BUILDING CODE OF AUSTRALIA REPORT

NSW Department of Industry
Prince Street, Orange, NSW

Prepared for: ADCO Constructions
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Table of Contents

EXECUTIVE SUMMARY 4

1.0 INTRODUCTION 7

2.0 PRELIMINARIES 7

3.0 FIRE PROTECTION 9

4.0 ATRIUM PROVISIONS (BCA G3) 12

5.0 EGRESS PROVISIONS 13

6.0 ACCESS FOR PEOPLE WITH DISABILITIES 16

7.0 FIRE SERVICES AND EQUIPMENT 19

8.0 HEALTH AND AMENITY 22

9.0 ENERGY EFFICIENCY 23

APPENDIX A - DESIGN DOCUMENTATION 24

APPENDIX B - DRAFT FIRE SAFETY SCHEDULE 25

APPENDIX C - FIRE RESISTANCE LEVELS 26
Executive Summary

Development Overview

The proposed development strategy includes the construction of a vertical campus for property NSW. The site location is part of a city block bounded by Dalton Street, Prince Street, Anson Street and Sale Street, with the proposed entry to the development being off Prince Street.

The development includes the construction of a four (4) storey commercial building, with basement car parking connecting to a multi deck car park at the rear of the site and an on-grade car park.

Compliance Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Group GSA Pty Ltd for compliance with the Building Code of Australia 2016 Volume One Amendment 1.

The assessment of the design documentation has revealed that the following areas are required to be assessed against the relevant performance requirements of the BCA. The submission for Building Permit will need to include verification from a suitably accredited fire engineer: -

<table>
<thead>
<tr>
<th>No.</th>
<th>Alternative Solution Description</th>
<th>DTS Clause</th>
<th>Performance Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Exposure between fire source features</strong>&lt;br&gt;The commercial and multistorey carpark are proposed to be located within 6m of each other on the same allotment. A performance solution is proposed to be prepared by the fire engineer to rationalise the degree of protection required to achieve compliance with the performance requirements of the BCA.</td>
<td>C3.2</td>
<td>CP2, CP8</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Provision for Escape – Exit travel distance</strong>&lt;br&gt;A performance solution prepared by the fire engineer for travel distances within the development will proposed distances of up to: <strong>Commercial building</strong>&lt;br&gt;• 30m to a single exit or point of choice and where two exits are provided,&lt;br&gt;• a maximum of 60m to one of those exits; and&lt;br&gt;• exits shall be located to not be more than 70m apart and not closer than 9m <strong>Car parks</strong>&lt;br&gt;• 20m to a single exit or point of choice and where two exits are provided,&lt;br&gt;• a maximum of 60m to one of those exits; and&lt;br&gt;• exits shall be located to not be more than 70m apart and not closer than 9m</td>
<td>D1.4, D1.5</td>
<td>DP4, EP2.2</td>
</tr>
</tbody>
</table>
3. **Fire Hose Reels**  

A performance solution is to be developed by the fire engineer verifying compliance with the performance requirements of the BCA for the omission of Fire Hose Reel to Class 5 Office uses.

The fire engineered solution relating to EP1.3 and EP2.2 will be subject to consultation with the NSW Fire Brigade as part of the Construction Certificate process under Clause 144 of the Environmental Planning & Assessment Regulation 2000.

The assessment of the design documentation has also revealed that the following additional information is required in order to assess BCA compliance within the development.

<table>
<thead>
<tr>
<th>No.</th>
<th>Further Information / Review Required</th>
<th>Report Reference</th>
</tr>
</thead>
</table>
| 1.  | **Size of Fire Compartments**  
The floors within the commercial building is proposed to be connected via a void connecting 3 levels. The size of the fire compartment is to be designed to ensure the limitations nominated in the table above are adhered to. Alternatively, the oversized compartment is to also be addressed in the fire engineered solution for the development. | 2.2, 3.1 |
| 2.  | **Non-Combustible Building Elements**  
Details proposed external walls are to be provided, including details of the combustibility (i.e. testing to AS1530.1) of all materials making up external walls. It is recommended that once material selections are made, copies of the fire test certificates/reports be provided for review and approval. | 3.3 |
| 3.  | **Compartmentation and Fire Separation**  
Compartmentation drawings are to be provided showing the location of and fire ratings achieved by the fire rated construction and openings. This is to include details of any external walls achieving an FRL and any protection proposed to openings or non-fire rated elements. | 3.1, 3.5, 3.6 |
| 4.  | **Stair Detail Drawings**  
Details of proposed stairs are to be provided to enable review of goings and risers, landings, thresholds, handrails, balustrades and tactile indicators. | 4.5, 5.4, 5.5 |
| 5.  | **Exit locations**  
Further information if to be provided for assessment on the location of exits in the following areas:  
- Roof Plant Level  
- Level Three - currently documented to have a single exit, however additional exits required to accommodate travel distance.  
- Basement car park. | 5.1 |
| 6.  | **Discharge of Fire Isolated exits and fire protection**  
Further review and commentary on this as design progresses will be provided and confirmation of egress routes to the road are to be provided on architectural drawings. | 5.2 |
### Dimensions of Exits
Confirmation is to be provided by the architect of the unobstructed width of exits, measures clear of all obstructions included handrails etc.

### Dedicated Egress Stairs vs Circulation Stairs
Should the fire isolated stairs within the development be proposed to be used as circulation stairs, this includes carpark stairs, the stairs are to be design to comply with the accessibility provisions of AS1428.1-2009.

### Accessible Sanitary Facilities
Level 3 of the building is to be afforded with an accessible sanitary facility.

### Location of Infrastructure for Fire Services
Design documentation is to identify the location of sprinkler and booster assemblies, pump rooms, Fire Control Panel (etc) tp be identified on drawings and deviations from DtS provisions to be identified by Services Engineers.

### Performance Solution for Weatherproofing of External Walls
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 in regards to the penetration of water into the building.

### Energy Efficiency
The building is to be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

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.
1.0 Introduction

The proposed development strategy includes the construction of a vertical campus for property NSW. The site location is part of a city block bounded by Dalton Street, Prince Street, Anson Street and Sale Street, with the proposed entry to the development being off Prince Street.

The development includes the construction of a four (4) storey commercial building, with basement car parking connecting to a multi deck car park at the rear of the site and an ongrade car park.

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.

1.1 Current Legislation

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 Certifying authority for the Construction Certificate. For the purposes of this Report, BCA 2016 Amendment 1 has been utilised as the version of the BCA applicable at the time of preparation this Report.

2.0 PRELIMINARIES

2.1 Building Assessment Data

Summary of Construction Determination: -

<table>
<thead>
<tr>
<th>Part of Project</th>
<th>Commercial Building</th>
<th>Car Park</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classification</td>
<td>7a &amp; 5</td>
<td>7a</td>
</tr>
<tr>
<td>Number of Storeys</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Rise In Storeys</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Type of Construction</td>
<td>Type A</td>
<td>Type A</td>
</tr>
<tr>
<td>Effective Height (m)</td>
<td>&lt;25m</td>
<td>&lt;25m</td>
</tr>
</tbody>
</table>

Note: Due to the connectivity between the commercial and capark buildings, for the purpose of BCA Compliance, these building are considered “United Buildings”.

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

<table>
<thead>
<tr>
<th>Part of Project</th>
<th>BCA Classification</th>
<th>Approx. Floor Area (m²)</th>
<th>Approximate Volume (m³)</th>
<th>Assumed Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basement</td>
<td>7a</td>
<td>3,740</td>
<td>TBA</td>
<td>125</td>
</tr>
<tr>
<td>Ground Floor</td>
<td>5</td>
<td>2,662</td>
<td>TBA</td>
<td>270</td>
</tr>
<tr>
<td>Ground Floor Retail</td>
<td>6</td>
<td>TBA</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>---</td>
<td>-----</td>
<td>-----</td>
<td></td>
</tr>
<tr>
<td>Level 1</td>
<td>5</td>
<td>2,662</td>
<td>TBA</td>
<td>270</td>
</tr>
<tr>
<td>Level 2</td>
<td>5</td>
<td>2,662</td>
<td>TBA</td>
<td>270</td>
</tr>
<tr>
<td>Level 3 Office</td>
<td>5</td>
<td>1360</td>
<td>TBA</td>
<td>170</td>
</tr>
<tr>
<td>Level 3 Plant</td>
<td>5</td>
<td>575</td>
<td>TBA</td>
<td>20</td>
</tr>
<tr>
<td>Level 4 Plant</td>
<td>5</td>
<td>1,420</td>
<td>TBA</td>
<td>50</td>
</tr>
<tr>
<td>Car park</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level 1 (CP2, CP3)</td>
<td>7a</td>
<td>1,990</td>
<td>TBA</td>
<td>70</td>
</tr>
<tr>
<td>Level 2 (CP3, CP4)</td>
<td>7a</td>
<td>1,990</td>
<td>TBA</td>
<td>70</td>
</tr>
</tbody>
</table>

Notes:
1. The above populations have been based on the floor areas and calculations in accordance with Table D1.13 of the BCA.
2. The carpark areas have been considered ancillary to the use for the purposes of population numbers.
3. The Area of the retail space on ground floor is to be advised for calculation of populations.

### 2.2 Structural Provisions (BCA B1)

Any new structural works are to comply with the applicable requirements of AS/NZS 1170.1.

Glazing is to comply with AS1288, and AS2047.

The building is considered importance level 2, due to the capacity of the building being less than 5000 occupants.

Prior to the issue of the Construction Certificate structural certification is required to be provided, including determination of the importance level of the development.

Note: should the site be flood affected, an assessment against the provisions of BCA Clause B1.6 – Construction of Buildings in Flood Areas is to be undertaken by the structural engineer.

### 2.3 Development Approval

A Development Approval will be required from the Local Authority for the development. A copy of the Development Permit 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.

### 2.4 Copy of Certificate of Title:

A copy of the current Certificate of Title and Registered Plan / Plan of Subdivision is required. Where it is proposed to construct any part of the building work within an easement, the consent of the relevant authority and/or Council is required prior to the issue of the Construction Certificate.
3.0 FIRE PROTECTION

3.1 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, the building is required to be Type A Construction in accordance with Table 3 & 3.9 of Specification C1.1 of the Building Code of Australia 2016 Amendment 1.

As the carparks (basement and multi deck) are proposed to be open deck and/or sprinkler protected, Fire Resistance Levels as nominated in Table 3.9 apply to the carparks.

The building has been assessed on the basis of the following fire separation/ compartmentation within the development;

- Fire separation between the basement car park and commercial ground floor of 120 minutes.
- Fire compartmentation / separation of the sprinkler protected carpark and the open deck caroark of 120 minutes.

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

<table>
<thead>
<tr>
<th>BCA Classification</th>
<th>Type of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>max floor area— 8 000 m²</td>
</tr>
<tr>
<td></td>
<td>max volume— 48 000 m³</td>
</tr>
</tbody>
</table>

The floors within the commercial building is proposed to be connected via a void connecting up to three levels (including ground floor). The size of the fire compartment/atria is to design to ensure the limitations nominated in the table above are adhered to. Alternatively, the oversized compartment is to also be addressed in the fire engineered solution for the development.

3.2 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 A Construction, Please refer to Appendix A which outlines the required fire rating to be achieved by the development. These fire ratings are summarised below:-

<table>
<thead>
<tr>
<th>Building Element</th>
<th>Commercial Office Building (BCA Class 5)</th>
<th>Carparks (BCA Class 7a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>External Walls (&gt;3m from fire source feature)</td>
<td>120/120/120 -120/120 -120/120</td>
<td>-/-/-</td>
</tr>
<tr>
<td>External Columns</td>
<td>120/-/-</td>
<td>-</td>
</tr>
<tr>
<td>Fire Walls</td>
<td>120/120/120</td>
<td>60/60/60</td>
</tr>
</tbody>
</table>
### Fire Stair / Shaft Walls

<table>
<thead>
<tr>
<th></th>
<th>Loadbearing</th>
<th>Non-loadbearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120/120/120</td>
<td>60/60/60</td>
</tr>
<tr>
<td></td>
<td>-/120/120</td>
<td>60/60/60</td>
</tr>
</tbody>
</table>

### Public Corridors

<table>
<thead>
<tr>
<th></th>
<th>Loadbearing</th>
<th>Non-loadbearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120/-/-/-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Service Shaft Walls

<table>
<thead>
<tr>
<th></th>
<th>Loadbearing</th>
<th>Non-loadbearing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120/90/90</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>-/-90/90</td>
<td>-</td>
</tr>
</tbody>
</table>

### Floors

<table>
<thead>
<tr>
<th></th>
<th>120/120/120</th>
<th>60/60/60</th>
</tr>
</thead>
</table>

### Walls, Beams, Columns Supporting Floors

|                  | 120/-/-/-   | 60/-/-          |

### Walls, Beams, Columns Supporting Roof

|                  | 120/-/-/-   | -/-/-          |

### Roof

|                  | 120/60/30   | -/-/-          |

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

- Lift Motor Rooms,
- Emergency Power Supply,
- Electricity Supply,
- 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.

### 3.3 Fire Hazard Properties (BCA C1.10 and BCA C1.12)

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 Building Code of Australia. The following requirements apply:

#### Commercial building - Sprinkler Protected Areas

- a) Floor Coverings – Critical radiant Flux not less than 1.2 kW/m²
- b) Wall and Ceiling Linings – Material Group No. 1,2,3
- c) Other Materials – Spread of Flame Index not exceeding 0 and Smoke Developed Index not exceeding 2.

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

Floor linings and floor coverings used in lift cars must have a critical radiant flux not less than 2.2, and wall and ceiling linings must be a Material Group No. 1 or 2.

#### External Wall Cladding

As the building is of Type A construction the external walls, including any external and internal claddings & linings must be non-combustible as determined by AS1530.1. 1994.

The following materials may be used wherever a non-combustible material is required:

- a) Plasterboard.
- b) Perforated gypsum lath with a normal paper finish.
- c) Fibrous-plaster sheet.
- d) Fibre-reinforced cement sheeting.
e) Pre-finished metal sheeting having a combustible surface finish not exceeding 1 mm thickness and where the Spread-of-Flame Index of the product is not greater than 0.

f) Bonded laminated materials where—
   i. each lamina, including any core, is non-combustible; and
   ii. each adhesive layer does not exceed 1 mm in thickness and the total thickness of the adhesive layers does not exceed 2mm; and
   iii. the Spread-of-Flame Index and the Smoke-Developed Index of the bonded laminated material as a whole does not exceed 0 and 3 respectively.

The BCA does nominate that ancillary elements may be fixed to an external wall that is required to be non-combustible unless they comprise of the following:

a) An ancillary element that is non-combustible.

b) A gutter, downpipe or other plumbing fixture or fitting.

c) A flashing.

d) A grate or grille not more than 2 m² in area associated with a building service.

e) An electrical switch, socket-outlet, cover plate or the like.

f) A light fitting.

g) A required sign.

h) A sign other than one provided under (a) or (g) that—
   i) achieves a group number of 1 or 2; and
   ii) does not extend beyond one storey; and
   iii) does not extend beyond one fire compartment; and
   iv) is separated vertically from other signs permitted under (h) by at least 2 storeys.

It is recommended that once material selections are made, copies of the fire test certificates/reports be provided for review and approval.

3.3 Protection of Openings in External Walls (BCA C3.2)

Openings in external walls of buildings that are located within:

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,

Fire source feature is defined as:

a) The far boundary of a road, river, lake or the like adjoining an allotment,

b) The side or rear boundary of the allotment,

c) The external wall of another building on the allotment which is not a class 10 building.

Protection of openings is to be achieved by the following means:-

1. Doorways—
   a. external wall-wetting sprinklers used with doors that are self-closing or automatic closing; or
   b. ~/60/30 fire doors that are self-closing or automatic closing.

2. Windows —
   a. external wall-wetting sprinklers used with windows that are automatic closing or permanently fixed in the closed position; or
   b. ~/60/~ fire windows that are automatic closing or permanently fixed in the closed position; or
   c. ~/60/— automatic closing fire shutters.

3. Other openings—
   a. excluding voids —external wall-wetting sprinklers; or
b. construction having an FRL not less than –/60/–.

The commercial and multistorey carpark are proposed to be located within 6m of each other on the same allotment. As such, the openings in the external walls of these buildings are required, under Deemed-to-satisfy provisions, to be treated.

A performance solution is proposed to be prepared by the fire engineer to rationalise the degree of protection required to achieve compliance with the performance requirements of the BCA.

3.4 Protection of Openings in fire rated building elements (BCA C3.5 and BCA C3.10)

The prescriptive provisions of the BCA stipulate that openings within building elements required to have an FRL shall be protected as follows:

a) Penetrations through fire rated floors to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a fire rated shaft achieving an FRL of 120/120/120;

b) Any penetration through a wall or room required to have an FRL (e.g. substation, boiler room, apartment separating wall etc) is to be protected either by a tested prototype (e.g. fire collar, fire damper, etc) or be installed within a shaft achieving an FRL of –/60/– (or 120/120/120 where it is a room such as a substation);

c) Self-closing –/60/30 fire doors to the doors opening to the fire isolated stairs (note that this also includes the access doors to the condenser units on the plant platforms).

4.0 ATRIUM PROVISIONS (BCA G3)

Part G3 of the BCA contains additional fire and smoke management provisions for buildings containing atriums, but only applies where the atrium connects –

a) More than 2 storeys, or

b) More than 3 storeys if each storey is protected with a sprinkler system and one of those storeys connected is situated at a level which has direct egress to a road or open space

As the commercial building is proposed to be provide with sprinkler protection and the void connecting level within the building dies not exceed three, the provisions of Part G3 do not apply to the building.
5.0 EGRESS PROVISIONS

5.1 Provisions for Escape (BCA D1)

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways

Every storey of the building is to be afforded with at least one exit, and where travel distances require it, multiple exits are to be afforded in the building.

The Basement carpark to be afforded with a minimum of two (2 exits) and additional to accommodate travel distances.

Further information if to be provided for assessment on the location of exits in the following areas:

- Roof Plant Level
- Level Three - currently documented to have a single exit, however additional exits required to accommodate travel distance.
- Basement car park.

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Stair construction
- Handrail and balustrade construction
- Details of Separation of rising & descending stairs
- Discharge from the Fire Isolated Exits
- Details of the egress provisions to the Road

Note: Automatic doors on the ground floor (and throughout the building) are form part of a required exit or are located on the path of travel to an exit, are to be capable of being operated manually in the event of power failure, under a force of 110N.

5.2 Travel via Fire Isolated Exits (BCA D1.7)

The proposed exits are required to be fire isolated.

The BCA requires each fire isolated stairway to provide independent egress from each storey served and discharge directly, or by way of its own fire isolated passageway to:

- A road or open space; or
- To a point in a storey within the confines of the building, that is used only for pedestrian movement, car parking or the like and is open for at least 2/3 of its perimeter, and an unimpeded path of travel not more than 20m to a road or open space; or
- A covered area that adjoins a road or open space, is open for at least 1/3 of its perimeter, has an unobstructed clear height throughout of not less than 3m, and provides an unimpeded path of travel to a road or open space of not less than 6m.

Additionally, where the path of travel from the point of discharge requires occupants to pass within 6m of any part of the external wall of the same building (measured horizontally), that external wall must have a 60/60/60 FRL and have any openings protected internally for a distance of 3m above or below the path of travel.

It is anticipated that compliance is capable of being achieved with the requirement of these provision in the design through deemed-to-satisfy provisions. Further review and
commentary on this as design progresses will be provided and confirmation of egress routes to the road are to be provided on architectural drawings.

Should the fire isolated stairs within the development be proposed to be used as circulation stairs, this includes carpark stairs, the stairs are to be design to comply with the accessibility provisions of AS1428.1-2009.

5.3 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:
- 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

Travel distances within the development are subject to ongoing review as the design progresses. Further documentation of exits from each storey of the building are to be provided for review and assessment of travel distances.

A performance solution prepared by the fire engineer for travel distances within the development will proposed distances of up to:

**Commercial building**
- 30m to a single exit or point of choice and where two exits are provided, a maximum of 60m to one of those exits; and
- exits shall be located to not be more than 70m apart and not closer than 9m

**Car parks**
- 20m to a single exit or point of choice and where two exits are provided, a maximum of 60m to one of those exits; and
- exits shall be located to not be more than 70m apart and not closer than 9m

5.4 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 in which case a 600mm clear width is required).

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

<table>
<thead>
<tr>
<th>Storey</th>
<th>Number of People</th>
<th>Exit Width Required</th>
<th>Exit Width Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basement</td>
<td>125</td>
<td>2m</td>
<td>TBA</td>
</tr>
<tr>
<td>Ground Floor</td>
<td>270</td>
<td>2.6m</td>
<td>TBA</td>
</tr>
<tr>
<td>Level One</td>
<td>270</td>
<td>2.6m</td>
<td>TBA</td>
</tr>
<tr>
<td>Level Two</td>
<td>270</td>
<td>2.6m</td>
<td>TBA</td>
</tr>
<tr>
<td>Level Three</td>
<td>190</td>
<td>1.9m</td>
<td>TBA</td>
</tr>
</tbody>
</table>

Note:
- a) The population above are based on a 1sqm per person ratio for office floors.
Confirmation is to be provided by the architect of the unobstructed width of exits, measures clear of all obstructions included handrails etc.

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).

5.5 Balustrading and Handrails (BCA D2.16 and BCA D2.17)

Generally

Balustrading to a height of 1000mm with a maximum opening of 125mm in any direction should be provided adjacent to balconies, landings, corridors etc where located adjacent to a change in level exceeding 1000mm.

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 ramps and 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.

5.6 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

<table>
<thead>
<tr>
<th>Application</th>
<th>Surface conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dry</td>
</tr>
<tr>
<td>Ramp steeper than 1:14</td>
<td>P4 or R11</td>
</tr>
<tr>
<td>Ramp not steeper than 1:14</td>
<td>P3 or R10</td>
</tr>
<tr>
<td>Tread or landing surface</td>
<td>P3 or R10</td>
</tr>
<tr>
<td>Nosing or landing edge strip</td>
<td>P3</td>
</tr>
</tbody>
</table>
6.0 ACCESS FOR PEOPLE WITH DISABILITIES

6.1 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 2016 Amendment 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;
- AS1428.4-2009 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/shops Class 5

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.

6.2 Provision for Access to Buildings

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

- Via the principle public entry and at least 50% of all other entrances
- 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 public.

In buildings over 500m² in floor area, a non-accessible entrance must not be located more than 50m from an accessible entrance.

And where a pedestrian entry contains multiple doors, the following is required:

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

6.3 Provisions for Access within Buildings (BCA D3.3)

A building required to be accessible is required to be equipped with either a 1428.1 compliant lift.

Within the building the following are required:

- Door circulation space as per AS1428.1 Clause 13.3 and as attached in appendix 1;
- 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
- Any glazed 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.

6.4 Car parking (BCA D3.5)

Accessible car parking spaces are required to comply with AS 2890.6-2009 at the rate of 1 accessible space for every 100 carpark or part there of.

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

6.5 Tactile Indicators (BCA D3.8)

Tactile indicators are required to be provided to warn occupants of all stairs (except dedicated 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.

6.6 Stairs (BCA D3.3, 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 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 in 300mm, 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.

6.9 Provisions for 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 towels and as per following.

<table>
<thead>
<tr>
<th>Building Type</th>
<th>Minimum accessible unisex sanitary compartments to be provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office,</td>
<td>a) 1 on every storey containing sanitary compartments; and</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
</tbody>
</table>
Level 3 of the building is to be afforded with an accessible sanitary facility.

**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.

An accessible unisex sanitary compartment or an accessible unisex shower need not be provided on a storey or level that is not provided with a passenger lift or ramp complying with AS1428.1-2009

**6.10 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;
- Hearing Augmentation System;
- Identify each door required by BCA Clause E4.5 to be provided with an exit sign, stating ‘EXIT’ and ‘Level’ number

**6.12 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.
7.0 FIRE 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.

7.1 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:

- Feed hydrants (within 20m of hard stand for pumping appliance), 150 kPa
- Attack hydrant (within 50m of hard stand) 250 kPa
- Hydrants on a pump station, 700 kPa

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 and within sight of the main entry of the building within 20m of a hardstand area.

The fire hydrant booster and pump location is still need to be identified.

7.2 Fire Hose Reels (BCA E1.4)

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

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

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

A performance solution is to be developed by the fire engineer verifying compliance with the performance requirements of the BCA for the omission of Fire Hose Reel to Class 5 Office uses.

7.3 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 building.

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

<table>
<thead>
<tr>
<th>Occupancy Class</th>
<th>Risk Class (as defined in AS 2444)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCA Class 5 and 7a</td>
<td>(a) To cover Class AE or E fire risks associated with emergency services switchboards. (Note 1)</td>
</tr>
<tr>
<td></td>
<td>(b) To cover Class F fire risks involving cooking oils and fats in kitchens.</td>
</tr>
<tr>
<td></td>
<td>(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).</td>
</tr>
</tbody>
</table>
Fire extinguishers are to be located in accordance with AS 2444, often collocated with fire hydrants and/or fire hose reels.

7.4 Automatic Sprinkler Protection (BCA E1.5)

Automatic sprinkler protection is proposed to be provided throughout the building in accordance with BCA Specification E1.5 and AS2118.1-2017 to the following areas:

- Throughout any Class 7a car park (other than open deck car parks) containing accommodation for more than 40 vehicles;
- Throughout the Commercial building.

Location of pumps, tanks, FIP, control valves and booster assemblies will be subject to review.

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

7.5 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 AS2293.1-2005

7.8 Smoke Hazard Management (BCA E2.2)

General

An air handling system which does not form part of the smoke hazard management system, which recycles air from one fire compartment to another, and may unduly contribute to the spread of smoke throughout the building, must:

a) Be designed and installed to operate as a smoke control system in accordance with AS1668.1; or

b) Incorporate smoke dampers where the air-handling ducts penetrate any elements separating the fire compartments served; and
   a. Be arranged such that the air handling system is shut down and the smoke dampers are activated to close automatically by smoke detectors complying with clause 7.5 of AS1670.1

Commercial Building – BCA Class 5

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

a) Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-2015; or
b) Zone Smoke Control System in accordance with AS1668.1; or
   c) Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2004; or
   d) Be provided with a sprinkler system complying with Specification E1.5 and AS2118.1-2015.

The building is proposed to be provided with a sprinkler system in accordance with option (d) above.

A fire indicator panel is required as part of the detection system. This panel is to be located within 4m of the main entry. 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.

Basement Car Park – Class 7a
Smoke hazard management shall be provided throughout the building by means of the following systems:

The mechanical ventilation system, provided in accordance with AS1668.2 must comply with clause 5.5 of AS1668.1 except that:

a) fans with metal blades suitable for operation at normal temperature may be used; and
b) the electrical power and control cabling need not be fire rated

Open Deck Car Park

The Smoke Hazard Management provisions of BCA Cl E2.2 do not apply to an open deck car park (BCA Cl E2.1 (i)).

7.9 Lift Services (BCA E3.42 and BCA E3.6)

The passenger lifts to be installed are to be:

- fitted with warning signs, fire service controls in accordance with Clauses E3.3, E3.7, E3.9 and E3.10 of the BCA.
- Be provided with the following:
  - A handrail in accordance with AS 1735.12;
  - Minimum internal floor dimensions as specified in Table E3.6b of the BCA i.e. 1,400mm x 1,600mm;
  - Minimum clear door opening complying with AS 1735.12;
  - Passenger protection system complying with AS 1735.12;
  - Have a set of buttons for operating the lift located at heights above level complying with AS 1735.12;
  - Lighting in accordance with AS 1735.12;

A Stretcher facility is to be provided within one the lifts serving level 3 and above. with minimum dimensions of 600mm wide, 2000mm long and 1400mm high.

7.10 Fire Precautions During Construction (BCA E1.9)

After the building has reached an effective height of 12m, the following fire services are required to be operational:

- Required fire hydrants and fire hose reels on every storey covered by the roof/floor structure (except the 2 uppermost storeys); and
- Booster connections installed.

These provisions are required to be installed and certified by installers at the completion of the slab of level 3.
8.0 HEALTH AND AMENITY

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

To accommodate a population of 270 persons on a typical floor, the following sanitary provisions should be provided on each storey -

<table>
<thead>
<tr>
<th>Sanitary Facilities Required / Provided (amend as applicable)</th>
<th>WC</th>
<th>Urinals</th>
<th>Basins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>6</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>8</td>
<td>NA</td>
<td>4</td>
</tr>
<tr>
<td>Accessible</td>
<td>1</td>
<td>NA</td>
<td>1</td>
</tr>
</tbody>
</table>

The design currently demonstrates compliance with the sanitary provision requirements above, however, an accessible sanitary facility is to be afforded on Level 3.

Note:
1. 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.

8.3 Light and Ventilation (BCA Part F4)

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. The architect is to provide calculations to verify compliance is achieved.

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

7.5 Weatherproofing of External Walls (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.
9.0 ENERGY EFFICIENCY

The proposed development shall comply with Part J of the BCA. To achieve compliance, there are two options available:

1. The building can comply with the deemed-to-satisfy provisions of the BCA, relating to the following areas:
   - Building Fabric
   - Glazing
   - Building Sealing
   - Air Conditioning & Ventilation Systems
   - Artificial Lighting & Power
   - Hot Water Supply

2. The building can be verified against a reference building as per Verification Method JV3. This requires that the proposed building and its services be shown to have an annual energy consumption of equal or less than the reference building which has been modelled as per the requirements of Part J of the BCA.

Certification from an appropriately qualified engineer should be provided for either option with a report / computations outlining how compliance is achieved.

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 7.
### Appendix A - Design Documentation

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

<table>
<thead>
<tr>
<th>DRAWING NO.</th>
<th>Title</th>
<th>Date</th>
<th>Drawn By</th>
<th>Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1100</td>
<td>Site Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2000</td>
<td>Basement Carpark (South)</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P1</td>
</tr>
<tr>
<td>2001</td>
<td>Ground Floor Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2002</td>
<td>Level 1 Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2003</td>
<td>Level 2 Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2004</td>
<td>Level 3 Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2005</td>
<td>Roof Plan</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P1</td>
</tr>
<tr>
<td>2006</td>
<td>Basement Carpark (North)</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2007</td>
<td>Carpark CP2-3</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
<tr>
<td>2008</td>
<td>Carpark CP4-5</td>
<td>13.08.18</td>
<td>Group GSA</td>
<td>P3</td>
</tr>
</tbody>
</table>
## Appendix B - Draft Fire Safety Schedule

<table>
<thead>
<tr>
<th>ESSENTIAL FIRE SAFETY MEASURES</th>
<th>STANDARD OF PERFORMANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Emergency Lifts</td>
<td>BCA Clause E3.4 &amp; AS 1735.2 – 2001</td>
</tr>
<tr>
<td>6. EWIS (Sound Systems and Intercom Systems for Emergency Purpose)</td>
<td>BCA Clause E4.9 &amp; AS 1670.4 - 2015 &amp; AS 4428.4-2004</td>
</tr>
<tr>
<td>8. Exit Signs</td>
<td>BCA Clauses E4.5, NSW E4.6 &amp; E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 &amp; 2</td>
</tr>
<tr>
<td>10. Fire Hose Reels</td>
<td>BCA Clause E1.4 &amp; AS 2441 – 2005 Amdt 1</td>
</tr>
<tr>
<td>11. Fire Hydrant System</td>
<td>BCA Clause E1.3 &amp; AS 2419.1 – 2005 Amdt 1</td>
</tr>
<tr>
<td>14. Fire Windows</td>
<td>BCA Spec. C3.4</td>
</tr>
<tr>
<td>15. Mechanical Air Handling System</td>
<td>BCA Clause E2.2, AS/NZS 1668.1 – 2015</td>
</tr>
<tr>
<td>17. Portable Fire Extinguishers</td>
<td>BCA Clause E1.6 &amp; AS 2444 – 2001</td>
</tr>
<tr>
<td>20. Warning and Operational Signs</td>
<td>EP&amp;A Reg 2000 Clause 183, BCA Clause C3.6, D2.23, E3.3 &amp; H101.8</td>
</tr>
</tbody>
</table>
Appendix C- Fire Resistance Levels
The table below represents the Fire resistance levels required in accordance with BCA 2016 Amendment 1: Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

<table>
<thead>
<tr>
<th>Building element</th>
<th>Class of building — FRL: (in minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Structural adequacy/Integrity/Insulation</td>
</tr>
<tr>
<td></td>
<td>2, 3 or 4 part</td>
</tr>
</tbody>
</table>
| 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—
For loadbearing parts—
less than 1.5 m | 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
1.5 to less than 3 m | 90/ 60/ 60 | 120/ 90/ 90 | 180/180/120 | 240/240/180 |
3 m or more | 90/ 60/ 30 | 120/ 60/ 30 | 180/120/ 90 | 240/180/ 90 |
For non-loadbearing parts—
less than 1.5 m | –/ 90/ 90 | –/120/120 | –/180/180 | –/240/240 |
1.5 to less than 3 m | –/ 60/ 60 | –/ 90/ 90 | –/180/120 | –/240/180 |
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 3 m | 90/–/– | 120/–/– | 180/–/– | 240/–/– |
3 m or more | –/–/– | –/–/– | –/–/– | –/–/– |
COMMON WALLS and FIRE WALLS—
| 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
INTERNAL WALLS—
Fire-resisting lift and stair shafts—
Loadbearing | 90/ 90/ 90 | 120/120/120 | 180/120/120 | 240/120/120 |
Non-loadbearing | –/ 90/ 90 | –/120/120 | –/120/120 | –/120/120 |
Bounding public corridors, public lobbies and the like—
Loadbearing | 90/ 90/ 90 | 120/–/– | 180/–/– | 240/–/– |
Non-loadbearing | –/ 60/ 60 | –/–/– | –/–/– | –/–/– |
Between or bounding sole-occupancy units—
Loadbearing | 90/ 90/ 90 | 120/–/– | 180/–/– | 240/–/– |
Non-loadbearing | –/ 60/ 60 | –/–/– | –/–/– | –/–/– |
Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion—
Loadbearing | 90/ 90/ 90 | 120/ 90/ 90 | 180/120/120 | 240/120/120 |
Non-loadbearing | –/ 90/ 90 | –/ 90/ 90 | –/120/120 | –/120/120 |
OTHER LOADBEARING INTERNAL WALLS, INTERNAL BEAMS, TRUSSES and COLUMNS—
| 90/ 90/ 90 | 120/120/120 | 180/180/180 | 240/240/240 |
FLOORS | 90/ 60/ 60 | 120/ 60/ 30 | 180/ 60/ 30 | 240/ 90/ 60 |
Table 3.9 REQUIREMENTS FOR CARPARKS

<table>
<thead>
<tr>
<th>Building element</th>
<th>FRL (not less than)</th>
<th>Structural adequacy/integrity/Insulation</th>
<th>ESA/M (not greater than)</th>
</tr>
</thead>
</table>

**Wall**

(a) **external wall**

(i) less than 3 m from a fire-source feature to which it is exposed:

<table>
<thead>
<tr>
<th>Loadbearing</th>
<th>60/60/60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-loadbearing</td>
<td>−/60/60</td>
</tr>
</tbody>
</table>

(ii) 3 m or more from a fire-source feature to which it is exposed

−/−/−

(b) **internal wall**

(i) loadbearing, other than one supporting only the roof (not used for carparking)

60/−/−

(ii) supporting only the roof (not used for carparking)

−/−/−

(iii) non-loadbearing

−/−/−

(c) **fire wall**

(i) from the direction used as a carpark

60/60/60

(ii) from the direction not used as a carpark as required by Table 3


**Column**

(a) supporting only the roof (not used for carparking) and 3 m or more from a fire-source feature to which it is exposed

−/−/−

(b) steel column, other than one covered by (a) and one that does not support a part of a building that is not used as a carpark

60/−/− or 26 m²/tonne

(c) any other column not covered by (a) or (b)

60/−/−

**Beam**

(a) steel floor beam in continuous contact with a concrete floor slab

60/−/− or 30 m²/tonne

(b) any other beam

60/−/−

**Fire-resisting lift and stair shaft** (within the carpark only)

60/60/60

**Floor slab and vehicle ramp**

60/60/60

**Roof** (not used for carparking)

−/−/−

Notes:

1. ESA/M means the ratio of exposed surface area to mass per unit length.

2. Refer to Specification E1.5 for special requirements for a sprinkler system in a carpark complying with Table 3.9 and located within a multi-classified building.