Level 15, 133 Castlereagh Street Sydney, NSW 2000 Australia www.ghd.com



Our ref: 12596025 Revision: 0

28 April 2023

Warren Duarte

Iris Capital Level 4, 264 George St Sydney NSW 2000

Re: DDN01: Design Development Note – Fire Engineering Advice Project: East End Stages 3 & 4

Dear Warren

This Consultant Advice Note (CAN) provides the Preliminary Fire Safety Engineering Strategy for the proposed development of Stages 3 & 4 of the Newcastle East End development.

A preliminary fire engineering investigation has been undertaken to advise the current design with regards to fire safety features and performance solutions. This document outlines the construction, fire safety systems and management requirements considered necessary to achieve an acceptable level of life safety with the building to satisfy the Performance Requirements of the NCC, specifically through the development of Performance Solutions.

As a preliminary document the requirements are indicative only and subject to change, meant to assist with development of the detailed design. No fire engineering analysis is contained herein and the complete fire engineering analysis will form the Performance Based Design Brief (via the Fire Engineering Brief Questionnaire) and Fire Engineering Report, and is to be developed as the design progresses.

Prepared,

Mark Looney

Mark Cooney Technical Director (Fire Engineering) Certifier (Fire Safety)

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The Power of Commitment

1. Introduction and Understanding

1.1 Project Background

GHD understand that the development is situated on Hunter Street within the Newcastle Central Business District. Stage 3 has frontage to Hunter Street to the north, Laing Street to the south, Morgan Street to the east and Thorn Street to the west. Stage 4 has frontage to Hunter Street to the north, King Street to the south, Newcomen Street to the east and Morgan Street to the west.



Figure 1:Stage 3 & 4: SJB, DBJ, Curious Practise



Figure 2:Stage 3 & 4 Tower Layout Sketch

Stage 3 is made up of three towers - 3 East, 3 North, and 3 South, which include retail and commercial tenancies on the ground floor and residential apartments on the floors above. The associated parking facilities are located in three basement levels. The building is considered a united building that is over 25 m in effective height due to the connection of all towers via the basement carparking.



Figure 3:Stage 3 Sectional Plan

Stage 4 comprises two separate buildings known as 4 North and 4 South. These two buildings are to be separated by a fire wall on Basement Level 2 and the Ground Floor to be considered separate buildings. 4 North contains retail tenancies and residential storage facilities on the Ground Floor, a mix of retail and residential uses on Level 1 and residential apartments from Levels 2 to 8. This building has an effective height of less than 25 m due to the separation at basement and ground level.

4 South has communal uses on the Lower Ground Floor, residential apartments and storage facilities on the Upper Ground Floor and residential apartments from Levels 1 to 9. This building has an effective height in excess of 25 m.



Figure 4:Stage 4 Sectional Plan

1.2 Design Objectives

The aim of the design is to provide an appropriate level of fire safety for the building occupants (including visitors and maintenance personnel), firefighters, and other emergency services personnel. The NCC fire safety objectives are:

- Safety of occupants (reduce risk to an acceptable level).
- Facilitation of effective emergency services intervention.
- Protection of adjoining property and third parties.

1.3 Building Characteristics

NCC Clause	Category	Description
Sch 3	Effective Height	Stage 3
		38.29 m
		Stage 4 North
		23.47 m
		Stage 4 South
		38.01 m
A6.0	Occupancy Classification	Stage 3
		Class 2, Class 6 Class 7a
		Stage 4 North
		Class 2, Class 6, class 7a <u>Stage 4 South</u>

NCC Clause	Category	Description
		Class 2, Class 6, Class 7a, Class 7b, Class 9b
C1.1	Minimum Type of Construction	NCC Туре А
C1.2	Rise in Storeys	Stage 3
		13
		Stage 4 North
		8
		Stage 4 South
		12

1.4 Documentation

The documents listed below have been reviewed to a high level and are the basis of this advice.

Drawing No / Rev	Name	Date
022-219164	BCA Compliance Capability Report	12 April 2023
DA-3E-1001/3	FLOOR PLAN -3E -BASEMENT 03	31/03/2023
DA-3E-1002/3	FLOOR PLAN -3E -BASEMENT 02	31/03/2023
DA-3E-1003/3	FLOOR PLAN -3E -BASEMENT 01	31/03/2023
DA-3E-1004/D	FLOOR PLAN - 3E - GROUND PLAN	27/03/2023
DA-3E-1005/D	FLOOR PLAN - 3E - LOADING LEVEL PLAN	27/03/2023
DA-3E-1006/D	FLOOR PLAN - 3E - LEVEL 1 PLAN	27/03/2023
DA-3E-1007/D	FLOOR PLAN - 3E - LEVEL 2 PLAN	27/03/2023
DA-3E-1008/D	FLOOR PLAN - 3E - LEVEL 3 PLAN	27/03/2023
DA-3E-1009/D	FLOOR PLAN - 3E - LEVEL 4 PLAN	27/03/2023
DA-3E-1010/D	FLOOR PLAN - 3E - LEVEL 5 PLAN	27/03/2023
DA-3E-1011/D	FLOOR PLAN - 3E - LEVEL 6 PLAN	27/03/2023
DA-3E-1012/D	FLOOR PLAN - 3E - LEVEL 7 PLAN	27/03/2023
DA-3E-1013/D	FLOOR PLAN - 3E - LEVEL 8 PLAN	27/03/2023
DA-3E-1014/D	FLOOR PLAN - 3E - LEVEL 9 PLAN	27/03/2023
DA-3E-1015/D	FLOOR PLAN - 3E - LEVEL 10 PLAN	27/03/2023
DA-3E-1016/A	FLOOR PLAN - 3E - LEVEL 10 MEZZANINE PLAN	27/03/2023
DA-3E-1017/D	FLOOR PLAN - 3E - PLANT PLAN	27/03/2023
DA-3E-1018/D	FLOOR PLAN - 3E - ROOF PLAN	27/03/2023
DA-3E-1401/C	ELEVATIONS – 3E – NORTH ELEVATION	27/03/2023
DA-3E-1402/C	ELEVATIONS – 3E – SOUTH ELEVATION	27/03/2023
DA-3E-1403/C	ELEVATIONS – 3E – EAST ELEVATION	27/03/2023
DA-3E-1404/C	ELEVATIONS – 3E – WEST ELEVATION	27/03/2023

DA-3E-1405/C	ELEVATIONS – 3E – LANEWAY NORTH ELEVATION	27/03/2023
DA-3E-1406/C	ELEVATIONS – 3E – LANEWAY SOUTH ELEVATION	27/03/2023
DA-3E-1501/B	SECTIONS – 3E – BUILDING SECTION A	27/03/2023
DA-3E-1502/B	SECTIONS – 3E – BUILDING SECTION B	27/03/2023
DA-3E-1503/B	SECTIONS – 3E – BUILDING SECTION C	27/03/2023
DA-3E-9001/C	MATERIAL SCHEDULE	27/03/2023
DA-3E-1001/3	FLOOR PLAN -3E - BASEMENT 03	31/03/2023
DA-3E-1002/3	FLOOR PLAN -3E - BASEMENT 02	31/03/2023
DA-3E-1003/3	FLOOR PLAN -3E - BASEMENT 01	31/03/2023
DA-3E-1001/3	FLOOR PLAN -3W - BASEMENT 03	31/03/2023
DA-3E-1002/3	FLOOR PLAN -3W - BASEMENT 02	31/03/2023
DA-3E-1003/3	FLOOR PLAN -3W - BASEMENT 01	31/03/2023
DA-3W-1004/3	FLOOR PLAN - 3W - GROUND	31/03/2023
DA-3W-1005/3	FLOOR PLAN - 3W - LEVEL 01	31/03/2023
DA-3W-1006/3	FLOOR PLAN - 3W - LEVEL 02	31/03/2023
DA-3W-1007/3	FLOOR PLAN - 3W - LEVEL 03	31/03/2023
DA-3W-1008/3	FLOOR PLAN - 3W - LEVEL 04	31/03/2023
DA-3W-1009/3	FLOOR PLAN - 3W - LEVEL 05	31/03/2023
DA-3W-1010/3	FLOOR PLAN -3W -LEVEL 06	31/03/2023
DA-3W-1011/3	FLOOR PLAN -3W -LEVEL 07	31/03/2023
DA-3W-1012/3	FLOOR PLAN -3W -ROOF	31/03/2023
DA-3W-1401/3	ELEVATIONS - 3W - NORTH	31/03/2023
DA-3W-1402/3	ELEVATIONS - 3W - SOUTH	31/03/2023
DA-3W-1403/3	ELEVATIONS - 3W - EAST	31/03/2023
DA-3W-1404/3	ELEVATIONS - 3W - WEST	31/03/2023
DA-3W-1501/2	SECTIONS - 3W - BUILDING SECTION A	31/03/2023

DA-3W-1502/2	SECTIONS - 3W - BUILDING SECTION B	31/03/2023
DA-3W-9001/3	MATERIAL SCHEDULE - 3W	31/03/2023
DA-4N-0252/B	FLOOR PLAN - 4N - LEVEL 01	31/03/2023
DA-4N-0253/B	FLOOR PLAN - 4N - LEVEL 02	31/03/2023
DA-4N-0254/B	FLOOR PLAN - 4N - LEVEL 05	31/03/2023
DA-4N-0271/B	FLOOR PLAN - 4N - NORTH ELEVATION	31/03/2023
DA-4N-0272/B	FLOOR PLAN - 4N - WEST ELEVATION	31/03/2023
DA-4N-0273/B	FLOOR PLAN - 4N - EAST ELEVATION	31/03/2023
DA-4N-1001/B	FLOOR PLAN - 4N - GROUND	31/03/2023
DA-4N-1002/B	FLOOR PLAN - 4N - LEVEL 01	31/03/2023
DA-4N-1003/B	FLOOR PLAN - 4N - LEVEL 02	31/03/2023
DA-4N-1004/B	FLOOR PLAN - 4N - LEVEL 03	31/03/2023
DA-4N-1005/B	FLOOR PLAN - 4N - LEVEL 04	31/03/2023
DA-4N-1006/B	FLOOR PLAN - 4N - LEVEL 05	31/03/2023
DA-4N-1007/B	FLOOR PLAN - 4N - LEVEL 06	31/03/2023
DA-4N-1008/B	FLOOR PLAN - 4N - LEVEL 07	31/03/2023
DA-4N-1009/B	FLOOR PLAN - 4N - LEVEL 08	31/03/2023
DA-4N-1010/B	FLOOR PLAN - 4N - ROOF	31/03/2023
DA-4N-1401/B	ELEVATIONS - 3E - NORTH ELEVATION	31/03/2023
DA-4N-1402/B	ELEVATIONS - 3E - EAST ELEVATION	31/03/2023
DA-4N-1403/B	ELEVATIONS - 3E - EAST SECTIONAL	31/03/2023
DA-4N-1404/B	ELEVATIONS - 3E - SOUTH ELEVATION	31/03/2023
DA-4N-1405/B	ELEVATIONS - 3E - WEST ELEVATION	31/03/2023
DA-4N-1406/B	ELEVATIONS - 3E - WEST SECTIONAL	31/03/2023
DA-4N-1501/B	SECTIONS - 4N - BUILDING SECTION A	31/03/2023
DA-4N-1502/B	SECTIONS - 4N - BUILDING SECTION B	31/03/2023

DA-4N-9001/B	MATERIAL SCHEDULE 31		31/03/2023
DA-4S-1001/8	FLOOR PLAN -4S -BASEMENT 03	31/03/2023	
DA-4S-1002/11	FLOOR PLAN -4S -BASEMENT 02	;	31/03/2023
DA-4S-1003/11	FLOOR PLAN -4S -BASEMENT 01	;	31/03/2023
DA-4S-1004/10	FLOOR PLAN -4S -LOWER GROUND	;	31/03/2023
DA-4S-1005/9	FLOOR PLAN -4S -UPPER GROUND	;	31/03/2023
DA-4S-1006/9	FLOOR PLAN -4S -LEVEL 01	;	31/03/2023
DA-4S-1007/9	FLOOR PLAN -4S -LEVEL 02 (KING ST)	;	31/03/2023
DA-4S-1008/9	FLOOR PLAN -4S -LEVEL 03	;	31/03/2023
DA-4S-1009/9	FLOOR PLAN -4S -LEVEL 04	;	31/03/2023
DA-4S-1010/9	FLOOR PLAN -4S -LEVEL 05	31/03/2023	
DA-4S-1011/9	FLOOR PLAN -4S -LEVEL 06	31/03/2023	
DA-4S-1012/9	FLOOR PLAN -4S -LEVEL 07	31/03/2023	
DA-4S-1013/9	FLOOR PLAN -4S -LEVEL 08	31/03/2023	
DA-4S-1014/9	FLOOR PLAN -4S -LEVEL 09	31/03/2023	
DA-4S-1015/9	FLOOR PLAN -4S -ROOF	31/03/2023	
DA-4S-1401/5	ELEVATIONS - 4S - SHEET 1	;	31/03/2023
DA-4S-1402/5	ELEVATIONS - 4S - SHEET 2	;	31/03/2023
DA-4S-1403/5	ELEVATIONS - 4S - SHEET 3		31/03/2023
DA-4S-1404/5	ELEVATIONS - 4S - SHEET 4	31/03/2023	
DA-4S-1501/5	SECTIONS - 4S - SHEET 01 31/03/2		31/03/2023
DA-4S-1502/5	S-1502/5 SECTIONS - 4S - SHEET 02		31/03/2023
DA-4S-1503/3	SECTIONS - 4S - SHEET 03		31/03/2023
DA-4S-9001/4	MATERIAL SCHEDULE - 4S		31/03/2023
DA-PR-0000/2	COVER	31/03/2023	
DA-PR-0001/2	DRAWING SCHEDULE		31/03/2023

DA-PR-0100/3	SITE PLAN	31/03/2023
DA-PR-0301/8	FLOOR PLAN - PRECINCT - BASEMENT 03	31/03/2023
DA-PR-0302/8	FLOOR PLAN - PRECINCT - BASEMENT 02	31/03/2023
DA-PR-0303/8	FLOOR PLAN - PRECINCT - BASEMENT 01	31/03/2023
DA-PR-0304/8	FLOOR PLAN - PRECINCT - GROUND - (HUNTER STGROUND)	31/03/2023
DA-PR-0305/6	FLOOR PLAN - PRECINCT - LEVEL 01	31/03/2023
DA-PR-0306/6	FLOOR PLAN - PRECINCT - LEVEL 02	31/03/2023
DA-PR-0307/6	FLOOR PLAN - PRECINCT - LEVEL 03	31/03/2023
DA-PR-0308/6	FLOOR PLAN - PRECINCT - LEVEL 4 - (3N ROOF)	31/03/2023
DA-PR-0309/6	FLOOR PLAN - PRECINCT - LEVEL 05 - (KING STGROUND)	31/03/2023
DA-PR-0310/6	FLOOR PLAN - PRECINCT - LEVEL 06	31/03/2023
DA-PR-0311/6	FLOOR PLAN - PRECINCT - LEVEL 07	31/03/2023
DA-PR-0312/6	FLOOR PLAN - PRECINCT - LEVEL 08 - (3W ROOF)	31/03/2023
DA-PR-0313/6	FLOOR PLAN - PRECINCT - LEVEL 09 - (4N ROOF)	31/03/2023
DA-PR-0314/6	FLOOR PLAN - PRECINCT - LEVEL 10	31/03/2023
DA-PR-0315/6	FLOOR PLAN - PRECINCT - LEVEL 11 - (3S ROOF)	31/03/2023
DA-PR-0316/6	FLOOR PLAN - PRECINCT - LEVEL 12	31/03/2023
DA-PR-0317/6	FLOOR PLAN - PRECINCT - LEVEL 13 - (4S ROOF)	31/03/2023
DA-PR-0351/6	OVERALL ELEVATIONS - PRECINCT - NORTH	31/03/2023
DA-PR-0352/6	OVERALL ELEVATIONS - PRECINCT - SOUTH	31/03/2023
DA-PR-0353/6	OVERALL ELEVATIONS - PRECINCT - EAST	31/03/2023
DA-PR-0351/6	OVERALL ELEVATIONS - PRECINCT - WEST	31/03/2023
DA-PR-0361/6	OVERALL SECTIONS - PRECINCT - SHEET 1	31/03/2023
DA-PR-0362/6	OVERALL SECTIONS - PRECINCT - SHEET 2	31/03/2023
DA-PR-0363/5	OVERALL SECTIONS - PRECINCT - SHEET 3	31/03/2023
DA-PR-0364/4	OVERALL SECTIONS - PRECINCT - SHEET 4	31/03/2023

DA-PR-0365/2	OVERALL SECTIONS - PRECINCT - SHEET 5	31/03/2023
DA-PR-0365/4	OVERALL SECTIONS - PRECINCT - SHEET 6	31/03/2023

2. Preliminary Performance Solution Details

2.1 List of Identified Performance Solutions

The subject design has been observed to exhibit a number of non-conformances with the prescriptive provisions of the NCC. These non-conformances have been identified to us in the BCA Report prepared by the regulatory reviewer Philip Chun (Ref: 022-219164_NEE_Stages3&4_BCA Report_230412_SRMS dated 12 April 2023).

Subsequently, it will be necessary for the method of compliance with the building regulations to incorporate a Performance Based approach as supported by Clause A2G2 of the NCC. GHD have reviewed the Development Application drawings and consider the following items to likely be proposed as Performance Solutions.

Solution	DtS Clause	Description of DtS Variations	Performance Requirements
1	Spec 5	 The fire resistance level in the following storage areas are to be reduced from 240 minutes to 120 minutes: Ground Floor in 4 North Upper Ground Floor in 4 South 	C1P1, C1P2
2	C4D12	 Lifts open directly to apartments on Levels 5 in 4 North and 4 South respectively. Lift doors will not achieve the required FRL of -/60/30 (normally only -/60/-). 	C1P2
3	D2D3	 The following areas have access to a single exit: <u>Residential levels in 3 North and 3 West.</u> The whole of Stage 3 is a single building in excess of 25 m in effective height. <u>Upper Level of café in 4 South</u>. 4 South has an effective height in excess of 25m. 	D1P4
4	D2D4	Whilst the stair serving the upper levels of 3 North is not required to be fire-isolated, a Performance Solution to address extend travel distance on these levels requires the stair to be fire-isolated. The stair will not be fire-isolated at roof level and will be subject to a Performance Solution.	D1P5
5	D2D5	Distances to exits in the residential areas will exceed the limits from an SOU imposed by D2D5 in the following areas and will be subject to a Performance Solution: <u>3 North</u> – Distance to exit of 7m on residential levels	D1P4, E2P2

Table 1: Summary of Performance Solutions

Solution	DtS Clause	Description of DtS Variations	Performance Requirements
		4 North	
		 Distance to exit of 8m on Levels 2 and 3 	
6	D2D5	Distances to exits from s residential common area will exceed the limits imposed by D2D5 in the following area and will be subject to a Performance Solution:	D1P4, E2P2
		4 North	
		 Distance to exit from Terrace on Level 4 exceeds 20m (25m) 	
7	D2D5	Distances to exits will exceed the limits imposed by D2D5 in the following areas and will be subject to a Performance Solution:	D1P4, E2P2
		4 South	
		 Distance to exits on Basement Levels 1 and 2 exceeds 40m (41m) 	
		 Distance to point of choice from Loading Dock exceeds 20m (30m) and distance to exit exceeds 40m (43m) 	
		 Distance to exit from B1.11 exceeds 40m (43m) 	
8	D2D5	Distances to exits will exceed the limits imposed by D2D5 in the following areas and will be subject to a Performance Solution:	D1P4, E2P2
		4 South	
		– Distance to point of choice from MSB exceeds 20m (28m)	
9	D2D6	Distances between exits exceeds the limits imposed by D2D6 in the following areas and will be subject to a Performance Solution:	D1P4, E2P2
		<u>3 South</u>	
		 Distance between alternative exits less than 9m (5m) 	
10	D2D6	Distances to exits and between exits exceeds the limits imposed by D2D6 in the following areas and will be subject to a Performance Solution:	D1P4, E2P2
		<u>4 South</u>	
		 Extended distance to exits and distance between alternative exits on Basement Levels 1 and 2 (61m). 	
11	D2D12	Paths of travel from fire-isolated exits to the road are exposed to, and within 6m of openings in the external walls of the building in the following locations:	D1P5

Solution	DtS Clause	Description of DtS Variations	Performance Requirements
		 Stairs serving 3 North – Path of travel is also exposed to 3 South 	
		 Stairs serving 3 South – Path exposed to opening of loading dock. 	
		 North eastern stair serving 4 South. 	
12	D2D12	Stair 9 serving 4 South discharges into an enclosed area on Basement Level 1 which is not open for at least 1/3 of its perimeter.	D1P5, E2P2
13	E1D5	Sprinkler protection will not be provided under external awnings.	E1P4

2.2	Preliminary	Additional	Fire Safety	Measures
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Fire Safety Measure	Description					
General	If not specifically mentioned herein, the fire safety measures as required by the governing Deemed-to-Satisfy provisions of the NCC are to be installed within the building, for which the governing BCA report refers.					
Fire Doors	 Any doorway opening into the store rooms addressed by Performance Solution 1 shall be fitted with self-closing -/120/30 fire doors. 					
	 Each doorway shall also be fitted with an ambient, medium and hot (intumescent) temperature smoke seal. All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7 					
	 Ambient, medium and hot (intumescent) temperature intumescent smoke seals are required on: 					
	 All doorways of SOU's (sole-occupancy units). 					
	 All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7 					
Mechanical ventilation &	 The fire isolated stair serving 3 West shall be provided with an automatic air pressurisation system for fire isolated exits in accordance with AS1668.1. 					
pressurisation	 The air conditioning systems serving the Class 7b enclosures addressed by Performance Solution 1 are to completely shut down upon initiation of general fire alarm or sprinkler activation. This is to limit the amount of oxygen within each of the compartments and prevent smoke spill into an adjacent compartment. 					
Automatic suppression	The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012, with the following additional requirements:					
	 the sprinkler heads serving the storage areas shall be fitted with fast response sprinkler heads with an activation temperature of 68 °C and an RTI of 50 m ^{1/2} s^{1/2} 					
	 a sprinkler head shall be installed within 500 mm of the lift doors addressed by Performance Solution 2. 					
	 the Class 7a carpark areas shall include fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2} shall be used; and 					
	 The spacing of the sprinklers shall be based on an ordinary hazard with a maximum coverage of 12 m2. 					
	 The ground level of each building shall provided fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2}. 					

Fire Safety Measure	Description
Fire Safety Measure Fire isolated stair	 Description The fire isolated stair serving 3 North serves up to Level 3 with a maximum of four levels permitted to be connected to this stair, and the stair is permitted to be open at roof level. The fire isolated stair serving 3 West serves up to Level 7, and Level 8 is a roof terrace for the sole SOU accessed internally from this SOU The distance of travel from an SOU is within the prescribed limits, with the exception of 3 North which is permitted to be up to 7 m. Relocate the final exit from 3 South as indicated below or Dynamic Signage shall be required on every level of 3 South.
Emergency Warning & Intercommunication System (EWIS)	 The (EWIS) shall achieve a sound level not less than 75 dB at the SOU bedhead to wake sleeping occupants. The sound level must be achieved with the smoke seals installed and the SOU door closed. This may be achieved through the use of speakers inside the SOU's or in the corridor so long as the specified sound pressure of 75 dB is met.
	 The roof terrace on Level 8 of 3 West shall be provided with visual and audible warning devices. The common terrace on Level 4 of 4 North shall be provided with visual and audible warning devices.
Automatic fire detection	 In addition to detection which required, the concession of NCC S20C5 (2) is to not be applied, and this report requires detectors to be installed in the public corridors on all levels of the building
Signage	 Signage stating "NO STORAGE PERMITTED IN CORRIDOR" in text of 25 mm height and in a colour contrasting with its background shall be provided the public corridors of 3 South.

2.3 Details of Performance Solution

The following table lists the anticipated method of assessment for the Performance Solutions and where the potential fire safety requirements are applied.

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
1.	The fire resistance level in the following storage areas are to be reduced from 240 minutes to 120 minutes: – Ground Floor in 4 North – Upper Ground Floor in 4 South	Spec 5	C1P1, C1P2	 A quantitative, absolute and deterministic method shall also be undertaken using the Beyler Method, to calculate the length of time the fire is expected to burn within an enclosed room, and subsequently the maximum temperature it will heat to. The likely fire safety measures are: Any doorway opening into the store rooms addressed by Performance Solution 1 shall be fitted with self-closing -/120/30 fire doors. Each doorway shall also be fitted with an ambient, medium and hot (intumescent) temperature smoke seal. All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7. The air conditioning systems serving the Class 7b enclosures addressed by Performance Solution 1 are to completely shut down upon initiation of general fire alarm or sprinkler activation. This is to limit the amount of oxygen within each of the compartments and prevent smoke spill into an adjacent compartment. The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012, with the exception that the sprinkler heads serving the storage areas shall be fitted with fast response sprinkler heads with an activation temperature of 68 °C and an RTI of 50 m ^{1/2} s^{1/2}
2.	Lifts open directly to apartments on Levels 5 in 4 North and 4 South respectively.	C4D12	C1P2	A qualitative and absolute method shall review the proposed reduction in FRL of the lift doors which is -/60/- in lieu of -/60/30, a reduction in 30 minutes insulation. The assessment shall consider the benefits of sprinkler

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
	 Lift doors will not achieve the required FRL of - /60/30 (normally only -/60/-) 			protection, and the additional measure of locating a sprinkler head within 500 mm of the lift doors is likely to wet and cool all the subject lift doors, offsetting the non-conformance.
				The likely fire safety measures are:
				 The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012, with the exception that a sprinkler head shall be installed within 500 mm of the subject lift doors.
3.	 The following areas have access to a single exit: <u>Residential levels in 3 North and 3 West</u>. The whole of Stage 3 is a single building in excess of 25 m in effective height. <u>Upper Level of café in 4 South.</u> 4 South has an effective height in excess of 25m. 	D2D3	D1P4	A qualitative review of the subject residential levels, whilst being technically united with the overall building and having an effective height of greater than 25 m, are remote from the parts of the building which trigger a greater than 25 m effective height. It shall be demonstrated that the subject residential levels served by a single stair is at least equivalent to the benchmark level of safety. Furthermore, there are compliant travel distances to the exits within 6 m (with the exception of 3North of up to 7 m), and a NCC DtS design is afforded with an extension of up to 12 m when provided with an automatic sprinkler system.
				Similarly, for the upper level café which is in close proximity to the level of egress, it shall be demonstrated that upper level café which is served by a single stair is at least equivalent to the benchmark level of safety for occupants located only a single level above ground.
				The likely fire safety measures are:
				 The fire isolated stair serving 3 West shall be provided with an automatic air pressurisation system for fire isolated exits in accordance with AS1668.1.
				 The fire isolated stair serving 3 North serves up to Level 3 with a maximum of four levels permitted to be connected to this stair.
				 The fire isolated stair serving 3 West serves up to Level 7, and Level 8 is a roof terrace for the sole SOU accessed internally from this SOU.

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
				 The distance of travel from an SOU is within the prescribed limits, with the exception of 3 North which is permitted to be up to 7 m. The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012. Ambient, medium and hot (intumescent) temperature intumescent smoke seals are required on: All doorways of SOU's (sole-occupancy units). All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7. The (EWIS) shall achieve a sound level not less than 75 dB at the SOU bedhead to wake sleeping occupants. The sound level must be achieved with the smoke seals installed and the SOU door closed. This may be achieved through the use of speakers inside the SOU's or in the corridor so long as the specified sound pressure of 75 dB is met. The roof terrace on Level 8 shall be provided with visual and audible warning devices. The concession of NCC S20C5 (2) is to not be applied, and this report requires detectors to be installed in the public corridors on all levels of the building
4.	Whilst the stair serving the upper levels of 3 North is not required to be fire-isolated, a Performance Solution to address extended travel distance on these levels requires the stair to be fire-isolated. The stair will not be fire-isolated at roof level and will be subject to a Performance Solution.	D2D4	D1P5	A qualitative and comparative review of the subject fire isolated stair serving 3 North is compared to a design in accordance with the NCC DtS provisions that serves the same number of levels and is not required to be fire isolated. The subject design comprises of fire isolating the stair on every level, whilst keeping it open at roof level. Any smoke from a fire at this level is likely to vent to atmosphere and not spread into the stair. The likely fire safety measures are:

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
				 The fire isolated stair serving 3 North serves up to Level 3 with a maximum of four levels permitted to be connected to this stair, and the stair is permitted to be open at roof level.
5.	Distances to exits in the residential areas will exceed the limits from an SOU imposed by D2D5 in the following areas and will be subject to a Performance Solution: <u>3 North</u> - Distance to exit of 7m on residential levels <u>4 North</u> - Distance to exit of 8m on Levels 2 and 3	D2D5	D1P4, E2P2	 A quantitative and comparative shall assess the benefits of smoke seals to all SOU doors and demonstrate an improvement from smoke leakage into the public corridor. Furthermore, the travel distance of a building complying with Spec E1.5a may exceed 6 m up to 12 m where the effective height does not exceed 25 m with any sprinkler system, and the subject building is protected with an automatic sprinkler system in accordance with AS2118.6. The likely fire safety measures are: The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012. Ambient, medium and hot (intumescent) temperature intumescent smoke seals are required on: All doorways of SOU's (sole-occupancy units). All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7. The (EWIS) shall achieve a sound level not less than 75 dB at the SOU bedhead to wake sleeping occupants. The sound level must be achieved with the smoke seals installed and the SOU door closed. This may be achieved through the use of speakers inside the SOU's or in the corridor so long as the specified sound pressure of 75 dB is met. The concession of NCC S20C5 (2) is to not be applied, and this report requires detectors to be installed in the public corridors on all levels of the building.

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
6.	Distances to exits from s residential common area will exceed the limits imposed by D2D5 in the following area and will be subject to a Performance Solution: <u>4 North</u> - Distance to exit from Terrace on Level 4 exceeds 20m (25m)	D2D5	D1P4, E2P2	 A qualitative review of egress from the common terrace which although it exceeds the limit of 20 m to an exit, occupants egressing from this area need to pass a single SOU door to reach the fire isolated exit. An equivalent DtS compliant design with a compliant travel distance could require passing more than one SOU door to reach an exit. The addition of visual and audio warning devices will improve occupants' awareness of a fire in the building. The likely fire safety measures are: The subject building will be protected with a sprinkler system in accordance with AS 2118.6 – 2012. The common terrace on Level 4 of 4 North shall be provided with visual and audible warning devices. Ambient, medium and hot (intumescent) temperature intumescent smoke seals are required on: All doorways of SOU's (sole-occupancy units). All smoke seal systems (perimeter and bottom seal) shall have a smoke leakage rate of < 40 m3/h (at medium temperature conditions at a pressure differential of 25 Pa after exposure at 200 °C for at least 30 minutes) when tested to AS 1530.7.
7.	 Distances to exits will exceed the limits imposed by D2D5 in the following areas and will be subject to a Performance Solution: <u>4 South</u> Distance to exits on Basement Levels 1 and 2 exceeds 40m (41m) Distance to point of choice from Loading Dock exceeds 20m (30m) and distance to exit exceeds 40m (43m) 	D2D5	D1P4, E2P2	A quantitative and comparative assessment comparing the Performance Solution design and a DtS compliant basement carpark where the travel distance to a point of choice is 20 m and to an exit is 40 m. The activation time of fast response sprinkler heads (Performance Solution) and standard response sprinkler heads (DtS Compliant) will be assessed to determine any improvement in the detection time or cue time in the overall occupant egress time. The analysis will compare the required safe egress time (RSET) of the Performance Solution with that of similar buildings designed in accordance with the DtS Provisions. The likely fire safety measures are:

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
	 Distance to exit from B1.11 exceeds 40m (43m) 			 The AS 2118.6 – 2012 sprinkler system in the Class 7a carpark areas, shall Include fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2} shall be used; and The spacing of the sprinklers shall be based on an ordinary hazard with a maximum coverage of 12 m².
8.	Distances to exits will exceed the limits imposed by D2D5 in the following areas and will be subject to a Performance Solution:	D2D5	D1P4, E2P2	A quantitative and comparative assessment comparing the Performance Solution design and a DtS compliant basement carpark where the travel distance to a point of choice is 20 m and to an exit is 40 m.
	 <u>4 South</u> Distance to point of choice from MSB exceeds 20m (28m) 			The activation time of fast response sprinkler heads (Performance Solution) and standard response sprinkler heads (DtS Compliant) will be assessed to determine any improvement in the detection time or cue time in the overall occupant egress time. The analysis will compare the required safe egress time (RSET) of the Performance Solution with that of similar building designed in accordance with the DtS Provisions.
				The likely fire safety measures are:
				 The AS 2118.6 – 2012 sprinkler system in the Class 7a carpark areas, shall
				 Include fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2} shall be used; and
				 The spacing of the sprinklers shall be based on an ordinary hazard with a maximum coverage of 12 m².
9.	Distances between exits exceeds the limits imposed by D2D6 in the following areas and will be subject to a Performance Solution: <u>3 South</u>	D2D6	D1P4, E2P2	A quantitative and absolute assessment shall assess the fire size and resulting radiant flux from a fire originating between the two exits. It shall be demonstrated that both the exits should not be block from this single fire event.

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
	 Distance between alternative exits less than 9m (5m) 			 The likely fire safety measures are: The AS 2118.6 – 2012 sprinkler system installed throughout the building; and The concession of NCC S20C5 (2) is to not be applied, and this report requires detectors to be installed in the public corridors on all levels of the building. Signage stating "NO STORAGE PERMITTED IN CORRIDOR" in text of 25 mm height and in a colour contrasting with its background shall be provided the public corridors.
10.	 Distances to exits and between exits exceeds the limits imposed by D2D6 in the following areas and will be subject to a Performance Solution: <u>4 South</u> Extended distance to exits and distance between alternative exits on Basement Levels 1 and 2 (61m). 	D2D6	D1P4, E2P2	 A qualitative, quantitative and comparative assessment comparing the Performance Solution design and a DtS compliant basement carpark where the travel distance between exits is up to 60 m. The activation time of fast response sprinkler heads (Performance Solution) and standard response sprinkler heads (DtS Compliant) will be assessed to determine any improvement in the detection time or cue time in the overall occupant egress time. The analysis will compare the required safe egress time (RSET) of the Performance Solution with that of similar building designed in accordance with the DtS Provisions. Furthermore, occupants are not likely to egress back through the point of choice if an exit was found to be blocked, and it will be demonstrated that the actual distance to the nearest exist is within the limit. The likely fire safety measures are: The AS 2118.6 – 2012 sprinkler system in the Class 7a carpark areas, shall Include fast response sprinkler heads with activation temperatures no greater than 50 (ms)^{1/2} shall be used; and The spacing of the sprinklers shall be based on an ordinary hazard with a maximum coverage of 12 m².
11.	Paths of travel from fire-isolated exits to the road are exposed to, and within 6m of openings in the	D2D12	D1P5	<u>3 North</u> A quantitative, qualitative and absolute combined approach shall demonstrate that occupants should be able to evacuate without exposure to

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
	 external walls of the building in the following locations: Stairs serving 3 North – Path of travel is also exposed to 3 South Stairs serving 3 South – Path exposed to opening of loading dock. North eastern stair serving 4 South. 			untenable levels of radiant heat, and it shall be shown that once remote from the building occupants have a choice between two paths of travel to reach a place of safety. <u>3 South</u> It is recommended that a minor design change is provided to move the door away from the loading dock, as indicated below. Otherwise, the performance solution will require dynamic clever evacuation signage on every single level of this building and the signage would revert occupants into the stair that discharge further away from the loading dock in the event of a fire originating in the loading dock.

Sol	Description of Performance Solution	DtS Clause	Performance Requirement	Method of assessment/Fire safety requirement
				the building occupants have a choice between two paths of travel to reach a place of safety.
				The likely fire safety measures are:
				 An AS 2118.6 – 2012 sprinkler system serving adjacent areas and provided fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2}.
				 Relocate the final exit from 3 South or Dynamic Signage shall be required on every level of 3 South.
12.	Stair 9 serving 4 South discharges into an enclosed area on Basement Level 1 which is not open for at least 1/3 of its perimeter.	D2D12	D1P5, E2P2	The analysis shall qualitatively discuss the risk associated with the discharge point of the fire-isolated stair into a covered area which although is not open for 1/3 of its perimeter, it has other improvements such as travel distance less than 6 m to the open space and a height greater than 3 m.
				The likely fire safety measures are:
				 An AS 2118.6 – 2012 sprinkler system serving adjacent areas and provided fast response sprinkler heads with activation temperatures no greater than 68 °C and a Response Time Index (RTI) of not greater than 50 (ms)^{1/2}
13.	Sprinkler protection will not be provided under external awnings.	E1D5	E1P4	It may be feasible to omit sprinkler protection from areas under external awnings but will be assessed on a case by case basis, as factors such as proximity to exits will impact the feasibility of this solution. The solution shall also be subject to FRNSW as this solution is contrary to their position statement on the omission of sprinkler. Therefore, GHD will only provide this solution to limited areas where the risk is deemed very low.