REF: 067458-09BCA

BUILDING CODE OF AUSTRALIA REPORT

Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP)

BUILDING CODE OF AUSTRALIA REPORT FOR SECTION 74W FOR SSD 6626 (Darling Square, North East Plot, Darling Harbour)

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Date	Revision Number	No. of pages	Issue or Description of Amendment	Prepared By	Approved By	Date Approved
3.10.14	A	22	draft	Mike Gooley		3.10.14
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29.02.16	F	20	Design review	Lindsay Beard		29.02.16
1.03.16	G	20	Amendments after comments received	Lindsay Beard		1.03.16
20.10.16	H	20	S96	Lindsay Beard		13.10.16

Executive Summary

As Accredited Certifiers, we have reviewed architectural design documents prepared by Lend Lease Design (refer appendix A) for compliance with the Building Code of Australia 2015.

We have reviewed the drawings for the Section 96 application to modify the building located within the North East Plot of Darling Harbour site against the relevant provisions of the Building Code of Australia.

It is anticipated that due to the size and nature of the building, there will be alternate solutions that address non-compliances with the deemed to satisfy provisions of the BCA. The alternative solutions will be assessed against the relevant Performance Requirements of the BCA by suitable qualified persons.

Where items for which an alternate solution is prepared relate to Category 2 items under the Environmental Planning and Assessment Regulation 2000, approval will be required by the NSW Fire Brigade as part of the Construction Certificate process.

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

Assessed By

Lindsay Beard
Senior Building Surveyor

1.0 Introduction

This report supports an application made under section 96 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to modify Development Consent, SSD 6626 relating to the development of the North East Plot of Darling Square which is part of the Sydney International Convention, Exhibition and Entertainment Precinct (SICEEP).
Development Consent SSD 6626 was granted on 16 April 2015 by the delegate of the Minister for Planning for the following components of development:

- site preparation works including demolition of existing Sydney Entertainment Centre;
- staged construction of 8 storey, 19 storey and 41 storey buildings, including a 5 storey podium, to be used for:
  - 2,050m^2 retail floor space at ground floor level;
  - 445 above ground car parking spaces and storage; and
  - 581 residential apartments
- various public domain improvements including:
  - provision of footpath treatment to the northern and eastern frontages and associated landscaping along the northern boundary; and
  - interim surface treatments to the southern and western frontages.

This section 96 application (the Modification Application) constitutes the first modification to the consent. This Modification Application follows the approval and current assessment of a number of SSDAs within the SICEEP site as set out in Table 1.

Table 1 Status of initial SICEEP SSD DAs

DA No	Description of Application	Status
12_5752	SICEEP Core Facilities – Exhibition Centre, Convention Centre, The Theatre, Event Deck and Tumbalong Park	Approved: 22 August 2013
MOD 1	S96(1A) - various	Approved: 20 February 2014
MOD 2	S96(1A) – various	Approved: 18 July 2014
MOD 3	S96(1A) – various	Approved: 1 July 2015
13-5878	Darling Square Concept Proposal	Approved: 5 December 2013
MOD 1	S96(1A) – various	Approved: 26 November 2015
MOD 2	S96(1A) – various	Approved: 4 October 2016
6010	Western Plot (Student Accommodation – Building W2)	Approved: 7 May 2014
MOD 1	S96(2) – various	Approved: 1 April 2016
6013	North-West Plot (Public car park/ commercial office building)	Approved: 7 May 2014
MOD 1	S96(2) – various	Approved: 20 July 2015
MOD 2	S96(1A) – various	Approved: 26 November 2015

DA No	Description of Application	Status
MOD 3	*S96(1A) – various*	*Under Assessment*
6011	South-West Plot (Mixed Use Residential Development)	Approved: 21 May 2014
MOD 1	S96(1A) – various	Approved: 27 July 2015
6116	ICC Hotel	Approved: 15 June 2014
MOD 1	S96(1A) – various	Approved: 8 July 2015
6626	North-East Plot (Mixed Use Residential Development)	Approved: 16 April 2015
MOD 1	***S96(1A) – various***	***Subject of this application***
6831	ICC Hotel fit-out, façade lighting system and subdivision	Approved: 16 October 2015
7133	Western Plot (Student Accommodation – Building W1)	Approved: 1 April 2016
7021	*North Plot (Community and Retail Building and Public Open Space)*	*Under Assessment*
6633	*South East Plot (Mixed Use Residential Development)*	*Under Assessment*

1.1 Overview of Proposed Modifications

This Modification Application seeks approval for the following amendments:

- internal amendments to the podium levels, including the provision of new public amenities and additional service parking spaces;
- minor internal revisions to some residential apartments; and
- minor external amendments at the upper and lower levels, including refined interfaces with the public domain.

A range of other minor amendments resulting from design development, including amendments made in light of the continual design of surrounding buildings and public domain elements, are illustrated on the amended Architectural Drawings. These changes are to be expected in any project, especially given the nature and scale of the approved North East Plot development.

1.2 Site Description

The SICEEP Site is located within Darling Harbour. Darling Harbour is a 60 hectare waterfront precinct on the south-western edge of the Sydney Central Business District that provides a mix of functions including recreational, tourist, entertainment and business.

With an area of approximately 20 hectares, the SICEEP Site is generally bound by the light rail Line to the west, Harbourside shopping centre and Cockle Bay to the north, Darling Quarter, the Chinese Garden and Harbour Street to the east, and Hay Street to the south (refer to Figure 1).

The Darling Square Site is:

- located in the south of the SICEEP Site, within the northern portion of the suburb of Haymarket;
- bounded by the Powerhouse Museum to the west, the Pier Street overpass and Little Pier Street to the north, Harbour Street to the east, and Hay Street to the south; and
- irregular in shape and occupies an area of approximately 43,807m2.

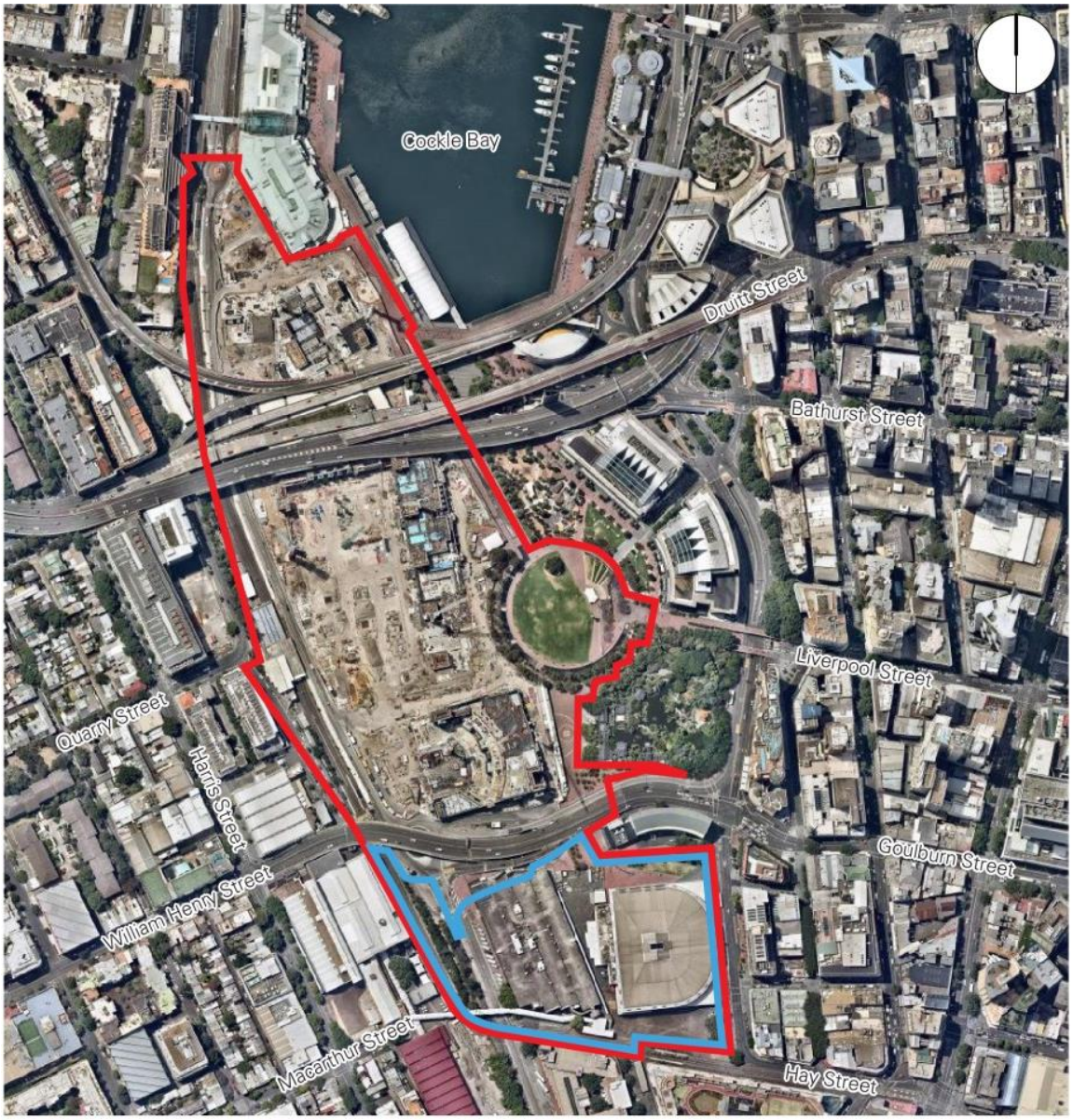

Figure 1 – Aerial Photograph of the SICEEP Site

The Modification Application Site relates to the North East Plot and surrounds as detailed within the drawings submitted in support of Modification Application. **Figure 2** illustrates the North East Plot in the approved Concept Proposal.

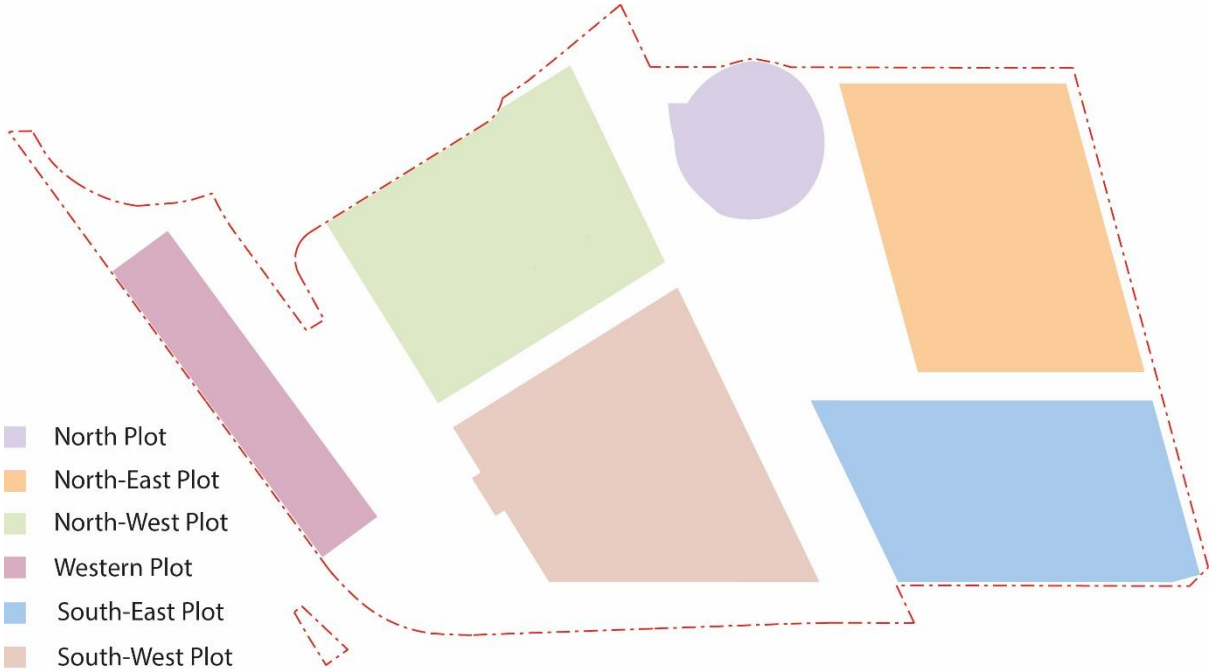

Figure 2 Concept Proposal Development Plots

2.1 Building Description

The development comprises a new mixed use residential complex, including a landscaped podium at level 6. There are three (3) residential towers consisting of eight (8), nineteen (19) and forty-one (41) storeys. Retail will be situated at ground level around the perimeter of the building complex with an enclosed five (5) storey carpark.

2.2 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.

3.0 Building Assessment Data

Summary of Construction Determination: -

Classification	2, 5, 6, 7a
Number of Storeys Contained	42
Rise In Storeys	41
Type of Construction	A
Effective Height (m)	Greater than 50.0m (measured as 127.16)

4.0 Fire Resistance

The buildings should be constructed generally in accordance with Table 3 of Specification C1.1 of the Building Code of Australia 2014. The building is required to be Type A Construction.

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

- Bounding construction to the sole occupancy units and public corridors must achieve an FRL of not less than 90 minutes for loadbearing and 60 minutes for non-loadbearing construction;
- Separation between the carpark levels and the retails portions of 180 minutes,
- Fire compartmentation of the building at each floor level,
- Rooms opening into public corridors being fire-separated with construction that achieve an FRL of not less than -/60/60 minutes for non-loadbearing construction.

Fire resistance levels for building structural members are as follows:
- Retail Portions 180 minutes
- Car park levels 120 minutes
- Residential Levels 90 minutes

5.0 Egress

The egress provisions from the proposed building are provided by:

- Fire isolated stairways
- External perimeter doorways to ground floor level
- Required non-fire isolated stairways

The locations of the proposed exits would appear to indicate that the travel distances and distances between alternative exits and egress widths will need to be assessed on a performance basis to BCA Performance Requirement DP4 and EP2.2.

Other detailing issues that will need to be addressed include:

- Door Hardware
- Exit door operation
- Stair construction
- Handrail and balustrade construction

6.0 Access for Persons with a Disability

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 2014. Parts of the building required to be accessible shall comply with the requirements of AS1428.1-2009.

Where the main public entrance is via a ramp, tactile indicators shall be provided in accordance with AS 1428.4 at the top and bottom. Parking shall be provided for people with disabilities in accordance with in accordance with Clause D3.5 of the BCA. Facilities services and features of the building accessible to people with disabilities shall be identified by signage complying with Clause D3.6 of the BCA.

General

Access to be provided to and within the building pursuant to AS1428.1-2009 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.

Note that entrances that are not accessible are to be located within 50m of an entrance that is accessible.

Refer to Access Consultant Report for status of compliance with Part D3 of the BCA and referenced Australian Standards.

6.0 Fire Services & Equipment

The following fire services will need to be provided throughout the building:

- An automatic sprinkler system in accordance with the relevant provision of clause E1.5 of the BCA and AS 2118.1-1999 and AS2118.6-2012.
- Fire hydrants in accordance with clause E1.3 of the BCA and AS 2419.1-2005,
- Fire hose reels in accordance with clause E1.4 of the BCA and AS 2441-2005,
- Portable Fire Extinguishers in accordance with Clause E1.6 of the BCA and AS 2444-2001,
- Sound System & Intercom System for Emergency Purposes in accordance with AS 1670.4-2004.
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA and AS/NZS 2293.1-2005

A fire control room shall be provided to the building in accordance with Part E of the BCA

7.0 Ventilation and Smoke Hazard Management

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 1668.1-1998;
- Automatic Smoke Detection and Alarm System in accordance with the requirements of BCA Spec E2.2a and AS 1670.1-2004
- Automatic Pressurisation to Fire Isolated Exits in accordance with the requirements of AS/NZS 1668.1-1998
- Each SOU must be providing with stand-alone smoke detection system in accordance with AS 3786.

It is anticipated that the smoke hazard management will be assessed on a performance basis to BCA Performance Requirement EP2.2

Throughout the development provision of natural or mechanical ventilation is required to all habitable rooms in accordance with Part F of the Building Code of Australia.

8.0 Lift Services

The passenger lifts to be installed are to be: -

- fitted with warning signs, fire service controls in accordance with AS 1735.2
- Stretcher facilities are to be provided within the lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high.
- At least two (2) emergency lift with stretcher facilities in accordance with part E3.4 of the BCA and AS 1735.2 must serve the 19 and 41 storey building with each passenger lift within the 6 storey building being an emergency lift.

9.0 Sanitary Facilities

The sanitary facilities for the commercial areas will generally be required at a rate of 1 WC per 20 males and 1 WC per 15 females. Urinals will be required to the male facilities at the rate of 1 per 50 occupants. Basins will be required for each sex at the rate of 1 per 30 occupants.

For the retail portions, facilities are required for patrons where the number of patrons exceeds 600. Staff facilities to the retail portions are to be provided at the same rate as those for the commercial areas.

Sanitary facilities will be provided to the project as per the requirements of BCA Part F2.

Please 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 AS1428.1-2001.

10.0 Energy Efficiency

Class 2 (apartments):

The proposed development shall be provided with insulation building sealing and services in accordance with NSW Part J of the BCA 2014.

The deemed-to-satisfy provisions of the BCA only apply to thermal insulation in a class 2 building where development consent specifies that the insulation is to be provided as part of the development. The class 2 building will be subject to a Basix Assessment.

We will rely upon the Basix Assessment together with confirmation that the commitments made under BASIX have been incorporated into the design prior to the issue of the Construction Certificate.

Class 6 (Retail):

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.

Appendix A - Design Documentation

The following documentation prepared by Lend Lease Design was used in the assessment and preparation of this report: -

Drawing No.	Title	Date	Drawn By	Revision
AD02000001	PODIUM GROUND FLOOR – SHEET 01	4.10.16	Lend Lease Design	E
AD02000002	PODIUM GROUND FLOOR – SHEET 02	4.10.16	Lend Lease Design	E
	Design report for Section 96 Application to Modify SSDA7	October 2016	Tzannes	02

Appendix B - Draft Fire Safety Schedule

	Essential Fire Safety Measures	Standard of Performance
1.	Access Panels, Doors and Hoppers	BCA Clause C3.13
2.	Automatic Fail Safe Devices	BCA Clause D2.19 & D2.21
3.	Automatic Fire Detection and Alarm System	BCA Spec. E2.2a & AS 1670 – 2004
4.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999, AS 2118.4 – 2012 (Residential) AS 2118.6 – 2012 (Combined sprinkler & hydrant)
5.	Emergency Lifts	BCA Clause E3.4 & AS 1735.2 – 2001
6.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005
7.	Sound systems and intercom systems for emergency purposes	BCA Clause E4.9 & AS 1670.4 - 2004
8.	Emergency Evacuation Plan	AS 3745 – 2002
9.	Exit Signs	BCA Clauses E4.5, E4.6 & E4.8 and AS/NZS 2293.1 – 2005
10.	Fire Control Centres and Rooms	BCA Spec. E1.8
11.	Fire Blankets	AS 2444 – 2001
12.	Fire & Smoke Dampers	BCA Clause C3.15, AS 1668.1 – 1998 & AS 1682.1 & 2 – 1990
13.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8 and AS 1905.1 – 2005
14.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005
15.	Fire Hydrant System	Clause E1.3 & AS 2419.1 – 2005
16.	Fire Seals	BCA Clause C3.15 & AS 1530.4 – 1997
17.	Lightweight Construction	BCA Clause C1.8 & AS 1530.3 – 1999
18.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 1998 & AS 1668.2 – 1991
19.	Paths of Travel	EP&A Reg 2000 Clause 186
20.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
21.	Stair Pressurising Systems	BCA Clause E2.2 & AS/NZS 1668.1 – 1998
22.	Required Exit Doors (power operated)	BCA Clause D2.19(d)
23.	Self-Closing Fire Hoppers	BCA Clause C3.13 & AS 1530.4 – 1997
24.	Smoke Hazard Management System to the retail spaces and corridor areas on residential levels	BCA Part E2 & AS/NZS 1668.1 – 1998
25.	Smoke Dampers	AS/NZS 1668.1 – 1998
26.	Wall-Wetting Sprinklers	BCA Clause C3.4 & AS 2118.2 – 1995
27.	Warning and Operational Signs	Section 183 of the EP & A Regulations 2000, AS 1905.1 – 2005, BCA Clause C3.6, D2.23, E3.3

Note:	A fire Engineering Assessment will be developed to satisfy the performance requirements of the BCA. The fire safety schedule will be modified to reflect recommendations contained within the fire engineering report.

Appendix C - Fire Resistance Levels

The table below represents the Fire resistance levels required in accordance with BCA 2011:

Table 3 TYPE A CONSTRUCTION: FRL OF BUILDING ELEMENTS

Building element	**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 therein) 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/–/–	120/–/–	180/–/–	240/–/–
FLOORS	90/ 90/ 90	120/120/120	180/180/180	240/240/240
ROOFS	90/ 60/ 30	120/ 60/ 30	180/ 60/ 30	240/ 90/ 60

Table 3.9 REQUIREMENTS FOR CARPARKS

Building element			FRL (not less than) Structural adequacy/Integrity/Insulation
			ESA/M (not greater than)
Wall			
(a)	*external wall*		
	(i)	less than 3 m from a *fire-source feature* to which it is exposed:	
		Loadbearing	60/60/60
		Non-*loadbearing*	–/60/60
	(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 m^2/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 m^2/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.	