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PERFORMANCE BASED FIRE ENGINEERING DESIGN BRIEF

Project

JONSON STREET HOTEL
109 JONSON STREET, BYRON BAY, NSW, 2481

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QA CHECK

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1. EXECUTIVE SUMMARY

This document, prepared for Jobern Pty Ltd (Principal) is the Performance Based Fire Engineering Design Brief (PBFEDB) for the proposed new/refurbished hotel development to be located at 109 Jonson Street, Byron Bay, New South Wales.

The proposed development is the partial demolition of an existing commercial building and the construction of a multi use, four storey commercial/residential building.

The development will be Type A construction, rise in storeys of 4, effective height of 9.85 m. Total floor area of approximately 1,310 m^2.

The building consists of:

- Ground floor (Class 6, 7a): Retail, hotel lobby/bar/restaurant, car park
- First floor (Class 3): Hotel residential accommodation, communal kitchen
- Second floor (Class 3): Hotel residential accommodation
- Roof terrace (Class 3, 10b): Sauna, change rooms, shower, swimming pool

The proposed development has an effective height of 9.85 m measured to the floor of the topmost storey from the floor of the lowest storey providing direct egress to a road or open space.

The building has been designed to meet the DtS requirements of the 2022 Amendment 1 NCC, with the following departures:

1. C3D15 Public corridor in class 3 building exceeds 40 m in length – level 2 (Approx 42 m)
2. C4D3 Openings within 3 m of boundary or 6 m from another building not protected in accordance with C4D5 –
    - Eastern wall Level 1 communal wall
    - Glass block window openings in southern wall of second floor corridor
    - Western window opening to Type K unit adjacent to northern boundary of site – second floor
    - Door openings to dumb waiter, laundry chutes, plant room and amenities adjacent to south boundary – roof terrace
3. D2D4 Extended travel distances -
    - Level 1 units fronting Jonson Street
    - Unit type L on Level 2
    - Pool deck

The project FER will demonstrate the effectiveness of the proposed building alternate solution in meeting the performance requirements of the 2022 Amendment 1 NCC.

SUMMARY OF PERFORMANCE SOLUTION

Table A summarises the NCC DTS departures and associated NCC DtS Clause and Performance Requirements. In addition, code compliance, assessment method, proposed analysis method, assessment methodology and acceptance criteria are also summarised.

The applicability of the proposed Performance Solution will be assessed and presented as the project FER.

Departure Reference	NCC Clause	NCC Performance Requirements	NCC DtS Provision Departures
Fire Resistance			
Performance Solution 1	C3D15	C1P2 E2P2	Public corridor exceeds 40 m in length without smoke proof wall or door separation (approximately 42 m) on Level 2
	IFEG Sub-systems		Sub-system B – Smoke Development & Spread & Control Sub-system C – Fire Spread and Impact and Control Sub-system E – Occupant Evacuation and Control
	Code Compliance and Assessment Method:		A2G2 as detailed in Section 2.2
	Proposed Analysis Method, Assessment Methodology and Acceptance Criteria:		Qualitative and quantitative analysis based on ability of occupants to safely exit the building. Building and areas are fully sprinklered so active fire safety systems are in place. Enhanced smoke alarms will provide early warning to building occupants. Smoke seals on unit doors to add safety. Corridor ceiling height to be 2400 mm minimum in lieu of 2100 mm (DtS) – this achieves a higher level for smoke layer before it becomes untenable. Acceptance will be demonstrated where the level of protection afforded to the building occupants will be equivalent to that provided by a DTS solution.
	Design fire scenarios		A fire within building.
	Key hazards		Fire may affect occupant egress.
	Sensitivity analysis		1.0 m/s is adopted for the occupant travel speed.
Fire Resistance			
Performance Solution 2	C4D3	C1P2	Openings within 3 m of boundary or 6 m from another building not protected in accordance with C4D5 – Eastern wall Level 1 communal wall Glass block window openings in southern wall of second floor corridor Western window opening to Type K unit adjacent to northern boundary of site – second floor Door openings to dumb waiter, laundry chutes, plant room and amenities adjacent to south boundary – roof terrace

	IFEG Sub-systems		Sub-system A – Fire Initiation & Development & Control Sub-system B – Smoke Development & Spread & Control Sub-system C – Fire Spread and Impact and Control
	Code Compliance and Assessment Method:		A2G2 as detailed in Section 2.2
	Proposed Analysis Method, Assessment Methodology and Acceptance Criteria:		Qualitative analysis method based on the measures provided to limit fire spread. Fire sprinkler to be located internally, within 500 mm of the opening. In addition, this boundary is a gazetted parkland. Acceptance will be demonstrated where the level of safety provided to the building occupants will be equivalent to a DtS design.
	Design fire scenarios		A fire at the boundary.
Access and Egress			
Performance Solution 3	D2D5	D1P4 E2P2	D2D4 Extended travel distances - Level 1 units fronting Jonson Street Unit type L on Level 2 Pool deck
	IFEG Sub-systems		Sub-system E – Occupant Evacuation and Control Sub-system F – Fire Services Intervention
	Code Compliance and Assessment Method:		A2G2 as detailed in Section 2.2
	Proposed Analysis Method, Assessment Methodology and Acceptance Criteria:		Qualitative analysis based on conditions provided for exiting occupants. Height is 2400 mm in lieu of 2100 mm minimum requirement, increased time for exit before smoke layer becomes untenable. Building is sprinkler protected – increasing safety and time for escape. Building to have enhanced fire detection and alarms to provide early warning and give building occupants earlier warning and more time to exit in an emergency. Acceptance will be demonstrated where the level of protection given to exiting occupants will be sufficient to ensure a safe egress from the building.
	Design fire scenarios		A fire within the non secured area
	Key hazards		Smoke build up from fire may affect exiting occupants.
	Sensitivity analysis		1.0 m/s is adopted for the occupant travel speed.

FIRE ENGINEERING OUTCOMES

The Fire Engineering Outcomes (also known as the Trial Concept Design or Performance Solution) is required to address departures from the NCC DTS provisions and is intended to achieve a level of fire and life safety which meets Jobern Pty Ltd's objectives set out in Section 2.3 of the final FER.

All other items of fire and life safety, where not specifically addressed or reviewed as part of this document are to be in accordance with NCC DTS provisions or as accepted by the Building Certifier and other Regulatory Authorities.

The following Fire Engineering Outcomes detail the required preventative and protective measures based on the fire engineering assessment in order to achieve compliance with the NCC Performance Requirements and shall take precedence over the remainder of the Fire Engineering Report (FER).

Fire and Smoke Resistance

New building works must be constructed in accordance with the NCC DTS requirements for Type A construction

Doorsets and the like

Except as per the provisions of this report, doorsets to SOU entrances, fire-isolated stairs and other rooms that bound the public corridors must comply with NCC DTS requirements

Provisions for escape

Except as per the provisions of this report, the number of exits must comply with NCC Clause D2D3.

Hydrants, Hose Reels and Extinguishers

Fire hydrants must be provided in accordance with the NCC DTS requirements.

Fire hose reels must be provided in accordance with the NCC DTS requirements.

Portable fire extinguishers must be provided in accordance with the NCC DTS requirements.

Detection and Alarm Systems

Smoke detection and alarm system must be installed throughout the building in accordance with NCC Specification 20.

Emergency Lighting and Exit Signs

Emergency lighting must be provided in accordance with the NCC DTS requirements.

Exit signs must be provided in accordance with the NCC DTS requirements.

2. INTRODUCTION

2.1. General

Property Technologies Pty Ltd has been commissioned by Jobern Pty Ltd to undertake a performance-based assessment of the building design for the Jonson Hotel project to be developed at Byron Bay, New South Wales.

The fire engineering assessment is to address the relevant Performance Requirements of the National Construction Code (NCC) 2022 Building Code of Australia (NCC) Volume One. Where a Performance Solution is proposed, via qualitative analysis methods, as defined in the International Fire Engineering Guidelines (IFEG).

Utilising the NCC, an acceptable Building Solution is to be achieved by a combination of compliance with the NCC Deemed-to-Satisfy (DTS) provisions and formulating an acceptable Performance Solution. This approach is intended to allow the development of an effective alternative building design, whilst maintaining an acceptable level of Fire and Occupant Life Safety.

2.2. Legislative Requirements

This project is to be designed under the National Construction Code (NCC) 2022 Building Code of Australia (NCC) Volume One, incorporating Amendment One.

The fire engineering assessment will need to demonstrate that the Performance Solution achieves compliance with the relevant NCC Performance Requirements. All other Performance Requirements are to be met by complying with the NCC DTS provisions or accepted by the Building Certifier and other Regulatory Authorities. It is also to be commensurate with the Objectives outlined in Section 2.3.

Compliance with the NCC is illustrated via Clause A2G1 and then A2G2, A2G3 and A2G4, whereby to comply with legislative requirements, the design of the building must comply with the NCC Performance Requirements. Note: The Performance Requirements are the only part of the NCC with which a design must comply. The NCC Objectives and Functional Statements are given as guidance to explain the intent of the Performance Requirements.

Where the building solution complies with the NCC DTS provisions, it is deemed to comply with the Performance Requirements.

NCC Clause A2G1 states that compliance with the NCC Performance Requirements can only be satisfied by a -

a. Performance Solution; or

b. Deemed to Satisfy Solution; or

c. Combination of (a) and (b)

NCC Clause A2G2 states that:

(1) 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.

(2) 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 provided in the NCC.
    (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.

(3) Where a Performance Requirement is satisfied entirely by a Performance Solution, in order to comply with (1) the following method must be used to determine the Performance Requirement or Performance Requirements relevant to the Performance Solution:

(a) Identify the relevant Performance Requirements from the Section or Part to which the Performance Solution applies.
(b) Identify Performance Requirements from other Sections or Parts that are relevant to any aspects of the Performance Solution proposed or that are affected by the application of the Performance Solution.

(4) Where a Performance Requirement is proposed to be satisfied by a Performance Solution, the following steps must be undertaken:
(a) Prepare a performance-based design brief in consultation with relevant stakeholders.
(b) Carry out analysis, as proposed by the performance-based design brief.
(c) Evaluate results from (4)(b) against the acceptance criteria in the performance-based design brief.

(d) Prepare a final report that includes—
(i) all Performance Requirements and/or Deemed-to-Satisfy Provisions identified through A2G2(3) or A2G4(3) as applicable; and
(ii) identification of all Assessment Methods used; and
(iii) details of steps (4)(a) to (4)(c); and
(iv) confirmation that the Performance Requirement has been met; and
(v) details of conditions or limitations, if any exist, regarding the Performance Solution.

2.3. Client Objectives

At a community level, fire safety objectives are met if the relevant legislation and regulations are complied with. As stated in Clause A2G1 of the NCC, “A Building Solution will comply with the NCC if it satisfies the Performance Requirements”.

The NCC Performance Requirements are intended to meet the Objectives and Functional Statements of the NCC, which outline the NCC’s goal.

The NCC’s goal in the area of fire safety is to protect the lives of the building occupants, facilitate Fire Brigade intervention in the event of an emergency, and protect adjacent property from the spread of fire and physical damage caused by structural failure.

2.4. Fire Brigade Objectives

The overall philosophy of the Fire Brigade objectives throughout Australia is to protect life, property and the environment from fire according to the FBIM.

Fire and Rescue New South Wales (FRNSW) reported in their 2016/17 annual report, attendance to 90th percentile of all fires within 12 minutes from the time of notification.

Over and above the requirements of the NCC, the Fire Brigade has functions with regards to property protection and considerations regarding occupational health and safety for its employees, which we understand are commensurate with the Fire Safety Strategy to be incorporated.

2.5. Fire Engineering Brief

This document serves as the Fire Engineering Brief (FEB) for the project and will be the basis of the FEBQ which will be produced and distributed to all parties for comment.

2.6. Relevant Stakeholders

The relevant stakeholders for this project are listed in Table 2.1:

Table 2.1: Stakeholders

Role	Company	Representative
Design Stakeholders		
Client/Principal	Jobern Pty Ltd	Andrew Thompson
Architect	Habitat Studio Architects	
Fire Safety Engineer	Property Technologies Pty Ltd	Jessica Sutton
Review and Authority Stakeholders		
Building Code Consultant	Devex Pty Ltd	Craig Nowlan
Fire Brigade	FRNSW	

2.7. Sources of Information

This document is based on the following sources of information:

a. Habitat Studio Architects Drawing Set J.1.28

b. Devex Pty Ltd Preliminary BCA Assessment

2.8. Limitations

Limitations relate to design boundaries applied to the analyses undertaken and the relevance of empirical results for formulation of recommended outcomes. The following limitations apply to this document:

a. The relevant design criteria for the Alternative Solution to meet the Performance Requirements of the BCA are set out herein. Where not specifically mentioned, the design is expected to meet the BCA DTS requirements of all relevant codes and legislation at the time of construction and/or at the time of production of this document.

b. No liability is accepted for the application or use of the Fire Engineering Outcomes listed herein and/or the parameters on which Property Technologies Pty Ltd have based this analysis, including the set design criteria and specific project scope/works and parameters, by any third party outside the stakeholders and design team noted herein or this specific project works.

c. No liability is accepted for the accuracy of the documents provided by others which form the basis of the analysis.

d. Drawings referred to or incorporated in this document may change resulting from design variations. Readers of all fire engineering documentation must ensure that they observe the latest project related drawings and relate these to this document. Changes to the sources of information will require further fire engineering assessment to determine compliance with the intent of the design objectives.

e. Fire Resistance Levels (FRLs) grading periods, where not specifically indicated as a three component unit for building works, must be applied at the given FRL rating in accordance with the structural adequacy/integrity/insulation criteria specified in the relevant BCA DTS provision for the Class occupancy applicable.

f. The analysis of deliberate fires through acts of malicious intent or arson is limited to the assessment as addressed in the DTS provisions of the BCA. That is to say:

   i. The likelihood of a fire through acts of malicious intent or arson is no greater than for a design fully compliant with the DTS provisions of the BCA. The proposed design is equivalent to the DTS provisions of the BCA in this regard.

ii. Multiple fire ignitions are not considered in either the DTS provisions of the BCA or the proposed design. While possible through malicious intent or arson, this event is unlikely.

iii. Ignition of a single item of fuel contained on the premises is within the limitation of this analysis as far as it is considered to result in design fires as those resulting by accidental cause.

g. Only one fire will occur at one time. It is in our opinion the BCA DTS provisions only consider a single fire. This is evident by prescribing alternative exits and fire sprinkler systems being designed for only one area of operation.

h. Occupants will become aware of the fire through fire cues, respond to the cue, cope with the cue and attempt to avoid the fire, as intended by the BCA for safe evacuation.

i. Responsibility for re-installation and costs of any damages caused by fire is considered to be beyond the scope of the fire engineering assessment.

j. This fire engineering solution is derived making all reasonable assumptions regarding Disability Discrimination Act (DDA) issues. That is, all physically and intellectually handicapped occupants within the building are capable of evacuating to the fire exit of their own accord, or are assisted by colleagues/others.

k. The fire engineering assessment, in this case, will not include for building and contents damage, stock loss, goodwill impact, environmental impact (in a fire situation) or any loss of trade or business interruption associated directly or indirectly with a fire in these premises.

l. Except where specifically noted herein, the fire engineering assessment will not address nor analyse explosive materials, multiple ignition sources and locations, processing of flammable liquids, arson, sabotage of existing fire safety systems, bulk storage or the like.

m. Specific consideration of the effects of an LPG boiled liquid evaporation vapour explosion (BLEVE) in a carpark fire involving a vehicle with an LPG tank is excluded from the fire engineering assessment. The effects from a BLEVE Fire are potentially severe and could lead to catastrophic events within the building. We limit our liability in this analysis and note in this limitation that all LPG installations whether within carparks or fixed installations as part of the building services, are assumed to be maintained to current regulatory and statutory requirements, and that all appropriate safety procedures are followed.

   We consider that the BLEVE is an extreme event, is outside the realms of a BCA DTS compliant building, and outside the scope of this fire engineering assessment.

n. Property Technologies Pty Ltd incorporates all reasonable and practical efforts into producing a Fire Safety Strategy commensurate with the client's objectives, expectations and operations. Property Technologies Pty Ltd cannot guarantee, in producing a Fire Safety Strategy, by way of the FEB, FER and fire engineering assessment, that ignition or fire will not occur. Moreover, no amount of advice can guarantee that ignition or fire will not occur.

o. Unless explicitly noted herein, this fire engineering assessment does not address protection of the building during construction, renovation or demolition.

3. PROJECT DESCRIPTION

3.1. General

This document, prepared for Jobern Pty Ltd (Principal) is the Performance Based Fire Engineering Design Brief (PBFEDB) for the proposed new/refurbished hotel development to be located at 109 Jonson Street, Byron Bay, New South Wales.

The proposed development is the partial demolition of an existing commercial building and the construction of a multi use, four storey commercial/residential building.

The development will be Type A construction, rise in storeys of 4, effective height of 9.85 m. Total floor area of approximately 1,310 m^2.

The building consists of:

- Ground floor (Class 6, 7a): Retail, hotel lobby/bar/restaurant, car park
- First floor (Class 3): Hotel residential accommodation, communal kitchen
- Second floor (Class 3): Hotel residential accommodation
- Roof terrace (Class 3, 10b): Sauna, change rooms, shower, swimming pool

The proposed development has an effective height of 9.85 m measured to the floor of the topmost storey from the floor of the lowest storey providing direct egress to a road or open space.

The building has been designed to meet the DtS requirements of the 2022 Amendment 1 NCC, with the following departures:

1. C3D15 Public corridor in class 3 building exceeds 40 m in length – level 2 (Approx 42 m)
2. C4D3 Openings within 3 m of boundary or 6 m from another building not protected in accordance with C4D5 –
    - Eastern wall Level 1 communal wall
    - Glass block window openings in southern wall of second floor corridor
    - Western window opening to Type K unit adjacent to northern boundary of site – second floor
    - Door openings to dumb waiter, laundry chutes, plant room and amenities adjacent to south boundary – roof terrace
3. D2D4 Extended travel distances -
    - Level 1 units fronting Jonson Street
    - Unit type L on Level 2
    - Pool deck

The project FER will demonstrate the effectiveness of the proposed building alternate solution in meeting the performance requirements of the 2022 Amendment 1 NCC.

3.2. Building Characterisation

Table 3.1 details the general subject building characteristics that are relevant to the NCC.

Table 3.1 – General Building Characteristics

Characteristic	Description
Effective height	9.85 m
Rise in storeys	4
Storeys contained	4
Classifications	Class 3, 6, 10b and 7a
Type of construction	Type A
Relevant Code	NCC 2022 Amdt 1

Table 3.2 details the function or uses of the building or building part associated with the subject building classification.

Table 3.2 – Building Classification and Function or Use

Building Classification	Description
Class 3, 6, 10b, 7a	The building is a four storey hotel with carpark and associated retail and auxiliary areas.

3.3. Building Layout, Size and Shape

Table 3.3 sets out the floor areas of the various parts of the building. The floor areas are approximate based on information as referenced in Section 1.5.

.Table 3.3 – Building Floor Areas

Level	Occupancy Type	NCC Classification	Approx. Floor Area
Ground	Retail, lobby, carpark	7a, 6, 3	327
Level 1	Hotel	3	586
Level 2	Hotel	3	390
Roof terrace	Sauna, pool, amenities	10b, 3	320

3.4. Property Location

The development is to be located at 109 Jonson Street in Byron Bay, New South Wales and will occupy the site, as shown in Figure 3.1.

Figure 3.1 – Site Location

3.5. Proximity to Other Buildings and Boundaries

Except for the provisions of this report, general compliance to boundaries and Fire Source Features (FSFs) are understood to be in accordance with the DtS provisions of the NCC.

3.6. General Egress Provisions

Except as detailed in this report, general compliance of exits from the building are understood to be in accordance with the DTS provisions of the NCC.

4. PERFORMANCE BASED BUILDING SOLUTIONS

4.1. General

The following sections detail the various aspects of the proposed Alternative Building Solution and its deviation from the NCC DtS Provisions, the relevant NCC Performance Requirements that need to be complied with, the Assessment and Analysis Methods and Methodologies, and Acceptance Criteria for the NCC DtS departures.

4.2. Public corridor exceeds 40 m in Class 3 building

General
This assessment addresses Performance Solution 1.

NCC DTS Requirements
NCC DTS Clause C3D15 requires that In a Class 2 or 3 building, a public corridor, if more than 40 m in length, must be divided at intervals of not more than 40m with smoke-proof walls complying with S11C2.

Proposed Building Solution
Level 2 public corridor exceeds 40 m in length, approximately 42 m.

Building and areas are fully sprinklered so active fire safety systems are in place.

Enhanced smoke alarms will provide early warning to building occupants.

Smoke seals will be provided to unit doors.

The corridor ceiling height is to be 2400 mm minimum in lieu of 2100 mm (DtS) – this achieves a higher level for smoke layer before it becomes untenable.

Acceptance will be demonstrated where the level of protection afforded to the building occupants will be equivalent to that provided by a DTS solution.

Code Compliance and Assessment Methods
Compliance with the NCC Performance Requirements is to be achieved via Clause A2G2 as detailed in Section 2.2.

Expert judgement and qualitative analysis as detailed in Section 2.2 will be utilised, as appropriate, to demonstrate that the Alternative Solution complies with the relevant Performance Requirement determined in accordance with A2G2 (3).

The Performance Solution is required to meet NCC Performance Requirements C1P2 and E2P2.

Analysis Methods, Assessment Methodology and Acceptance Criteria
Compliance with the NCC Performance Requirement is to be achieved using a qualitative analysis method based on the measures provided to protect the exiting occupants.

Acceptance will be demonstrated where the level of protection provided to the occupants is equal to or greater than the DTS requirements of the NCC.

4.3. Openings in external walls not protected in accordance with C4D5

General
This assessment addresses Performance Solution 2.

NCC DtS Requirements

NCC DtS Clause C4D3 stipulates that—

(1) Subject to (2), openings in an external wall that is required to have an FRL must be protected in accordance with C4D5, and if wall-wetting sprinklers are used, they must be located externally.

(2) The requirements of (1) only apply if the distance between the opening and the fire-source feature to which it is exposed is less than—

(a) 3 m from a side or rear boundary of the allotment; or

(b) 6 m from the far boundary of a road, river, lake or the like adjoining the allotment, if not located in a storey at or near ground level; or

(c) 6 m from another building on the allotment that is not Class 10.

(3) Openings required to be protected under (1), must not occupy more than 1/3 of the area of the external wall of the storey in which they are located unless they are in a Class 9b building used as an open spectator stand.

Clause C3D5 offers the following acceptable methods of protection:

(1) Where protection is required, doorways, windows and other openings must be protected as follows:

(a) Doorways—

(i) internal or external wall-wetting sprinklers as appropriate used with doors that are self-closing or automatic closing; or

(ii) –/60/30 fire doors that are self-closing or automatic closing.

(b) Windows—

(i) internal or external wall-wetting sprinklers as appropriate used with windows that are automatic closing or permanently fixed in the closed position; or

(ii) –/60/– fire windows that are automatic closing or permanently fixed in the closed position; or

(iii) –/60/– automatic closing fire shutters.

(c) Other openings—

(i) excluding voids — internal or external wall-wetting sprinklers, as appropriate; or

(ii) construction having an FRL not less than –/60/–.

(2) Fire doors, fire windows and fire shutters must comply with Specification 12.

Proposed Building Solution

The following openings are proposed to be protected via methods not in accordance with C3D5:

- Eastern wall Level 1 communal wall
- Glass block window openings in southern wall of second floor corridor
- Western window opening to Type K unit adjacent to northern boundary of site – second floor
- Door openings to dumb waiter, laundry chutes, plant room and amenities adjacent to south boundary – roof terrace

Qualitative analysis will be completed based on the measures provided to limit fire spread.

Fire sprinkler to be located internally, within 500 mm of the opening, this will assist in limiting fire outbreak.

Assessment of boundaries, radiant flux and risk factors to be completed.

Acceptance will be demonstrated where the level of safety provided to the building occupants will be equivalent to a DtS design.

It is not considered that the openings will cause a risk to occupants.

Code Compliance and Assessment Methods
Compliance with the NCC Performance Requirements is to be achieved via Clause A2G2 as detailed in Section 2.2.

Expert judgement and qualitative analysis as detailed in Section 2.2 will be utilised, as appropriate, to demonstrate that the Alternative Solution complies with the relevant Performance Requirement determined in accordance with A2G2 (3).

Acceptance will be demonstrated where it is shown that the risk presented to the building is equivalent to DtS design.

The Performance Solution is required to meet NCC Performance Requirement C1P2.

Analysis Methods, Assessment Methodology and Acceptance Criteria

Compliance with the NCC Performance Requirement is to be achieved using qualitative analysis method, based on the building geometry.

Acceptance will be demonstrated where the risk presented by the design is considered to be acceptable when compared to DtS and the performance requirements of the code.

4.4. Extended travel distances

General

This assessment addresses Performance Solution 3.

NCC DtS Requirements

NCC DtS Clause D2D5 requires that —

(1) Class 2 and 3 buildings —

(a) The entrance doorway of any sole-occupancy unit must be not more than—

(ii) 6 m from an exit or from a point from which travel in different directions to 2 exits is available; or

(ii) 20 m from a single exit serving the storey at the level of egress to a road or open space; and

(e) no point on the floor of a room which is not in a sole-occupancy unit must be more than 20 m from an exit or from a point at which travel in different directions to 2 exits is available.

Proposed Building Solution

Travel distance exceeds 6 m on hotel levels. This is a non compliance to D2D5 (1) (a) (ii).

Travel distance exceeds 20 m on rooftop.

Enhanced smoke alarm system is proposed to provide early warning to the building occupants.

1 x addressable AS1670.1-2018 thermal detector is to be installed within 1.5 m of the SOU entry door (within the SOU). Additional thermal detectors are to be interconnected to the site fire brigade panel and shall incorporate an audible and visual indication for fault and or vandalism at the fire brigade panel. Each of the additional thermal detectors shall trigger the building occupant warning system via the fire brigade panel.

Building fire alarm system is to achieve sound pressure level of 75 dB when measured at the bedhead. To achieve this, speakers in bedrooms are recommended.

In addition, the building is fully sprinklered.

Acceptance will be demonstrated where the level of early warning provided to the building occupants will be sufficient to ensure a safe egress time from the building.

Code Compliance and Assessment Methods

Compliance with the NCC Performance Requirements is to be achieved via Clause A2.2 as detailed in Section 2.2.

Expert judgement and qualitative analysis as detailed in Section 2.2 will be utilised, as appropriate, to demonstrate that the Alternative Solution complies with the relevant Performance Requirement determined in accordance with A2.2 (3).

The Performance Solution is required to meet NCC Performance Requirements D1P4 and E2P2.

Analysis Methods, Assessment Methodology and Acceptance Criteria

Compliance with the NCC Performance Requirement is to be achieved using a qualitative analysis method based on the measures provided to facilitate occupant egress.

Acceptance will be demonstrated where the level of protection provided to the building occupants will allow safe egress from the building.

Conclusion

Table 4.1 provides a review of the relevant considerations of the identified Performance Requirements, so that compliance with the NCC can be achieved.

Table 4.1 – Performance Requirements

Performance Requirement	Comment
C1P2 Spread of fire – (a) A building must have elements which will, to the degree necessary, avoid the spread of fire -	
To exits;	Will be assessed as part of FER
To sole occupancy units and public corridors (Class 2 part only)	Will be assessed as part of FER
Between buildings	Will be assessed as part of FER
In a building	Will be assessed as part of FER.
(b) Avoidance of the spread of fire referred to in (a) must be appropriate to -	
the function or use of the building;	Will be assessed as part of FER.
the fire load;	Will be assessed as part of FER.
the potential fire intensity	Will be assessed as part of FER.
the fire hazard;	Will be assessed as part of FER.
The number of storeys in the building	Will be assessed as part of FER.
Its proximity to other property	Will be assessed as part of FER.
Any active fire safety systems in the building	Will be assessed as part of FER.
The size of any fire compartment	Will be assessed as part of FER. Compartment size will be DtS.
Fire brigade intervention	Will be assessed as part of FER.
Other elements they support	Will be assessed as part of FER.
The evacuation time	Will be assessed as part of FER.

D1P4 – Exits must be provided from a building to allow occupants to evacuate safely, with their number, location and dimension being appropriate to -	
The travel distance	Will be assessed as part of FER
The number, mobility and other characteristics of occupants	Will be considered as part of the assessment – average speed will be determined through research.
The function or use of the building	Will be addressed as part of the assessment – building is a hotel
The height of the building	Building height is not greater than 25 m – fire sprinklers are being provided throughout.
Whether the exit is from above or below ground level	Exit locations will be considered as part of the FER
EP2.2 (2) - The period of time occupants take to evacuate referred to in (a) must be appropriate to—	
The number, mobility and other characteristics of the occupants; and	Will be addressed as part of the assessment.
the function or use of the building; and	Will be addressed as part of the assessment – building is a hotel
the travel distance and other characteristics of the building; and	Will be assessed as part of FER
the fire load; and	Fire load has been considered as comparable to a DtS building.
the potential fire intensity; and	Fire intensity has been considered as comparable to a DtS building.
the fire hazard; and	Fire hazard has been considered as comparable to a DTS building.
any active fire safety systems installed in the building; and	Fire sprinklers and AS1670 alarms provided throughout.
fire brigade intervention.	Occupants are presumed, based on a FRNSW response time, to have exited the building prior to brigade arrival. The performance solution has given additional warning and increased available exit time.

Building Performace Solution will be shown to meet the performance requirements C1P2, D1P4 and E2P2.

Based on the proposed assessment and proposed fire safety measures, it is expected that the proposed building solution will be shown to not unduly impact on the ability of the building occupants to exit safely in case of fire or impact the ability for the Fire Brigade to undertake fire-fighting operations.