Regulatory Compliance Report

Proposed Warehouse Development
311 South Street, Marsden Park

Prepared for: **Dexus**
C/- Archile Projects
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Date	Rev No	No. of Pages	Issue or Description of Amendment	Assessed By	Approved By	Date Approved
10/12/2021	B	26	Preliminary	Luis De Araujo	Vanessa Hinge	10/12/2021

1. Executive Summary

Development Overview

The proposed development is for two large warehouses located at 311 South Street, Marsden Park.

The development comprises of two separate buildings, Unit 1 being 16,032m^2 & Unit 2 being 25,237m^2 of floor area with a building height of 13.7m

Compliance Summary

As Registered Certifiers, we have reviewed the concept architectural design documents prepared by Watson Young (refer appendix A) for compliance with the current building assessment provisions, i.e. the Building Code of Australia 2019 Amendment 1 (BCA).

This report has been prepared to assess the project against the Building Code of Australia to enable issuance of construction approvals. Further assessment of the design will be undertaken as the design develops to ensure compliance is achieved prior to approval being issued

Deviations from the Deemed-to-Satisfy Provisions

The assessment of the schematic design documentation has revealed that the following areas deviate from the deemed-to-satisfy provisions of the BCA. These items are to be addressed to ensure compliance is achieved, either through design amendment to achieve compliance with the deemed-to-satisfy provisions, or through a performance solution demonstrating compliance with the Performance Requirements of the BCA:

No.	Description	DTS Clause	Performance Requirements
Fire Safety Items			
1	Extended travel distance in the warehouse portions	D1.4	DP4
2	Extended travel distance to the First Floor Office areas	D1.4	DP4
3	Continuous Perimeter Vehicle Access	C2.4	CP9
4	Reduced aggregate Exit Width in office areas	D1.6	DP6
5	Location of External Hydrants under Canopies	E1.3	EP1.3
6	Height of Exit signs	E4.5	EP4.2
Miscellaneous Items			
7	**Weatherproofing of External Walls** As there are no deemed to satisfy provisions relating to the weatherproofing of external walls, a performance solution is to be provided by the façade engineer/registered architect demonstrating that the external walls comply with the requirements of Performance Requirement FP1.4.	-	FP1.4

The feasibility and any additional requirements that will apply as a result of the performance solution will need to be confirmed by the professional preparing the performance solution. Any performance solution will need to be prepared by a suitably qualified/accredited professional.

Fire Safety Services

The following key fire safety services are required to meet the minimum DTS requirements.

1.	Sprinklers system throughout
2.	Fire hydrant system throughout
3.	Fire hose reels to the warehouse portions of the building/(except to the office portions)
4.	Smoke Hazard Management System
5.	Perimeter Vehicular Access
6.	Automatic Fire Detection and Alarm System
7.	Automatic Fire Suppression System

Refer to part 7 of this report for further details regarding the required services.

(NSW) Any fire engineered solution relating to insert relevant category 2 items will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

Further Assessment

The assessment of the design documentation has also revealed that the following additional information is required in order to complete the assessment, and/or the following areas need to be further reviewed.

No.	Further Information / Review Required
1.	Circulation space to WH entry door in Office 2B ground floor
2.	Location of Fire Services infrastructure including booster assembly
3.	Restriction on locations of sanitary compartments
4.	Services design requirements for Freezer and Coolroom, and any deviations from DtS provisions.
5.	Confirmation as to whether insulation sandwich panels are proposed to be used in the development.
6.	Confirmation of any requirements for the separation of equipment in accordance with BCA Clause **, including batteries.
7.	Confirmation from the client as to the occupant numbers to be accommodated in the design. For the purpose of this report, a reverse calculation has been undertaken based on the number of sanitary facilities proposed.

Documentation to enable assessment and demonstrate compliance will be required to address the above items prior to approval.

The application for Construction Certificate shall be assessed under the relevant provisions of the Environmental Planning & Assessment Act 1979 (As Amended) and the Environmental Planning & Assessment Regulation 2000.

2. Introduction

The proposed development comprises of new warehouse buildings with ancillary office and carparking portions.

This report is based upon the review of the design documentation listed in Appendix A of this Report

The report is intended as an overview of the relevant provisions of the Building Code of Australia for assistance only. Detailed drawings and associated review will still be required as the final design is developed.

The applicable legislation governing the design of buildings is the Environmental Planning and Assessment Act 1979. This Act requires that all new building works must be designed to comply with the BCA.

The version of the BCA applicable to the development, is version that in place at the time of the application to the Registered Certifier for the Construction Certificate. For the purposes of this Report, BCA 2019 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

3. Compliance with the Building Code of Australia

The Building Code of Australia is a performance based document, whereby compliance is achieved by complying with the Governing Requirements and the Performance Requirements.

Performance Requirements are satisfied by one of the following:

1) A Performance Solution
2) A Deemed-to-Satisfy Solution
3) A combination of (1) and (2)

4. Documentation of Performance Solutions

A Performance Solution must demonstrate compliance with all relevant Performance Requirements, or the solution must be at least equivalent to the Deemed-to-Satisfy provisions.

Compliance with the Performance Requirements is to be demonstrated through one or a combination of the following:

a) Evidence of suitability in accordance with Part A5 of the BCA 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

Where a Performance Solution is proposed as the method to achieve compliance, the following steps must be undertaken:

a) Prepare a performance-based design brief in consultation with relevant stakeholders
b) Carry out analysis, using one or more of the assessment methods nominated above, as proposed by the performance-based design brief.
c) Evaluate results from (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 as applicable
ii. Identification of all assessment methods used
iii. Details of required steps above
iv. Confirmation that the Performance Requirement has been met; and
v. Details of conditions or limitations, if an exist, regarding the Performance Solution.

5. Preliminaries

5.1. Building Assessment Data

Summary of Construction Determination:

Part of Project	Warehouse 1	Warehouse 2
Classification	Class 7b & 5	Class 7b & 5
Number of Storeys	2	2
Rise In Storeys	2	2
Type of Construction	C	C
Effective Height (m)	4.59m	4.51m

Note: The effective height of the project includes all stories included in the rise in stories of the project.

Summary of the floor areas and relevant populations where applicable: -

Part of Project – Warehouse 1	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population (Based on toilet numbers)
Warehouse/Loading Dock	Class 7b	14,976	176,022	30
Battery Charging	Class 7b	460	5,082	
Workshop	Class 7b	260	2,816	
Refrigeration Plant	Class 7b	396	4,400	
Main Office level 1	Class 5	338	850	30
Total		16,370	180,224	60

Part of Project – Warehouse 2	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population (Based on toilet numbers)
Unit 2A				
Warehouse/Loading Dock	Class 7b	4,654		30
Main Office Ground	Class 5			
Main Office level 1	Class 5			30
Total				60

Part of Project – Warehouse 2	BCA Classification	Approx. Floor Area (m^2)	Approximate Volume (m^3)	Assumed Population (Based on toilet numbers)
Unit 2B				
Warehouse/Loading Dock	Class 7b	5,094		30
Main Office Ground	Class 5			
Main Office level 1	Class 5			30
Total				60
Unit 2C				
Warehouse/Loading Dock	Class 7b	5,039		30
Main Office Ground	Class 5			
Main Office level 1	Class 5			30
Total				60
Unit 2D				
Warehouse/Loading Dock	Class 7b	5,033		30
Main Office Ground	Class 5			
Main Office level 1	Class 5			30
Total				60
Unit 2E				
Warehouse	Class 7b	5,424		30
Main Office Ground	Class 5			
Main Office level 1	Class 5			30
Total		25,244	278,091	60

Notes:

- The above populations have been based on a reverse calulcation on sanitary facilities proposed verification of whether these occupants numbers align with the proposed use are to be provided
- The carpark areas have been considered ancillary to the use for the purposes of population numbers

5.2. Council Development Approval

A Development Approval will be required from the Local Authority for the development. A copy of the Development Approval conditions and approved drawings will be required prior to the issuing of the Building Approval for that component of works.

The proposed development must not be inconsistent with the endorsed drawings and all relevant conditions will need to be satisfied and accurately reflect the construction issue drawings.

6. Structure

6.1. Structural Provisions (BCA B1):

New structural works are to comply with the applicable requirements of BCA Part B1, including AS/NZS 1170.0-2002, AS/NZS 1170-1-2002, AS/NZS 1170.2-2011 and AS 1170.4-2007.

Depending on the importance level of the building as determined by AS/NZS 1170.0-2002, the non structural elements of the building, including partitions (and non-structural fire walls), ceilings, services and racking/shelving may be required to comply with the seismic restraint requirements of AS 1170.4-2007. Where this is required, certification will be required confirming that the design of the seismic restraints comply with AS 1170.4-2002. This may be provided by a specialist seismic consultant or by the architect and services design engineers.

It is noted that BCA 2019 introduced a new Verification Method, BV2, which is a pathway available to verify compliance with BCA Performance Requirement BP1.1(a)(iii).

Glazing is to comply with AS1288-2006, and AS2047-2014.

Prior to the issue of the Construction Certificate structural certification is required to be provided by a Professional Engineer registered on the National Engineering Register.

7. Fire Protection

7.1. Fire Compartmentation (BCA C1.1)

The BCA stipulates three levels of fire resistant construction, which is based upon the rise in storeys and classification of the building. Each of these types of construction has maximum floor area and volume limitations as per BCA Table C2.2.

Based upon the rise in storeys and use of the building, it is required to be constructed in accordance with the requirements of Type B Construction, in accordance with Table 5 & 5.9 of Specification C1.1 of the Building Code of Australia 2019 Amendment 1.

The maximum floor area and volume limitations of a fire compartment as nominated in the deemed to satisfy provisions are as follows:

Classification		**Type of Construction**		
		A	**B**	**C**
5, 9b or 9c aged care building	max floor area—	8 000 m^2	5 500 m^2	3 000 m^2
	max volume—	48 000 m^3	33 000 m^3	18 000 m^3
6, 7, 8 or 9a (except for patient care areas)	max floor area—	5 000 m^2	3 500 m^2	2 000 m^2
	max volume—	30 000 m^3	21 000 m^3	12 000 m^3

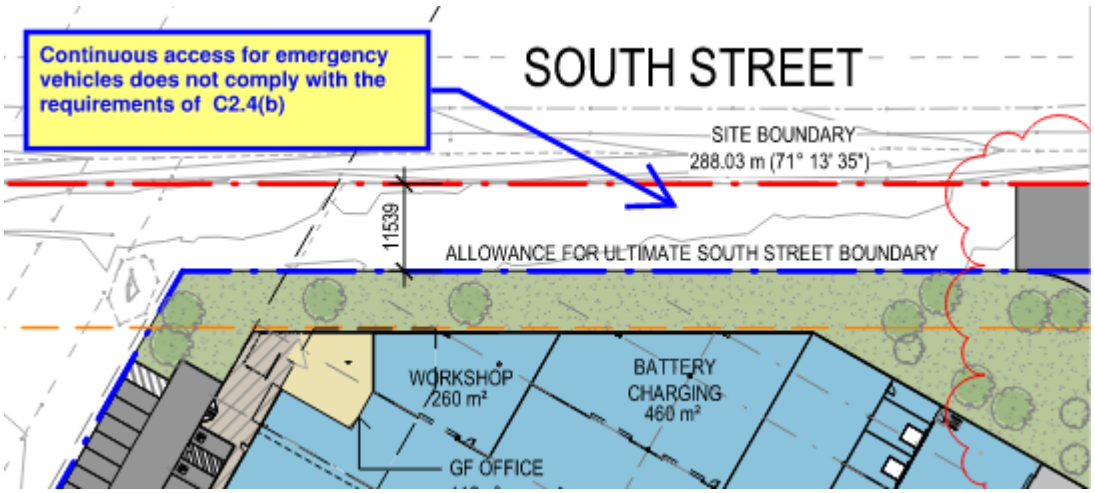
As the building exceeds the area / volume limitations of the BCA provisions, the building is then considered a large isolated building and the following provisions will apply:

- Automatic sprinkler protection to AS2118.1 and BCA Specification E1.5 throughout the development
- Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter in accordance with BCA Clause C2.4,

- Smoke exhaust or smoke and heat vents required throughout the development if the building exceeds 18,000m^2 or 108,000m^3 in volume
- Provision of a fire hydrant ring main

Perimeter emergency vehicular access 6m wide located within 18m of the entire building perimeter is required. Continues Perimeter emergency vehicular access is not provided in the Northwest of Warehouse 1 of a minimum 6m clear path.

We note that the Perimeter Vehicular access to the site will be required to be addressed against Performance Requirement CP9 of the BCA.



7.2. Fire Resistance (BCA C1.1)

The building should be constructed generally in accordance with the relevant provisions of Specification C1.1 of the BCA applicable to Type C Construction, Please refer to Appendix D which outlines the required fire rating to be achieved by the development.

Other passive fire protection issues that will need to be addressed in detailed documentation phase include:

- Electricity Supply;
- Boilers or Batteries;
- Hydrant Pump Rooms;
- Sprinkler Pump Rooms;

The above areas are to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

Please note that with regards to fire separation, the provisions and required FRL's that apply to the building also apply to an occupiable outdoor space associated with the building.

7.3. Fire Hazard Properties (BCA C1.10 and BCA C1.9)

The fire hazard properties of fixed surface linings and mechanical ductwork will also need to be addressed within the detailed documentation phase pursuant to Specification C1.10 of the Building Code of Australia.

Rigid and flexible air handling ductwork must comply with AS4254 Parts 1 & 2 2012.

7.4. Separation of equipment (C2.12)

Equipment listed below must be separated from the remainder of the building providing a FRL as required by Spec C1.1 but not less than 120/120/120 with a self-closing fire door with an FRL or not less than -/120/30. When separating a lift shaft and lift motor room, an FRL of not less than 120/-/- is required.

a) Emergency generators used to sustain emergency equipment operating in the emergency mode; or
b) Central smoke control plant; or
c) A battery system installed in that building that has total voltage of 12 volts or more and a storage capacity of 200kWh or more.

Further information is required for the battery storage provisions to assess compliance with the above requirements to determine the extent of the fire separation required under this clause.

8. Access and Egress

8.1. Provision for Escape (BCA D1)

The egress provisions for the proposed building are provided by the following:

- External perimeter doorways
- Non Fire isolated Stairs
- External Doors

Detailing issues that will need to be addressed as the design develops include:

- Door Hardware
- Exit Door Operation
- Stair Construction
- Handrail and Balustrade construction
- Door swings

8.2. Exit Travel Distances (BCA D1.4)

The locations of the proposed exits would appear to indicate that the deemed to satisfy requirements in terms of travel distances, distances between alternative exits and egress widths would be satisfied.

The travel distances to exits should not exceed:

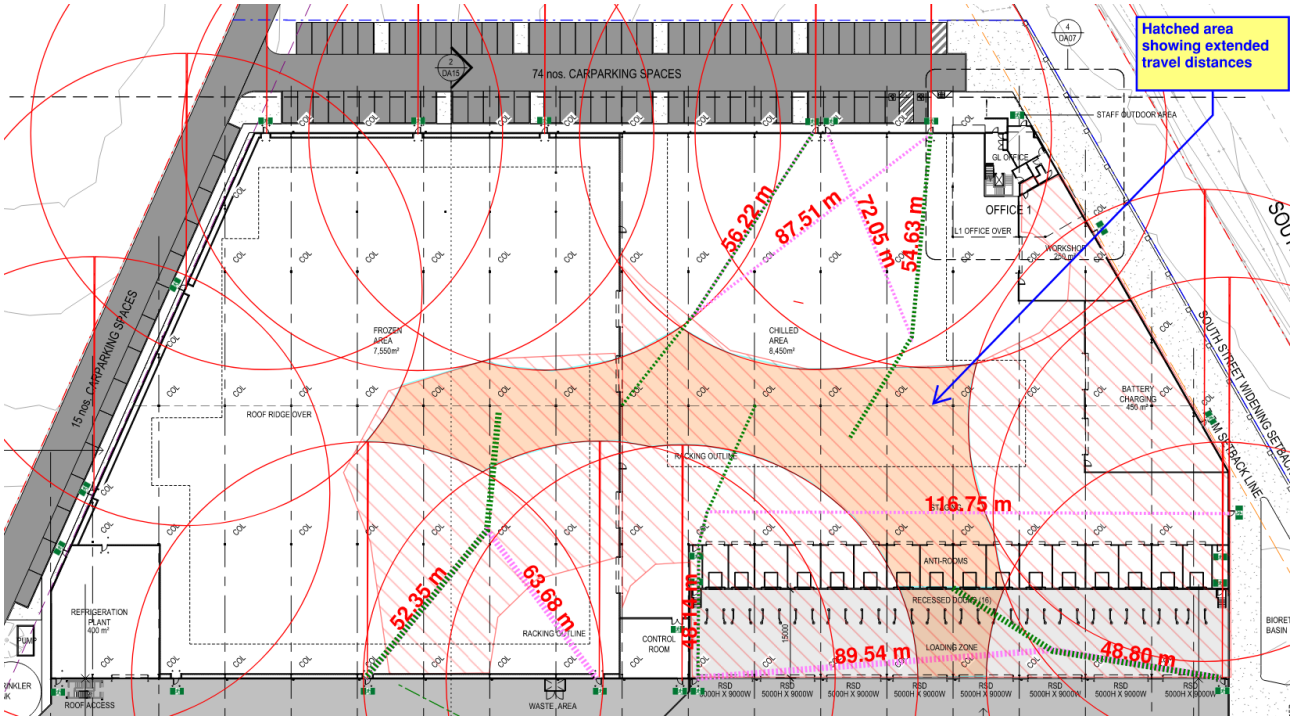
Class 5 to 9

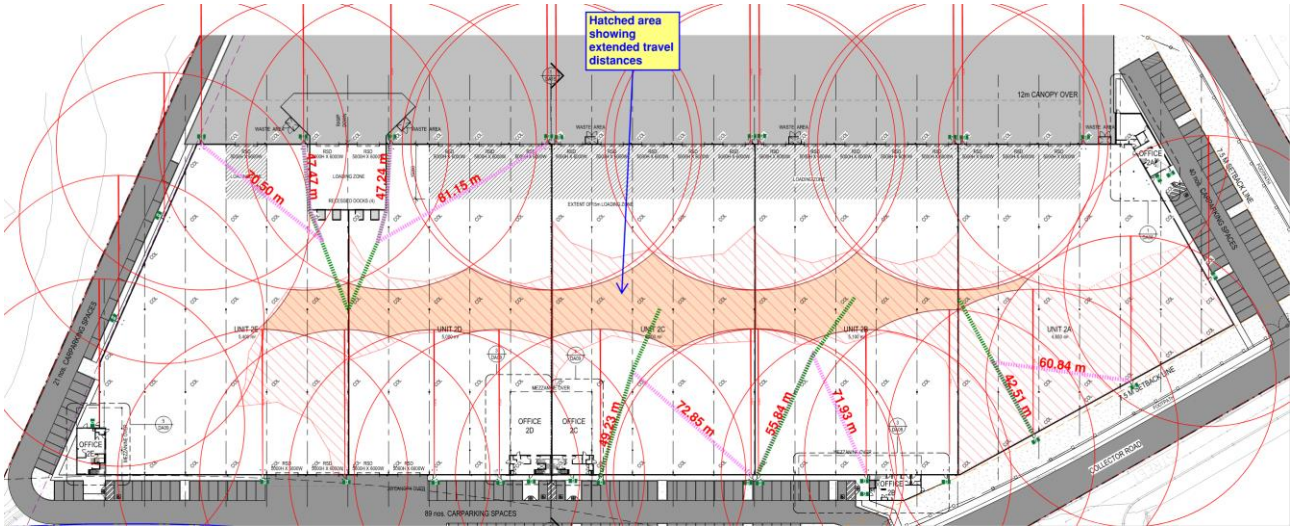
- no point on the floor must be more than 20m to a single exit or point of choice and where two exits are provided, a maximum of 40m to one of those exits; and
- exits shall be located to not be more than 60m apart and not closer than 9m

The locations of the proposed exits indicate that the extended travel distances within the building are as follows:

Area	BCA Provisions (Distance to Point of Choice/ Travel Distance/Distance Between	Assessed Distances			Comments
		To a Point of Choice	Overall Travel Distance	Between Alternate Exits	
WH1 Frozen Area	20m/40m/60m	20m	**53m**	**64m**	With the additional of extra exit doors, the extended travel distance still remains at the centre of the warehouse for each tenancy. The extended travel distances identified are to be addressed through design development and/or verification through the development of a performance based solution by the fire engineer
WH1 Chilled Area	20m/40m/60m	20m	**49m**	**117m**	
WH1 Loading Zone	20m/40m/60m	20m	**49m**	**90m**	
WH2 U2A	20m/40m/60m	20m	**43m**	**61m**	
WH2 U2A First Floor Office	20m/40m/60m	N/A	23m	NA	
WH2 U2A Ground Floor Office	20m/40m/60m	N/A	22m	NA	
WH2 U2B	20m/40m/60m	20m	**56m**	**72m**	
WH2 U2B First Floor Office	20m/40m/60m	N/A	24m	NA	
WH2 U2C	20m/40m/60m	20m	**50m**	**73m**	
WH2 U2C First Floor Office	20m/40m/60m	N/A	22m	NA	
WH2 U2D	20m/40m/60m	20m	**49m**	**82m**	
WH2 U2D First Floor Office	20m/40m/60m	N/A	22m	NA	
WH2 U2E	20m/40m/60m	20m	**48m**	**71m**	

The extended travel distances and distance between the exit stairs will need to addressed to comply with the requirements of the deemed to satisfy provisions noted above, or be assessed as performance solutions by the Fire Safety Engineer using BCA Performance Requirements DP4 & EP2.2





8.3. Dimensions of Exits (BCA D1.6)

Minimum dimensions of 1000mm and 2000mm height to be provided within exits, with the paths of travel should provide a minimum width of 1000mm (note that all maintenance access, cat walks, etc may comply with AS1657-2018 in which case a 600mm clear width is required).

The following table summarises the exit widths required by BCA Clause D1.6:

Storey	Number of people	Exit Width Required	Exit Width Provided
WH1 Ground Floor	30	1m	15.3m
WH1 First Floor	30	1m	1.72m

Storey	Number of people	Exit Width Required	Exit Width Provided
WH2 U2A	30	1m	1.64m
U2A First Floor	30	1m	1.1m
WH2 U2B	30	1m	3.28m
U2B First Floor	30	1m	1m
WH2 U2C	30	1m	3.28m
U2C First Floor	30	1m	1m
WH2 U2D	30	1m	3.28m
U2D First Floor	30	1m	1m
WH2 U2E	30	1m	4.92m
U2E First Floor	30	1m	1.2m

The table above identifies the required exit width and the exit width provided generally appears compliant with the DTS requirements based on the occupancy number. If the occupancy number was to increase, additional exit width may be required through compliance with design development and/or a performance solution prepared by the fire engineer.

Doorways are permitted to contain a clear opening width of the required width of the exit minus 250mm, with a height of 1980mm as part of egress requirements. Access for persons with disabilities however requires a clear doorway opening width of 850mm (i.e. minimum 920 mm doors).

8.4. Balustrades and Handrails (BCA D2.16 / BCA D2.17 / D2.24)

Generally

Balustrading to a minimum height of 1000mm with a maximum opening of 124mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm, or where it is possible to fall through an openable window located more than 4m above the surface beneath.

Where it is possible to fall more than 4m to the surface below, the balustrade shall not contain any horizontal or near horizontal members that facilitate climbing between 150 – 760mm above the floor.

Handrails should generally be provided at a minimum height of 865mm alongside of all stairs.

The public stairs and ramps located along an accessible path of travel should be designed in accordance with the requirements of AS1428.1 for persons with disabilities. This requires a handrail on each side of the stair and ramp and for the handrail to extend approximately 550mm – 600mm past the last tread / end of ramp.

In addition to the above, handrails are required to both sides of all stairs with a width of 2m or more.

The balustrading and handrails indicated are not acceptable due to the following:

- Further design details are required to assess compliance.

Further review will be undertaken to ensure compliance as the design develops.

8.5. Slip Resistance

The adoption of BCA 2014 introduced a requirement for slip resistance of stairway treads and ramp surfaces. The requirements are as follows:

Table D2.14 SLIP-RESISTANCE CLASSIFICATION

Application	Surface conditions	
	Dry	Wet
Ramp steeper than 1:14	P4 or R11	P5 or R12
Ramp steeper than 1:20 but not steeper than 1:14	P3 or R10	P4 or R11
Tread or landing surface	P3 or R10	P4 or R11
Nosing or landing edge strip	P3	P4

9. Services and Equipment

The following section of this report describes the essential fire safety measures and the minimum performance requirements of those measures. A draft essential fire safety schedule can be found in Appendix B.

9.1. Fire Hydrants (BCA E1.3)

A system of Fire Hydrants is required to be provided in accordance with BCA Clause E1.3 and AS2419.1-2005.

Pressure and flow information will be required to confirm the required pressures and flow to the system, depending on the type of hydrant to be utilized;

The fire services/hydraulic engineer is to confirm the required flow rates for the development.

The building is required to be provided with a booster assembly as part of the fire hydrant requirements. The booster is required to be located attached to the building at the main entry. If remote from the building, the booster is to be located at the main vehicle entry or with sight of the main entry of the building within 20m of a hardstand area.

A fire ring main is required.

The fire pump location is satisfactory and will be subject to review by the NSWFR as part of the building approval process.

9.2. Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441-2005.

The system is required to provide coverage to the Class 7b warehouse portions only.

Fire hose reels are to be located within 4m of exits and provide coverage within the building based on a 36m hose length and 4m of water spray. Where required, additional fire hose reels shall be located internally as required to provide coverage. These hose reels are to be located adjacent to internal hydrants.

Fire hose reel cupboards must not contain any other services such as water meters, etc., and doors to fire hose reel cupboards are not to impede the path of egress unless a performance solution is developed under BCA Performance Requirement EP1.1

Fire Hose reel are not to extend through Fire and Smoke Walls.

The hose reels currently are not indicated on the drawings.

Fire hose reel shortfalls occur in the following areas:

- Further information on the Fire Hose Reel System coverage is required to determine compliance.

9.3. Fire Extinguishers (BCA E1.6)

The provision of portable fire extinguishers is required to BCA Clause E1.6 and AS2444 - 2001 to provide coverage to the warehouse and the office areas.

Table E.6 details when portable fire extinguishers are required:

Occupancy Class	Risk Class (as defined in AS 2444)
General provisions – Class 2 to 9 buildings (except within sole-occupancy units of a Class 9c building)	a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1) b) To cover Class F fire risks involving cooking oils and fats in kitchens. c) To cover Class B fire risks in locations where flammable liquids in excess of 50 litres are stored or used (not excluding that held in fuel tanks of vehicles). d) To cover Class A fire risks in normally occupied fire compartments less than 500m^2 not provided with fire hose reels (excluding open deck carparks). e) To cover Class A fire risks in classrooms and associated schools not provided with fire hose reels. f) To cover Class A fire risks associated with Class 2 or 3 building or class 4 part of building.

The fire extinguisher locations currently are not indicated on the drawings.

- Further information on the Fire Extinguisher location is required to determine compliance.

9.4. Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is required to Specification E1.5 and AS2118.1-2017 to the following areas:

- Throughout the entire building if it is classified as large isolated under BCA Clause C2.3;

A sprinkler system is required to be provided throughout the whole building in a Class 2 or 3 building (excluding a residential care building) or a building containing a Class 2 or 3 part where any part of the building has a rise in storeys of 4 or more. This system is to comply with Specification E1.5a and the relevant parts of Specification E1.5a.

The sprinkler system shall be connected to and activate an occupant warning system complying with BCA Specification E2.2a.

Details of the proposed sprinkler system design will need to be reviewed as the design develops.

An occupant warning system should be provided in accordance with BCA Specification E1.5.

9.5. Smoke Hazard Management (BCA E2.2)

Smoke hazard management shall be provided throughout the building by means of the following systems:

- Automatic Shutdown of Mechanical Systems in accordance with the requirements of AS/NZS 1668.1-2015 Amendment 1; and
- Automatic Smoke Exhaust System activated by Automatic Smoke Detection & Alarm System in accordance with the requirements of BCA Spec E2.2a and AS1670.1-2018; or
- Automatic Smoke and Heat Vents in accordance with the requirements of BCA Spec E2.2b

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry and should be incorporated within the fire control room. Any variation to the prescriptive provisions will require the consent of the fire brigade and should form part of the fire safety engineering report to verify the performance requirements of the BCA.

9.6. Exit Signs and Emergency Lighting (BCA E4.2 and BCA E4.5)

Emergency Lighting and Exit Signs indicating exit location paths of travel to exits to be provided in accordance with BCA Part E4 and AS/NZS 2293.1-2018, including the potential use of photo luminescent exit signs.

Where exit signs are proposed to be above 2.7m to avoid potential damage by forklifts in the warehousing areas, this will need to be documented as a performance solution by an accredited fire safety engineer. This would need to be assessed to BCA Performance Requirement EP4.2.

Details are required to be provided for review.

9.7. Fire Precautions During Construction (BCA E1.9)

In a building during construction:

- Not less than one fire extinguisher to suit Class a, B and C fires and electrical fire must be provided at all times on each storey adjacent to the required exit.

10. Health and Amenity

10.1. Sanitary Facilities (BCA F2.2 and BCA F2.3)

Warehouse/Offices

Separate sanitary facilities are required to be provided for male & female employees at a rate at the following.

The following table summarises the sanitary facilities provided:

Sanitary Facilities Required / Provided			
WH 1	WC	Urinals	Basins
Male	2	2	2
Female	2	-	2
Accessible	1	-	1
The Above Facilities are adequate for 30 males & 30 females.			

Sanitary Facilities Required / Provided			
WH 2 (U2A to 2E)	WC	Urinals	Basins
Male	2	2	2
Female	2	-	2
Accessible	1	-	1
The Above Facilities are adequate for 30 males & 30 females.			

Note: The Unisex facilities provided for people with disabilities may be counted once for each sex. These facilities are to be provided in accordance with AS1428.1-2009.

Bathroom Construction

Where bathrooms or rooms containing water closets have the WC within 1200mm of the doorway, the door shall be either sliding, open outwards, or be provided with removable hinges.

10.2. Light and Ventilation (BCA Part F4)

Class 5 & 7

Natural Ventilation is required to be provided to rooms at a rate of 5% of the floor area in openings. Alternatively, mechanical ventilation is required in accordance with AS1668.2-2012

Artificial lighting complying with AS/NZS1680.0-2009 is to be incorporated with the final detailed design to be developed to confirm this.

10.3. Waterproofing (BCA FP1.4)

Performance Requirement FP1.4 which relates to the prevention of the penetration of water through external walls, must be complied with. It is noted that there are no Deemed-to-Satisfy Provisions for this Performance Requirement in respect of external walls.

As such, a performance solution is to be prepared by a suitably qualified professional that demonstrates that the external walls of the proposed building complies with Performance Requirement FP1.4 which reads as follows:

A roof and external wall (including openings around windows and doors) must prevent the penetration of water that could cause—

a) unhealthy or dangerous conditions, or loss of amenity for occupants; and
b) undue dampness or deterioration of building elements.

External above Ground Membranes

All external above ground areas (roof slabs, balconies etc.) shall be protected by a waterproofing system in accordance with AS4654 Parts 1 and 2 – 2012.

For external balconies the waterproofing membrane must have a vertical upward termination height in accordance with the table below dependant on the wind class of the site. The wind class is determined by the structural engineer.

Wind Class Regions A & B	Wind Class Regions C & D	Ultimate Limit State Wind Speed	Termination Height (mm)
N1	-	34	40
N2	-	40	50
N3	C1	50	70
N4	C2	61	100
N5	C3	74	150
N6	C4	86	180

Wet Areas

Internal wet areas throughout the development (e.g. bathrooms, laundries) shall be waterproofed in accordance with AS3740 - 2010 requirements.

Further review will be undertaken as the design develops with respect to the specification of waterproofing membrane, provision of water-stops at doorways etc.

10.4. Stormwater Drainage

Stormwater drainage systems serving the building are to comply with AS3500.3 - 2018.

The use of a syphonic stormwater drainage system is not covered by Australian Standards and any design incorporating one would need an appropriate performance solution will need to be documented by the hydraulic consultant addressing the system compliance against BCA Performance Requirements FP1.2 & FP1.3.

11. Energy Efficiency

The deemed-to-satisfy provisions of the BCA only apply to thermal insulation in a class 2 building where development consent or a Complying Development certificate specifies that the insulation is to be provided as part of the development.

11.1. SECTION J (JP1 Energy Use)

Efficient energy use must be achieved appropriate to the function and use of the building, level of human comfort, solar radiation, energy source of the services and sealing of the building envelope. To achieve this JV1, JV2, JV3 and JV4 verification methods have been introduced as options available to achieve compliance.

It is noted that a deemed to satisfy pathway is still available.

Access for maintenance is to be provided to the building in accordance with the requirements of BCA Part J8.

The proposed site will be located in a climate zone 6.
Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

Verification Methods

The Verification Methods available to demonstrate compliance with the BCA on a performance basis are as follows:

JV1 NABERS Energy for Offices

- To achieve compliance with JP1 a class 5 building must achieve a minimum of 5.5 NABERS Energy for Offices Base Building Commitment Agreement and comply with ANSI/ASHRAI Standard 140.
- To achieve the energy model for (JP1 (i)) solar radiation the base buildings greenhouse gas emissions are not more than 67% of the 5.5 star level when excluding:
  - Tenant supplementary heating; and
  - Cooling systems; and
  - External lighting; and
  - Car park services.
  - A thermal comfort level between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% f annual hours of operation.
- The building also need to comply with additional requirements of Spec JVa.

JV2 Green Star

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings Green Star can be used as a verification method when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:
  - The building complies with simulation requirements and is registers for a Green Star – Design & As-Built rating; and
  - The annual greenhouse gas emissions of the proposed building are less than 90% of the annual greenhouse gas emissions of the reference building; and
  - In the proposed building, a thermal comfort level of between predicted mean vote of -1 to +1 is achieve across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation of the building; and
  - The building complies with the additional requirements of Specification JVa.

JV3 Verification Using a Reference Building

- To achieve compliance with JP1 for Class 3,4,5,6, 7, 8, 9 and common area of Class 2 buildings verification using a reference building can be used when the calculation method complies with ANSI/ASHRAE Standard, Specification JVb and when:

- It is determined that the annual greenhouse gas emissions of the proposed building are not more than the annual greenhouse gas emissions of a reference building when the proposed building is modeled with the proposed services and the proposed building is modelled with the same services as the reference building. The proposed building thermal comfort level is to be between predicted mean vote of -1 to +1 across not less than 95% of the floor area of all occupied zones for not less than 98% of the annual hours of operation; and
- The building achieves the additional requirements in Specification JVa; and
- The greenhouse gas emissions of the proposed building may be offset by renewable energy generated and use on site and another process such as reclaimed energy used on site.

JV4 Building Envelope Sealing

- Compliance with sealing of the building against air leakage is verified when the envelope is sealed at an air permeability rate tested in accordance with Method 1 of AS/NZS ISO 9972, of not more than –
  - For a class 2 building or a class 4 part of a building, 10m³hr.m² at 50 Pa reference pressure; or
  - For a class 5, 6, 8, 9a or 9b building other than a ward area in climate zones 1, 7 and 8, 5 m³/hr.m² at 50 Pa reference pressure; or
  - For class 3 or 9c building, or a class 9a ward area in climate zones 1, 3, 4, 6, 7 and 8 5m³/hr.m² at 50 Pa reference pressure.
- Part J3 and performance solution that uses on of the other NCC assessment Methods which verifies that compliance with JP1 (e) will be achieve can also be used as verification methods.

12. Access for People with Disabilities

The development is required to comply with the accessibility provisions contained within:

- The Building Code of Australia 2019 Amendment 1;
- Disability (Access to Premises – Buildings) Standards 2010;
- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators
- AS2890.6-2009 Car Parking for People with Disabilities

Note: With the introduction of the Commonwealth *Disability Discrimination Act (DDA)* in 1992 (enacted in 1993), all organisations have a responsibility to provide equitable and dignified access to goods, services and premises used by occupants. Organisations and individuals since its introduction, are required to work to the objects of the Act which are to eliminate, as far as possible, discrimination against persons on the ground of disability in the **areas of work, accommodation, education, access to premises, clubs and sports, and the provision of goods, facilities, services and land, existing laws and the administration of Commonwealth laws and programs.**

This report assesses against the requirements contained with the Building Code of Australia (and documents referred to therein) and is not considered to be a full assessment against the Disability Discrimination Act.

12.1. General Building Access Requirements (BCA D3.1)

Access for people with disabilities shall be provided to and within the building in accordance with the requirements of Clause D3.2, D3.3 and D3.4 of the BCA 2019 Amdt 1 and AS 1428.1. Parts of the building required to be accessible shall comply with the requirements of:-

- AS1428.1-2009 General Requirements for Access – New Building Work;
- AS1428.4.1 -2009 Tactile Ground Surface Indicators

- AS2890.6-2009 Car Parking for People with Disabilities

Access for persons with a disability is to be provided as follows:

Office (Class 5 buildings)

To and within all areas normally used by the occupants

Car parks (Class 7a buildings)

To and within any level containing accessible car parking spaces.

Warehouse and production/Manufacturing facilities

To and within all areas normally used by the occupants, but as the uses of these areas could be deemed inappropriate, confirmation is required as the appropriateness of the areas in question by the owners or tenant.

12.2. Provision for Access to Buildings

The BCA prescribes access to be provided to and within the building as follows:

- Via the principle pedestrian entry and at least 50% of all other entrances from the allotment boundary
- From designated car parking spaces for the use of occupants with a disability.
- From another accessible building connected by a pedestrian link.
- All areas used by the occupants.

In buildings over 500m^2 in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

Where a pedestrian entry contains multiple doors, the following is required;

- Entrance containing not more than 3 doors, at least one of the doorways must be accessible.
- Where an entrance contains more than 3 doors, not less than 50% of the doorways must be accessible.

A door is considered to be accessible if it is automatic (open and closing) or is more than 850mm in clear opening width and contains the required door circulation space.

12.3. Accessibility within Building (BCA D3.3)

A building required to be accessible is required to be equipped with either a AS 1428.1 compliant lift or AS 1428.1 compliant ramp, (but the maximum vertical rise of a ramp must not exceed 3.6m).

Within the building the following are required;

- Door circulation space as per AS1428.1 Clause 13.3 and as attached in Appendix B;
- Doorways must have a clear opening of 850mm;
- Passing spaces (1.8m wide passages) must be provided at maximum of 20m intervals
- Within 2.0m of end access ways/corridors, turning areas spaces are required to be provided.
- Carpet pile height of not more than 11mm to an adjacent surface and backing <4mm
- Any glazing capable of being mistaken for a doorway or opening must be clearly marked (or contain chair rail, hand rail or transom as per AS 1288 requirements)

The design would generally comply with the prescriptive provisions of the BCA with additional ongoing review being undertaken as to door widths, circulation, etc. Further details are to be provided or access to these areas is to be assessed by an access consultant.

12.4. Car Parking (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 space for every 100 carparking spaces/

The Warehouse 1 development is proposed to contain 177 car parking spaces which requires a minimum of 2 accessible spaces.

The Warehouse 2 development is proposed to contain 150 car parking spaces which requires a minimum of 2 accessible spaces.

A ‘shared zone’ of minimum 5400mm x 2400mm is required adjacent to accessible car parking spaces, protected with a bollard.

12.5. Tactile Indicators (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all stairs (except Fire Isolated stairs) and ramps regardless of public nature or private environment and where an overhead obstruction occurs less than 2.0m above the finished floor level.

12.6. Stairs (BCA D3.3 inter Alia AS1428.1)

Stairs shall be constructed as follows:

a) Where the intersection is at the property boundary, the stair shall be set back by a minimum of 900mm so that the handrail and TGSIs do not protrude into the transverse path of travel.
b) Where the intersection is at an internal corridor, the stair shall be set back one tread width plus 300mm (nominally 700mm as per AS 1428.1-2009 Fig 26(b)), so the handrails do not protrude into transverse path of travel.
c) Stairs shall have opaque risers.
d) Stair nosing shall not project beyond the face of the riser and the riser may be vertical or have a splay backwards up to a maximum 25mm.
e) Stair nosing profiles shall;
   - Have a sharp intersection;
   - Be rounded up to 5mm radius; or
   - Be chamfered up to 5mm x 5mm
f) All stairs, including fire isolated stairs shall, at the nosing of each tread have a strip not less than 50mm and not more than 75mm deep across the full width of the path of travel. The strip may be set back a maximum of 15mm from the front of the nosing. The strip shall have a minimum luminance contrast of 30% to the background. Where the luminous contrasting strip is affixed to the surface of the tread, any change in level shall not exceed a difference of 5mm.

12.7. Accessible Sanitary Facilities (BCA F2.4)

Unisex Accessible Sanitary Facilities

An accessible unisex sanitary facility must be located so that it can be entered without crossing an area reserved for one sex only and provided in accordance with AS 1428.1-2009 and must contain a closet pan, washbasin, shelf or bench top and adequate means of disposal of sanitary products and as per following.

Building Type	Minimum accessible unisex sanitary compartments to be provided
Office, industrial, assembly building, schools, health care except for within a ward area of a Class 9a health-care building	a) 1 on every storey containing sanitary compartments; and b) Where a storey has more than 1 bank of sanitary compartments containing male and female sanitary compartments, at not less than 50% of those banks.

Ambulant Facilities

At each bank of toilets where there is one or more toilets in addition to an accessible unisex sanitary compartment, a sanitary compartment suitable for a person with an ambulant disability in accordance with AS 1428.1-2009 must be provided for use by males and females.

Where male sanitary facilities are provided at a separate location to female sanitary facilities, accessible unisex sanitary facilities are only required at one of those locations.

12.8. Signage (BCA D3.6)

As part of the detailed design package, specifications will need to be developed indicating:

- Sanitary Facility Identification Signs (note that they are to comply with BCA Specification D3.6 and include the use of Braille, Tactile, etc and be placed on the wall on the latch side of the facility);
- Directional / Way Finding signs to the Lifts, Sanitary Facilities, etc;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level” number
- Braille and tactile signs must be illuminated to ensure *luminance contrast* requirements are met at all times during which the sign is required to be read.

12.9. Lifts (BCA E3.6)

Lifts compliant to BCA E3.6 and BCA E3.7 must be provided, where required to be provided, with a minimum size of 1400 x 1600mm or 1100mm x 1400mm (whichever is appropriate) in size – with appropriate handrails and auditory commands.

13. Appendix A - Reference Documentation

The following documentation was used in the assessment and preparation of this report:

Drawing No.	Title	Date	Revision
DA00	COVERSHEET	20.10.21	P1
DA01	EXISTING CONDITIONS PLAN	11.11.21	A
DA02	DEMOLITION PLAN	11.11.21	A
DA03	SITE ANALYSIS	11.11.21	A
DA04	PROPOSED SITE PLAN	11.11.21	A
DA05	PROPOSED FLOOR PLANS - WH1	11.11.21	A
DA06	PROPOSED FLOOR PLANS – WH2	11.11.21	A
DA07	PROPOSED OFFICE PLANS - WH1	11.11.21	A
DA08	PROPOSED OFFICE PLANS – WH2	11.11.21	A
DA09	PROPOSED OFFICE PLANS – WH2	11.11.21	A
DA10	PROPOSED OVERALL ROOF PLAN	11.11.21	A
DA11	PROPOSED WAREHOUSE ELEVATIONS WH1 – SHEET 1	11.11.21	A
DA12	PROPOSED WAREHOUSE ELEVATIONS WH2 – SHEET 2	11.11.21	A
DA13	PROPOSED OFFICE ELEVATIONS – SHEET 1	11.11.21	A
DA14	PROPOSED OFFICE ELEVATIONS – SHEET 2	11.11.21	A
DA15	PROPOSED SECTIONS	11.11.21	A
DA16	PESPECTIVES	11.11.21	A
DA17	PERSPECTIVES	11.11.21	A

14. Appendix B - Draft Fire Safety Schedule

No.	Measure	Particulars of Measure *(including where the requirement for the measure is set out or described i.e. in building plans or in a performance solution report)*
1.	Automatic Fail Safe Devices	BCA 2019 Amdt 1 Clause D2.19 & D2.21
2.	Automatic Fire Detection and Alarm System	BCA 2019 Amdt 1 Spec. E2.2a & AS 1670.1 – 2015, AS/NZS 1668.1 - 2015
3.	Automatic Fire Suppression System (sprinklers)	BCA 2019 Amdt 1 Spec. E1.5 & AS 2118.1 – 2017,
4.	Emergency Lighting	BCA 2019 Amdt 1 Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
5.	Exit Signs	BCA 2019 Amdt 1 Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
6.	Fire Control Centres and Rooms	BCA 2019 Amdt 1 Spec. E1.8
7.	Fire Hose Reel Systems	BCA 2019 Amdt 1 Clause E1.4 & AS 2441 – 2005 Amdt 1
8.	Fire Hydrant Systems	BCA 2019 Amdt 1 Clause E1.3 & AS 2419.1 – 2005 Amdt 1
9.	Lightweight Construction	BCA 2019 Amdt 1 Clause C1.8, C3.17 & AS 1530.3 – 1999
10.	Mechanical Air Handling System (nominate installed systems here e.g. zone smoke, smoke exhaust, pressurisation)	BCA 2019 Amdt 1 Clause E2.2, AS/NZS 1668.1 – 2015
11.	Perimeter Vehicular Access for emergency vehicles	BCA 2019 Amdt 1 Clause C2.4
12.	Portable Fire Extinguishers	BCA 2019 Amdt 1 Clause E1.6 & AS 2444 – 2001
13.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA 2019 Amdt 1 Clause C3.6, D2.23, E3.3 & H101.8
14.	Building Occupant Warning System	BCA 2019 Amdt 1 Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2015 – Clause 3.22
15.	Emergency Evacuation Plan	Fire Engineering Report XXXX Revision XX prepared by XXXX dated XXXX and AS 3745 – 2002
16.	Paths of Travel	EP&A Reg 2000 Clause 183, 184, 184 & 186

15. Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2019 Amendment 1:

Table 5 **TYPE C CONSTRUCTION: FRL OF BUILDING ELEMENTS**	**Class of building—FRL: (in minutes)** ***Structural adequacy/Integrity/Insulation***			
	2, 3 or 4 part	**5, 7a or 9**	**6**	**7b or 8**
EXTERNAL WALL (including any column and other building element incorporated within it) or other external building element, where the distance from any fire-source feature to which it is exposed is—				
Less than 1.5 m	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
1.5 to less than 3 m	–/–/–	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
EXTERNAL COLUMN not incorporated in an *external wall*, where the distance from any *fire-source feature* to which it is exposed is—				
Less than 1.5 m	90/–/–	90/–/–	90/–/–	90/–/–
1.5 to less than 3 m	–/–/–	60/–/–	60/–/–	60/–/–
3 m or more	–/–/–	–/–/–	–/–/–	–/–/–
COMMON WALLS and FIRE WALLS—	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90	90/ 90/ 90
INTERNAL WALLS-				
Bounding *public corridors*, public lobbies and the like—	60 / 60/ 60	–/–/–	–/–/–	–/–/–
Between or bounding *sole-occupancy units*—	60/ 60/ 60	–/–/–	–/–/–	–/–/–
Bounding a stair if *required* to be rated—	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60	60/ 60/ 60
ROOFS	–/–/–	–/–/–	–/–/–	–/–/–