



BUILDING CODE OF AUSTRALIA REPORT

**Sydney International Convention,
Exhibition and Entertainment Precinct
(SICEEP)**

**Darling Square, North East Plot,
Darling Harbour**

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1.0 Introduction

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Application (referred to as SSDA 7) follows the approval of a staged SSD DA (SSDA 2) in December 2013. SSDA 2 sets out a Concept Proposal for a new mixed use residential neighbourhood at Haymarket referred to as “Darling Square”, previously known as “The Haymarket”. Darling Square forms part of the Sydney International Convention, Exhibition and Entertainment precinct (SICEEP) Project, which will deliver Australia’s global city with new world class convention, exhibition and entertainment facilities and support the NSW Government’s goal to “make NSW number one again”.

More specifically this subsequent DA seeks approval for mixed use development within the North East development plot of Darling Square and associated public domain works. The DA has been prepared and structured to be consistent with the Concept Proposal DA.

2.0 Overview of Proposed Development

The proposal relates to a detailed (‘Stage 2’) DA for a mixed use residential development in the North East Plot of Darling Square together with associated public domain works. The Darling Square Site is to be developed for a mix of residential and non-residential uses, including but not limited to residential buildings, commercial, retail, community and open space. The North East Plot is one of six development plots identified within the approved Concept Proposal.

Under the Concept Proposal, the North East Plot is planned to accommodate a mixed use podium and three residential buildings (NE1, NE2, and NE3) above and within the podium structure. More specifically, this SSD DA seeks approval for the following components of the development:

- Demolition of existing site improvements, including the existing Sydney Entertainment Centre (SEC);
- Associated tree removal and planting;
- Construction and use of a predominantly 6 storey mixed use podium, including:
 - retail floor space and residential lobbies on Ground Level;
 - above ground parking;
 - residential apartments; and
 - communal facilities.
- Construction and use of three residential buildings above podium;
- Public domain improvements surrounding the site, including interim works;
- Provision of vehicle access to the development from Harbour Street;
- Landscaping works to the podium roof level; and
- Extension and augmentation of physical infrastructure / utilities as required.

Background

The NSW Government considers that a precinct-wide renewal and expansion of the existing convention, exhibition and entertainment centre facilities at Darling Harbour is required, and is committed to Sydney reclaiming its position on centre stage for hosting world-class events with the creation of SICEEP.

Following an extensive and rigorous Expressions of Interest and Request for Proposals process, a consortium comprising AEG Ogden, Lend Lease, Capella Capital and Spotless was announced by the NSW Government in December 2012 as the preferred proponent to transform Darling Harbour and create SICEEP.

Key features of the Preferred Master Plan include:

- Delivering world-class convention, exhibition and entertainment facilities, including:
 - Up to 40,000m² exhibition space;
 - Over 8,000m² of meeting rooms space, across 40 rooms;
 - Overall convention space capacity for more than 12,000 people;
 - A ballroom capable of accommodating 2,000 people; and
 - A premium, red-carpet entertainment facility with a capacity of 8,000 persons.
- Providing a hotel complex at the northern end of the precinct.
- A vibrant and authentic new neighbourhood at the southern end of the precinct, now called 'Darling Square', including apartments, student accommodation, shops, cafes and restaurants.
- Renewed and upgraded public domain that has been increased by a hectare, including an outdoor event space for up to 27,000 people at an expanded Tumbalong Park; and
- Improved pedestrian connections linking to the proposed Ultimo Pedestrian Network drawing people between Central, Chinatown and Cockle Bay Wharf as well as east-west between Ultimo/Pymont and the City.

On 21 March 2013 a critical step in realising the NSW Government's vision for the SICEEP Project was made, with the lodgement of the first two SSD DAs with the (now) Department of Planning and Environment. The key components of these proposals are outlined below.

Public Private Partnership SSD DA (SSD 12_5752)

The Public-Private Partnership (PPP) SSD DA (SSDA 1) includes the core facilities of the SICEEP Project, comprising the new, integrated and world-class convention, exhibition and entertainment facilities along with ancillary commercial premises and public domain upgrades. SSDA1 was approved on 22 August 2013.

Concept Proposal (SSD 13_5878)

The Concept Proposal SSD DA (SSDA 2) establishes the vision and planning and development framework which will be the basis for the consent authority to assess detailed development proposals within the Darling Square Site. SSDA2 was approved on 5 December 2013.

The Stage 1 Concept Proposal approved the following key components and development parameters:

- Indicative staging of demolition and development of future development plots;
- Land uses across the site including residential and non-residential uses;
- Street and laneway layouts and pedestrian routes;
- Open spaces and through-site links;
- Six separate development plots, development plot sizes and separation, building envelopes, building separation, building depths, building alignments, and benchmarks for natural ventilation and solar access provisions;
- A maximum total gross floor area of 197,236m² (excluding ancillary above ground parking), comprised of:
 - A maximum of 49,545m² non-residential GFA; and
 - A maximum of 147,691m² residential GFA
- Above ground car parking including public car parking;
- Residential car parking rates;
- Design Guidelines to guide future development and the public domain; and
- A remediation strategy.

In addition to the approval of SSDA1 and SSDA2, the following approvals have been granted for various stages of Darling Square site:

- Darling Drive (part) development plot (SSDA3) for the construction and use of a residential building (student accommodation) and the provision of associated public domain works approved on 7 May 2014;
- North-West development plot (SSDA4) for the construction and use of a mixed use commercial development and public car park building and associated public domain works approved on 7 May 2014; and
- South-West development plot (SSDA5) – construction and use of a mixed use residential development and associated public domain works approved on 21 May 2014.

Approval was also granted on 15 June 2014 for SSDA6 which includes the construction and use of the International Convention Centre (ICC) Hotel and provision of public domain works.

This report has been prepared to support a detailed Stage 2 SSD DA for mixed use development and associated public domain works within Darling Square (SSDA 7), consistent with the approved Concept Proposal (SSDA 2).

3.0 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.



 SICEEP Site

Figure 1 – Aerial Photograph of the SICEEP Site

The Concept Proposal DA provides for six (6) separate development plots across the Darling Square Site (refer to **Figure 2**):

1. North Plot;
2. North East Plot;
3. South East Plot;
4. South West Plot;
5. North West Plot; and
6. Western Plot (Darling Drive).

The Application Site area relates to the North East Plot and surrounds as detailed within the architectural and landscape plans submitted in support of the DA.



Figure 2 – Concept Proposal Development Plots

Planning Approvals Strategy

The SICEEP Project has resulted in the lodgement of numerous SSD DAs for the various components of the redevelopment project. Future applications will continue to be lodged in accordance with the Concept Proposal SSD DA for the remaining development plots of Darling Square Site.

4.0 BCA Assessment

As Accredited Certifiers, we have reviewed architectural design documents prepared by Tzannes Associates (refer appendix A) for compliance with the Building Code of Australia 2014.

The design will be further developed to comply with the relevant BCA prescriptive (deemed-to-satisfy) provisions together with areas in which an alternative performance based solution will be developed in consultation with Fire and Rescue NSW.

Alternative Solution Assessment:

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 Construction certificate will need to include verification from a suitably accredited fire engineer: -

DTS Clause	DTS provisions to be assessed by Performance Based Solution
Spec. C1.1	<u>Fire Resistance of Building Elements:</u> The FRL of structural elements within the retail levels will be reduce from 180 minutes to 120 minutes.
C2.14	<u>Smoke Separation of Public Corridors:</u> Public corridors to residential levels are not separated by smoke doors to reduce the length to less than 40m. A fire engineering solution is proposed to be developed to address smoke separation within public corridors.
D1.2, D1.10, D1.11	<u>Required Exits:</u> • Carpark levels will be served by horizontal exits which comprise more than half of the required exits; • The plantroom at roof level of the NE building will be served by a single exit in lieu of 2 required exits. • The 2nd required exit from level 6 of NE2 (6 storey building) will require re-entry into the alternative public corridors before to accessing the fire-isolated stairways.
D1.4, D1.5	<u>Travel Distances:</u> <u>Residential Levels:</u> • Travel from entrance doors of SOU to required exits exceed 6.0m. • Travel distance within the plantroom (NE building) at roof level exceeds 20.0m to required exit. <u>Carpark Levels:</u> • Travel distances to required exits exceed 40.0; • Distances between alternative exits exceed 60.0m.
E1.3 & AS 2419.1-2005	<u>Booster Assembly:</u> There are glazed windows situated within 2.0m of the hydrant booster assembly.
E1.8, Spec. E1.8	<u>Location of Fire Control Room:</u> The building is served by three (3) entrance foyers which connect with the upper levels of the building. The fire control room will be situated along a secondary street frontage with access to the NE2 south foyer.

DTS Clause	DTS provisions to be assessed by Performance Based Solution
E1.4	<u>Fire Hose Reels:</u> Fire Hose Reel system will serve the residential portion of the building in lieu of portable fire extinguishers.
E2.2	<u>Smoke Hazard Management:</u> • Stair pressurization system to fire-isolated stairways will not serve NE2 building. • The retail areas will consist of a number of different fire compartments. The retail areas are not proposed to be served by a zone smoke control system.
E4.9	<u>Operation of EWIS:</u> EWIS speakers in the carpark to be tonal in lieu of verbal messaging in the car parking levels.

The fire engineered solution relating to category 2 will need to be approved after consultation with the NSW Fire Brigade as part of the Construction Certificate process.

The documentation will need further detailing such as architectural design specifications, service design, etc. These matters will be suitably assessed at the Construction Certificate stage.

Nothing in this report precludes a development consent being issued as the proposed building generally complies with the DTS provisions of the BCA 2014. Departures from the DTS provisions will be suitably addressed by a fire engineering assessment.

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.

5.1 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.

5.0 Building Assessment Data

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.

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)

6.0 Structural Provisions

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

Glazing is to comply with AS1288, and AS2047.

Prior to the issue of the Construction Certificate structural certification is required to be provided.

7.0 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

A fire engineering assessment will be developed to reduce the FRL of building elements within the retail levels to reduce from 180 minutes to 120 minutes.

8.1 Protection of Openings

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

1. Any external opening within 3m of the fire source feature protected by -/60/- fire rated construction, or externally located wall wetting sprinklers, or an alternate solution be provided to verify CP2 of the BCA.
2. 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 the required FRL;
3. 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 in accordance with spec. C1.1 (or 120/120/120 where it is a room such as a substation);
4. 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).

Note that where fire dampers, fire collars, etc are utilised, allowance needs to be made for access hatches to be provided within the walls / ceilings to ensure that maintenance access is provided.

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.*

The development site is bounded by public roads (Harbour Street and Hay Street.) and public thoroughfares (the Boulevard and Little Hay Street) on all sides hence exposure to fire source features will not apply.

8.2 Public Corridors: Class 2 and 3 Buildings

Public corridors exceeding 40m in length are required to be divided into intervals of not more than 40m by smoke proof walls.

Public corridors to residential levels are not separated by smoke doors to reduce the length to less than 40m. A fire engineering solution is proposed to be developed to address smoke separation within public corridors.

8.3 Passive Fire Protection

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

- Lift motor rooms,
- Emergency power supply,
- Emergency generators,
- Electricity supply,
- Boilers or batteries,
- Hydrant Pump rooms,
- Sprinkler Pump Rooms,

To be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120 minutes.

8.4 Fire Hazard Properties

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.

8.0 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

Other detailing issues that will need to be addressed include:

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

9.1 Exit Travel Distances

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 will be exceeded and subject to a fire engineering assessment for the relevant parts of the buildings.

The DTS provisions require travel distances to exits should not exceed:

Class 5-9

- 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

Class 2

- 6m from an exit or from a point of choice
- 20m from a single exit at the level of egress to a road or open space
- Alternate exits not more than 45m apart

Travel distances to required exits will be exceeded in following locations:

Residential Levels:

- Travel from entrance doors of sole-occupancy units to fire-isolated stairway exceed 6m. (Measured up to approx. 10.0m).

Carpark Levels:

- Travel distances to required exits exceed 40.0;
- Distances between alternative exits exceed 60.0m.

A fire engineering solution is proposed to be developed to address extended travel distances to required exits.

9.2 Dimensions of Exits

Minimum width 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 exit width provided within each level of the building is sufficient dimension to serve the expected occupant numbers. Required exit doors need to be detailed to swing in the direction of egress from the building.

Doorways are permitted to contain a clear opening width of 750mm 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 870 mm doors).

9.3 Fire Isolated Exits

Each fire-isolated stairway must 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. The design is capable of complying with the BCA.

9.4 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.

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.

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.

9.0 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,
- 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

Fire Control Room:

The fire control room will be located along the secondary street frontage with access via a fire isolated passageway and to NE2 foyer Signage in the main entrance and booster assembly will direct fire crew to the FCR and booster. A mimic FIP can be provided within each entrance foyers of the building.

The design of the fire control room must comply with specification E1.8 of the BCA, except the location which will be assessed as part of the fire engineering strategy in consultation with Fire and Rescue NSW.

10.1 Fire Hydrants

A system of Fire Hydrants is required to be provided to BCA Clause E1.3 and AS 2419.1-2005. We will rely upon design certificate from a Hydraulic Consultant.

Fire hydrants are to be provided within fire isolated stairs/within 4.0m of required exits.

A fire hydrant booster assembly is attached to the external wall of the building. The AS requires the booster to be protected by 90 minutes fire-rated walls that extend 2.0m either side and 3.0m above the ground level. There will be glazed walls situated within the 2.0m protection zone.

A fire engineering assessment will be developed to address the abovementioned non-compliance with the fire hydrant system.

10.2 Fire Hose Reels

A Fire Hose Reel System is required to BCA Clause E1.4 and AS2441. To be located within 4m of exits and provide coverage within the building based on a 36m hose length, with the exception of the Class 2 residential areas.

Fire Hose Reel system will serve the residential portion of the building in lieu of portable fire extinguishers. An alternative solution will be developed in relation to the provision of FHR to the residential levels.

10.3 Automatic Sprinkler Protection

An Automatic Fire Suppression System is required to Specification E1.5 and AS 2118 -1-1999.

Location of Sprinkler Value/Pump Room:

Sprinkler alarm valves and pump rooms must be located in a secure room or enclosure which has direct egress to fire-isolated stairway or road or open space.

Access to the fire pump room is via the fire control room or door connecting with the carpark. Compliance is not achieved with requirement of specification E1.5 as direct access is not provided to outside the building. The location of the fire pump room will be assessed as part of the fire engineering strategy in consultation with Fire and Rescue NSW

10.0 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.

The design of the smoke hazard management system will be subject to a fire engineering assessment in relation to the following:

- Stair pressurization system to fire-isolated stairways will not serve NE2 building.
- The retail areas will consist of a number of different fire compartments. The retail areas are not proposed to be served by a zone smoke control system.

Throughout the development the provision of natural or mechanical ventilation is required to all habitable rooms in accordance with F4.5 Building Code of Australia and AS 1668 and AS/NZS 3666.1.

11.0 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 600mm 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.

12.0 Emergency Lighting, Exit Signs and Warning Systems

A system of emergency lighting and exit signage is required to be installed throughout the building in accordance with Part E4 of the BCA and AS 2293.1.

The building has an effective height greater than 25m and must be served by a sound systems and intercom systems for emergency purposes in accordance with AS 1670.4.

13.0 Sanitary Facilities

Class 2:

The Class 2 (apartments) is provided with sanitary facilities together with laundry facilities that will satisfy the provisions of the BCA.

Facilities for employees consisting of closet pan and washbasin must be provided in a separate room at or near ground level and accessible to employees without entering a sole occupancy unit. It is noted that employee toilet is provided within the carpark.

Retail Tenancies:

Sanitary facilities for employees:

Class	Occupant Number	Pop	Required		
			WC	Urinals	Basins
6 Staffs	Male	50	2	2	2
	Female	50	3	NA	2
	Unisex Facility*		1	NA	1

Notes:

1. The staff numbers are based an assumption for the purposes of this report.
2. Male and female split of population for staff is 50/50.

The internal fitout and use of retail tenancies will be subject to a separate application, which will have sanitary facilities within the retail tenancy. This can be assessed at a later stage.

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.

14.0 Sound Transmission & Insulation

The sound transmission and insulation requirements for the Class 2 portions shall be provided in accordance with Part F 5 of the BCA 2014. A report from a qualified acoustic engineer will need to be provided to validate compliance with the BCA.

15.0 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.

The proposed site will be located in a climate zone 5.

Due to special nature of the building some energy provisions may not be appropriate.

Appendix A - Design Documentation

The following documentation prepared by Tzannes Associate was used in the assessment and preparation of this report: -

Drawing No.	Title	Date	Drawn By	Revision
DHL_AD031100	NE1 FLOOR PLAN LEVEL 01	24.10.14	Tzannes Associate	H
DHL_AD031200	NE1 FLOOR PLAN LEVEL 02 - 05	24.10.14	Tzannes Associate	H
DHL_AD031300	NE1 FLOOR PLAN LEVEL 06 - PODIUM	24.10.14	Tzannes Associate	H
DHL_AD031400	NE1 FLOOR PLAN LEVEL 07 -17	24.10.14	Tzannes Associate	H
DHL_AD031500	NE1 FLOOR PLAN LEVEL 18 - PENTHOUSE	24.10.14	Tzannes Associate	H
DHL_AD031600	NE1 FLOOR PLAN LEVEL 19 - PLANT / ROOF	24.10.14	Tzannes Associate	F
DHL_AD031700	NE2 FLOOR PLAN LEVEL 01 -05	24.10.14	Tzannes Associate	F
DHL_AD031800	NE2 FLOOR PLAN LEVEL 06 - PENTHOUSE LOWER LEVEL	24.10.14	Tzannes Associate	F
DHL_AD031900	NE2 FLOOR PLAN LEVEL 07 - PENTHOUSE UPPER LEVEL	24.10.14	Tzannes Associate	F
DHL_AD032000	NE2 FLOOR PLAN LEVEL 08 - PLANT	24.10.14	Tzannes Associate	F
DHL_AD032100	NE3 FLOOR PLAN LEVEL 01	24.10.14	Tzannes Associate	F
DHL_AD032200	NE3 FLOOR PLAN LEVEL 02 - 05	24.10.14	Tzannes Associate	F
DHL_AD032300	NE3 FLOOR PLAN LEVEL 06 - PODIUM	24.10.14	Tzannes Associate	F
DHL_AD032400	NE3 FLOOR PLAN LEVEL 07 - 37	24.10.14	Tzannes Associate	F
DHL_AD032500	NE3 FLOOR PLAN LEVEL 38 - 40 - PENTHOUSE OPTION	24.10.14	Tzannes Associate	F
DHL_AD032600	NE3 FLOOR PLAN LEVEL 41 - PLANT	24.10.14	Tzannes Associate	F
DHL_AD041000	SOUTH ELEVATION	24.10.14	Tzannes Associate	G
DHL_AD041100	ELEVATION SOUTH NE3	24.10.14	Tzannes Associate	G
DHL_AD042000	WEST ELEVATION	24.10.14	Tzannes Associate	G
DHL_AD042100	ELEVATION WEST NE1	24.10.14	Tzannes Associate	G
DHL_AD043000	NORTH ELEVATION	24.10.14	Tzannes Associate	G
DHL_AD044000	EAST ELEVATION	24.10.14	Tzannes Associate	G

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DHL_AD044100	ELEVATION EAST NE2	24.10.14	Tzannes Associate	G
DHL_AD050100	SECTION AA	24.10.14	Tzannes Associate	G
DHL_AD050200	SECTION BB	24.10.14	Tzannes Associate	G
DHL_AD070001	NE1 ADAPTABLE APARTMENT LAYOUT	24.10.14	Tzannes Associate	B
DHL_AD070002	NE2 ADAPTABLE APARTMENT LAYOUT	24.10.14	Tzannes Associate	B

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 – 1995 (Residential) AS 2118.6 – 1995 (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	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.
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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)			
	<i>Structural adequacy</i> / <i>Integrity</i> / <i>Insulation</i>			
	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 <i>fire-source feature</i> to which it is exposed is—				
For <i>loadbearing</i> 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- <i>loadbearing</i> 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 <i>external wall</i> , where the distance from any <i>fire-source feature</i> 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—				
<i>Fire-resisting lift and stair shafts—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/120/120	180/120/120	240/120/120
<i>Non-loadbearing</i>	–/ 90/ 90	–/120/120	–/120/120	–/120/120
<i>Bounding public corridors, public lobbies and the like—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/–/–	180/–/–	240/–/–
<i>Non-loadbearing</i>	–/ 60/ 60	–/–/–	–/–/–	–/–/–
<i>Between or bounding sole-occupancy units—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/–/–	180/–/–	240/–/–
<i>Non-loadbearing</i>	–/ 60/ 60	–/–/–	–/–/–	–/–/–
<i>Ventilating, pipe, garbage, and like shafts not used for the discharge of hot products of combustion—</i>				
<i>Loadbearing</i>	90/ 90/ 90	120/ 90/ 90	180/120/120	240/120/120
<i>Non-loadbearing</i>	–/ 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)	<i>external wall</i>	
	(i) less than 3 m from a <i>fire-source feature</i> to which it is exposed:	
	<i>Loadbearing</i>	60/60/60
	<i>Non-loadbearing</i>	–/60/60
	(ii) 3 m or more from a <i>fire-source feature</i> to which it is exposed	–/–/–
(b)	<i>internal wall</i>	
	(i) <i>loadbearing</i> , other than one supporting only the roof (not used for carparking)	60/–/–
	(ii) supporting only the roof (not used for carparking)	–/–/–
	(iii) <i>non-loadbearing</i>	–/–/–
(c)	<i>fire wall</i>	
	(i) from the direction used as a <i>carpark</i>	60/60/60
	(ii) from the direction not used as a <i>carpark</i>	as required by Table 3
Column		
(a)	supporting only the roof (not used for carparking) and 3 m or more from a <i>fire-source feature</i> 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 <i>carpark</i>	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 <i>carpark</i> 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 <i>carpark</i> complying with Table 3.9 and located within a multi-classified building.	