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Fire Safety Engineering
Fire Protection Engineering
ABN 14 162 610 568

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Attention: **Paola Moran**
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Dear Paola

BOARDING HOUSE DEVELOPMENT – 67 PACIFIC PARADE, DEE WHY PROVISION FOR FIRE ENGINEERING (for DA SUBMISION)

INTRODUCTION

We refer to the proposed Boarding House Development to be located at 67 Pacific Parade, Dee Why NSW. The purpose of this document is to provide advice with regards to the proposed use of Performance Solutions to address identified variations to the Deemed to Satisfy (DtS) provisions of the Building Code of Australia 2019, Amendment 1 (BCA).

PROJECT DESCRIPTION

The proposed works comprise the construction of a new Boarding House Development, which will include:

- Basement – car parking, ancillary
- Lower Ground – car parking, entry lobby, ancillary
- Upper Ground – residential rooms, communal room
- Level 1 – residential rooms, communal room
- Level 2 – residential rooms
- Level 3 – residential rooms, communal room, common open space
- Level 4 – residential rooms (upper level)

The site is bounded by Pacific Parade to the north, and adjoining allotments to the south, east and west. The main pedestrian and vehicle entry into the building is from Pacific Parade.

BCA ASSESSMENT DATA

The relevant BCA Assessment Data for the subject development is summarised in Table 1.

Table 1: Relevant BCA Assessment Data

BCA Reference	BCA Assessment
Classification	Class 3 (boarding house) Class 7a (car parking)
Rise in Storeys	6

BCA Reference	BCA Assessment
No. of Levels Contained	7
Minimum Type of Construction Required	Type A
Effective Height	Less than 25m
Maximum Fire Compartment Size	Complies for Type A construction

REFERENCED DRAWINGS

Table 2: List of Referenced Architectural Drawings

Drawing No.	Issue	Title	Revision Date
DA-0100	01	General Arrangement – Basement Plan	24-11-2020
DA-0101	01	General Arrangement – Lower Ground Plan	24-11-2020
DA-0102	01	General Arrangement – Upper Ground Plan	24-11-2020
DA-0103	01	General Arrangement – Level 1 Plan	24-11-2020
DA-0104	01	General Arrangement – Level 2 Plan	24-11-2020
DA-0105	01	General Arrangement – Level 3 Plan	24-11-2020
DA-0106	01	General Arrangement – Level 4 Plan (Mezz)	24-11-2020
DA-0107	01	General Arrangement – Roof Plan	24-11-2020
DA-0200	01	Elevations – North Elevation	24-11-2020
DA-0201	01	Elevations – South Elevation	24-11-2020
DA-0202	01	Elevations – East Elevation	24-11-2020
DA-0203	01	Elevation – West Elevation	24-11-2020
DA-300	01	Sections – Section AA	24-11-2020
DA-301	01	Sections – Section BB	24-11-2020
DA-302	01	Sections – Sections CC/DD	24-11-2020
DA-303	01	Sections – Sections EE/FF	24-11-2020

ACHIEVING COMPLIANCE WITH THE BCA

Compliance with the BCA is achieved by satisfying the Performance Requirements. Clause A2.1 of the BCA states that the Performance Requirements can be satisfied by:

1. *Performance Solution; or*
2. *Deemed-to-Satisfy Solution; or*
3. *a combination of (1) and (2).*

Clause A2.2(1) of the BCA states that a Performance Solution is achieved by demonstrating:

(a) compliance with all relevant Performance Requirements; or

(b) the solution is at least equivalent to the Deemed-to-Satisfy Provisions,

Clause A2.2(2) of the BCA states that a Performance Solution must be shown to comply with the relevant Performance Requirements 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, form of construction or design meets the relevant Performance Requirements.

(b) A Verification Method including the following -

(i) the Verification Methods in the NCC; or

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

(c) Expert judgment.

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

SUMMARY OF PROPOSED PERFORMANCE SOLUTIONS

Table 3 summarises the identified Variations to the DtS Provisions of the BCA, the relevant BCA Performance Requirements, the Assessment Methods, the Methods of Analysis, and the Acceptance Criteria that are proposed to be used in the future Fire Engineering Assessment for the proposed development.

Note: At this stage of the design, the identified variations to the DtS provisions of the BCA are not exhaustive, and other variations resulting in the development of additional Performance Solutions may arise through the detailed design process.

Table 3: Summary of Proposed Performance Solutions

Performance Solution	BCA DTS Provisions	Variations to BCA DTS Provisions	BCA Performance Requirements
1	**Specification C1.1** Fire resisting construction	To permit glazing within the bounding construction between the communal room on level 3 and the public corridor.	**CP1, CP2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. ▪ The glazing to comprise of 6mm thick safely glass that complies with AS 1288-2006. ▪ The provision of a self-closing device to the swing door into the communal room from the public corridor. The door to also be fitted with medium temperature smoke seals. ▪ The provision of wall wetting sprinklers to the glazing, on the communal room side, to protect the glazing from the impact of radiant heat. The wall wetting sprinklers to be connected directly from the required fire hydrant system. ▪ The characteristics and use of the public corridor.	
	BCA Compliance and Assessment Method	**A2.2(1)(a)** and **A2.2(2)(b)(ii)**, Absolute Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring the risk of fire spread from the communal room to the public corridor is mitigated.	

Performance Solution	BCA DTS Provisions	Variations to BCA DTS Provisions	BCA Performance Requirements
2	**Clauses C3.2, C3.4** Protection of openings in external walls	To vary the method of protection afforded to openings (windows) within the external walls of the building that will be located less than 3m from the side allotment boundary to the west.	**CP2, CP8**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The size and orientation of the openings with respect to the allotment boundary. ▪ Subject to the results of a radiant heat assessment, the openings may need to be protected with radiant heat attenuation screens to mitigate the risk of fire spread between buildings on adjoining allotments. The radiant heat screens will be similar or equal to Crimsafe.	
	BCA Compliance and Assessment Method	**A2.2(1)(a)** and **A2.2(2)(b)(i)**, Verification Method CV1, Quantitative Analysis	
	Acceptance Criteria	Ensuring the risk of fire spread between buildings on adjoining allotments via openings within the external walls of the building will be mitigated.	
3	**Clause D1.2** Number of exits required **Clause D1.4** Exit travel distances	To have a single exit from the basement level, in lieu of at least 2 exits as required for a storey if egress from that storey involves a vertical rise within the building of more than 1.5m and where the floor area of the storey exceeds 50m^2. To have a travel distance from the basement level to a single exit of up to 30m, in lieu of 20m.	**DP4, EP2.2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. The sprinkler system serving the car parking areas will also comprise of fast response sprinklers. ▪ The provision of an enhanced building occupant warning system to improve occupant pre-movement time. ▪ Utilising the vehicle ramp as an alternative exit from the basement level, whereby the ramp does not exceed a gradient of 1:5. With reference to the SFPE Handbook[1], Proulx provides evidence that a ramp at a 1:5 gradient is passible for evacuation. ▪ The characteristics and use of the basement level.	
	BCA Compliance and Assessment Method	**A2.2(1)(b)** and **A2.2(2)(d)**, Comparative Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring occupants are permitted to evacuate from the basement level safely and in conditions that are comparable to the DtS provisions of the BCA.	

[1] The SFPE Handbook of Fire Protection Engineering, 4th Edition, National Fire Protection Association and the Society of Fire Protection Engineers, USA, 2008.

Performance Solution	BCA DTS Provisions	Variations to BCA DTS Provisions	BCA Performance Requirements
4	**Clause D1.4** Exit travel distances	To have a travel distance from the car parking areas on lower ground floor to the open space of up to 35m, in lieu of 20m.	**DP4, EP2.2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. The sprinkler system serving the car parking areas will also comprise of fast response sprinklers. ▪ The provision of an enhanced building occupant warning system to improve occupant pre-movement time. ▪ The characteristics and use of lower ground floor and the path of travel to the open space.	
	BCA Compliance and Assessment Method	**A2.2(1)(b)** and **A2.2(2)(d)**, Comparative Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring occupants are permitted to evacuate from lower ground floor safely and in conditions that are comparable to the DtS provisions of the BCA.	
5	**Clause D1.4** Exit travel distances	To have a travel distance from the entry door into a residential room on upper ground floor, level 1, level 2 and level 3 of up to 13m (worst case), in lieu of 12m.	**DP4, EP2.2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. ▪ The provision of an enhanced building occupant warning system to improve occupant pre-movement time. ▪ The provision of medium temperature smoke seals to the entry doors into the residential rooms to mitigate the risk of smoke spread into the public corridors. ▪ The characteristics and use of the public corridors, which will be fire separated from the adjoining areas of the building and are expected to remain relatively fuel free. Therefore, the public corridors are expected to present a low fire hazard.	
	BCA Compliance and Assessment Method	**A2.2(1)(b)** and **A2.2(2)(d)**, Comparative Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring occupants are permitted to evacuate from the residential levels of the building safely and in conditions that are comparable to the DtS provisions of the BCA.	

Performance Solution	BCA DTS Provisions	Variations to BCA DTS Provisions	BCA Performance Requirements
6	**Clause D1.7** Travel via fire-isolated exits	To have the fire-isolated exit serving the residential levels of the building discharge into the entry lobby on lower ground floor, in lieu of directly to an open space. To have the fire-isolated exit serving the basement level discharge within the confines of the building on lower ground floor that is not open for at least 2/3 of its perimeter.	**DP5, EP2.2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. ▪ The provision of an enhanced building occupant warning system to improve occupant pre-movement time. ▪ The characteristics and use of the entry lobby, which will be fire separated from the adjoining areas of the building and is expected to remain relatively fuel free. Therefore, the entry lobby is expected to present a low fire hazard and a fire in the entry lobby is considered unlikely. ▪ The characteristics and use of the covered area in which the fire-isolated exit serving the basement level discharges into.	
	BCA Compliance and Assessment Method	**A2.2(1)(a)** and **A2.2(2)(b)(ii)**, Absolute Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring occupants are permitted to evacuate from the building via the fire-isolated exits safely and protected from the effects of fire such as flames, smoke and radiant heat.	
7	**Clause D1.7** Travel via fire-isolated exits	To have the fire hydrant pump room on the basement level open directly into a fire-isolated exit without an airlock.	**DP5, EP2.2**
	Summary of Fire Safety Strategy	The preliminary fire safety strategy is based on: ▪ The provision of fire sprinklers throughout the building, which is expected to mitigate the development and spread of fire. ▪ Ensuring the fire hydrant pump room is fire separated from the remainder of the building in 2-hour fire rated construction. ▪ The characteristics and use of the fire hydrant pump room. ▪ The provision of medium temperature smoke seals to the doorway providing entry into the fire hydrant pump room.	
	BCA Compliance and Assessment Method	**A2.2(1)(a)** and **A2.2(2)(b)(ii)**, Absolute Assessment, Qualitative Analysis.	
	Acceptance Criteria	Ensuring the fire hydrant pump room does not impact on the required fire resisting performance of the fire-isolated exit.	

REQUIRED FIRE SAFETY SYSTEMS

The following fire safety systems will be required to be installed throughout the subject building as required by the relevant DtS provisions of the BCA:

- Fire hydrants
- Fire hose reels (non-residential use areas)
- Fire sprinklers
- Wall wetting sprinklers (level 3 communal room)
- Portable fire extinguishers
- Automatic smoke detection and alarm system
- Building occupant warning system (enhanced to include a verbal directive to instruct occupants to evacuate)
- Emergency lighting and exit signs

Note: The above list may change or vary during the detailed design process, and / or as a result of the future Fire Engineering Assessment.

CONCLUSION

In consideration of the above, it is concluded that Performance Solutions can be developed to the DtS provisions of the BCA to ensure the proposed development can achieve compliance with the relevant Performance Requirements of the BCA.

Yours Faithfully
Innova Services Pty Ltd

Jason Powell
Director
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