. Detailed occupant load calculations will be undertaken as the design progresses. Note that the occupant load for the carparks has been excluded from the total, as carpark occupants are assumed to be going to or from other areas of the building.

Table 2-2: Number of Occupants

Floor / Area	Density	Floor Area	No. of Occupants
Restaurant / Café / Bar	1 m²/person	340 m²	340
Facility Lobby Spaces & Ancillary Office Spaces	10 m²/person	310 m³	31
Cinema	1 person / seat	-	56
Block A	2 person / bedroom	-	84
Block B	2 person / bedroom	-	120
Block C	2 person / bedroom	-	180
Block D	2 person / bedroom	-	80
Block E	2 person / bedroom	-	140
Block F	2 person / bedroom	-	80
Block G	2 person / bedroom	-	60
Block H	2 person / bedroom	-	30
RAC residential areas	1 person / room	-	74
RAC patient care / admin areas	10 m²/person	550 m²	55
Basement 1 carparking	30 m²/person	8,500 m²	280
Basement 2 carparking	30 m²/person	6,000 m²	200
Basement 3 carparking	30 m²/person	3,000 m²	100
			Total ~1,400 occupants

2.4 Fire Safety Provisions

The building is to be provided with the following fire safety measures, listed in Table 2-3.

Table 2-3: Fire Safety Provisions

Fire Safety Measure	Standard of Performance
Access panels, doors and hoppers to fire-resisting shafts	BCA 2016 Clause C3.13
Automatic door closers	BCA 2016 Clause C3.4, C3.8, C3.11, Spec C3.11
Automatic fail safe devices	BCA 2016 Clause D2.19, D2.21, D2.22, Spec C3.11
Automatic fire detection and alarm system	BCA 2016 Clause C3.8, C3.11, E2.2a, Spec C3.4, Spec E2.2a, AS 1670.1-2015
Automatic fire suppression system	BCA 2016 Clause E1.5, Spec. E1.5, Spec. E2.2a, AS 2118.1-1999 or 2017 (as applicable), AS 2118.4-2012 (residential areas – as applicable)
Emergency evacuation procedures	AS 3745-2010, Clause 43 of the Work Health & Safety Regulation 2011
Emergency lighting	BCA 2016 Clause E4.2 & E4.4, AS 2293.1-2005
Exit and directional signage	BCA 2016 Clause E4.5, NSW E4.6 & E4.8, AS 2293.1-2005
Fire alarm monitoring system	BCA 2016 Spec E2.2a, AS 1670.3-2004, AS 2118.1-1999 or 2017 (as applicable)
Fire dampers	BCA 2016 Clause E2.2, AS/NZS 1668.1-2015, AS 1682.1-2015
Fire doorsets	BCA 2016 Clause C2.12, C2.13, C3.4, C3.8, C3.11, Spec C3.4, AS 1905.1-2015
Fire hydrant system	BCA 2016 Clause E1.3, AS 2419.1-2005
Fire hose reel systems	BCA 2016 Clause E1.4, AS 2441-2005
Fire seals (protecting openings and service penetrations in fire resisting components of the building)	BCA 2016 Clause C3.15, Spec C3.15, Manufacturer's specifications
Lightweight construction	BCA 2016 Clause C1.8, Spec A2.3, Spec C1.8, Manufacturer's specifications
Mechanical air handling systems	BCA 2016 Clause E2.2, Spec E2.2a, AS/NZS 1668.1-2015, AS 1668.2-2012
Openings in fire-isolated lift shafts	BCA 2016 Clause C3.10, AS 1735.11-1986

Fire Safety Measure	Standard of Performance
Occupant warning system	BCA 2016 Spec. E1.5, Clause E2.2, Spec. E2.2a, AS 1670.1-2015
Path of travel for stairways, passageway and ramps	Clauses 183-186 of the Environmental Planning and Assessment Regulation 2000
Portable fire extinguishers	BCA 2016 Clause E1.6, AS 2444-2001
Pressurising systems	BCA 2016 Clause E2.2a, AS/NZS 1668.1-2015
Required automatic exit doors	BCA 2016 Clause D2.19, D2.21
Smoke seals	Ambient and medium temperature smoke seals tested to AS 6905-2007 Installation as per Manufacturer's specifications
Smoke dampers	BCA 2016 Clause C2.5, AS/NZS 1668.1-2015, AS 1682.1-2015
Sound systems and intercom systems for emergency purposes	BCA 2016 Clause E4.9, AS 1670.4-2015, AS 7240.24-2015
Warning and operational signs	BCA 2016 Clause D2.23, E3.3, Clause 183 of the Environmental Planning and Assessment Regulation 2000
Maintenance	The latest relevant industry maintenance standards, these currently being AS 1851-2012 (the maintenance standard for active fire protection measures) and AS/NZS 2293.2-1995 (the maintenance standard for exit lighting and signage).

3 BUILDING ASSESSMENT

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
Part A1 – Interpretation and Part A3 – Classifications							
A1.1	Definitions The effective height is the distance from the lowest floor included in the rise in storeys, to the topmost floor irrespective of whether that floor is included in the calculation of rise in storeys, in accordance with the definition of 'Effective Height' in the BCA: **Effective height** means 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).	Effective Height: ~15.85 m	☒	☐	☐	☐	☐
A3.2	Classifications	The subject building is classified as: Class 3 – Residential accommodation for the aged Class 6 – Restaurant / Café / Bar (GF of Building A & D) Class 7a – Basement carpark Class 9b – Library / Cinema (GF of Building A & D) & Gym / Spa *(Wellness Centre)* Class 9c – Aged care (RAC Building) Class 10b – Swimming Pool	☒	☐	☐	☐	☐
Part C1 – Fire Resistance and Stability							
C1.1 Type of construction required	The type of construction is based on the building's rise in storeys and classification (refer to Table C1.1)	Type A construction is required. The Fire Resistance Level (FRL) is generally: Class 3 – 90/90/90, permitted to be reduced to 60/60/60 generally (BCA Specification C1.1, Clause 2.9) Class 6 – 180/180/180 Class 7a – 120/120/120, permitted to be reduced to 60/60/60 (BCA Specification C1.1, Clause 3.9) Class 9b – 120/120/120 Class 9c – 120/120/120 *A Performance Solution may be possible in order to reduce the FRL of the Class 6 areas.*	☐	☒	☐	☐	☒

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
C1.2 Calculation of rise in storeys	Calculation of rise in storeys Refer to Appendix A for guidance on the calculation of Rise in Storeys.	The subject building has a 'rise in storeys' of four, with six storeys contained. Note that the RAC Building is considered 4 storeys, as the basement beneath the RAC building has external walls with a height of more than 1 m above the ground next to it. Therefore, the basement storey in this area does not meet the exception provided in BCA Clause C1.2(b)(ii), resulting in this portion of the building having a rise in storeys of 4 (Basement 1 to Level 2).	☒	☐	☐	☐	☐
C1.3 Buildings of multiple classification	The most fire-resisting type of construction required for the building applies to all storeys based on the classification applying to the top storey applying to all storeys.	Noted	☒	☐	☐	☐	☐
C1.4 Mixed types of construction	Allowable where they are separated in accordance with Clause C2.7.	The subject building will have areas separated from the basement carpark areas. Additionally Class 6 areas on Ground Level will be separated from Class 3 areas. However, mixed types of construction are not currently proposed to be utilised.	☒	☐	☐	☐	☐
C1.5 Two storey Class 2, 3, or 9c buildings	Allows subject building to be of Type C construction if the building has a rise in storeys of two, access to two exits or direct access to a road, and is only of Class 2, 3, or 9c use.	The subject building have a rise in storeys of four.	☒	☐	☐	☐	☐
C1.6 Class 4 parts of buildings	Requires building to have the same FRL as Class 2 parts in the same type of construction.	Subject building does not have any Class 4 parts.	☒	☐	☐	☐	☐
C1.7 Open spectator stands and indoor sports stadiums	Concessions allowing for Type C construction.	The building is not Type C construction.	☒	☐	☐	☐	☐
C1.8 Lightweight construction	Lightweight construction must comply with the requirements of Specification C1.8.	Loadbearing internal walls and loadbearing firewalls must be of concrete or masonry construction. There may be non-loadbearing internal walls that could be of lightweight construction.	☐	☒	☐	☐	☐
C1.10 Fire hazard properties	Materials and assemblies to comply with relevant fire hazard properties in Specification C1.10.	Material and assembly specifications have not been provided. It is assumed that compliance will be achieved.	☐	☒	☐	☐	☐
C1.11 Performance of external walls in fire	Concrete external walls that could collapse as complete panels in a building with a rise in storeys of not more than two must comply with Specification C1.11.	The subject building have a rise in storeys of four.	☒	☒	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
C1.12	This Clause is blank.		☒	☐	☐	☐	☐
C1.13 Fire-protected timber: Concession	Fire-protected timber in a Class 2, 3, or 5 building may be used wherever an element is required to be non-combustible, provided the building is less than 25 m in height and is sprinkler protected.	Compliance is achievable, should fire-protected timber be proposed.	☐	☒	☐	☐	☐
Part C2 – Compartmentation and Separation							
C2.2 General floor area and volume limitations	**Class 9b, 9c** / **Class 6** **Maximum floor area:** 8,000 m^2 / 5,000 m^2 **Maximum volume:** 48,000 m^3 / 30,000 m^3	Area and volume limitations do not apply to Class 3 buildings or to a carpark provided with a sprinkler system. Area and volume limitations for other areas are not exceeded. Note that smoke proof areas required by Clause C2.5 are exceeded.	☐	☒	☐	☐	☐
C2.3 Large isolated buildings	Additional fire protection measures are required for a building that exceeds the areas/volumes listed in Table C2.2.	Building is not considered a large isolated building.	☒	☐	☐	☐	☐
C2.4 Requirements for open spaces and vehicular access	Requirements to enable access to the perimeter of the building for the fire brigade.	Building is not considered a large isolated building.	☒	☐	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
C2.5 NSW Class 9a and 9c buildings	Additional requirements for fire compartmentation and smoke zones for Class 9a and 9c buildings. Doors in smoke proof walls must either swing in the direction of egress or in both directions.	The residential aged care building is required to be divided into areas not more than 500 m² by smoke proof walls. The greatest smoke-proof areas appear to exceed 500 m², being up to approximately: ▪ South GF (RL 199.35) - 570 m² ▪ South L1 (RL 203.3) – 625 m² ▪ North GF (RL 203.3) – 510 m² ▪ South L2 (RL 207.3) – 625 m² ▪ North L1 (RL 207.3) – 570 m² ▪ North L2 (RL 210.4) – 605 m² *Holmes Fire may be able to provide a Performance Solution to allow for a rationalised smoke separation strategy with oversized smoke proof areas. Note however that it is not recommended that the smoke proof areas exceed 600 m² (20% greater than permitted by the Deemed-to-Satisfy Provisions).* The residential aged care building has doors in smoke proof walls that do not swing in the direction of egress. *Holmes Fire can provide a Performance Solution to address doors swinging against the direction of egress. However, it is considered to be more cost-effective to re-swing the doors, or have them as dual swing, therefore not requiring a Performance Solution.*	☐	☒	☐	☒	☒
C2.6 Vertical separation of openings in external walls	Vertical separation is required to openings in external walls located directly above other external openings, in non-sprinkler protected Type A buildings.	The building is sprinkler protected.	☐	☐	☒	☐	☐
C2.7 Separation by fire walls	Fire walls must be constructed in accordance with Specification C1.1. Separation of buildings and fire compartments can be achieved by the construction of a fire wall.	Fire walls are to achieve the required FRL as specified in Specification C1.1 and openings in walls must not reduce the FRL of the wall. *A Performance Solution may be possible in order to reduce the FRL requirements for the Class 6 areas.*	☐	☒	☐	☐	☒

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
C2.8 Separation of classifications in the same storey	Fire walls between areas of different classifications on the same storey are to achieve the higher FRL specified in Specification C1.1.	Refer to Specification C1.1 for required FRLs for fire walls. The highest of the classifications applies to the common fire wall(s). *Facility areas are to be separated from the residential areas on Ground Floor of Building A and Building D.* *The carparking areas are to be fire separated from the adjacent South GF RAC areas.* *A Performance Solution may be possible in order to reduce the FRL of the Class 6 areas.*	☐	☒	☐	☐	☒
C2.9 Separation of classifications in different storeys	Floor/ceiling construction between storeys of different classifications	The subject building is of Type A construction and the FRL of the lower floor prescribed in Specification C1.1 applies to the floor between storeys of different classification.	☐	☒	☐	☐	☐
C2.10 Separation of lifts shafts	FRLs prescribed for the separation of lift shafts in different building types.	Fire rated lift shafts are required to any lift serving more than 3 storeys. Additionally, any lift in a Class 9c resident use area must be provided with a fire rated shaft achieving an FRL of not less than 120/120/120. It appears that all lifts either serve more than 3 storeys, or serve Class 9c resident use areas, and therefore all lifts would be required to be within fire rated lift shafts.	☐	☒	☐	☐	☐
C2.11 Stairways and lifts in one shaft	Stairways and lifts must not be located in the same shaft if either one is required to be in a fire-resisting shaft.		☐	☐	☒	☐	☐
C2.12 Separation of equipment	Lift motors, lift control panels, emergency generators, central smoke control plants, boilers or batteries must be fire separated from the remainder of the building.		☐	☒	☐	☐	☐
C2.13 Electricity supply system	FRLs required for the separation of electrical equipment within a building.		☐	☒	☐	☐	☐
C2.14 Public corridors in Class 2 and 3 buildings	Division of public corridors into 40 m lengths in Class 3 buildings.	Multiple class 3 building public corridors are connected on multiple levels by way of non-fire-isolated stairways, resulting in excessive corridor lengths. Smoke-proof walls are required for Deemed-to-Satisfy compliance. *A Performance Solution may be possible to justify longer public corridors (up to approximately 60 m).*	☐	☒	☐	☒	☒

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
Part C3 – Protection of Openings							
C3.2 Protection of openings in external walls	External openings within the minimum distances to a fire source feature must be protected in accordance with Clause C3.4 and must not occupy more than 1/3 the area of the external wall.	The building is located more than 3 m from fire source features.	☐	☐	☒	☐	☐
C3.3 Separation of external walls and associated openings in different fire compartments	External openings within the minimum distances to other fire compartments must be protected in accordance with Clause C3.4.		☐	☒	☐	☐	☐
C3.4 Acceptable methods of protection	Requirements for the protection of external openings.		☐	☒	☐	☐	☐
C3.5 Doorways in fire walls	Doors in fire walls must maintain the integrity of the fire wall.		☐	☒	☐	☐	☐
C3.6 Sliding fire doors	Installation requirements for automatic closing sliding fire doors in a fire wall.		☒	☐	☐	☐	☐
C3.7 Protection of doorways in horizontal exits	Installation requirements for doorways in horizontal exits.		☒	☐	☐	☐	☐
C3.8 Openings in fire-isolated exits	Doorways in fire-isolated exits which do not open to a road or open space must be provided with fire protection and be self-closing or automatic closing, triggered by either a smoke detector located within 1.5 m of the door, or via the building's sprinkler system. External windows (from fire-isolated exits) within 6 m of another window of the same building must be protected in accordance with Clause C3.4.		☐	☒	☐	☐	☐
C3.9 Service penetrations in fire-isolated exits	Fire-isolated exits must not be penetrated by any services other than electrical wiring in accordance with D2.7(e), ducting associated with the pressurisation system constructed of material with an FRL not less than -/120/60 where it passes through other parts of the building, or water supply pipes serving fire services.		☐	☒	☐	☐	☐
C3.10 Openings in fire-isolated lift shafts	Doorways to fire-isolated lift shafts must be protected by -/60/- fire doors. Lift indicator panels must be backed by construction no less than -/60/60.		☐	☒	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
C3.11 NSW Bounding construction: Class 2 and 3 buildings and Class 4 parts	Doorways in Type A buildings to be self-closing -/60/30 fire rated doorsets. Other openings must maintain the integrity and insulation performance of the wall. Additional requirements for paths of travel to an exit along open balconies.		☐	☒	☐	☐	☐
C3.12 Openings in floors and ceilings for services	In a Type A building, a service passing through a floor or ceiling, the service must be protected by a shaft complying with Specification C1.1.		☐	☒	☐	☐	☐
C3.13 Openings in shafts	In a Type A building, openings in shafts must be provided with fire protection.		☐	☒	☐	☐	☐
C3.15 Openings for service installations	Where services penetrate a fire-rated building element, they must maintain the FRL of the element they penetrate and be a tested system or installed in accordance with Specification C3.15.		☐	☒	☐	☐	☐
C3.16 Construction joints	Construction joints, spaces and the like in between building elements must achieve the same FRL of the associated building element.		☐	☒	☐	☐	☐
C3.17 Columns	Columns protected with lightweight construction to achieve an FRL		☒	☐	☐	☐	☐
Part D1 – Provision for Escape							
D1.2 NSW Number of exits required	At least two exits must be provided to basement levels requiring a vertical rise within the building of more than 1.5 m; Class 9 storeys accommodating more than 50 occupants (in addition to any horizontal exits); and to any storey accommodating sleeping areas in a Class 9c building.	In summary, a minimum of two exits are required from the basements, the facilities building, and the RAC building. Basement level 1 is provided with a single exit with an excessive travel distance (see Clause D1.4). Refer to Appendix C for markups. Since this exit provides vertical egress of 1.5 m or more but externally in lieu of internally within the building, it is considered that one exit from this area is Deemed-to-Satisfy compliant. However, the travel distance would have to be addressed, refer to Clause D1.4. It is assumed that occupants on Ground Level within the facility areas can exit via the main entrance doorways of the lobby, or through the northern frontage, or the front entrance of the restaurant.	☐	☒	☐	☒	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
D1.3 When fire-isolated stairways and ramps are required	**Class 3:** Each stairway or ramp serving as a required exit must be fire-isolated where it connects, passes through or passes by three or more consecutive storeys in a sprinkler protected building. **Class 9c:** Each stairway or ramp serving as a required exit must be fire-isolated. **Class 7a:** Each stairway or ramp serving as a required exit must be fire-isolated where it connects, passes through or passes by three of more consecutive storeys in a sprinkler protected building.	The **Class 3** building stairways that only pass through three consecutive storeys are permitted to be non-fire-isolated. However, note that Clause C2.14 length of public corridors requirements are impacted by non-fire-isolated stairways. The **Class 9c** stairs are required to be fire-isolated. The **Class 7a** stairs connect three storeys or more, as multiple storeys are interconnected via the driveways, and are therefore required to be fire-isolated, or be external stairs.	☐	☒	☒	☐	☐
D1.4 Exit travel distances	**Class 3 Areas:** The entrance doorway of a sole-occupancy unit must be no greater than 6 m from a single exit or from a point of choice of alternative exits, other than on ground level where this distance may be 20 m.	The distance from SOU entry doorways to the exit stair appears to be greater than 6 m throughout the residential blocks above ground level, being up to approximately 12 m, refer to example in Appendix C. This is expected to be further refined as the design progresses. *A Performance Solution may be possible to justify extended travel distances of more than 6 m, up to approximately 12 m.*	☐	☐	☐	☒	☒
	Class 6, 7, and 9 areas: Every point on a floor must be located no more than 20 m from a single exit or to a point of choice of exits, to which the maximum travel to the nearest exit shall be no greater than 40 m.	The distances to a point of choice and to an exit exceed 20 m and 40 m respectively in the basement carparks and within the Ground Floor facility areas (see Appendix C for example markups). It is assumed that occupants on Ground Level within the facility areas can exit via the main entrance doorways of the lobby, or through the northern frontage, or through the restaurant. *A Performance Solution is possible to permit longer travel distances within the basement levels and within the Ground Floor areas, thereby reducing the number of stairs. The travel distance to a point of choice is recommended to not exceed 30 m, and the travel distance to the nearest exit to not exceed 60 m. In Basement 1 north-west, it is recommended that the maximum travel distance to a single exit is not more than 40 m, in order to address through a Performance Solution.* Travel distance in the RAC building, on storeys above ground, exceed 20 m to a point of choice, being up to approximately 33 m (see Appendix C for example markups). It is recommended that secondary doors are provided between the SOU areas and the FOH areas such that a point of choice is provided within the SOU areas, reducing the travel distance ot a point of choice.	☐	☐	☐	☒	☒

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
D1.5 Distance between alternative exits	A minimum of two exits must be provided and be distributed evenly throughout the storey they are located with a minimum distance between exits of 9 m and travel paths leading to them not converging such that they are less than 6 m apart.	The MINIMUM distance between alternative exits appears tyo comply.	☐	☒	☒	☐	☐
	In a Class 3 building the maximum travel distance between alternative exits must be no greater than 45 m.	Only one exit is required from each Class 3 part.	☒	☐	☐	☐	☐
	In a Class 7a building the maximum travel distance between alternative exits must be no greater than 60 m.	The distance between the exits in the basement exceed the BCA DTS limits. Refer to Appendix C for example markups. *A Performance Solution is possible to provide an increased distance between alternative exits within the basement levels of approximately up to 80 m, thereby reducing the amount of excess stairways and increasing usable floor space.*	☐	☒	☐	☒	☒
D1.6 NSW Dimensions of exits and paths of travel to exits	The unobstructed height and width of required exits or paths of travel to exits must be no less than 2 m and 1 m respectively. The aggregate egress width per storey is based on the number of persons accommodated, as calculated by D1.13.	Note that the aggregate egress width from the facilities areas are to be refined as the design progresses. Compliance is achievable.	☐	☒	☒	☐	☐
D1.7 Travel via fire-isolated exits	A doorway from a room must not open directly into a fire-isolated exit unless it is from a public corridor, a sole-occupancy unit occupying the entire storey, or a sanitary compartment.		☐	☐	☒	☐	☐
	Each fire-isolated exit must provide independent egress directly to open space, or to a covered area meeting certain requirements.	All fire-isolated stairs appear to provide independent egress.	☐	☒	☒	☐	☐
	A path of travel from a fire-isolated exit discharge must not pass within 6 m of unprotected openings in the building's external walls.	Fire-isolated stairs serving the basements and the RAC building discharge such that occupants are required to travel within 6 m of openings. *If the subject openings are not proposed to be protected internally by drenchers or similar, Holmes Fire can provide a Performance Solution to address unprotected openings within 6 m of the path of travel.*	☐	☒	☐	☐	☒
	If more than two access doors open into the stair, either a smoke lobby or pressurisation must be provided.	Not more than two doors from the same storey open into any fire-isolated stairway.	☒	☐	☐	☐	☐
D1.8 External stairways or ramps in lieu of fire-isolated exits	Non-combustible external stairways or ramps located greater than 6 m from unprotected openings may be used in lieu of fire-isolated exits when serving a storey below an effective height of 25 m.	Further review required upon design progression. Compliance achievable.	☐	☒	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
D1.9 Travel by non-fire-isolated stairways or ramps	A non-fire-isolated stairway or ramp must provide continuous means of travel by its own flights to reach open space. In a Class 3 building, the distance from a sole-occupancy unit to open space via the non-fire-isolated stairway or ramp must be no greater than 60 m in a building of Type A construction and the stairs must discharge within 15 m of a door providing egress to open space or 30 m if two doors in different directions available. The exits must provide separate egress to a road and be smoke separated at the level of discharge.	Travel distance is less than 60 m via the non-fire-isolated stairways to a road or open space. Discharge distance from stairways to open space complies.	☐	☒	☒	☐	☐
D1.10 NSW Discharge from exits	Exits must discharge to an open space that has an unobstructed travel path with a minimum width of 1 m to allow occupants to reach the road.		☐	☐	☒	☐	☐
D1.11 Horizontal exits	Horizontal exits can be considered as required exits in certain cases. They must not comprise more than half the required exits from a storey.	It is assumed that the building has no horizontal exits.	☒	☐	☐	☐	☐
D1.12 Non-required stairways, ramps or escalators	An escalator, moving walkway or non-required non-fire-isolated stair may connect up to two consecutive storeys.	It is assumed that the building does not contain non-required non-fire-isolated stairways, ramps or escalators.	☒	☐	☐	☐	☐
D1.13 Number of persons accommodated	Table D1.13 provides the area per person according to the usage of the area.	Refer to Section 2.3.	☒	☐	☐	☐	☐
D1.14 Measurement of distances	Distances involving exits must be measured to the nearest part of the exit.	Noted	☒	☐	☐	☐	☐
D1.15 Method of measurement	Outlines the method used to measure travel distances.	Noted	☒	☐	☐	☐	☐
D1.16 Plant rooms, lift machine rooms and electricity network substations: concession	A ladder may form part of a required exit from small plant rooms, lift machine rooms and electricity network substations.		☐	☒	☐	☐	☐
D1.17 Access to lift pits	Access to the lift pit must be provided either via the lowest landing doors where the pit depth is not more than 3 m, or via an access doorway where the pit depth is deeper than 3 m.		☐	☒	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
Part D2 – Construction of Exits							
D2.2 Fire-isolated stairways and ramps	A stairway or ramp within a fire-resisting shaft must be constructed of non-combustible materials.		☐	☒	☐	☐	☐
D2.3 Non-fire-isolated stairways and ramps	In a building with a rise in storeys greater than two, non-fire-isolated stairways and ramps must be constructed in accordance with the requirements of Clause D2.2 or D2.3.	The non-fire-isolated stairways must be constructed to Clause D2.2 and D2.3.	☐	☒	☐	☐	☐
D2.4 Separation of rising and descending stair flights	Fire-isolated stairs must have no direct connection between the rising and descending parts of the stair. Separating construction must be non-combustible and smoke proof.	Stairways leading from the basement areas are not to connect to stairways from above, or are to be provided with non-combustible and smoke-proof construction.	☐	☒	☐	☐	☐
D2.5 Open access ramps and balconies	Ventilation openings to the outside are required to open access ramps and balconies.	Open access ramps and balconies are not proposed.	☒	☐	☐	☐	☐
D2.6 Smoke lobbies	Smoke lobbies must have a floor area not less than 6 m^2 and be smoke separated from the occupied areas on the storey they are located.	Smoke lobbies are not proposed.	☒	☐	☐	☐	☐
D2.7 Installations in exits and paths of travel	Access to service shafts and non-firefighting or detection equipment must not be located in a fire-isolated stair, passageway or ramp. Certain services and equipment may be installed in a fire-isolated exit or corridor leading to the exit if they are enclosed by non-combustible construction and smoke sealed.		☐	☒	☐	☐	☐
D2.8 Enclosure of space under stairs and ramps	The space below a required fire-isolated stair or ramp must not be enclosed if it is within the fire-isolated shaft. The space below a required non-fire-isolated stair must not be enclosed unless provided with construction with an FRL of 60/60/60 and a self-closing -/60/30 fire rated doorset.		☐	☒	☐	☐	☐
D2.9 Width of required stairways and ramps	A required stairway or ramp greater than 2 m in width counts as a width of 2 m unless it is divided by a handrail, balustrade or other barrier, continuous between landings, in 2 m divisions.		☐	☒	☐	☐	☐
D2.10 Pedestrian ramps	A fire-isolated ramp may be used in lieu of a fire-isolated stairway provided its dimensions comply with the requirements for a fire-isolated stairway.	It is assumed that the building will not contain fire-isolated ramps.	☒	☐	☐	☐	☐
D2.11 Fire-isolated passageways	A fire-isolated passageway must have an FRL not less than the fire-isolated stair or ramp to which it adjoins, or not less than 60/60/60.		☐	☒	☐	☐	☐

<table>
<tr><th>Clause</th><th>Clause Requirement</th><th>Comments</th><th>Noted / Not applicable</th><th>Compliance Achievable</th><th>Complies</th><th>Non-compliant</th><th>Performance Solution</th></tr>
<tr><td>D2.12
Roof as open space</td><td>If an exit discharges occupants to the roof, the roof must have an FRL not less than 120/120/120, and not have any openings or rooflights within 3 m of the travel path to reach open space.</td><td>Fire-isolated stairs may discharge to the roof of the basement carpark.</td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.13 NSW
Goings and risers</td><td>A stairway must have not more than 18 nor less than 2 risers in each flight, consistent goings and risers as per Table D2.13 which do not have openings greater than 125 mm, and treads of solid construction with a non-slip finish. Required stairways must not have winders in lieu of a landing.
<table>
<tr><th rowspan="2">Stairway type</th><th colspan="2">Riser (R)</th><th colspan="2">Going (G)</th><th colspan="2">Quantity (2R + G)</th></tr>
<tr><th>Max</th><th>Min</th><th>Max</th><th>Min</th><th>Max</th><th>Min</th></tr>
<tr><td>Public</td><td>190</td><td>115</td><td>355</td><td>250</td><td>700</td><td>550</td></tr>
<tr><td>Private</td><td>190</td><td>115</td><td>355</td><td>240</td><td>700</td><td>550</td></tr>
</table></td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.14
Landings</td><td>Landings with a maximum gradient of 1:50 may be used to separate risers in each flight of a stairway. They must be not less than 750 mm in length and 500 mm in width and have a non-slip finish.</td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.15 NSW
Thresholds</td><td>A doorway threshold must not incorporate a step or ramp any closer than the width of the door.</td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.16 NSW
Barriers to prevent falls</td><td>A continuous barrier must be provided alongside any trafficable area if it is greater than 1 m above the surface beneath. The balustrade must have a height not less than 1 m above the floor and 865 mm above the stair nosing. Additional requirements for opening and climbability.</td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.17
Handrails</td><td>Handrails must be provided to at least one side of a ramp or flight and both sides if the total width is greater than 2 m.</td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.18
Fixed platforms, walkways, stairways and ladders</td><td>Concessions available within plant rooms and non-habitable rooms and similar.</td><td></td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☐</td></tr>
<tr><td>D2.19 NSW
Doorways and doors</td><td>Allows roller shutter, tilt-up, sliding or power operated doors with certain requirements. Revolving doors may not be used.
Power operated doors must be manually openable by less than 110 N of force.
Sliding fire/smoke doors, revolving doors, roller shutter doors and tilt-up doors must not be used in Class 9c buildings.</td><td>The sliding doors leading from the Ground Level lobby areas to open space must satisfy the requirements of D2.19.
Additionally, it is assumed that in addition to the revolving doors to the facilities area to the south on Ground Floor, swinging doors will be provided for egress. Alternatively, a Performance Solution is possible to justify the use of revolving doors for exit purposes.</td><td>☐</td><td>☒</td><td>☐</td><td>☐</td><td>☒</td></tr>
</table>

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
D2.20 Swinging doors	Swinging doors must not encroach the travel path of exits. Doors must generally swing in the direction of egress.	Unable to determine based on available drawings.	☐	☒	☐	☐	☐
D2.21 NSW Operation of latch	A door in the path of travel must be readily openable without a key from the side that faces a person seeking egress, by a single hand downward action or pushing action on a single device, located between 900 mm and 1.1 m from the floor.		☐	☒	☐	☐	☐
D2.22 Re-entry from fire-isolated exits	Doors in a fire-isolated exit must not be locked from the inside in a Class 9c building. Automatic fail-safe devices may be used if on at least every fourth floor cannot be locked or an intercom system is provided.	Attention to be given to the RAC building stairways.	☐	☒	☐	☐	☐
D2.23 Signs on doors	Automatic fire / smoke door or door discharging from fire-isolated exit: “FIRE SAFETY DOOR – DO NOT OBSTRUCT” Self-closing door: “FIRE SAFETY DOOR DO NOT OBSTRUCT DO NOT KEEP OPEN”		☐	☒	☐	☐	☐
D2.24 Protection of openable windows	Window protection is required where the lowest level of the window opening is less than 1.7 m above the floor in a Class 3 building.		☐	☒	☐	☐	☐
D2.25 Timber stairways: Concession	Notwithstanding D2.2(a), timber treads, risers, landings, and associated supporting framework of certain dimensions may be used within a fire-isolated stairway constructed from fire-protected timber		☒	☐	☐	☐	☐
Part E1 – Fire Fighting Equipment							
E1.3 Fire hydrants	A fire hydrant system installed in accordance with AS 2419.1 is required in a building with a floor area greater than 500 m^2 in total.	Fire hydrant system compliance unable to be determined, as the fire hydrant system layout is not yet developed. It is noted that the hydrant booster assembly is required to be protected and located in accordance with AS 2419.1-2005, however a *Performance Solution may be possible to justify departures from these requirements.*	☐	☒	☐	☐	☒
E1.4 Fire hose reels	A fire hose reel system installed in accordance with AS 2441 is required where internal fire hydrants are installed or to serve any fire compartment greater than 500 m^2.	Fire hose reels are not required in a Class 3 and Class 9c areas.	☐	☒	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
E1.5 Sprinklers	A sprinkler system in accordance with Specification E1.5 is required in Class 3 buildings used for residential aged care, Class 9c buildings, and carparks with more than 40 vehicles.	The subject building is required to be sprinkler protected throughout. Note that AS 2118.1-2017 may be utilised.	☐	☒	☐	☐	☐
E1.6 Portable fire extinguishers	Portable fire extinguishers are required to be installed in certain areas as required by Table E 1.6 of the BCA, in accordance with AS 2444. In the class 3 occupancy, 2.5 kg ABE extinguishers are to be within 10 m of unit entry doors.		☐	☒	☐	☐	☐
E1.8 Fire control centres	A fire control centre in accordance with Specification E1.8 is required for a building greater than 25 m in effective height and a Class 6, 7, 8, 9 building with a total floor area more than 18,000 m2.	Building is less than 25 m in effective height and less than 18,000 m² in area.	☒	☐	☐	☐	☐
E1.9 Fire precautions during construction	Portable fire extinguishers must be provided to each exit and fire hydrants, hose reels and booster connections must be operational once the building has reached an effective height of 12 m.		☐	☒	☐	☐	☐
E1.10 Provisions for special hazards	Additional provisions may be required due to the quantity of materials stored or the location of the building.		☒	☐	☐	☐	☐
Part E2 – Smoke Hazard Management							
E2.2 NSW General requirements	Requirements for smoke hazard management systems. Stair pressurisation is required for fire-isolated stairways serving: ▪ more than 2 below ground storeys; and ▪ Class 9c buildings with a rise in storeys of more than 2. Buildings containing Class 9c areas, must be provided with an automatic smoke detection and alarm system throughout, and automatic shutdown of ait-handling systems on fire trip.	A smoke detection and alarm system is to be provided complying with BCA Spec. E2.2a throughout. The stairways in the Class 9c building and any fire-isolated stairway serving more than 2 basement storeys are required to be pressurised.	☐	☒	☐	☐	☐
E2.3 Provision for special hazards	Additional smoke hazard management measures not listed in Table E2.2a and Table E2.2b may be required in a building with special characteristics, function/usage, type and quantity of materials stored, or having a mix of classifications.	Not anticipated.	☒	☐	☐	☐	☐

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
Part E3 – Lift Installations							
E3.2 Stretcher facilities in lifts	Stretcher facilities must be provided in emergency lifts and in at least one passenger lift where any passenger lift is serving a storey above 12 m in effective height, as well as in any aged care building at levels where direct access to a road or open space is not provided (Clause E3.8). A stretcher facility must accommodate a raised stretcher with a patient lying on it horizontally by providing a clear space not less than 600 mm wide x 2000 mm long x 1400 mm high above the floor level.	As there are Class 9c levels without direct access to a road or open space, the RAC building is required to accommodate stretcher facilities. Additionally, the building has an effective height of more than 12 m, and therefore requires stretcher facilities to any lift serving a storey above 12 m in effective height. *A performance solution may be possible to omit stretcher facilities from Class 3 blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	☐	☒	☐	☐	☒
E3.3 Warning against use of lifts in fire	Warning signs must be displayed near lift call buttons stating: “DO NOT USE LIFTS IF THERE IS A FIRE”		☐	☒	☐	☐	☐
E3.4 Emergency lifts	Emergency lifts are required in buildings over 25 m in effective height and in Class 9a buildings.	Building has an effective height less than 25 m.	☒	☐	☐	☐	☐
E3.5 Landings	Access and egress to liftwell landings to comply with Section D.		☐	☒	☐	☐	☐
E3.6 Passenger lifts	Limitations and features for passenger lifts in accessible buildings.		☐	☒	☐	☐	☐
E3.7 Fire service controls	Passenger lifts serving a storey above 12 m must be fitted with fire service controls.	Building has an effective height of more than 12 m. Therefore, fire service lift controls are required to any lift serving a storey at an effective height of more than 12 m. *A performance solution may be possible to omit fire service lift controls from blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	☐	☒	☐	☐	☒
E3.8 Aged care buildings	On levels not provided with direct access to open space, a ramp or a lift able to accommodate a stretcher is required.	As there are Class 9c levels without direct access to a road or open space, the RAC building is required to accommodate stretcher facilities.	☐	☒	☐	☐	☐
E3.9 Fire service recall controls switch	Each group of lifts must be provided with one fire recall control switch located at the landing.	Building has an effective height of more than 12 m. Fire service recall control switch is required. *A performance solution may be possible to omit fire service recall control switches from blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	☐	☒	☐	☐	☒

Clause	Clause Requirement	Comments	Noted / Not applicable	Compliance Achievable	Complies	Non-compliant	Performance Solution
E3.10 Lift car fire service drive control switch	The lift car fire service drive control switch must be activated from within the lift car.	Building has an effective height less than 12 m. Fire service drive control switch is required. *A performance solution may be possible to omit fire service drive control switches from blocks with local vertical rise of less than 12 m from the adjacent ground level to the top storey in that block.*	☐	☒	☐	☐	☒
Part E4 – Visibility in an Emergency, Exit Signs and Warning Systems							
E4.2 Emergency lighting requirements	Emergency lights must be installed in every required stairway, in every storey greater than 300 m² in floor area, in corridors greater than 6 m in length, sole-occupancy units greater than 300 m² in floor area.		☐	☒	☐	☐	☐
E4.3 Measurement of distance	Distances to be measured via the shortest path.	Noted	☒	☐	☐	☐	☐
E4.4 Design and operation of emergency lighting	Emergency lighting systems must comply with AS 2293.1.		☐	☒	☐	☐	☐
E4.5 Exit signs	Clearly visible exit signs must be installed above doors providing egress from a storey or compartment.		☐	☒	☐	☐	☐
E4.6 NSW Direction signs	Exits not readily apparent to occupants must have directional signage leading to them.		☐	☒	☐	☐	☐
E4.7 Class 2 and 3 building and Class 4 parts: Exemptions	Exit signage is not required in a sole-occupancy unit of a Class 3 building.	This concession only applies to the Class 3 parts of the building.	☐	☒	☐	☐	☐
E4.8 Design and operation of exits signs	Exit signs to be clearly visible and comply with AS 2293.1 or Specification E4.8 for photoluminescent signs.		☐	☒	☐	☐	☐
E4.9 Sound systems and intercom systems for emergency purposes (SSISEP)	Required in a Class 3 building with a rise in storeys of more than 2 and used as accommodation of aged.	A SSISEP is required throughout the building.	☐	☒	☐	☐	☐

4 REPORT BASIS INFORMATION

The report is based on the following:

1) Preliminary architectural drawings, prepared by Marchese Partners and as listed in Table 4-1.

Table 4-1: Referenced Architectural Drawings

Dwg no.	Title	Issue	Date
DA2.01	Keyplan - Basement -3	F	23 May 2018
DA2.02	Keyplan - Basement -2	F	23 May 2018
DA2.03	Keyplan - Basement -1	F	23 May 2018
DA2.04	Ground Floor	F	23 May 2018
DA2.05	Level 1	F	23 May 2018
DA2.06	Level 2	F	23 May 2018
DA2.07	Roof Plan	F	23 May 2018
DA3.01	Elevations Quarry Rd & Vineys Rd	F	23 May 2018
DA3.03	Elevations North & South	F	23 May 2018
DA4.01	Section AA	F	23 May 2018
DA4.02	Section BB	F	23 May 2018
DA4.03	Section CC	F	23 May 2018
DA4.05	Sections 1, 2, 3	F	23 May 2018

5 CONCLUSION

This report has assessed the level of compliance with the fire safety Deemed-to-Satisfy Provisions of the BCA (Sections C, D (excluding Part D3) and E) for the proposed residential senior living facility located at 3 Quarry Road, Dural, NSW.

Potential BCA compliance concerns and possible Performance Solution opportunities have been identified, which generally relate to:

- Reduced fire-resistance levels of the Ground Level facility areas within Building A and Building D;
- Smoke proof area sizes within the residential aged care building;
- Door swing direction;
- Length of public corridors without smoke separation;
- Travel distance to an exit in the Class 3 areas;
- Travel distance to a point of choice and to an exit (Ground Floor facilities and Basement Levels);
- Travel distance between alternative exits within the Basement Levels;
- Travel distance to a point of choice in the RAC building;
- Travel past openings from discharge of fire-isolated stairways;
- Revolving doors used for egress;
- Location and protection of the fire hydrant booster assembly;
- Stretcher facilities in lifts; and
- Fire service lift control, recall control switch, and drive control switches to lifts serving storeys above 12 m.

Performance Solutions can be provided in relation to some of the above issues, as outlined herein.

Appendix A Calculation of Rise in Storeys – Guidance

Basement 2 has an external wall with a length of 12 m, where the average ground level adjacent is 1 m or more below the top of that wall. Therefore, Basement 2 is technically a storey included in the calculation of Rise in Storeys in accordance with BCA Clause C1.2.

Figure A-1: 4 Storey Portion - RAC Building

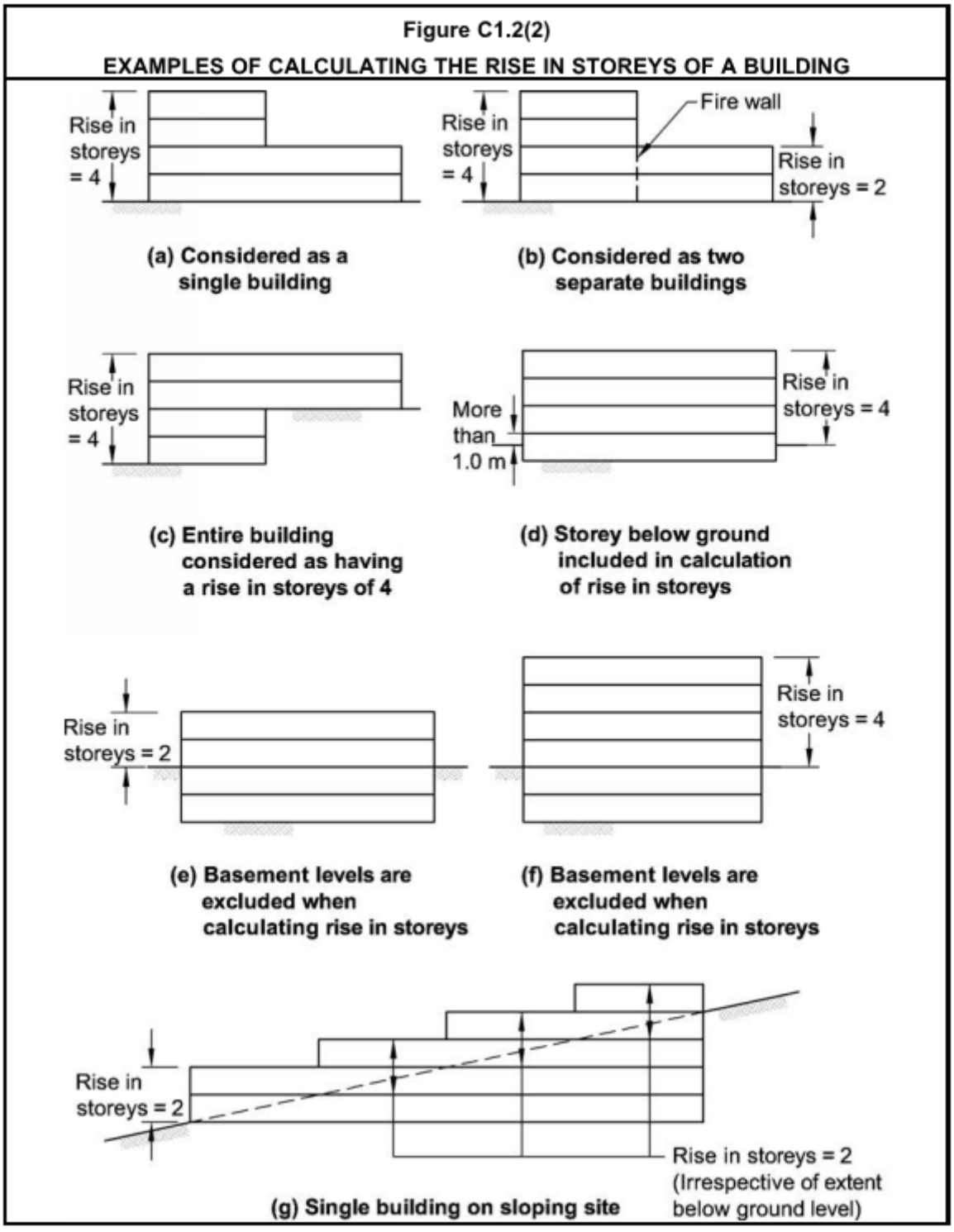


Figure A-2: Guidance 1, Rise in Storeys Calculation, Extract from the Guide to the BCA

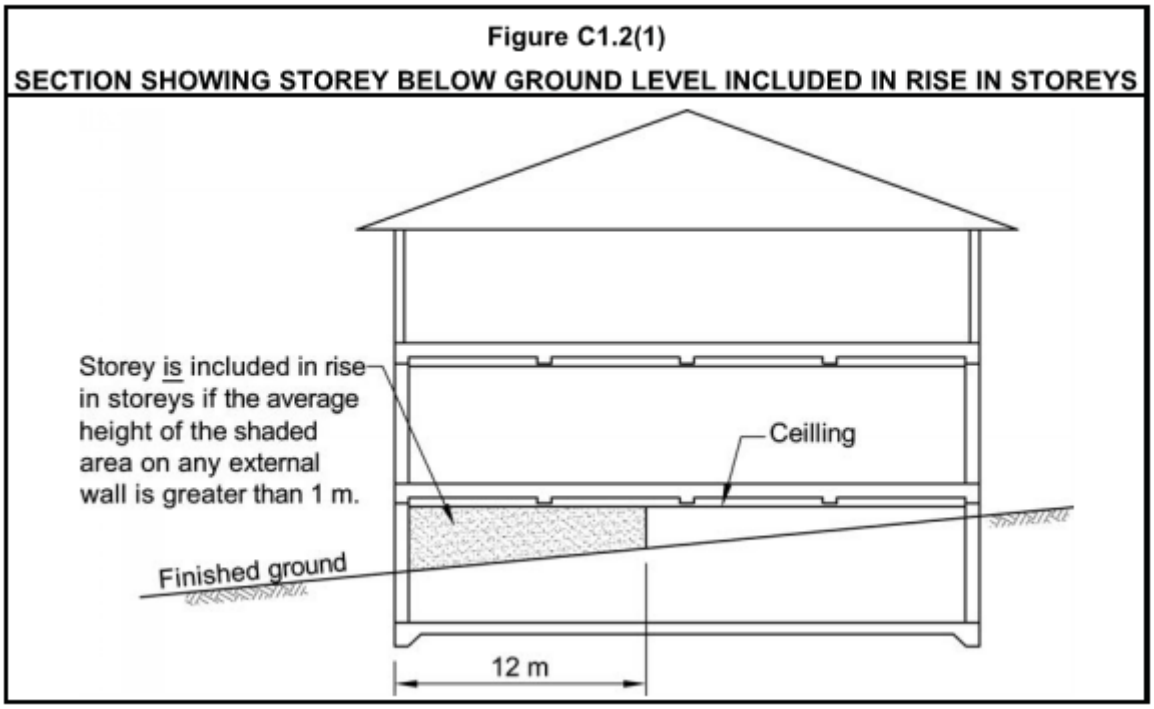


Figure A-3: Guidance 2, Rise in Storeys Calculation, Extract from the Guide to the BCA

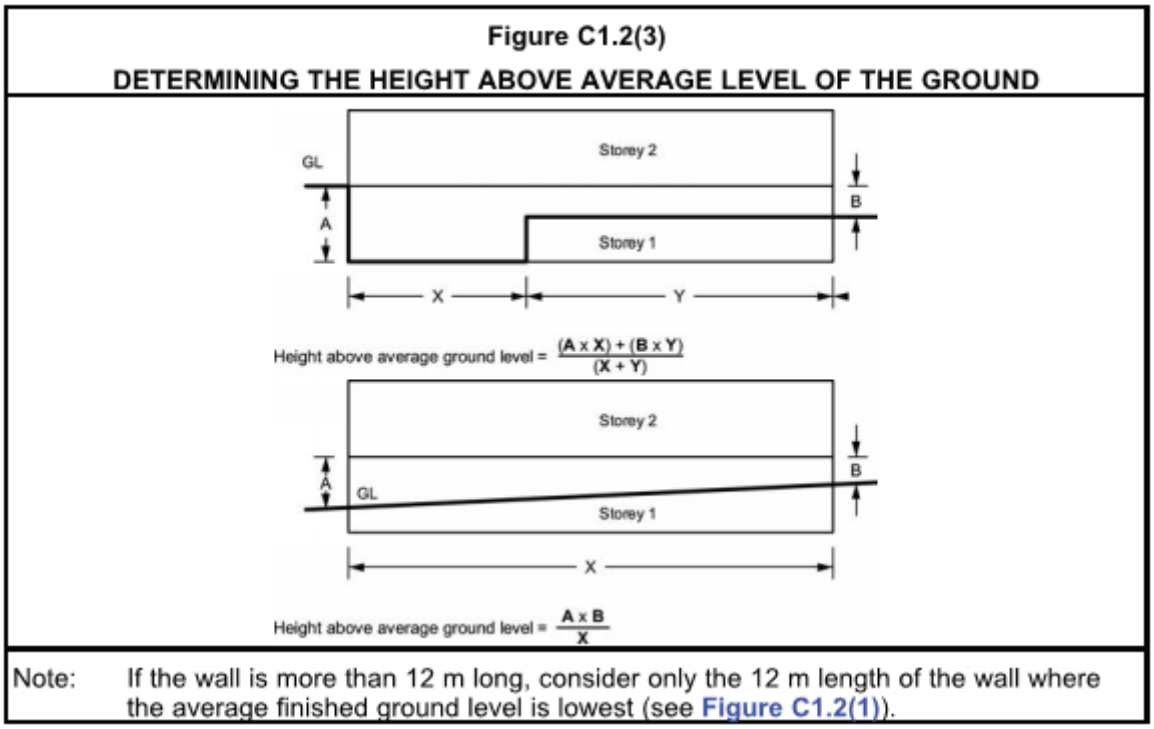


Figure A-4: Guidance 3, Rise in Storeys Calculation, Extract from the Guide to the BCA

Appendix B FRL of Building Elements

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

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

Appendix C Travel Distance and Exit Markups

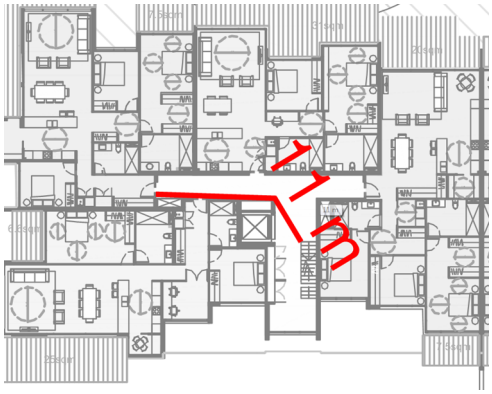


Figure C-1: Extended Travel Distance Example, Class 3 Areas

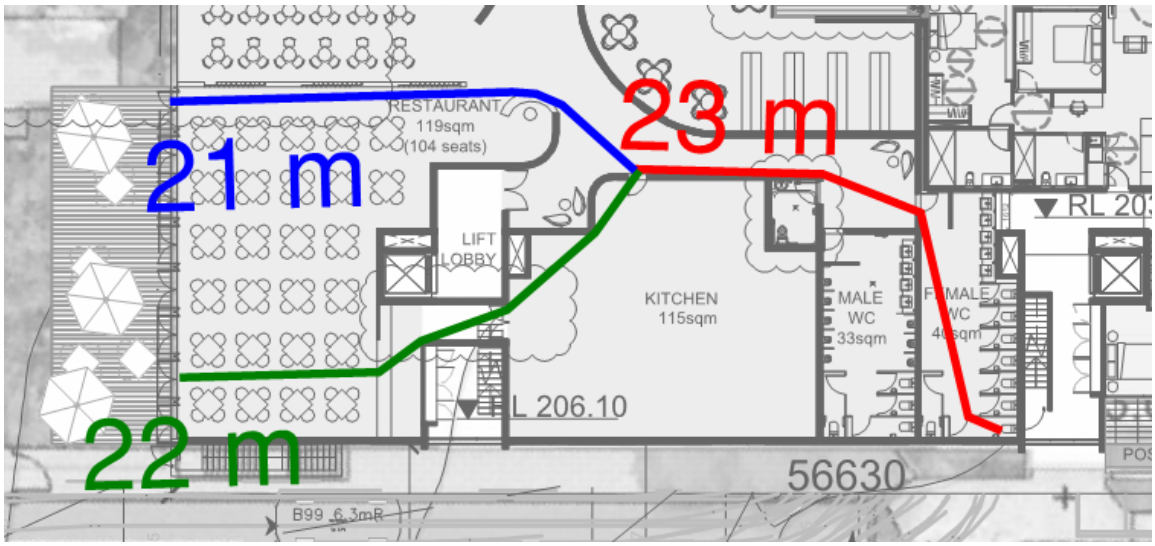


Figure C-2: Ground Level travel distance non-compliance (example)

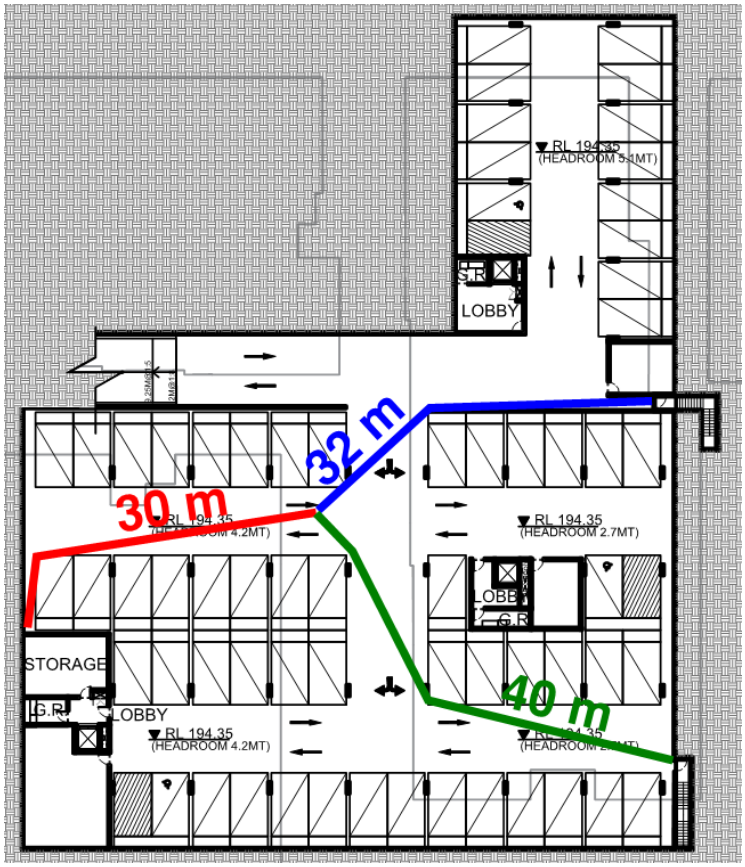


Figure C-3: Basement 3 Travel Distances (example)

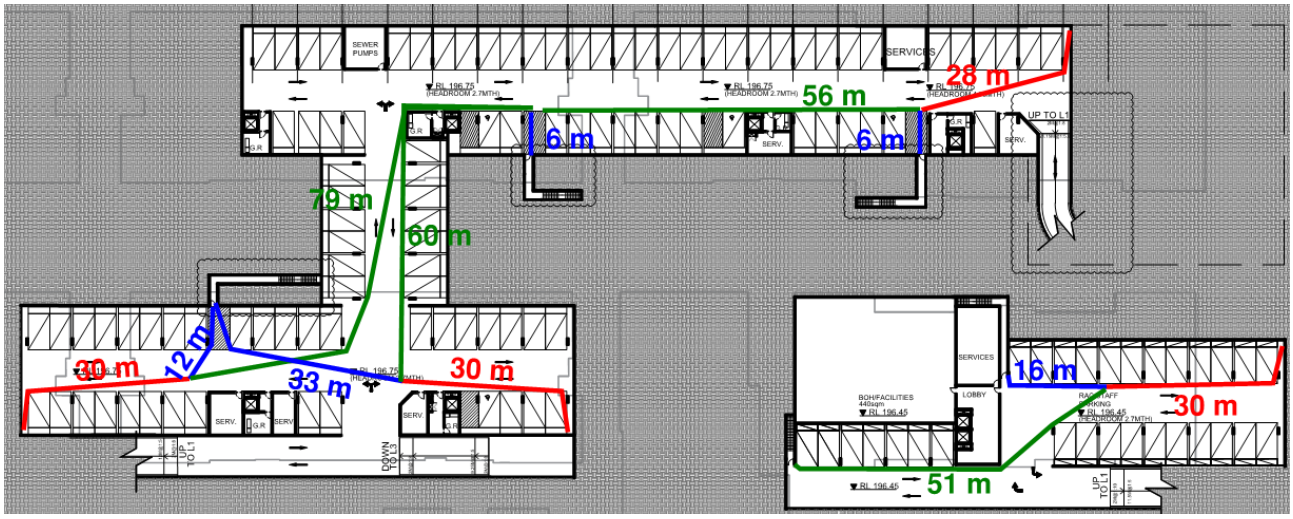


Figure C-4: Basement 2 Travel Distances (example)

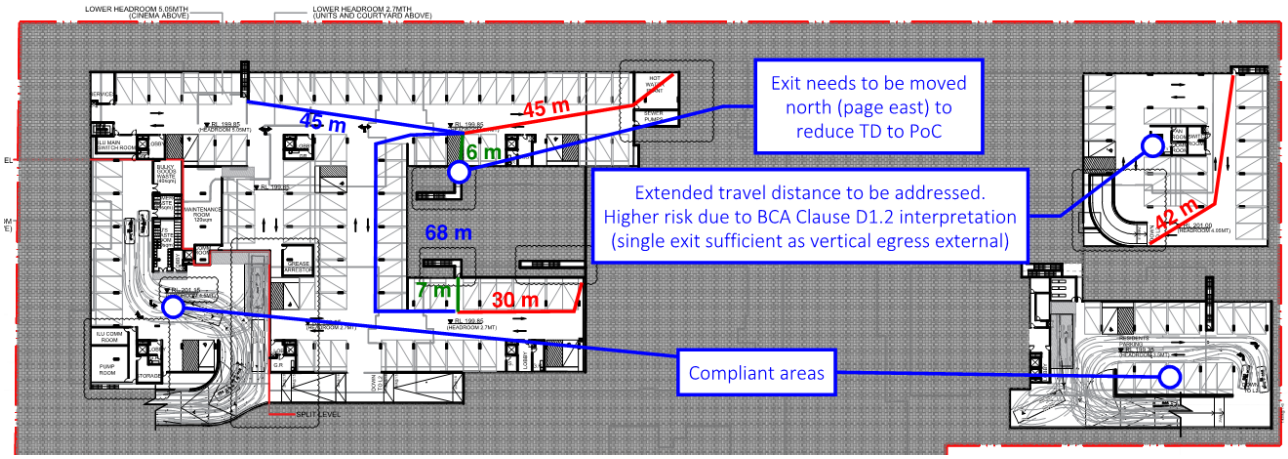


Figure C-5: Basement 1 Travel Distances (example)

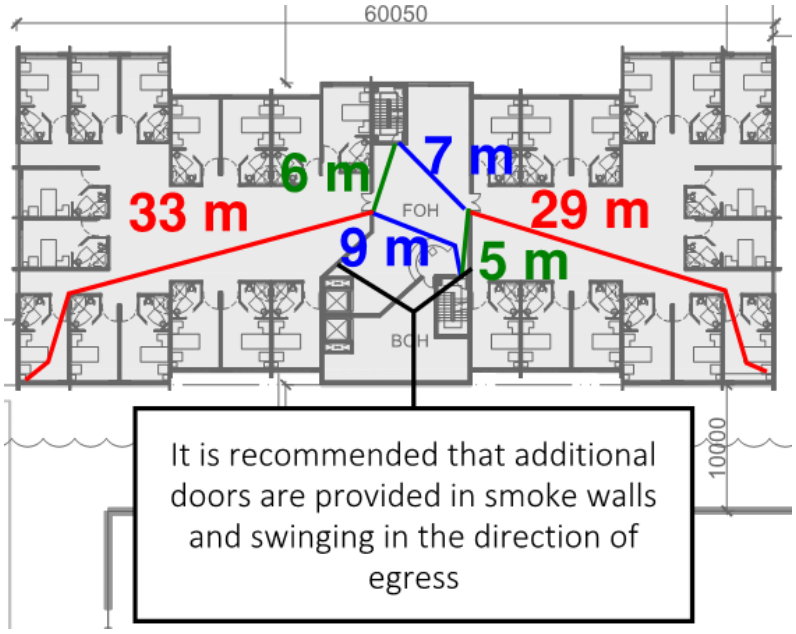


Figure C-6: RAC Above Ground Storey Travel Distance (example)