Fire Engineering Brief

Long Reef Golf Club | ANZAC Avenue, Collaroy

Project No.	P01573
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E-LAB Consulting

Where science and engineering inspire design.

Document QA and Revisions

DOCUMENT CONTROL

REVISION	DATE	DESCRIPTION	PREPARED BY	REVIEWER
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2	31/03/2025	Updated in line with Design Team feedback.	BW, TR	EJ
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Executive Summary

E-LAB Consulting has been engaged by Long Reef Golf Club to develop a Fire Engineering Brief (FEB) for Long Reef Golf Club located on Anzac Avenue, Collaroy, NSW 2097 to meet design compliance.

Located approximately 20 km from the Sydney CBD on the Northern Beaches, the clubhouse consists of dining and kitchen spaces, as well as meeting / community rooms and indoor/outdoor seating, with small storage spaces and staff offices.

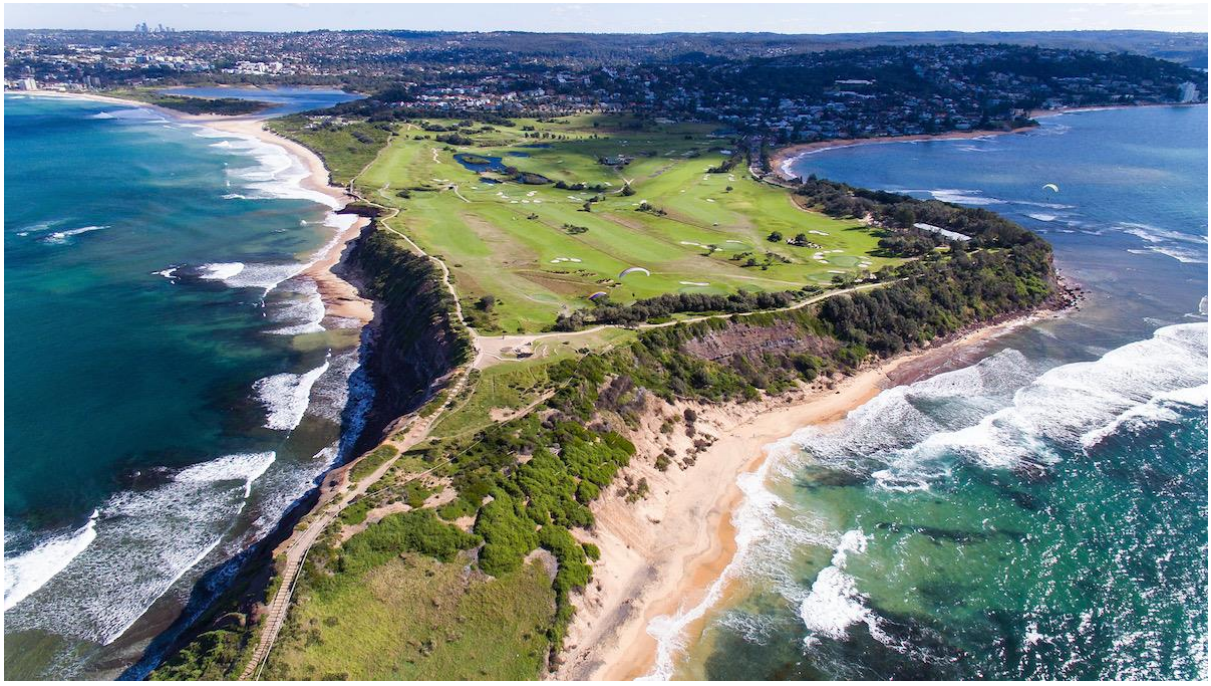


Figure 1: Surrounding Space

The performance solutions detailed in this report are listed in the table below. These performance solutions have been identified by relevant stakeholders as requiring further analysis to meet the Performance Requirements of the Building Codes of Australia (BCA) [1].

Table 1: Performance Solution List

ISSUE	PERFORMANCE SOLUTION	DTS CLAUSE(S)	PERFORMANCE REQUIREMENT(S)	ASSESSMENT METHOD	AFEG SUB-SYSTEM
1	Extended Travel Distances	D2D5	D1P4, E2P2	A2G2(2)(b)(ii) A2G2(2)(d)	D, E
2	Omission of Fire Hose Reels	E1D3	E1P1	A2G2(2)(b)(ii)	A, C, D, E
3	Protection of Openings to Boundary	C4D3 C4D5	C1P2	A2G2(2)(b)(ii)	A, B, C
4	Secure Door Provisions	D3D26	D1P4, E2P2	A2G2(2)(b)(ii)	E

All other items of fire and life safety not identified in this report are assumed to be in accordance with BCA DtS provisions and existing approved Fire Engineering Reports. The fire safety strategy detailed in this report is expected to be adhered to in order to meet the conclusions and findings of this Fire Engineering Report. Any changes in the design of the project to suit future building works or alterations will require additional analysis to confirm compliance with the building code regulations and the fire engineering assessment.

1 INTRODUCTION

1.1 Project Scope

E-LAB Consulting has been engaged by Long Reef Golf Club to develop a Fire Engineering Brief (FEB) for Long Reef Golf Club located on Anzac Avenue, Collaroy, NSW 2097 to meet design compliance.

The purpose of this report is to outline the proposed Performance Solutions to be applied to the Long Reef Golf Club site, detailing the fire engineering approach as well as the expected additional fire engineering requirements (if any).

E-LAB Consulting's approach to fire engineering is generally in accordance with the Australian Fire Engineering Guidelines [3] as outlined in Section 2.1.1 (of the AFEG). The AFEG is used as general guidance on the analysis process without strictly following each individual sub-system as outlined, which permits different approaches to demonstrate compliance as long as the intent is followed. Other international guidance documents and standards have been referred too throughout the document and appropriately referenced.

1.2 Key Stakeholders

The relevant stakeholders for this project are listed below in Table 2.

Table 2: Project Stakeholders

ROLE	ORGANISATION	NAME
Project Manager	Long Reef Golf Club	Toby Schraer
Architect	i2c	MD
Architect	Luchetti Krelle	
BCA Consultant	MBC Group	G. Panagiotlaris
Principal Certifying Authority	-	-
Fire Engineer	E-LAB Consulting	Ettienne Jordaan
Fire Brigade	Fire and Rescue NSW	-

1.3 Performance Based Design Brief

The Performance Based Design Brief / Fire Engineering Brief (FEB) process was undertaken as follows:

- A Fire Engineering Brief Questionnaire (FEB) was prepared by E-LAB Consulting detailing the proposed Performance Solutions and the associated Fire Engineering analysis proposed to be undertaken.

1.4 Documentation

The relevant documentation provided to E-LAB Consulting used to create this Fire Engineering Brief (FEB) is listed in Table 3.

Table 3: Documentation Received

ITEM	DOCUMENT NAME	ORGANISATION	DATE	REVISION
1	Architectural Drawings	i2C	02/04/2025	P13

1.5 Applicable Guidance and Legislations

1.5.1.1 REGULATORY FRAMEWORK

The Building Codes of Australia 2022 (BCA 2022) [1], compliance with the BCA is achieved by demonstrating that the Performance Requirements have been satisfied either through a Deemed to Satisfy design which are predetermined designs that meet a minimum standard or via a Fire Engineered Performance Solution. Demonstrating compliance using a Performance Solution allows a variety of assessment methods as stated in Clause A2G1 and A2G2 of the BCA. These alternative assessment methods have been detailed below.

Clause A2G1(2)

Performance requirements are satisfied by one of the following methods.

a) A Performance Solution.

b) A Deemed to Satisfy Solution.

c) A Combination of (a) and (b).

Clause A2G2(1)

A Performance Solution is achieved by demonstrating –

a) Compliance with the performance requirements; or

b) Be at least equivalent to the Deemed to Satisfy provisions.

Clause A2G2(2)

A performance solution must be shown to comply with the relevant Performance Requirement through one or a combination of the following Assessment Methods:

a) Evidence of suitability in accordance with Part A5 that shows the use of a material, product, plumbing and drainage product, for of construction or design meets the relevant Performance Requirements.

b) Verification Methods such as

i. The Verifications Methods in the NCC; or

ii. Other Verification Methods, accepted by the appropriate authority that show compliance with the relevant Performance Requirements.

c) Expert judgement.

d) Comparison with the Deemed-to-Satisfy Provisions.

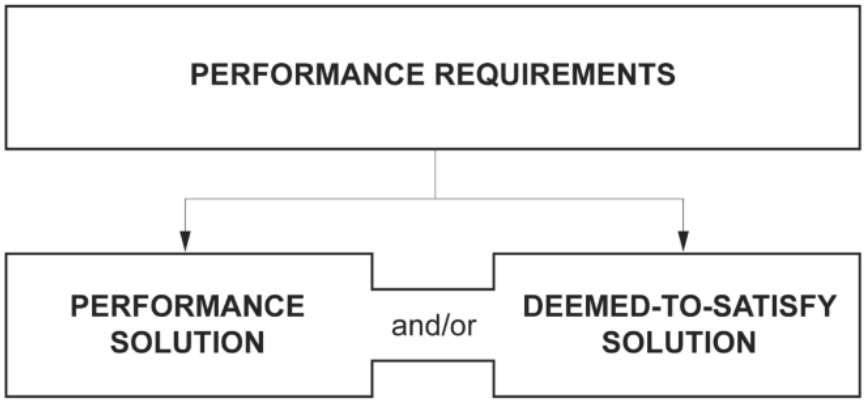


Figure 2: BCA Guidance on meeting Performance Requirements

1.6 Assumptions and Limitations

1.6.1 Assumptions

The following assumptions apply to the analysis undertaken in this report:

- The Fire Engineering Report will be read in conjunction with the relevant Architectural drawings and the BCA report.
- All other components of the design not covered in this report are installed to the relevant codes and legislation at the time of construction or production of this report.
- All essential equipment services and strategies will be maintained to the level of which they were designed, installed, commissioned, and certified.

- All essential equipment services and strategies discussed within this report are assumed to be functioning correctly during a fire scenario.
- Only one fire will occur at a time within the development.
- Exit routes are maintained and clear of obstruction.

1.6.2 Limitations

The following limitations apply to the analysis undertaken in this report:

- This report addresses the Performance Requirements of the BCA relevant to life safety.
- Where building alterations or a change in occupancy type occurs, the validity of this report and the analysis within may be impacted upon and further analysis will be required to update the report.
- This report and the conclusions drawn upon in each performance solution relate to the subject building and should not be used by a third party to justify design choices outside the scope of this project.
- No property protection requirements have been advised and therefore not assessed within this report. Some property protection is inherent with life safety systems however this is incidental.
- All performance solutions are subject to formal approval by the relevant regulatory authorities.

2 BUILDING CHARACTERISTICS

2.1 Building Description

The Site consists of a large single structure Clubhouse located at the end of Anzac avenue; the clubhouse has a small car park adjacent to it with green space surrounding the building.

Figure 3: Subject building

2.2 BCA Classification

The project characteristics have been noted in Table 4 based on the information provided.

Table 4: BCA Characteristics

BCA CLAUSE	DESCRIPTION	PROJECT DETAILS
Schedule 1	Effective Height	6m
A6	Main Occupancy Classification	9b
C2D2	Construction Type	Type B
C2D3	Rise in storey	2
Schedule 1	Floor area and volume	2321m^2 6963m^3

2.3 Building Location

The project is located at Anzac Avenue, Collaroy, NSW 2097

Figure 4: Building location

Figure 5: Existing Clubhouse (Google Maps)

2.4 Occupant Characteristics

The expected building occupant have been described using Table 2 – 'Occupancy Characteristics' from BS 9999 [10].

Table 5: Occupant Characteristics

OCCUPANT DESCRIPTION	CHARACTERISTICS	DISCUSSION
Staff	Awake and Familiar	Staff members are expected to be aware of evacuation strategies and able to self-evacuate
Maintenance Workers	Awake and Unfamiliar	Maintenance personnel are expected to be conscious and able to self-evacuate
Visitors	Awake and Unfamiliar	Visitors to the club area are expected to be awake and unfamiliar with the evacuation strategies in place, visitors are expected to be able-bodied and capable of self-evacuation

2.5 Egress Routes

The final egress points out of the development are shown below:

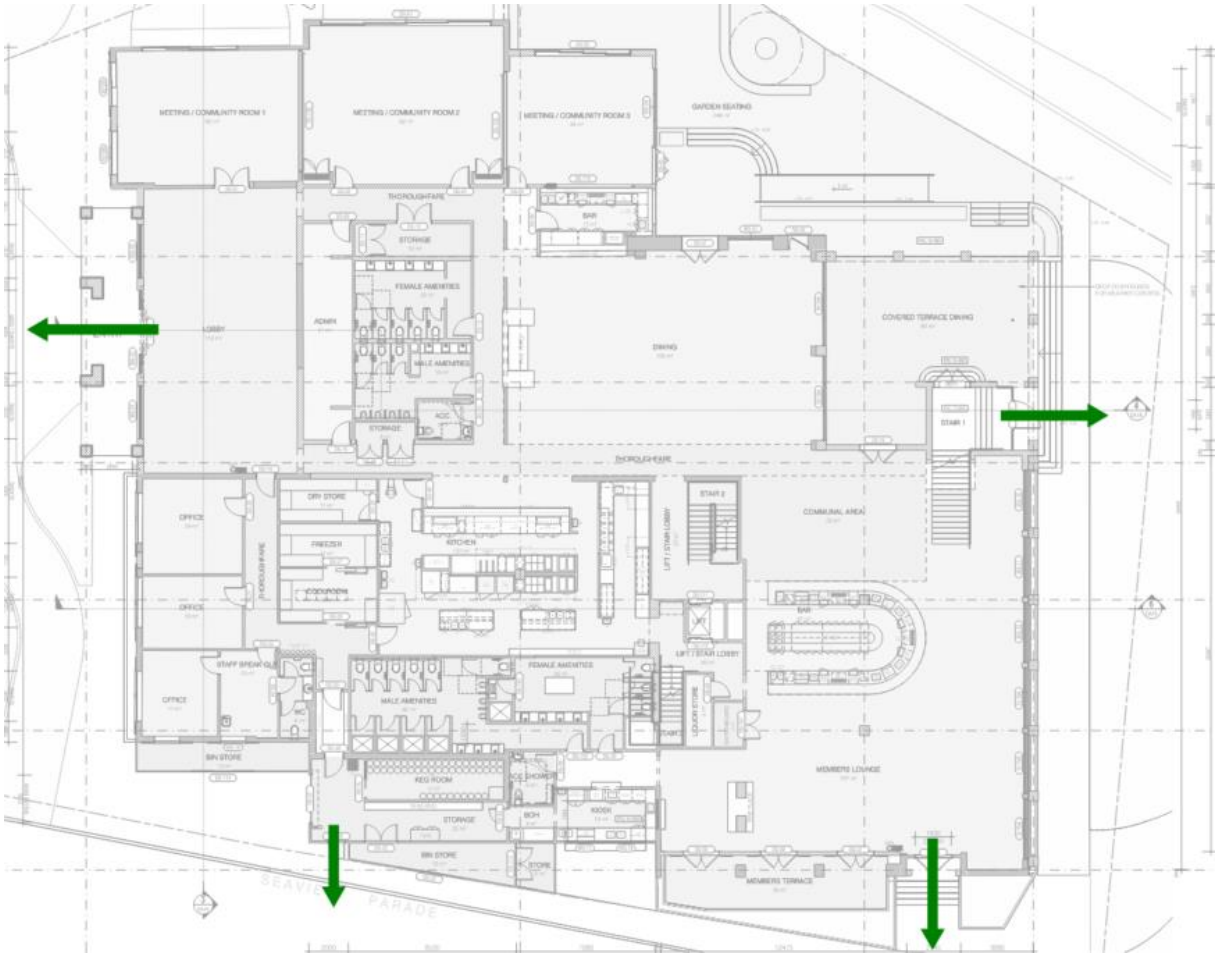


Figure 6: Egress Routes

2.6 Fire Service Access

2.6.1 Distance to FRNSW station

Fire and Rescue NSW Narrabeen Fire Station is located approximately 2.8 km away as shown by Figure 7.

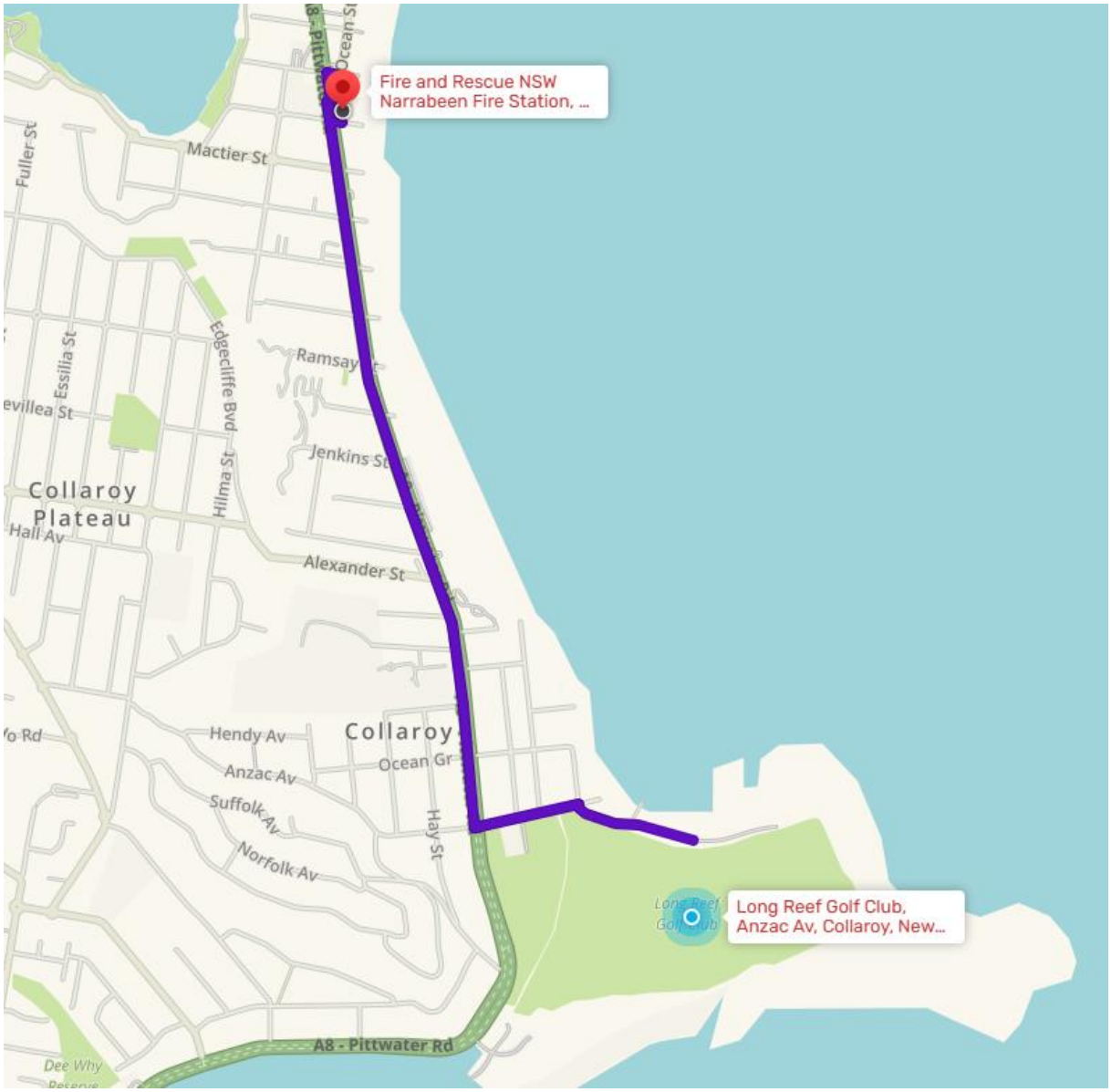


Figure 7: Distance to nearest fire station

2.6.2 Fire Brigade Access

Fire Brigade access to the building is available via the unnamed access road which is off Anzac avenue.

Figure 8: Brigade access

2.7 Fire Hazard Assessment

Fire hazard can be defined as the potential harm and degree of exposure from a fire starting and the spread of fire, smoke, and gases. A fire hazard can be defined by two categories, they are:

- The possibility of a fire occurring; and
- The severity of consequences of that fire.

The purpose of a hazard analysis is to identify potential scenarios and design fire of greatest risk as well as consider the characteristics of the building(s) and occupants that increase or decrease the associated risk. A hazard review can be characterised under three main headings:

1. The fire (fuel loads and ignition sources)
2. The occupants (building specific occupant characteristics)
3. The design (the architectural plans)

2.7.1 Classification Hazard

Table 6: Class Hazard Assessment

CLASS	HAZARD ASSESSMENT
9b	Data obtained from FRNSW Annual Statistical analysis for 2006/2007 [11] shows the breakdown of statistics on the most common ignition areas in Public Assembly Buildings. Of the 347 fire in Public Assembly Buildings the kitchen/ cooking areas were the most common ignition areas.

Table 7: Class 9b public assembly building

AREA OF FIRE ORIGIN	PERCENTAGE (%)
Functional areas (Sleeping room, dining area, kitchen, cooking area, bathroom, laundry, office, printing, electronic equipment room, stage area, process, etc.)	55.0

AREA OF FIRE ORIGIN	PERCENTAGE (%)
Storage areas (Product storage, closets, supply storage, vehicle storage, etc.)	10.1
Means of egress (Hallway, Corridor, mall, exterior stair, interior stair, lobby entrance, etc.)	7.8
Assembly, sales areas (large assembly areas with fixed seats e.g. 100 or more persons, Large open room without fixed seats e.g. 100 or more person, Small are with or without fixed seats e.g. less than 100 person, lounge are, sales show room, library, swimming pool, cinema, other)	7.5
Structural (Crawl space, concealed floor/ceiling, ceiling or roof assembly, wall assembly, exterior wall, exterior roof, awning)	7.5
Service facilities	3.7
Service, equipment areas	3.7
Undetermined, or not reported	2.9
Transportation, vehicle areas	0.0
Other location	1.7

3 FIRE SAFETY REQUIREMENTS

The following fire safety requirements are listed below with any modifications and additional requirements listed under the relevant Fire Safety System. This is not a comprehensive list of fire safety requirements for the building, but rather a list of key fire safety measures that are relied upon to support the Performance Solutions assessed within this Fire Engineering Report.

All other fire safety measures, unless modified below, shall comply with the BCA 2022 DtS Provisions where relevant.

3.1 Construction

3.1.1	Secure doors serving the building as required exits require additional push to open buttons internally to the door, to ensure that occupant egress can be facilitated through these in the event of a fire.

3.2 Fire Hose Reels

3.2.1	Fire Hose Reels are to be omitted from the Development.

3.3 Portable Fire Extinguisher

3.3.1	Portable Fire Extinguishers are required to be installed in accordance with AS2441-2005 and BCA Clause E1D14: Where Fire Hose Reels are omitted from the development, additional type ABE Fire Extinguishers are to be provided.

3.4 Maintenance and Management in Use

3.4.1	The following management requirements are placed on the eventual building owners and operators and are to be included in any management documentation: ▪ Regular evacuation drills are to be conducted annually (minimum) within the building. ▪ General housekeeping must be undertaken to maintain egress paths and ensure exits are operable to allow unobstructed travel. ▪ A no smoking policy is to be implemented in all public areas. ▪ Where services are modified as part of a performance solution, these must be included in the maintenance and annual certification. ▪ Maintenance on all active Fire Safety Systems is to be in accordance with the relevant AS1851-2012 section. ▪ Evacuation diagrams are to be provided in accordance with AS3745-2010.

3.5 Safety in Design

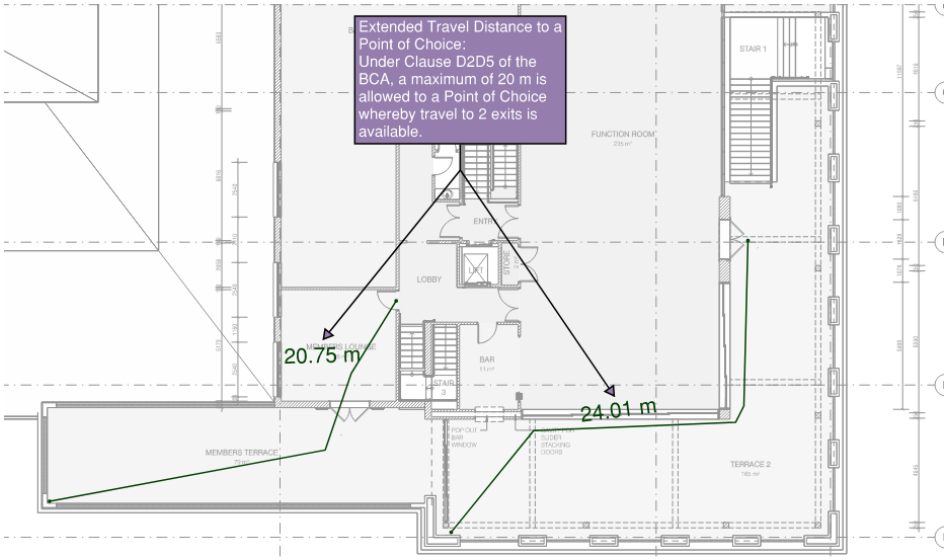
The Scope of the Fire Engineering Report does not consider “Safety in Design” as it is assumed any necessary requirements to meet this criterion will be covered by the risk management reporting required to be undertaken by the relevant consultants responsible for detailing works required by this document. E-LAB Consulting will not produce a Risk Management Report for this project while understanding that building management and property developers are required by OH&S to meet “Safety in Design” requirements during the construction, use, maintenance and demolition of plant and buildings.

4 PERFORMANCE SOLUTIONS

4.1 Summary of Performance Solutions

Table 8 lists the identified non-compliances with the BCA DtS provisions and are to be addressed by Fire Engineering Performance Solutions.

Table 8: Performance Solution List

ISSUE	PERFORMANCE SOLUTION	DTS CLAUSE(S)	PERFORMANCE REQUIREMENT(S)	ASSESSMENT METHOD	AFEG SUB-SYSTEM
1	Extended Travel Distances	D2D5	D1P4, E2P2	A2G2(2)(b)(ii) A2G2(2)(d)	D, E
	Extended travel distances to Points of Choice have been identified in the development, due to the open nature of these (Both located on external Terraces) – The distances shall be rationalised by a qualitative analysis of the floor, leaning on the open nature of the terraces allowing for smoke to ventilate away from the building and clear sightlines providing occupants with early detection of a fire.  *Figure 9: Extended Travel Distances*				
2	Omission of Fire Hose Reels	E1D3	E1P1	A2G2(2)(b)(ii)	A, C, D, E
	It is proposed to omit the requirement for Fire Hose Reels from the development, and in lieu of this, provide additional type ABE portable fire extinguishers (PFEs) where fire hose reels are omitted – The provision of additional PFEs will allow for adequate firefighting in the incipient phase of the fire, while maintaining the life safety of occupants in the building.				
3	Protection of Openings to Boundary	C4D3 C4D5	C1P2	A2G2(2)(b)(ii)	A, B, C
	The north side of the boundary is noted to be within 3m of a neighbouring lot boundary, in turn making it non-compliant with the requirements of BCA Clause C4D3 which states the following: Openings in external walls are required to be protected in accordance with C4D5 if the opening is less than 3 m from a side of rear boundary.				

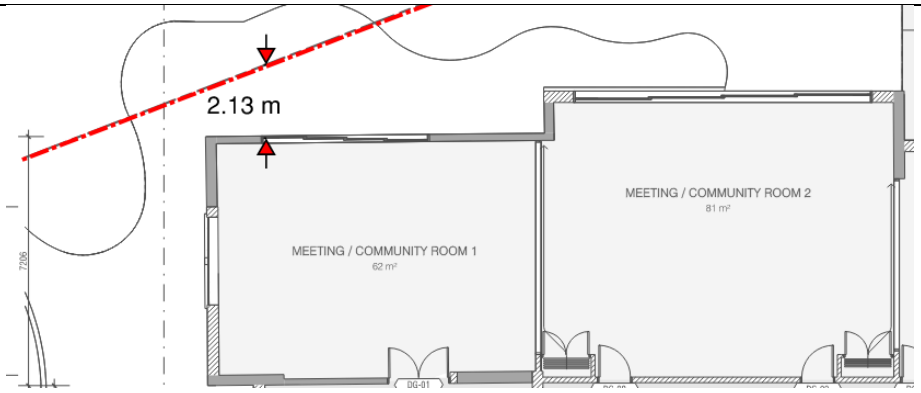


Figure 10: Opening with 3m of the boundary

Where this is the case, radiant heat assessment is proposed to be provided to determine whether or not this portion of the building requires additional protection.

4	Secure Door Provisions	D3D26	D1P4, E2P2	A2G2(2)(b)(ii)	E
	Due to the nature of the golf club, providing access to the building via secure “Members only” doors. It is proposed to provide additional provisions to these secure doors, to ensure that in a fire, occupants are provided with suitable egress and have access to all required exits of the building without compromising the security of the building facilities.				

Appendix A REFERENCES

Table 9: Reference list

Documentation	
1	ABCB 2022, National Construction Code Series, Volume 1, Building Code of Australia 2022, Class 2 to Class 9 Buildings, Australian Building Codes Board, Canberra.
2	ABCB, *Guide to the BCA 2019 amendment 1,* Australian Building Codes Board, Canberra.
3	ABCB 2021, *Australian Fire Engineering Guidelines*, 2021 Edition, Australian Building Codes Board, Canberra.
4	Babrauskas, V., *Glass breakages in fires,* Fire Science and Technology Inc.
5	*Society of Fire Protection Engineers (SFPE) Handbook* of Fire protection Engineering 5th edition, National Fire Protection Association, 2016.
6	*C/VM2*, Verification Method: Framework for Fire Safety Design, New Zealand Building Code, Protection from Fire, Department of Building and Housing, Wellington New Zealand.
7	CIBSE Guide E: Fire Safety Engineering, CIBSE, 2010
8	PD7974-6 - 2004. "The application of fire safety engineering principles to fire safety design of buildings – Part 6: Human factors: Life safety strategies – Occupant evacuation, behaviour and condition (Sub-system 6)", BSI British Standards
9	National Fire Protection Association, Standard for Smoke Management Systems in Malls, Atria, and Large Spaces (NFPA 92B), 2009
10	BS 9999:2017, Code of practice for fire safety in the design, management and use of buildings, British Standards, 2017
11	New South Wales Fire Brigades, *Statistical Assessment of AFAC Database, 2006/2007,* New South Wales Fire Brigades 2007.
12	EV FireSafe and P. Christensen, "Electric Vehicle & Charging Safety for Emergency Response," Sep. 2022.