BUILDING CODE OF AUSTRALIA REPORT

Revision: C 22 August 2018

Sydney Metro Martin Place Integrated Station Development: South Tower

Prepared for: Macquarie

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Date	Rev No	No. of Pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
12.07.18	A	26	Draft – Stage 2 DA submission	Vijay Perumal	Brigitte Thearle	13.07.18
03.08.18	B	29	Stakeholder comments update	Vijay Perumal	Brigitte Thearle	03.08.18
22.08.18	C	29	Final	Vijay Perumal	Brigitte Thearle	22.08.18

Executive Summary

As Accredited Certifiers, we have reviewed design documentation (Appendix A) for “The South Tower” Commercial Building located above the new Metro Station in Sydney CBD against the relevant provisions of the Building Code of Australia (BCA) and can confirm that the project is capable of achieving compliance with the BCA through a combination of deemed-to-satisfy provisions and performance based solutions as required by the BCA.

This report identifies the future design requirements and considerations that will need to be resolved through detailed design documentation through the Construction Certificate process.

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.

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

Assessed By

Vijay Perumal

Introduction

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning (Minister) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) on behalf of Macquarie Corporate Holdings Pty Limited (Macquarie), who is seeking to create a world class transport and employment precinct at Martin Place, Sydney.

The SSD DA seeks approval for the detailed design and construction of the **South Site** Over Station Development (OSD), located above and integrated with the Martin Place Metro Station (part of the NSW Government's approved Sydney Metro project). The southern entrance and South Site OSD above is located at 39-49 Martin Place, Sydney.

This application follows:

- Approval granted by the Minister for a Concept Proposal for two OSD commercial towers above the northern (North Site) and southern (South Site) entrances of Martin Place Metro Station (SSD 17_8351), which approved building envelopes, land uses, Gross Floor Areas (GFA) and Design Guidelines with which the detailed design (otherwise known as a Stage 2 DA) must be consistent.
- Gazettal of site specific amendments to the Sydney Local Environmental Plan 2012 (Planning Proposal reference: PP_2017_SYDNE_007_00) permitting greater building height (over a portion of the South Site) and additional floor space (over both the North and South Sites).

Lodged concurrently with this DA, is an amending DA to the Concept Proposal (Stage 1 Amending DA), which seeks approval for an amended concept for the precinct, aligning the approved South Site building envelope with the new planning controls secured for the precinct.
To ensure consistency, the Stage 1 Amending DA must be determined prior to the determination of the subject Stage 2 DA for the South Site.
This application does not seek approval for elements of the Martin Place Station Precinct which relate to Stage 2 of the Sydney Metro infrastructure project, which is subject to a separate Critical State Significant Infrastructure (CSSI) approval. These include:

- Demolition of buildings on the North Site and South Site;
- Construction of rail infrastructure, including station platforms and concourses;
- Ground level public domain works; and
- Station related elements in the podium of the South Site building.

However, this application does seek approval for OSD areas in the approved Martin Place Station Structure, above and below ground level, which are classified as SSD as they relate principally to the OSD. These components are within the Metro CSSI approved station envelope that will contain some OSD elements not approved in the CSSI consent. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

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.

Context

The New South Wales (NSW) Government is implementing Sydney's Rail Future (Transport for NSW, 2012), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (Stage 1) and Sydney Metro City & Southwest (Stage 2).

Stage 2 of the Metro entails the construction and operation of a new Metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and onto Bankstown through the conversion of the existing line to Metro standards. The project also involves the delivery of seven (7) new Metro stations, including Martin Place.

This step-change piece of public transport infrastructure once complete will have the capacity for 30 trains an hour (one every two minutes) through the CBD in each direction catering for an extra 100,000 customers per hour across the Sydney CBD rail lines.

On 9 January 2017 the Minister approved the Stage 2 (Chatswood to Sydenham) Metro application lodged by Transport for NSW (TfNSW) as a Critical State Significant Infrastructure (CSSI) project (reference SSI 15_7400). Work is well underway under this approval, including demolition of buildings at Martin Place.

The OSD development is subject to separate applications to be lodged under the relevant provisions of the EP&A Act. One application is being sought for the North Site, via a separate application, and another for the South Site – this application.

Site Description

The Sydney Metro Martin Place Station Precinct (the Precinct) project relates to the following properties (refer to **Figure 1**):

- 50 Martin Place, 9 – 19 Elizabeth Street, 8 – 12 Castlereagh Street, 5 Elizabeth Street, 7 Elizabeth Street, and 55 Hunter Street (North Site);
- 39 – 49 Martin Place (South Site); and
- Martin Place (that part bound by Elizabeth Street and Castlereagh Street).

This application relates **only to the South Site** being the land at 39-49 Martin Place, Sydney (refer to **Figure 1**).

The North Site is the subject of a separate detailed/Stage 2 SSD DA.

Figure 1 – Aerial Photo of the North and South Site of the Martin Place Metro Station Precinct

Background

Sydney Metro Stage 2 Approval (SSI 15_7400)

On 9 January 2017, the Minister approved Stage 2 of the Sydney Metro project, involving the construction and operation of a metro rail line between Chatswood and Sydenham, including the construction of a tunnel under Sydney Harbour, links with the existing rail network, seven metro stations (including a station at Martin Place), and associated ancillary infrastructure. The project approves the demolition of existing buildings at Martin Place, excavation and construction of the new station (above and below ground) along with construction of below and above ground structural and other components of the future OSD, although the fit-out and use of such areas are the subject of separate development approval processes.

Modification 3 to the Sydney Metro consent, approved 22 March 2018, enabled the inclusion of Macquarie-owned land at 50 Martin Place and 9-19 Elizabeth Street within the Martin Place Station footprint, and other associated changes (including retention of existing MLC pedestrian link).

Concept Proposal (SSD 17_8351) and Amending Stage 1 DA

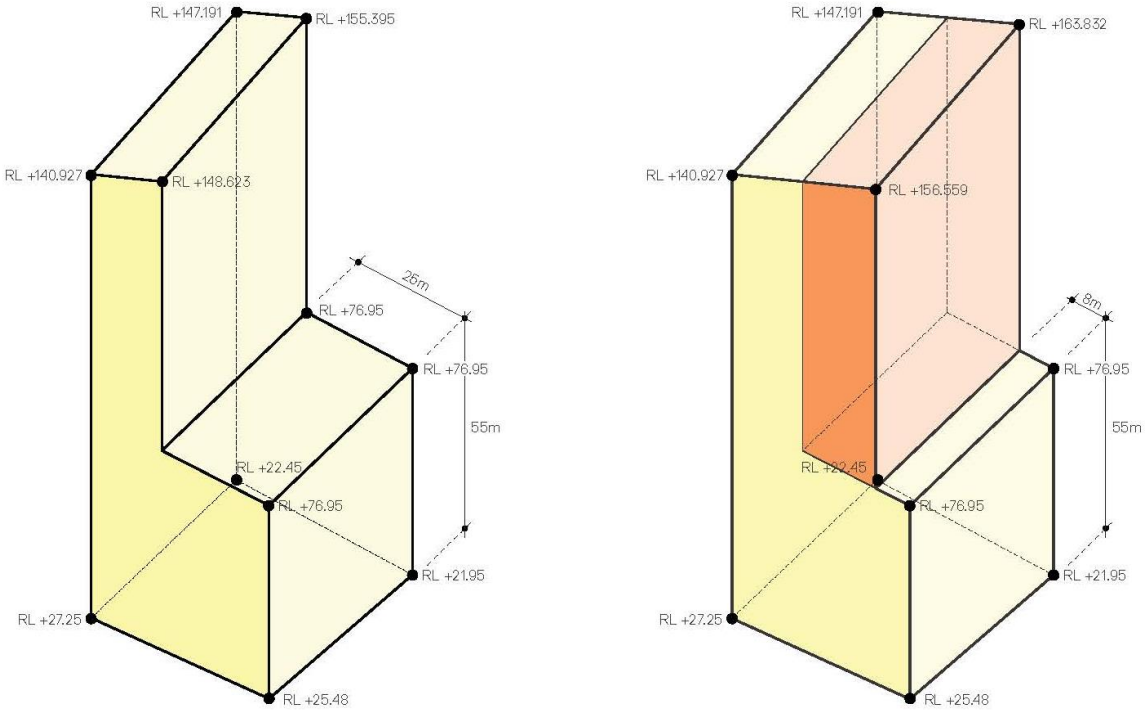
On 22 March 2018, the Minister approved a Concept Proposal (SSD 17_8351), relating to the Sydney Metro Martin Place Station Precinct. This Concept Proposal established the planning and development framework through which to assess the detailed Stage 2 applications.
Specifically, the Concept Proposal encompassed:

- Building envelopes for OSD towers on the North Site and South Site (see Figure 2) comprising:
  - 40+ storey building on the North Site
  - 28+ storey building on the South Site
  - Concept details to integrate the North Site with the existing and retained 50 Martin Place building (the former Government Savings Bank of NSW)
- Predominantly commercial land uses on both sites, comprising office, business and retail premises
- A maximum total GFA of 125,437m2 across both sites
- Consolidated Design Guidelines to guide the built form and design of the future development
- A framework for achieving design excellence
- Strategies for utilities and services provision, managing drainage and flooding, and achieving ecological sustainable development
- Conceptual OSD areas in the approved Martin Place Metro Station structure, above and below ground level [1]

[1] Refers to those components within the Metro CSSI approved station envelope that will contain some OSD elements not approved in the CSSI consent. Those elements include the end of trip facilities, office entries, office space and retail areas, along with other office/retail plant and back of house requirements that are associated with the proposed OSD and not the rail infrastructure.

Figure 2 – North Site and South Site Approved OSD Building Envelopes
The Concept Proposal was prepared and determined prior to the site specific Sydney LEP 2012 amendment (Planning Proposal reference: PP_2017_SYDNE_007_00) being gazetted and was developed based on the height development standards that applied to the South Site at the time. As a result, the Concept Proposal allows for a tower on the South Site that is now inconsistent with the building envelope envisaged through the Sydney LEP 2012. The new site specific provision that applies to the precinct under Sydney LEP 2012 reduces the portion of the South Site which is subject to a 55 metre height limit from 25 metres to 8 metres from the boundary to Martin Place, and applies the Hyde Park North Sun Access Plane to the remainder of the South Site, and also permits an FSR of 22:1 on the South Site (and an FSR of 18.5:1 on the North Site).

Accordingly, an amending DA to the Concept Proposal (Stage 1 Amending DA) has been lodged concurrently with this subject Stage 2 DA, which seeks to align the approved Concept Proposal building envelope for the South Site with the revised site specific development standards applying to under the Sydney LEP 2012, being increased FSR and building height. This Stage 1 Amending DA seeks to amend the planning and development framework established under the approved Concept Proposal that is used to assess this Stage 2 DA. The Stage 1 Amending DA is to be assessed concurrently with, and determined prior to the subject Stage 2 DA, with the amended South Site building envelope setting the broad development parameters for the South Site (see **Figure 4** below).



Approved South Site OSD Envelope

Proposed Amended South Site OSD Envelope (aligning with site specific)

Figure 3 – Relationship between the approved and proposed amended South Site building envelope

Overview of the Proposed Development
The subject application seeks approval for the detailed design, construction and operation of the South Site OSD commercial tower. The proposal has been designed as a fully integrated Station and OSD project that intends to be built and delivered as one development, in-time for the opening of the Sydney Metro line in 2024. The application seeks consent for the following:

- The design, construction and operation of a new XX storey commercial OSD tower within the approved building envelope for the South Site, including office space and retail tenancies.
- Vehicle loading and parking areas.
- Extension and augmentation of physical infrastructure / utilities as required.
- Detailed design and delivery of 'interface areas' within both the approved station and Concept Proposal envelope that contain OSD-exclusive elements, office entries, office space and retail areas not associated with the rail infrastructure.

Planning Approvals Strategy
The State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD) identifies development which is declared to be State Significant. Under Schedule 1 and Clause 19(2) of SEPP SRD, development within a railway corridor or associated with railway infrastructure that has a capital investment value of more than $30 million and involves commercial premises is declared to be State Significant Development (SSD) for the purposes of the EP&A Act.

The proposed development (involving commercial development that is both located within a rail corridor and associated with rail infrastructure) is therefore SSD.

Pursuant to Section 4.22 of the EP&A Act a Concept DA may be made setting out concept proposals for the development of a site (including setting out detailed proposals for the first stage of development), and for which detailed proposals for the site are to be the subject of subsequent DAs. This SSD DA represents a

detailed proposal and follows the approval of a Concept Proposal on the site under Section 4.22 of the EP&A Act.

Submitted separately to this SSD DA is a detailed proposal/SSD DA for the North Site (Stage 2 North Site DA), together with an amending DA to the Concept Proposal (Stage 1 Amending DA) that has the effect of aligning the approved South Site building envelope with the new planning controls established for the South Site (achieved through the site-specific amendment to the Sydney LEP 2012).

Figure 4 below is a diagrammatic representation of the suite of key planning applications undertaken or proposed by Macquarie and their relationship to the subject application (the subject of this report). The amending Stage 1 Concept Plan Proposal relates to the blue hatched area only.

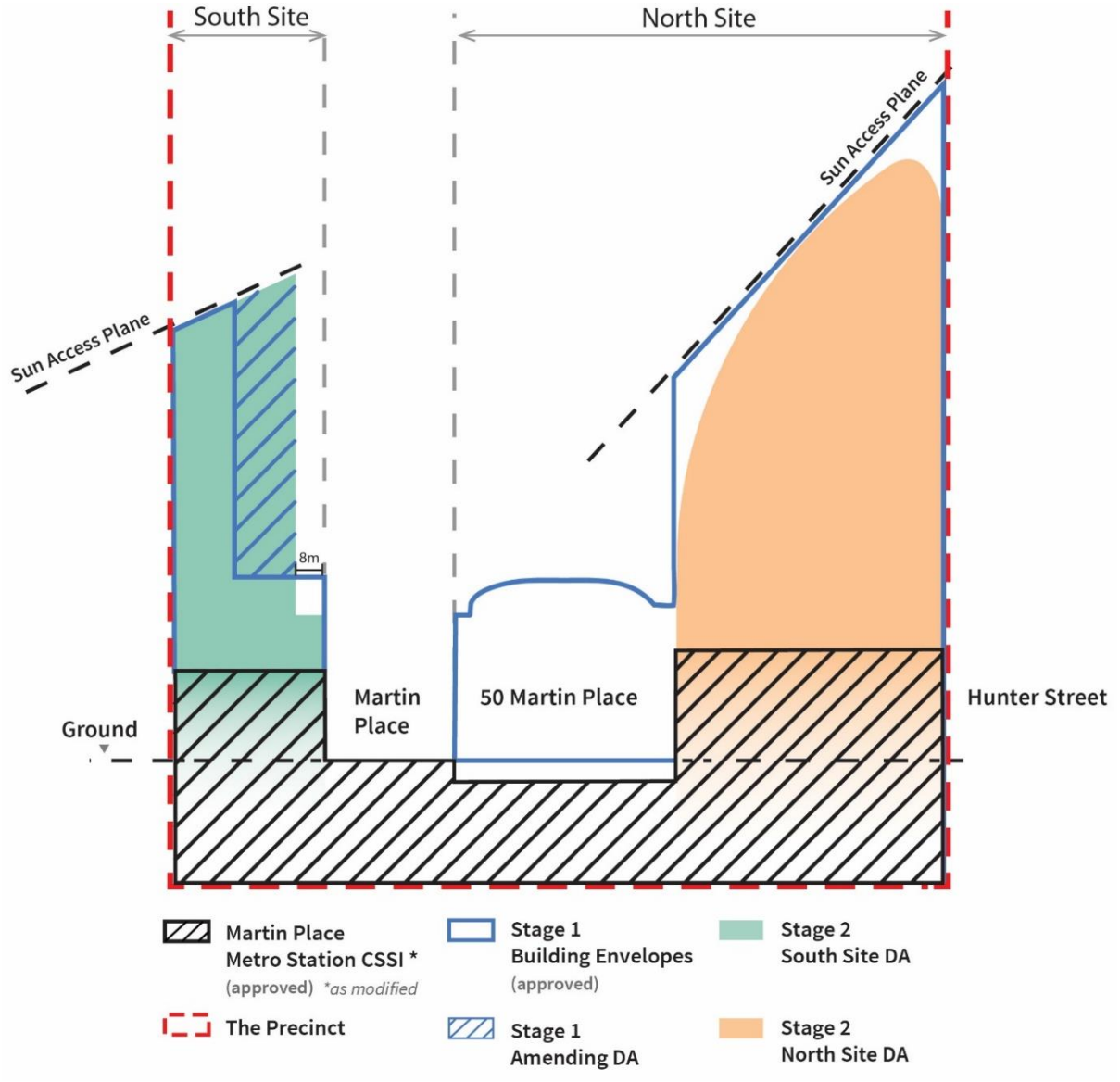


Figure 4 – Relationship of key planning applications to the **Stage 2 South Site DA** (this application)

The Department of Planning and Environment have provided Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as follows:

- To ensure the proposed development is capable of complying with the Building Code of Australia (BCA)

The north tower, south tower and station buildings have been considered as separate buildings with regards to their assessment against the Building Code of Australia 2016 (Amendment One). The building considered the 'station' generally includes all underground portions, and ground floor areas functioning as part of the station. The North Tower includes the ground floor reception area, mezzanine reception area, Macquarie Lounge and Level 3 function spaces. These portions are proposed to be separated from the station building by a combination of smoke proof and two hour fire rated construction and staged certification/occupation requirements. The South Tower includes the ground floor reception area, the reception and retail on the mezzanine area, and all areas above. From a BCA compliance perspective, the station portions and any retail on the ground floor or below (excluding café's in reception areas) are considered as one building and have been assessed accordingly.

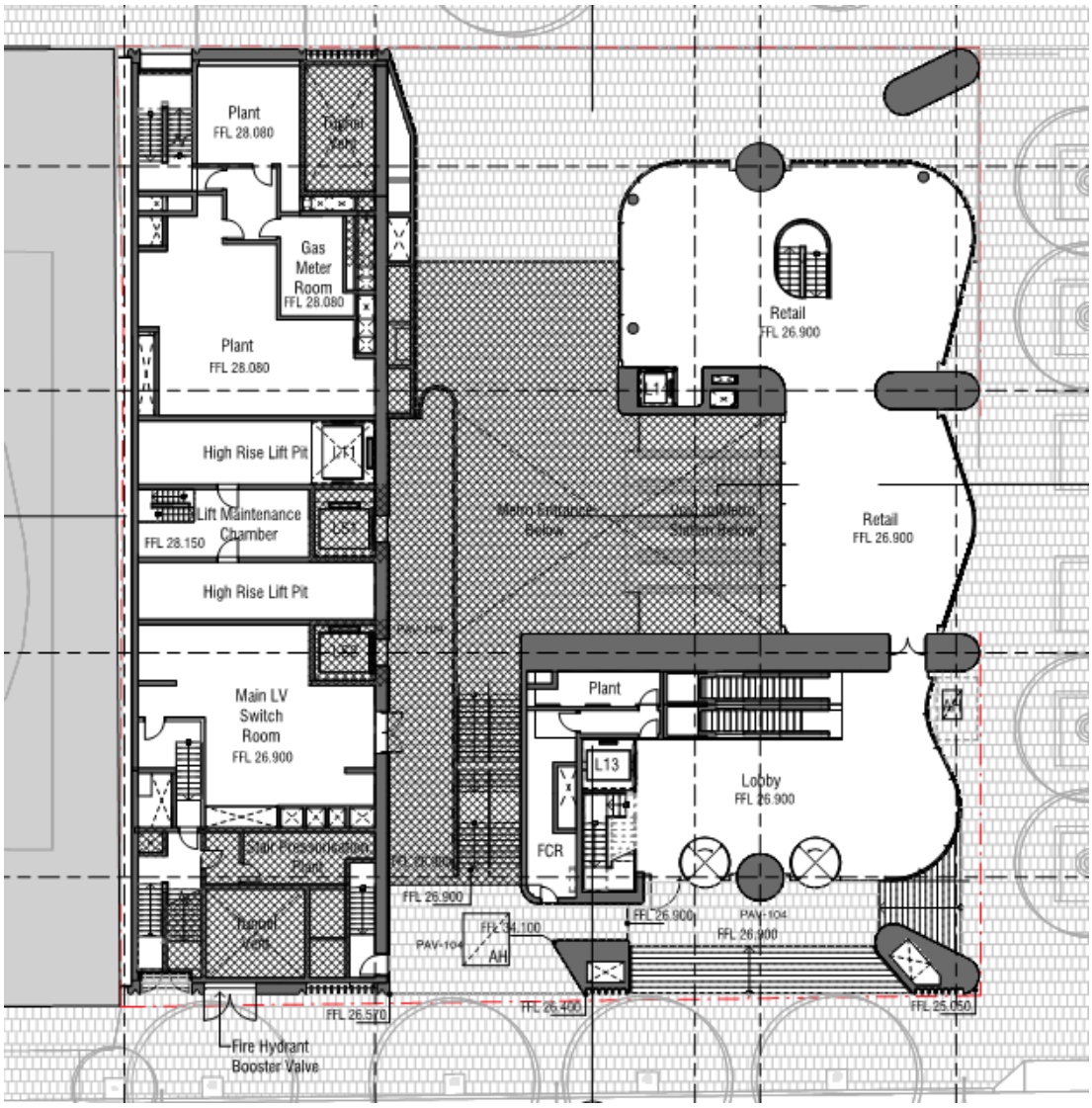


Figure 5 − South tower ground level plan

This report addresses the south over station commercial office building only. For assessment of the north over station commercial office building and the station building, please refer to the respective reports relating to these buildings. For implications that the proposed development has on 50 Martin Place, please refer to the relevant correspondence.

Compliance Summary

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.

It should be noted the Fire Engineering Brief (FEB) process has commenced with relevant stakeholders, relating the design development of required Performance Solutions in order to satisfy the relevant Performance Solutions of the BCA, as identified in the below table.

No.	Alternative Solution Description	Deemed to Satisfy (DTS) Clause	Performance Requirement
Fire Safety Items			
1.	**Separation from Station Below** The construction providing separation between the North Tower, the South Tower and the station building is proposed to be a combination of both horizontal and vertical construction in lieu of a vertical fire wall that extends the full height of the building to the underside of the roof. The buildings are proposed to be considered as separate buildings in lieu of united buildings.	C1.1, C2.7, Spec C1.1	CP1, CP2, EP2.2
2.	**Reduced FRL – Separation from Station Below** The building separation line between the station building below and the South Tower is proposed to be a combination of smoke proof and two hour fire rated construction in lieu of construction achieving an FRL of 120 minutes.	C1.1, C2.7, Spec C1.1	CP2
3.	**Retail Fire Resistance Levels** The fire resistance levels proposed to the retail portions are 120 minutes in lieu of 180 minutes.	C1.1, C2.7, C2.8, C2.9, Spec C1.1	CP1, CP2
4.	**Egress** The structure supporting the tower is located within the building considered to be the station building. The cascade of alarms etc. to ensure occupant evacuation occurs within the FRL parameters of the structure	C1.1, Spec C1.1, D1.4	CP1, CP2, DP4
5.	**Separation from Station – Smoke Hazard Management** The station and tower are proposed to be considered as separate buildings in all respects, except that the alarm	C2.7, C2.8, C2.9, EP2.2	CP2, EP1.6, EP2.2

	systems and smoke hazard management systems will be connected with a precinct cascade strategy.		
6.	**Exits Serving Multiple Buildings** The exits serving the over station buildings serve the station building also and need to pass through the station building to reach road or open space in lieu of each building having its own independent egress routes	D1.2, D1.7	DP4
7.	**Extended Travel Distances** Extended travel distances are proposed throughout the building. The maximum distances feasible as part of the performance solution are to be confirmed by Arup and the design adjusted accordingly. Refer part 4 of this report for distances as currently indicated on the drawings.	D1.4, D1.5	DP4, EP2.2
8.	**Fire Isolated Stairs** Fire stairs serving the tower are not proposed to have independent fire isolated passages to road or open space. The stairs serving the tower and the station building are proposed to merge before discharging to road or open space Stairs serving the tower are proposed to pass through the station building before discharging to road or open space.	D1.7	DP4, DP5, EP2.2
9.	**Level 29 Egress** Occupants on level 29 are required to utilise required non-fire isolated stairways to level 28, then egress to required fire isolated stairs. The required non-fire isolated stairs do not provide independent egress via their own flights to the level of road or open space.	D1.9	DP4, EP2.2
10.	**Location of Fire Services Infrastructure** Fire services pumps are proposed to be located in the station building in lieu of being located in the tower. This is also to be assessed in the station building performance solution.	E1.3, E1.5, E2.2	EP1.3, EP1.4, EP2.2
11.	**Systems Serving Ancillary & Plant Areas** The ancillary areas to the towers that are in the station building are proposed to be served by tower fire services and the plant areas serving the station that are in the	EP1.2, E1.3, E1.4, E1.5, E2.2, E3.4, E4.9, G3.8	EP1.1, EP1.3, EP1.4, EP1.6, EP2.2, EP3.2, EP 4.3

	tower building are proposed to be served by station services. The interconnection and cascade strategy are to be assessed as part of the performance solution.		
12.	**Booster Assembly – Location and Protection** The booster assembly is proposed to be located in the station building in lieu of being located within the tower. The south tower booster assembly is understood to be proposed on Elizabeth Street adjacent to the discharge of the fire isolated stairs at the southern end of the site. The location is not within sight of the main entrance, and is not afforded radiant heat protection that extends 2m either side and 3m above the upper hose connections that achieves an FRL of 90/90/90. It is noted that this assessment is also to be reflected in the performance solution for the station building in which the booster is located.	E1.3	EP1.3
13.	**Hydrant System Infrastructure** The following deviations from AS 2419.1-2005 with regards to the hydrant system infrastructure are proposed: ▪ A single hydrant relay pump is proposed to serve the whole building in lieu of providing separate relay pumps for every 50m ▪ More than 50% of the hydrants on each floor are proposed to be isolated	E1.3	EP1.3
14.	**Location of Infrastructure – Hydrant** The pump room and tanks associated with the tower hydrant and sprinkler system are proposed to be located within the station building in lieu of being located within the tower building.	E1.3, E1.5	EP1.3, EP1.4
15.	**Connectivity Between Station & Tower Buildings** As the deemed to satisfy provisions would consider the station and tower [and any other buildings connected through connection with the station] as the same building, the proposal to have separate fire control centre/rooms is to be assessed as part of the performance solution.	E1.8, E2.2	EP1.6, EP2.2
16.	**Connectivity Between Station & Tower Buildings** Due to the connectivity between buildings, and the interconnection between buildings, the smoke hazard management of all three buildings, including the alarm	E1.8, E2.2	EP1.6, EP2.2

	and cascade strategy, are to be reviewed collaboratively and assessed as part of the performance solution.		
17.	**Location of Stair Pressurisation Plant** The stair pressurisation plant that serves the tower stairs is proposed to be located in the station building.	E2.2	EP2.2
18.	**Deletion of Atrium Requirements** As a result of the connectivity with the station and north tower the building is, under the deemed to satisfy provisions considered to contain an atrium. The following additional provisions are required to a building that contains an atrium, however are not proposed to be provided to the south tower:: ▪ The operation of mechanical air handling systems serving the atrium must be deigned to operate in accordance with BCA Specification G3.8, Section 3 ▪ The atrium must be provided with a smoke exhaust system in accordance with BCA Specification G3.8, Section 3.4 ▪ A smoke detection system complying with AS1670.1-2004 and BCA Specification G3.8; Section 4 is to be installed throughout the building ▪ A break glass fire alarm system must be provided at each door to a fire isolated stairways	G3, Spec G3.8	EP2.2

This above performance solution table has been prepared by assessment from McKenzie Group Consulting based on the design documentation as referenced in Appendix A, other facts and matters known at the time of preparation of this document.

The fire engineered solution relating to items EP1.3, EP1.4, EP2.2 and EP3.2 will need to be approved after consultation with 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 & Assessment Act, 1979 (as amended) and the Environmental Planning & Assessment Regulation, 2000.

In addition, it is noted that an Interim/Final Occupation Certificate will be required for the relevant portions of the station building prior to the issuance of any Occupation Certificate relating to the South Tower. Where the station relies on infrastructure located in the South Tower e.g. stair pressurisation or the like, the initial Occupation Certificates incorporating this infrastructure will be required to be issued concurrently.

Assessed By

Vijay Perumal
McKenzie Group Consulting

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, the version that is 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 One) has been utilised as the version of the BCA applicable at the time of preparation this Report.

Purpose of this Report

This report has been prepared to accompany a detailed development application for a commercial office development located above the new Metro Station in Sydney's CBD. It addresses the relevant Secretary's Environmental Assessment Requirements (SEARS) for the project.

These Director-General Requirements are discussed in the Environmental Impact Statement (EIS) prepared to support the application.

Building Assessment Data

Summary of Construction Determination: -

Part of Project	Station Building	South Tower
Classification	5, 6, 7a, 7b, 9b	5
Number of Storeys	8 [below separation from over station buildings]	29 [above separation from station building]
Rise In Storeys	2 [below separation from over station buildings]	29 [above separation from station building]
Type of Construction	A	A
Effective Height (m)	>50m	>50m

It is noted that under the deemed to satisfy provisions, the station building, North Tower and South Tower are considered as one building due to the station sitting under and linking all three buildings. This gives a number of storeys of 46 and a rise in storeys of 39, with an overall effective height of more than 50m.

The assessment of each building as a separate building, including the separation proposed between each building is to be assessed as part of the performance solution. Refer the schedule of performance solutions above and the body of this report for deviations from the deemed to satisfy provisions.

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

Part of Project	BCA Classification	Approx. Floor Area (m^2)	Assumed Population (BCA Ratio)*
Ground Floor South – Retail	6	Refer to "Stage 2 – South tower design report	88
Ground Floor South – South Tower Lobby	5	"	10
Mezzanine South – Retail	6	"	160
Mezzanine South – South Tower Lobby	5	"	30
L01	5	"	143
L02 & L03	5	"	143
L04 & L05	5	"	144
L06	5	"	146
L07	5	"	147
L08	5	"	148
L09	5	"	39
L09	5 (plant)	"	16
L10	5	"	123
L11 - 26	5	"	127
L28	5 (plant)	"	43
L29	5 (plant)	"	31

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 floor areas have been adjusted without ancillary areas such as sanitary facilities, corridors, shelving and or racking layouts in storage areas.
3. The carpark areas have been considered ancillary to the use for the purposes of population numbers
4. Food and Beverage premises have been calculated at 1 person/m2 for 70% of the floor area

Fire Resistance

The buildings should be constructed generally in accordance with Part C of the BCA.

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

- Separation between the retail levels and the commercial portions; and
- Fire compartmentation of the building at each floor level as appropriate.

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; and
- Fire Control Room

It should be noted that the above areas are required to be separated from the remainder of the building by construction achieving a minimum fire resistance level of 120/120/120.

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

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Separation of Buildings

The BCA permits parts of buildings that are connected to be considered as separate buildings where the parts are separated by a fire wall that meets the following requirements:

(i) The fire wall extends through all storeys and spaces in the nature of storeys that are common to that part and any adjoining part of the building.
(ii) The fire wall is carried through to the underside of the roof covering.
(iii) Where the roof of one of the adjoining parts is lower than the roof of the other part, the fire wall extends to the underside of—

(A) the covering of the higher roof, or not less than 6 m above the covering of the lower roof; or
(B) the lower roof if it has an FRL not less than that of the fire wall and no openings closer than 3 m to any wall above the lower roof; or
(C) thelower roof if its covering is non-combustible and the lower part has a sprinkler system complying with Specification E1.5.

The station building, north tower and south tower are proposed to be considered as separate buildings, however are provided with a combination of horizontal and vertical separation in lieu of a vertical fire wall complying with the above. It is also noted that the construction proposed to separate the buildings is a combination of smoke-proof construction and fire rated construction achieving an FRL of 120 minutes, in lieu of all being 2 hour fire rated construction. This is to be assessed as part of the performance solution to BCA Performance Requirement CP1, CP2 and EP2.2 by an accredited fire safety engineer.

Separation from the north and south towers above the station is proposed to include a significant amount of glazed construction. The insulation requirement to the fire rated glazing is proposed to be reduced as part of

the performance solution and is to be assessed to BCA Performance Requirement CP2 by the accredited fire safety engineer.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

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 of the BCA. The following requirements apply:

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 or 3
c) Other Materials – Spread of Flame Index not exceeding9 and Smoke Developed Index not exceeding 8 if the Spread of Flame Index is more than 5

Non-Sprinkler Protected Areas

a) Floor Coverings – Critical radiant Flux not less than 2.2kW/m2 a maximum smoke development rate of 750 percent-minutes
b) Wall and Ceiling Linings – Material Group No. 1 or 2 and with a smoke growth rate index not more than 100, or an average specific extinction area less than 250m2/kg
c) Other Materials – Spread of Flame Index not exceeding 9 and Smoke Developed Index not exceeding 8 (if Spread of Flame if >5)

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.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Egress

The egress provisions from the proposed building are provided in fire isolated stairways and external perimeter doorways. The locations of the proposed exits would appear to indicate that the travel distances and distances between alternative exits and egress widths will comply with the BCA (through prescriptive and performance based assessments), and can be resolved through ongoing design development.

Other detailing issues that will need to be addressed during detailed documentation phase 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.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

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 Part D3 of the BCA. 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 Part D3 of the BCA. Facilities services and features of the building accessible to people with disabilities shall be identified by signage complying with Part D3 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; and
- Where access is not proposed to be provided as required by the BCA, these items will be required to be addressed through a performance solution, where the accredited Access consultant will need to confirm feasibility.

It is noted that MGAC has provided an Accessibility Assessment under a separate cover.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Fire Services & Equipment

The following fire services will need to be provided throughout the building, and demonstrated through the detailed documentation phase:

- An automatic sprinkler system in accordance with the relevant provision of Part E of the BCA;
- Fire hydrants in accordance with the BCA and AS 2419-2005 including access to the proposed Booster assembly for fire brigade vehicles;
- Fire hose reels in accordance with the BCA and AS 2441-2005;
- Portable Fire Extinguishers in accordance with BCA and AS 2444;
- Sound System and Intercom System for Emergency Purposes in accordance with the BCA; and
- Emergency lighting, exit signage and directional exit signage is required throughout the building in accordance with Part E of the BCA.

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

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Ventilation and Smoke Hazard Management

The detailed documentation phase will be required to outline the smoke hazard management to be provided throughout the building by means of:

- An automatic air pressurisation system to the fire isolated exits;
- Zone smoke control system; and
- An automatic smoke exhaust system to BCA Part E.

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

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

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 emergency lifts with minimum dimensions of 600m wide, 2000mm long and 1400mm high;
- An emergency lift with stretcher facilities in accordance with part E of the BCA and AS 1735.2;
- Provided with the following: -
  - A handrail in accordance with AS 1735.12
  - Minimum internal floor dimensions as specified in AS 1735.12;
  - Fitted with a series of door opening sensory devices which will detect a 75mm diameter rod across the door opening between 50mm and 1550mm above floor level; and
  - Have a set of buttons for operating the lift located at heights complying with AS 1735.12.

Where two or more passenger lifts are installed and serve the same storeys, at least two emergency lifts must be provided to serve those storeys and, if located within different shafts, at least one emergency lift must be provided in each shaft.

An emergency lift must be contained within a fire-resisting shaft in accordance with the requirements of Part C.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Sanitary Facilities

Retail

Sanitary facilities are required to be provided for employees. In relation to the public, sanitary facilities are required to be provided either where more than 600 persons can be accommodated (standard shops) or for café / restaurant where there are more than 20 seats.

Offices

The sanitary and other facilities within the development would generally consist of: -

Sanitary Facilities Provided			
	WC	Urinals	Basins
Male	4 (+1 accessible)	3	3 (+1 accessible)
Female	5 (+1 accessible)	N/A	3 (+1 accessible)
Accessible	1	N/A	1
The Above Facilities are adequate for 100 males and 90 females which is sufficient to cater for either a 1:10 or 1:8 population ratio to the office storeys.			

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.

An accessible sanitary facility compliant with AS 1428.1-2009 is required to be provided to all levels that are required to be accessible and contain sanitary facilities. In addition, an ambulant facility for each sex that is compliant with AS 1428.1-2009 is also required to be provided at each bank of sanitary facilities that contain an accessible facility. Where multiple banks of sanitary facilities are provided to a storey, an accessible facility is required to be provided to at least 50% of the banks on that floor.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Weatherproofing of External Walls

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 as part of the detailed documentation phase 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.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through performance based solutions.

Energy Efficiency

The building is required to comply with the energy provisions of the BCA. It is proposed that the ESD assessment shall incorporate the relevant part J provision of the BCA as part of the construction certificate process.

Options available are:

- Comply with either JV3 or
- Comply with the deemed to satisfy provisions in relation to:
  - Building Fabric
  - External Glazing
  - Building dealing
  - Air movement
  - Air conditioning and ventilation systems
  - Artificial light and power
  - Hot water supply

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

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Access for Maintenance

The following criteria must also be observed in the special design of the plant areas.

NSW J8.2 Access for maintenance

Access for maintenance must be provided to—

a) adjustable or motorised shading devices;
b) time switches and motion detectors;
c) room temperature thermostats;
d) plant thermostats such as on boilers or refrigeration units;
e) motorised air dampers and control valves;
f) reflectors, lenses and diffusers of light fittings;
g) heat transfer equipment; and
h) plant that receives a concession under verification method JV3(b) for the use of energy obtained from—
   i). a source that is renewable on-site such as solar, geothermal or wind; or
   ii). another process as reclaimed energy.

The current design details indicate the above requirements are capable of compliance with the relevant parts of the BCA, through a combination of deemed to satisfy provisions and/or performance based solutions.

Appendix A - Design Documentation

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

Drawing No.	Title	Drawn By	Date
CSWSMP-MAC-SMS-AT-DRG-DA- 000000	Cover Sheet	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 109805	Location Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA 109806	Site Plan - Roof Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 109808	Precinct Plan - Ground Plane	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA 159801	Precinct Section	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300000	Level 00 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300100	Level 01 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300200	Level 02-06 Typical Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300700	Level 07 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300800	Level 08 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 300900	Level 09 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 301000	Level 10 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA 301100	Level 11-12 Typical Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 301300	Level 13-26 Typical Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 302700	Level 27 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 302800	Level 28 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 302900	Level 29 Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 303000	Roof Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 306000	Level Mezzanine Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 308000	Level LG Plan	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 308100	Level B1 Plan - Upper Concourse	Tzannes	22.08.18

CSWSMP-MAC-SMS-AT-DRG-DA- 308200	Level B2 Plan - Lower Concourse	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 308300	Level B3 - Metro Station Plant	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 400100	East Elevation	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 400200	North Elevation	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 400300	West Elevation	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 400400	South Elevation	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 500100	Section - 01	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 500200	Section - 02	Tzannes	22.08.18
CSWSMP-MAC-SMS-AT-DRG-DA- 909900	GFA Schedule	Tzannes	22.08.18

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	Performance solution by accredited fire safety engineer
4.	Automatic Fire Suppression System	BCA Spec. E1.5 & AS 2118.1 – 1999 Amdt 1, AS 2118.6 – 2012 (Combined sprinkler & hydrant)
5.	Building Occupant Warning System	BCA Spec. E1.5, BCA Spec. E2.2a & AS 1670.1 – 2015 – Clause 3.22
6.	Emergency Lifts	BCA Clause E3.4 & AS 1735.2 – 2001
7.	Emergency Lighting	BCA Clause E4.2, E4.4 & AS/NZS 2293.1 – 2005 Amdt 1 & 2
8.	EWIS (Sound Systems and Intercom Systems for Emergency Purpose)	BCA Clause E4.9 & AS 1670.4 - 2015 & AS 4428.4-2004
9.	Emergency Evacuation Plan	AS 3745 – 2002
10.	Exit Signs	BCA Clauses E4.5, NSW E4.6 & E4.8 and AS/NZS 2293.1 – 2005 Amdt 1 & 2
11.	Fire Control Rooms	BCA Spec. E1.8 Performance solution by accredited fire safety engineer
12.	Fire Dampers	BCA Clause C3.15, AS/NZS 1668.1 – 2015 & AS 1682.1&2 - 1990
13.	Fire Doors	BCA Clause C3.2, C3.4, C3.5, C3.6, C3.7 & C3.8, Spec C3.4 and AS 1905.1 – 2015
14.	Fire Hose Reels	BCA Clause E1.4 & AS 2441 – 2005 Amdt 1
15.	Fire Hydrant System	BCA Clause E1.3 & AS 2419.1 – 2005 Amdt 1 Performance solution by accredited fire safety engineer
16.	Fire Seals, Collars	BCA Clause C3.15, C3.16 & AS 1530.4 – 2014
17.	Lightweight Construction	BCA Clause C1.8, C3.17 & AS 1530.3 – 1999
18.	Mechanical Air Handling System	BCA Clause E2.2, AS/NZS 1668.1 – 2015
19.	Paths of Travel	EP&A Reg 2000 Clause 186 Performance solution by accredited fire safety engineer
20.	Portable Fire Extinguishers	BCA Clause E1.6 & AS 2444 – 2001
21.	Pressurising Systems	BCA Clause E2.2 & AS/NZS 1668.1 – 2015
22.	Smoke Hazard Management System	BCA Part E2 & AS/NZS 1668.1 – 2015 Performance solution by accredited fire safety engineer
23.	Stand-by Power System	Performance solution by accredited fire safety engineer

	Essential Fire Safety Measures	Standard of Performance
24.	Warning and Operational Signs	EP&A Reg 2000 Clause 183, BCA Clause D2.23, E3.3

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

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