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FRASERS CENTRAL PARK

Block 4n
Building Services

State Significant Development Application Report

15/10/2014

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Block 4n

Building Services

State Significant Development Application Report

15/10/2014

Client

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1 Executive Summary

This report has been prepared for a State Significant Development Application (SSDA) for the eastern building, known as Block 4N.

The State Significant Development Application seeks approval for the redevelopment of Block 4N as a mixed use building, with associated non-residential/retail uses located on ground floor, consistent with the Concept Plan. Specifically, the proposal includes the following uses (as shown on the Architectural Drawing at Attachment B):

- Residential – 3,518 m^2 located on levels 11 to 16 consisting of 48 permanent residential apartments.
- Retail – 236 m^2 located on the ground level with frontage to Central Park Ave.
- Hotel – 13,986 m^2 located from ground to level 18 – approximately 283 hotel rooms.
- Commercial – 6,146 m^2 located on levels 5 to 10.
- Childcare Centre (shell space) – 1,080m^2 located on level 3 and 4.
- Existing Australia Hotel and Terraces (Heritage Pub and Terraces) – 789 m^2.

The proposal has a total GFA of 25,755 m^2 of which 22,237 m^2 is to be used for non-residential purposes and 3,518 m^2 is to be used for residential purposes in accordance with the Concept Plan (MP 06_0171 MOD9).

Hotel facilities, including concierge, storage, swimming pool, spa, gym, conference facilities, will be located within the building. The hotel swimming pool, spa and gym will also be made available to permanent residents. Separate entries and lobbies are proposed to the commercial office, childcare, hotel and permanent residential.

The existing Australia Hotel and adjoining Abercrombie Street terraces will be retained, with the design creating a publicly accessible courtyard behind the terraces, accessible from Broadway and Abercrombie Street.

A combined basement below Block 1 and 4N is proposed, that will accommodate all car parking, bicycle parking, residential and commercial storage, waste handling, back of house facilities, building plant and services. The basement will have a connection into Block 4S and Central Park's Central Thermal Plant. Service Vehicle loading is provided via the Abercrombie Street access ramp, and car park access for residents, hotel guests, office, retail and childcare drop off car spaces provided via Central Park Avenue. The basement will accommodate a total of 130 car parking spaces for the proposed Block 4N use. Additional spaces are provided within the basement that will service Block 1 and the Brewery Yard building as shown on the Architectural Plans.

The following report has been developed in line with the Secretary's Environmental Assessment Requirements (SEARs) section 78A(8A) of the Environmental Planning and Assessment, application number SSD 6673.

2 Introduction

The following description outlines the engineering services being provided for a building to be constructed on the Frasers Central Park precinct development in Chippendale, NSW.

The project involves the construction of a new multi-storey building known as 4 North (4N), designed by Foster and Partners with PTW as collaborating local architects. The building consists of a plant and loading dock basement level with a further levels of common basement car parking. Block 4N will consist of the following:

West Tower:

- L00 retail space
- L03 childcare and plant room space
- L04 childcare
- L05-10 commercial space
- L11-16 residential units
- Roof plant space

East Tower:

- L00 lobby areas
- L01-18 hotel areas
- Roof plant space

The building design will provide commercial services to meet the Property Council of Australia's "Grade A" Office Building Criteria.

The base building is to be designed to achieve a minimum 5 Star Green Star Office V3 rating, including future 5 star projected NABERS Energy status based on the energy benchmarks at time of writing and in accordance with Green Star ABGR protocol and Central Park Concept plan. A separate assessment has been provided as part of the ESD report accompanying this modification

The design objective is to provide a facility which will optimise, within appropriate commercial constraints, the opportunities for the reduction in the use of energy and water. The design will aim to reduce electricity consumption, which has a significant negative greenhouse gas implication through the use of coal for electricity generation. Water usage in the building will also be minimised as it is a scarce resource.

Low energy use and reduced water consumption will be achieved by the design of environmentally efficient systems with the capability to closely control operation. Unnecessary over ventilating, cooling, heating and water consumption is avoided through design of these systems.

The building fabric has been carefully selected to reduce heat transfer through the building. Solar gain through the glazing is minimised by inclusion of low E, spectrally selective glass and coverage of the building perimeter with external shading as required to further reduce the direct solar radiation to the building.

All building services systems will be designed to meet the Building Code of Australia and relevant associated Australian standards that are current at the time of this report.

Some specific system design features under consideration are listed as follows:

- Variable speed drive ventilation plant for future flexible building operation.
- Low flow rate sanitary fixtures to conserve potable water consumption and reduce flow to sewers.
- T5 efficient fluorescent lighting system with zone switching to reduce electricity consumption.
- Linkage with precinct wide Central Thermal Plant and Tri-generation Plant.
- Linkage with precinct wide Recycled Water Treatment Plant.

3 Precinct Approach

Consistent with the approved Central Park concept plan (as amended) each building is to target a minimum 5 Star Green Star standard which shall be assisted through the incorporation of site wide initiatives of tri-generation and central water recycling.

The completed tri-generation plant produces electricity via the combustion of natural gas. The by-product of producing electricity via a gas engine is waste heat. The waste heat energy is in equal order of magnitude to the electrical energy produced. This waste heat is then converted into hot water and chilled water.

The chilled water is produced via the utilisation of absorption chillers within a central thermal plant which will meet the base off-peak mechanical load of the site. This central thermal plant will also have electric chillers for peak demand over and above that provided by the absorption chillers, back up electric chillers, back up boilers and back up diesel generators.

The electricity produced will be used for the peak demand electric chillers with any excess electricity being exported to the electricity grid during off-peak periods. If additional capacity is provided within the Central Thermal Plant, then there maybe the potential opportunity to utilise this energy within Blocks 1 and 4 north. The chilled and hot water is to be reticulated to each building where heat exchangers will allow each building to make use of the services provided by the central thermal plant. Heat rejection by cooling towers for the central thermal plant will be required across the site. Thermal energy storage will also be employed to balance energy demand between peak and off-peak time, thus reducing the requirements for heat rejection.

The base building heating and cooling loads are to be provided by the Central Thermal Plant.

The central water treatment plant is to consist of a 1,000kL recycled water plant. The recycled water treatment plant is to utilise sewer mining to treat blackwater to a Grade A standard. This non potable water will be reticulated to each building to serve all of the non potable demands. Excess non potable water has the potential to be exported off site. Mains water will also be reticulated to each building to serve all potable demands.

4 Mechanical Services

The mechanical services will be designed in accordance with the following code and authority requirements:

- Building Code of Australia (BCA)
- AS/NZS 1668.1 and AS/NZS 1668.2
- City of Sydney Council Requirements
- AS 3666
- AS 1682
- AS 5601
- AS 4254
- AS/NZS 3000

For each use of space throughout Block 4 north, the air conditioning and heating system shall consist of 4-pipe fan coil units (FCUs). Each FCU will be designed to provide individual control to dedicated control zones. Residential units shall also be complete with smart metering.

The chilled and heating hot water is provided by a decoupled hydronic system served by the Central Thermal Plant's (CTP) district heating and cooling system. Plate heat exchangers, secondary pumps and ancillary plant shall be located within the basement, and distribution pipework via Block 4 north's core risers. 3 no. plate heat exchangers and secondary pumps shall be provided to serve the following combined building uses of Block 4 north:

- Commercial and childcare areas.
- Retail, common areas, residential areas.
- Hotel areas.

All strata, use of space, retail units and individual residential unit's chilled water and heating hot water supply shall be metered separately.

Commercial, childcare and hotel areas shall have the following standalone ducted outside air ventilation systems complete with heat recovery (where applicable):

- Gym (hotel).
- Restaurant (hotel).
- Kitchen (hotel).
- Conference/Seminar area (hotel).
- Outside air plant (commercial and childcare).
- Toilet blocks (commercial, childcare, hotel).

Each residential units and corner/slot hotel units are provided with a dedicated toilet and kitchen exhaust booster system, exhausting into separate dedicated centralised risers. Toilet and kitchen exhaust risers shall combine at roof level and be centrally exhausted by pressure dependant exhaust fans.

Make-up ventilation to units is provided via a naturally ventilated façade from the corridor and acoustically treated openings within the ceiling void to each apartment unit. Non-return dampers shall be fitted to façade louvres and make-up openings at units. Outside air provisions to each apartment unit shall be provided by a natural ventilation solution in accordance with BCA requirements. Openable windows shall be sized in excess of 5% of the floor area of the room to be ventilated.

The retail tenancies will be provided with pipe connections for future fit out provisions. Local external louvres shall also be provided for standalone ventilation requirements.

Dedicated stair pressurisation and mechanical relief to the façade shall be provided to ensure safe means of escape during a fire.

The car park supply and exhaust ventilation system incorporates variable speed fan drives controlled by CO and NO_2 sensors as appropriate. Car park supply and exhaust ventilation shall be provided to basement areas in accordance with AS 1668.2.

A naturally ventilated solution shall be provided to serve the sub-station in accordance with Ausgrid NS113 specification requirements.

All supply and exhaust ventilation systems and secondary pumping systems will incorporate variable speed drives.

5 Electrical Services

The electrical services will be designed in accordance with the following code and authority requirements:

- Building Code of Australia
- City of Sydney Council Requirements
- AS/NZS 3000
- AS/NZS 1680.0
- AS/NZS 1768
- AS 2293.1
- Energy Australia Requirements

The building will be supplied via an Ausgrid derived supply located within the basement area. The building will also be provided with a main switch room that will be located within close proximity to its associated substation.

The facility for standby diesel generators will be provided in a centralised plant room for the backup of certain electrical loads within the buildings.

Dependant on the final capacity of the Tri-generation system associated with the Central Thermal Plant, there may be the opportunity to utilise the excess electricity within Block 4 North.

Submains will be run horizontally through the basement car park areas and vertically in electrical risers to service the buildings above.

The exterior lighting will consist of purpose selected exterior landscape luminaires to ensure long life and accurate illumination with a minimum of spill light. Metal halide sources will be used for increased colour rendering and sense of safety. Security lighting shall be designed to the requirements of AS1158.3 and will conform to AS4282. The lighting will be arranged so that illumination is uniform and dark areas minimized. All luminaries and accessories will be suitable for outdoor use and will be vandal and weather resistant to suit the location.

External lighting will be provided around the buildings accordance with AS 1158 and AS 4282. External luminaires will be selected to be in keeping with the general building design and in accordance with Sydney City Council requirements. External lighting will be time clock and light level controlled.

Emergency escape lighting and exit signs will be provided throughout the buildings to comply with BCA and AS 2293.

A conventional lightning protection system will be provided for the buildings in accordance with the requirements of AS/NZS 1768 (subject to risk assessment).

Retail

Retail tenancies will be provided with separately metered electrical supplies.

Commercial

The commercial office floors will be provided with distribution boards, and provision for associated tenant electricity retailer energy metering will be made as required.

A separate energy metering monitoring system will be provided for monitoring and reporting on the energy usage of the buildings, thus meeting the requirements of NABERS Energy and Green Star.

The commercial office areas are provided with high efficiency light fittings generally utilising T5 fluorescent lamps or compact fluorescent lamps with electronic ballasts.

The commercial office area lighting will be divided into 100m^2 zones per floor and is to be controlled via a lighting control system with time scheduled programmes and timed overrides for after hours and cleaners use.

Perimeter areas near the façade will be provided with daylight sensors to dim the perimeter area of light fittings. The final extent of areas that can be treated for daylight harvesting will be reviewed during the design period. The lighting control system can also be extended by future tenants to add additional controls such as switches or occupancy sensors.

Time schedule programmes and occupancy sensor controls and local switching will be used for car parks, back of house and amenity areas to suit the usage.

Childcare

The childcare floors will be provided with distribution boards, and provision for associated tenant electricity retailer energy metering will be made as required.

A separate energy metering monitoring system will be provided for monitoring and reporting on the energy usage of the buildings, thus meeting the requirements of Green Star.

The childcare areas are provided with high efficiency light fittings generally utilising T5 fluorescent lamps or compact fluorescent lamps with electronic ballasts.

The childcare area lighting will be divided into 100m^2 zones per floor and is to be controlled via a lighting control system with time scheduled programmes and timed overrides for after hours and cleaners use.

Perimeter areas near the façade will be provided with daylight sensors to dim the perimeter area of light fittings. The final extent of areas that can be treated for daylight harvesting will be reviewed during the design period. The lighting control system can also be extended by future tenants to add additional controls such as switches or occupancy sensors.

Time schedule programmes and occupancy sensor controls and local switching will be used for car parks, back of house and amenity areas to suit the usage.

Residential

Each apartment shall contain a dedicated distribution board located within an apartment cupboard space. Each apartment shall be separately metered. Distribution boards shall be of the single or three-phase if required, surface mounted, insulated load centre type. Distribution Boards shall be of minimum 100Amp rating and 18 pole capacity.

Lighting for apartments shall be selected in accordance with BASIX requirements and shall be designed to meet the lighting levels nominated in AS1680. The lighting will be installed to ensure that the thermal envelope is not compromised at junctions with the building insulation (e.g. where downlights are to be installed under roof slabs).

Hotel

A separate energy metering monitoring system will be provided for monitoring and reporting on the energy usage of the buildings, thus meeting the requirements of NABERS Energy and Green Star. The metering system shall also facilitate sub-billing of dedicated restaurants and bar areas.

The hotel accommodation areas shall be provided with high efficiency light fittings generally utilising recessed LED downlights and compact fluorescent lamp sources where deemed appropriate.

Entry lobbies and other front of house areas shall be provided with high efficiency downlights, wall lights and recessed pelmet lighting where applicable. Luminaires shall be provided with LED lamp sources that have high colour rendering characteristics to enhance the visual appeal of the space.

All front of house areas shall utilise a programmable control system to further enhance visual appeal and design flexibility, whist facilitating the reduction in energy consumption.

6 Communications Services

The communications services will be designed in accordance with the following code and authority requirements:

- Australian Communications and Media Authority Requirements
- AS/NZS 3000
- AS/ACIF S008
- AS/ACIF S009

Dedicated Building Distributor Rooms will be provided for the accommodation of equipment from multiple telecommunications carriers. Telecommunications backbone cabling will be provided from the Building Distributor to the lifts, fire control centre and building management systems. Backbone cabling will also be provided to each commercial office floor and to each retail tenancy.

Retail/Commercial/Childcare/Residential

A digital compatible MATV & Pay TV system will be provided to the retail/commercial and residential areas of the building to distribute free to air & Pay TV television broadcasts

Hotel

The hotel shall be provided with an IPTV system to distribute MATV, Pay TV and Movies on Demand.

A complete 3G Mobile Phone Repeater System will be provided that will be suitable for connection to the Telstra, Optus and Vodafone digital mobile phone systems. This system will cover all floors of the building, including the basement car park areas.

A base building access control system will be provided to control the building entry points for both personnel and vehicles. Access control will also be provided to each lift for individual floor access.

CCTV monitoring will be provided to foyers and entry lobbies, main public areas, retail common areas, car park and ground floor lift lobbies, goods lifts, loading docks, building entry and exit points and car park entry and exit points. The CCTV coverage will be viewed and controlled by 24 hour security staff from a centralised security room.

7 Fire Services

The Fire Services will be designed in accordance with the following code and authority requirements:

- Building Code of Australia
- City of Sydney Council Requirements
- WSP Fire Engineering
- AS 2118.1
- AS 2118.6
- AS 1670.1
- AS 1668.1
- AS 1670.4
- AS 2419.1
- AS 2444

A fire control room will be located at ground level of Block 1 to serve the West Zone buildings, comprising;

- Blocks 1 and 4 North buildings including the combined basement car park,
- the heritage hotel on Abercrombie Street,
- the Brewery building and Central Thermal Plant
- Block 4s building.

A master fire indicator panel will be provided in the fire control room receiving input from the fire panels within those buildings.

A main fire indicator panel will be provided in the fire control room to serve Blocks 1 and 4 North buildings and the combined basement car park. A sub fire indicator panel will be provided in each of the buildings including the main entrance foyer of Block 4 North.

A smoke detection and alarm system will be provided throughout the Block 4n Building, Car park space, and Heritage Hotel Building. The smoke detection system will call the fire brigade, initiate the sound system and intercom system for emergency purposes, and initiate the smoke hazard management system and other relevant plant operation.

A fire fan control panel will be provided in the fire control room and will be interfaced with the Blocks 4n Building main fire indicator panel to enable automatic operation of the smoke control systems in a fire condition. The fire fan control panel will be provided with manual control switches which allow the fire brigade to override the automatic operation.

A sound system and intercom system for emergency purposes will be provided throughout the Block 4n Building, Car park, and Heritage Hotel Building. The sound system and intercom system for emergency purposes will be initiated by the smoke detection and combined fire sprinkler / hydrant systems. The main emergency control panel for Block 4n Building will be located within the fire control room and interfaced with the Block 1 and 4 North main fire indicator panel, and a sub emergency control panel will be provided in the lobby of the Heritage Hotel Building.

A combined fire sprinkler / hydrant system will be provided throughout the Block 4n Building, Car park, and Heritage Hotel Building. The system will be served by a central plant comprising an electric fire pump and standby diesel fire pump, and relay pumps to serve the high level pressure zones. The Grade 1 water supply will be supplied from a water storage tank located in the basement, and a dedicated town main connection. A fire brigade booster assembly will be provided, including brigade booster connections to each pressure zone, and a townsmain suction connection.

Fire extinguishers will be provided throughout the Block 4n Building, Car park, and Heritage Hotel Building.

8 Hydraulic Services

The Hydraulic Services will be designed in accordance with the following code and authority requirements:

- Relevant Australian Standards
- Building Code of Australia
- NSW Plumbing & Drainage Code of Practice
- Sydney Water Corporation
- City of Sydney Council requirements
- Gas authority requirements
- Green Building Council of Australia

Sewer drainage will discharge into sewer transfer tank and reticulated to the recycled water treatment plant in the car park area below block 2. The overflow will gravitate to the existing Sydney Water sewer main in Balfour Street in the event that the recycled water treatment plant does not require the discharge.

The above ground grease arrestors within the car park area will be provided to treat any trade waste generated from retail tenancies in accordance with Sydney Water's Trade Waste Policy. The pre-treated drainage waste will discharge to the sanitary drainage system.

A new water service connection will be extended from the existing 250mm Sydney Water main located in Broadway to the proposed development incorporating authority water meter and back flow containment device. Booster pump sets will be incorporated into new domestic water supply system to reticulate cold water within the building. Individual meters will be provided for residential apartments, commercial and childcare areas, retail areas, hotel, restaurant and associated kitchen and all major and permanent occupant water uses. These works shall are described under the SSDA report for Block 1.

The buildings non-potable water requirements will be supplied by the site wide non potable water reticulation system (High TDS) and will be supplied for landscape irrigation and sanitary flushing within the building. Pump sets will be provided to reticulate non-potable water as required.

The hot water plant will be located in the basement plant rooms and hot water will be reticulated throughout the building as required. The hot water plant shall comprise storage vessels and incorporating heat exchangers generated energy from infrastructure heated water system by mechanical services

A new natural gas service connection will be extended from the existing authority gas supply located in Balfour Street to the proposed development. The authority gas meter and regulator assembly will be located at Ground level with access from Balfour Street. Individual authority meters will be provided for residential apartments, retail areas, hotel restaurant with associated kitchen and all major equipment and plant where natural gas is required. These works shall are described under the SSDA report for Block 1.

Rainwater collected from roof outlets will gravitate to the storm water transfer tank and then discharge to the recycled water treatment plant below One Central Park. Overflow drainage will discharge to the external site wide storm water system when the storm water is not required by the recycled water plant.

All sanitary fixtures and tap ware will comply with Greenstar requirements as per the details below:

- Toilets to be 4 Star WELS rated or better.
- Taps to be 6 Star WELS rated or better.

Showers to be 3 Star WELS rated, flow rate 7.5L/min max.

9 Vertical Transportation

The Vertical Transportation Services will be designed in accordance with the following code and authority requirements:

- AS 1735.1/10/11/12
- AS 1428.2
- AS/NZS 4431
- Building Code of Australia
- City of Sydney Council Requirements
- Property Council of Australia Premium and A Grade Requirements
- AS/NZS 3000
- AS/NZS 3008
- Occupational Health & Safety Requirements
- ISO 9001

There are multiple vertical transportation provisions within Block 4N. Block 4N comprises of childcare facilities, office floors, residential floors, retail areas and a hotel. A unique vertical transportation solution has been provided for the building allowing some lifts to be shared by different sectors of the building.

There shall be three (3) lifts serving between the basement levels, main access level and all office floors. One (1) of these lifts shall be a backup to serve child care floors. In the event of the main child care lift being out of service, this back up lift shall switch over to only serve as a child care lift, leaving two (2) lifts to serve the office floors. This office lift will have a dual entry.

There shall be one (1) dedicated child care lift serving between the basement levels, main access level and the child care floors. It shall be located adjacent to one (1) of the office passenger lifts.

There shall be one (1) dedicated lift serving between the basement levels, main access level and all residential floors. A back of house lift for the hotel shall also provide access to the residential floors. This lift shall only be used to transport furniture/plant or as a backup lift to the residential floors. All residential lifts shall serve basement levels including B1 loading dock level.

The hotel shall have three (3) guest passenger lifts working as a group and two (2) individual back of house lifts serving all the hotel levels. One of the back of house lifts will be used as a back up lift to serve residential floors as well as transporting goods to those floors. In normal service, it will be dedicated to serving the hotel, and will only be switched over to serving residential areas by building management.

There are also three (3) individual goods lifts serving retail areas. Some of which shall connect ground level retail units with basement areas, and two (2) shall provide access to terrace areas above retail units. The goods lifts shall only be used by retail tenants.

All lifts will have the capability for CCTV monitoring.

There will be provisions for emergency lifts within each building. These lifts capability shall be in accordance with NCC requirements. All lifts will be compliant with disabled person's requirements. All lifts have shall be specified to comply with AS 1735.12 and AS1428.1/2.

Energy efficient lighting will be used in all lifts to minimise energy consumption. Passenger lifts in each building will also be provided with the ability to feedback regenerated power back into the building's power grid, to further improve the energy efficiency.

The vertical transportation system will be designed to interface with relevant fire, BMS and security requirements. A specialist lift monitoring system will also be implemented to allow remote monitoring and remote control of the lifts.

10 Fire Safety Engineering

Introduction

It is proposed to develop a holistic fire safety strategy for the development to ensure an appropriate occupant fire life safety and fire brigade intervention design. The fire safety strategy will detail a package of fire protection measures and how it relates to occupant egress, structural fire resistance, and fire brigade intervention. Initial thoughts are presented below, including a discussion of major Alternative Solutions to be developed and documented in the final Fire Engineering Report (FER) to demonstrate compliance with the Performance Requirements of the BCA. It is likely that further non-compliances may be identified during design development which will be addressed through design changes or Alternative Solutions as appropriate.

Fire compartmentation and fire resistance

The building is proposed to be separated by fire walls vertically over the non-residential levels into two, with the Hotel and the one side and the office/childcare are on the other side. Over the lower three levels the two areas are physically separated by an internal void extending from the one side through to the other side of the building. As the two areas consist of different fire compartments, any openings in the external walls of different fire compartments located within the DtS separation limits will be performance justified.

The building requires Type A construction due to its height, which is the most onerous with regard to required fire ratings. Owing to the building being sprinkler protected and large areas of the façade being glazed, it is foreseen that the fire rating of element of structure may potentially be rationalised as follows through fire engineered calculations:

- Class 6 parts to have 120 minutes fire rating, in lieu of the 180 minutes
- Class 9b parts in the Hotel on Level 02/03 (pool/gym etc.) to have 90 minute FRL in lieu of 120 minutes

The above will be justified on the basis that the sprinkler systems are highly reliable and that the likelihood of simultaneous failure of the sprinkler system in conjunction with an above average fuel load is highly unlikely. Furthermore, the large glazed areas will improve venting of heat and serve to reduce the severity of a fully involved compartment.

Occupant Egress

Occupant egress will be reliant on a passive fire and smoke separation, sprinkler protection, early detection of fire and occupant warning, emergency lighting and exit signage, protection of egress stairs with pressurisation systems, and zone smoke control systems to childcare/office areas to ensure tenability is maintained.

From an egress point of view the eastern part of the building, consisting of hotel, functions as a separate part from the western part consisting of childcare and office areas and residential apartments. Each part has separate means of escape consisting of two fire-isolated stairs serving each part respectively. The conference area in the hotel (Level 01) is also served by an additional internal open stair to account for the large number of occupants on this level. The internal stair is however located within 9 m of one of the fire-isolated stairs which is not permissible under the prescriptive provisions; this will however be performance justified.

The number and dimension of egress routes and stairs are generally in line with the prescriptive provisions of the BCA for the number of occupants served. Some minor departures are encounter; these will be performance justified. These include:

- The stairs serving the building discharge at ground level into the 3-storey high internal void which runs through the building and provide access to the north and south gates. Egress routes to road or open space also pass within 6 m of openings in external walls. These departures will be justified on the basis that the void is well ventilated being three storeys high, the building is sprinkler protected, and that there are egress routes in opposite directions to road or open space, i.e. no dead ends.
- Some small areas on Ground/Level 01 have only a single exits.
- Public corridors in the hotel residential areas exceed 40 m in aggregate length without being segregated by smoke proof construction. This will be performance justified based on the provision of medium temperature

smoke seals to hotel unit entry doors to prevent smoke leakage into the corridor in the first instance, sprinkler protection, and the fact that no stair is more than 20 m from any unit entry door (which is the maximum distance a unit door may be located from a stair/smoke door for a DtS solution.

- An extended travel of 8.5 m to a stair exit in lieu of 6 m (some units on Level 02 in the Hotel) will be performance justified.

Evacuation

Since the basement levels are common to several above ground buildings, the evacuation sequencing of the buildings will be performance justified so that fire in any one above ground building will only initiate evacuation of the fire-affected building and basement; the other buildings being unaffected unless the fire detection systems serving those buildings detect a fire. Detection of a fire in the common basement will initiate evacuation of the basement and the above ground buildings. In the basement levels, multi-criteria detectors will be installed within 1.5 m of the fire-isolated stairs and lifts doors.

Lift will be designed to 'home' to ground upon detection of a fire. See below.

Lifts

Emergency lifts will be provided for use by the fire brigade and will be designed in accordance with BCA Part E3 complete with stretcher facilities and fire service controls. Upon fire alarm in a particular building, the lifts serving that building will be arranged to 'home' to ground. If fire is detected in the basement, all the lifts serving the above ground buildings will be arranged to 'home' to ground to prevent occupants unwittingly take a lift to the basement.

Active fire safety systems

Active fire safety systems provided are described in the relevant services section in this report and include a combined fire sprinkler and hydrant system, smoke detection in accordance with the DtS provisions of the BCA, Sound Systems and Intercom Systems for Emergency Purposes (SSISEP), hose reels, fire extinguishers, emergency lighting and exit signage.

Smoke management

All fire-isolated egress stairs will be provided with stair pressurisation systems. Performance justification will be provided to permit zone smoke control to be omitted from the Class 6 parts and Class 9b parts in the hotel. The Class 9b childcare and Class 5 office parts will be provided with zone smoke control.

The Level 01 assembly area in the hotel is within a fire compartment of less than 2000 m^2 (Ground & Level 01 in the hotel forms a single fire compartment) and do not require smoke exhaust. Shut-down of air handling systems will be in accordance with prescriptive provisions of the BCA.

Fire Brigade intervention

Provision for fire brigade intervention is allowed for with internal fire hydrants located in the fire-isolated stairs. A booster assembly will be provided for the combined hydrant and sprinkler system serving the development which includes the common basement, Block 1, Block 4 and the Abercrombie hotel. The location of the booster assembly will be agreed with Fire and Rescue New South Wales (FRNSW) and will be performance justified being located in Block 1.

A single Fire Control Room (FCR) for the development is provided in Block 1 and the location will be performance justified and agreed with FRNSW. The FCR houses the main FIP, Fire Fan Control Panel, EWIS and WIP panel etc.

Conclusion

The fire engineering strategy will be documented during ongoing design development in accordance with the International Fire Engineering Guidelines and commensurate with international best practice. Fire life safety non-compliances will be addressed in the future FER as alternative solutions by demonstrating compliance with the Performance Requirements of the BCA.

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