Attachment A20

Services Design Brief
757-763 George Street, Haymarket

Combined Services Design Brief

757-763 George Street Hotel Development, Haymarket NSW

PREPARED FOR SAMPRIAN PTY LTD

REVISION B

Revision Information

Project	757-763 George Street Hotel Development, Haymarket
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Revision Schedule

Revision	Date	Issue Name	Author	Authorised
A	17/09/2020	Planning Application	JDB, SM, KM, NA	DJC
B	24/09/2020	Ceerose Comments Incorporated	JDB, SM, KM, NA	DJC

Contents

1 Introduction

LCI has been engaged to provide a Building Services Briefing Report that will form part of the documentation required to aid in the Planning Submission for the building services at the proposed new mixed use development at 757-763 George Street, Haymarket, NSW.

This report identifies and describes the intended Mechanical, Electrical, Hydraulics and Fire engineering services along with the Vertical Transport and ESD Requirements.

This report is based on the latest available Architectural drawings that were received on 10th September 2020.

1.1 Building Description

The mixed use development is a single 108m tower comprising of the following areas:

- Basement 2 – Car Parking accessible through a Car Lift, Back of House (BOH) Storage, Mechanical Plantrooms and Hydraulic Plantrooms
- Basement 1 – BOH End of Trip (EOT) Facility, BOH Bike Storage, Bin Store along with Electrical, Mechanical, Fire and Hydraulics Plantrooms
- Ground Floor – Hotel Entrance and Lobby areas, Retail Tenancies, Hotel Amenities, BOH Offices and the Loading Dock.
- Level 2 Mezzanine – Hotel Amenities
- Level 3 – Hotel Amenities, Sky Lounge and External Terrace Areas
- Levels 5 to 8 – Guestrooms
- Level 9 – Guestrooms and Plantroom
- Level 10 – Guestrooms and Hotel Terrace
- Levels 11 to 29 – Guestrooms
- Levels 30 and 31 – Roof Plant

1.2 References, Codes and Standards

The building is to be designed in accordance with the following criteria, guidelines, technical specifications, codes and standards:-

- Building Code of Australia (BCA)/ Nation Construction Code (NCC) 2019
- NSW Statutory Regulations and Australian Standards
- All Project Documents and Briefs
- Development BCA Report
- Development Fire Engineering Strategy Report
- Development Acoustic Report
- Development ESD Report

2 Mechanical Services

2.1 Objective

All Heating, Ventilation and Air Conditioning (HVAC) Systems shall be designed to achieve an energy efficient and environmentally sensitive system with low annual operating and maintenance costs.

The design of the HVAC systems will vary between but in system selection the following considerations must be realised:

- Optimum internal comfort control and air quality
- Energy efficiency, sustainability along with environmental considerations
- Room acoustics
- Future flexibility
- Whole Life Cycle Costs of equipment

The main mechanical services systems for the proposed building would be:

- Central Chilled Water and distribution pipework system
- Central Heating Hot Water and distribution pipework system
- Air conditioning systems comprising of 4-pipe Fan Coil Units (FCUs)
- Ventilation systems comprising of outside air Air Handling Units (AHUs) and clean General Exhaust Systems
- Separate local exhaust systems
- Smoke Hazard Management
- Building Management and Control System

2.2 References, codes and standards

The design of mechanical services will be in accordance with the following technical specifications, procedures, practices, codes and standards:

- Australian Standards AS 1668 Part 1 & 2, AS 3000, AS4252 1 & 2, and AS 3666.

2.3 Design Criteria

The mechanical services systems shall be designed to achieve the following requirements:

External Design Conditions

The cooling and heating loads design conditions for the Development are as follows:

	Summer	Winter
Outside Ambient	31.1°C DB / 22.7°C WB Full Solar Load	7.2°C DB No Solar Load

The following internal design conditions for the Development are as follows:

Item	Design Parameters
Guestrooms / Suites	Summer: 21 – 24°C and Winter: 20 – 22°C Humidity: Maximum 60% in worst case scenario.

Item	Design Parameters
	Maintain conditioned space under positive pressure with respect to the outdoors. No air infiltration through exterior wall cavities. Comfort cooled and heated via 4 – pipe ducted system with chilled water coil, hot water coil, filter, strainers; drain pan, fan and three speed motor in Guestroom entrance corridor ceiling with easy access for maintenance or replacement. Air velocity through the unit shall not exceed 2.5 m/s. Wall mounted thermostat controller located on guestroom wall with following controls: On/Off; Fan Low/Medium/High; Temperature up/down. Maximum sound level 37dB/A at medium fan speed.
Guest Bathrooms	Summer: 23 – 25ºC and Winter: 19 – 21ºC Exhaust based on 35l/s with make up air provided through door undercut from guestroom.
Public Areas	Summer: 21 – 24ºC and Winter: 19 – 21ºC Humidity: Maximum 60% in worst case scenario. Maintain conditioned space under positive pressure with respect to the outdoors. No air infiltration through exterior wall cavities. Air velocity through the unit shall not exceed 2.5 m/s. Minimum 30% fresh air and maximum 70% recirculation air (except when external conditions are favourable to reduce mechanical cooling/heating operation). Wall mounted thermostat controller in each meeting or conference room. Other public spaces on BMS set at 23ºC. Maximum sound level 40dB/A (ISO 3743); 37dB/A at medium fan speed.
Public Restrooms	Summer: 21 – 23ºC and Winter: 19 – 21ºC Exhaust based on 10/s/m^2 with make up air ducted from adjacent spaces or separate energy recovery device.
Back of House Areas	Summer: 21 – 24ºC and Winter: 20 – 22ºC Maximum sound level 40 dB/A Wall mounted thermostat controller in each room with temperature control adjustment only.
End of Trip Facility	Summer: 21 – 23ºC and Winter: 19 – 21ºC Exhaust based on 10/s/m^2 with outside air through energy recovery device.
Kitchen	Maximum of 26ºC in preparation areas. Base peak design loads on a temperature of 23ºC. The fans should be located in order to disperse exhaust away from building and to prevent re-entry of contaminated air into outside air intakes. Hoods to be equipped with a fire suppression system. Exhaust fans shall be interlocked via Fire alarm system It should be possible to locally disable the kitchen hood exhaust fan when kitchen hot section is not in use. The exhaust fan shall be interlocked to the main gas supply into kitchen. Where possible energy recovery should be utilised.

Item	Design Parameters
Refuse / Bin Store	Maximum temperature of 28°C, but usually exhaust rate based on 10l/s/m^2 is sufficient.
Grease Arrestor Room	Temperature uncontrolled - exhaust based on 10l/s/m^2.
Storage Rooms	Temperature uncontrolled - exhaust based on 5l/s/m^2.
Plantrooms	Temperature is uncontrolled but will depend on specific equipment requirements. Exhaust at 5l/s/m^2 (excludes gas fired heating plant).
Gas fired heating plantrooms	Preferably to be naturally ventilated. Temperature is uncontrolled but will depend on specific equipment requirements and be in accordance with AS 5601.1.
IT Room - Server Room	Independent split system at maximum of 30 degC in order to maintain a temperature control when the centralised chilled system is disabled.
Car Park and Loading Dock	Ventilation system in accordance with AS 1668.2.
Lift Motor Room	Two separate split systems both sized at 50% peak cooling load. Maximum temperature of 30°C.
Fire Pump Room	Temperature is uncontrolled but will depend on specific equipment requirements.
Retail Areas	Summer 24°C (maximum relative humidity controlled by the performance of the cooling coil, which will normally limit relative humidity to a maximum of 60%). Winter 21°C with control tolerance at ± 2°C of set point temperature for heating and cooling cycles Each retail tenancy shall be provided with condenser water pipe blanked off valved connections sized to provide 300W/m2 heat rejection. Perimeter louvres for future supply and exhaust tenancy requirements in accordance with AS 1668.2. No commercial cooking exhaust requirements.
Smoke Control	Smoke hazard management system in accordance with BCA and Fire Engineering Report.
Plant Redundancy	Cooling and Heating plant will continue operation at more than 60% of peak building cooling load in the event of a significant component failure (ie chiller, cooling tower, boiler, heat exchanger, pump failure etc).
Building Management and Control System	The building shall be provided with a fully addressable Web based building management and control system (BMCS), provided by a reputable manufacturer. Communications shall be fully BACnet compatible.

No humidity control shall be provided however inherent psychrometric processes should limit the maximum humidity level to no more than 60%.

Typical Internal Heat Loads

Area	People	Lighting (Average)	Equipment Heat Load (Average)
Office	10m^2/person	10W/m^2	12W/m^2
Conference Room	2m^2/person	12W/m^2	5W/m^2
Restaurant & Bar	1.5m^2/person	12W/m^2	5W/m^2
Lobby	5m^2/person	10W/m^2	5W/m^2

Ventilation Design Parameters

All areas will be ventilated in accordance with AS 1668.2.

2.4 Air Conditioning

This section outlines the HVAC systems considered to date and are summarised as follow:

2.4.1 Central Chilled Water System

The central chiller plant shall comprise proprietary high efficiency water cooled chillers complete with condenser water system and open circuit cooling towers. The chillers shall have their own chiller management control system to maintain the required chilled water flow temperature (including chilled water re-set) along with all necessary safety controls and be compatible with the BMCS system.

Each chiller shall be sized so that if a chiller is to be removed from service 70% of the system cooling load is maintained.

The chilled water design flow and return temperatures shall be 7ºC and of 14ºC respectively with condenser water chiller inlet temperature of 29.5ºC and a leaving temperature of 35ºC.

The chillers shall be selected to achieve maximum efficiency considering the development load profile and to provide an energy efficient design. A chilled water system low load bypass control valve shall be provided to ensure the chillers minimum chilled water flow rate is achieved at all times and the chillers be arranged to accommodate a turn down of at least 10% of their full capacity.

The chilled water system shall operate with two port valve control and will serve all outside air AHUs and FCUs with variable chilled water flow according to demand.

Sufficient isolation valves and commissioning sets should be provided to ensure ease of maintenance and commissioning throughout the installation.

All necessary air vents at system high points and drain down provision at low points are required.

2.4.2 Central Heating Hot Water System

The central heating distribution plant shall utilise modulating high efficiency condensing boilers, where each boiler is sized so that if a boiler is to be removed from service 70% of the system heating load is maintained.

Each boiler and associated pumps etc shall be provided with fully automatic control and shall be enabled and monitored by the BMCS system.

Boilers shall be provided with twin walled, insulated stainless steel conventional flue systems that avoid the use of fan assist.
The heating water shall be circulated through the system at 70ºC and 50ºC design flow and return water temperatures.

Variable speed pumps shall be provided to allow the heating system to operate under two port valve control and will serve all outside air AHUs and FCUs with variable heating water flow according to demand.

Sufficient isolation valves and commissioning sets should be provided to ensure ease of maintenance and commissioning throughout the installation.

All necessary air vents at system high points and drain down provision at low points are required.

2.4.3 Air Handling Units

AHUs shall be factory-assembled packaged type that shall include reinforced steel sections enclosing the fans, coils with pre and main filters. All components shall be fully accessible utilising purpose built access doors with high quality quick-opening handles. AHU casings shall be insulated and double skinned and all external air handling units shall be weatherproof construction.

The heating and cooling coils shall be suitably treated for protection against a saline atmospheres using copper/copper coils and each shall be controlled with a dedicated 2-port motorised control valve.

Each AHU shall incorporate a heat recovery section and modulating dampers to suit the application.

2.4.4 Fan Coil Units

Four pipe FCUs shall be fitted with heating and cooling coils and each shall be controlled with a dedicated 2-port motorised control valve.

Drip trays shall be provided under the coil and under control valve and be fabricated from non-corrosive material or protected against corrosion with external faces insulated to prevent condensation.

FCU capacities must be selected at medium fan speed and suit the noise level requirements of the area they serve.

2.4.5 Guestrooms

It is intended that each guestroom will be provided with 4-pipe FCUs located in a bulkhead over the entrance area of the bedroom. Care should be taken when locating supply air grilles as conditioned supply air directed towards the bed head should be avoided.

Each FCU shall have individual means of isolation from chilled water and heating water systems without affecting adjacent guestrooms.

Each guestroom should be provided with its own self-controlled system to enable guests to control their own room temperature within pre-set limits, typically in the order of 3ºC either side of the set point. The wall mounted controller shall be flush mounted and comprise of the following functions:

- FCU On/Off
- Temperature adjustment

- Fan speed adjustment

Each FCU shall be interfaced with the central BMCS.

The bathroom shall have some cooling and heating provision by the nature of the bathroom exhaust taking conditioned air from the bedroom.

2.4.6 Public Areas

Public areas typically include Front of House (FOH) areas like Entrance Foyers, Restaurants, Bars, Lounges, and Meeting Rooms.

These areas will be served by 4-pipe FCUs and be located in appropriate locations that do not rely on extensive furniture relocation in times of FCU access.

Each individual area shall be provided with independent temperature control with FCUs being controlled via the BMCS with no access possible by the public. Only meeting/conference rooms shall have local wall mounted controllers to allow local user temperature adjustment only.

Consideration can be made to providing common control valves serving a number of FCUs in the same thermal zone.

2.4.7 Kitchen

A dedicated 100% Outside Air AHU shall be provided to serve the kitchen area and cater for the kitchen cooling requirements. To compensate for the necessary exhaust air requirements and to reduce energy consumption, make up air may be taken from the surrounding areas but must not be drawn over any food services.

Variable speed fan drives are required to ensure that exhaust rates can be reduced to meet the kitchen activities allowing the supply air system to provide only temperature control with the ability of overcoming differing air balance requirements in the adjacent areas.

2.4.8 Back of House Areas

These areas shall generally be served by 4-pipe FCUs where each individual area will be provided with an independent local controller.

Consideration can be made to providing common control valves serving a number of FCUs in the same thermal zone.

Each FCU shall be controlled and monitored by the BMCS.

2.4.9 Electrical / IT Rooms

Independent separate refrigerant based split systems shall be provided for each of these rooms to ensure cooling availability. Dependant on severity of disruption to hotel operations duty/standby cooling provision maybe required.

In the event of any cooling failure an alarm shall be generated by the BMCS.

2.5 Ventilation

2.5.1 Guestrooms

Outside air shall be provided to each guestroom for occupancy needs with the excess air being taken away through the bathroom exhaust.

Central AHU plant shall utilise energy recovery by allowing some of the useful exhaust air at room temperature to be transferred over to the entering outside air stream resulting in reduced mechanical cooling and heating required.

Noise transfer between adjacent guestrooms to be considered when sharing the same supply and exhaust duct risers along with ensuring the installation of volume control dampers for commissioning purposes and fire dampers to retain fire integrity.

2.5.2 Public Areas and Back of House Admin and Office Areas

Indoor air quality is of high importance the FOH areas where the guest first enters the hotel and their impressions are made. The air quality within the building will require a constant supply of sufficient outside air to the back of the FCUs without the advantage of utilising economy cycles that central all air systems have.

2.5.3 Public Toilet Areas and End of Trip Facility

All Public Toilet areas and End of Trip facility shall be provided with dedicated extract systems that exhausts vitiated air direct to outside. The toilet area shall either have a dedicated outside air supply system with energy recovery or obtain makeup air from adjacent areas through ducted transfer systems.

Due to the amount of exhaust air removal from the End of Trip facility and the lack of suitable air quality in adjacent areas a dedicated outside air supply system with energy recovery shall be provided.

2.5.4 Kitchen

The kitchen exhaust system shall be sized to meet the requirements of the cooking facilities and comprise of a dedicated fire rated ductwork system in accordance with the fire strategy and local regulations. Stainless

Stainless steel exhaust canopies shall be located above cooking ranges to ensure that no spillage occurs with appropriate levels of filtration reduce grease laden air passing through the system.

Any dishwasher exhaust shall be separate from the kitchen exhaust and shall use stainless steel ductwork to prevent corrosion and installed at a fall to allow the draining of condensation.

2.5.5 General Plantroom Areas

General plantroom areas with no specific ventilation requirements for the associated plant and equipment shall have supply and or exhaust ventilation in accordance with AS 1668.2. Consideration can be made to grouping similar plantrooms together with common ventilation systems so long as fire compartmentation is not compromised. The ventilation systems will tend to operate continuously but if system operation is altered through temperature then dedicated systems will be required.

2.5.6 Car Park

The car park supply and exhaust ventilation shall be sized in accordance with AS 1668.2 and operates under carbon monoxide (CO) control.

The fans shall be supplied from a dedicated essential electrical supply and operate in accordance with AS 1668.1.

2.5.7 Loading Dock

The loading dock appears to extend beyond 10m from the façade entrance and shall require mechanical exhaust ventilation and shall be sized in accordance with AS 1668.2.

2.5.8 Car Lift

The car lift shall require mechanical exhaust ventilation and shall be sized in accordance with AS 1668.2.

2.5.9 Fire Pump Room

The fire pump room shall require a dedicated supply and exhaust systems that are sized on the intended simultaneous operation of the pumps. The ventilation system shall run at low speed to disperse fuel smells under normal operation but shall automatically ramp up if any of the pumps start.

2.5.10 Miscellaneous Items

- Provide BCA Section J compliant insulation for all air conditioning ductwork and chilled/heating water pipework.
- Comprehensive air and water proportional balancing required as part of the commissioning process to ensure that all design flow rates are achieved.

2.6 Smoke Hazard Management

To maintain a smoke free environment within fire-fighting staircases and lobbies until the evacuation process is completed and fire-fighting operations have commenced. The smoke hazard management systems shall operate generally in accordance with the requirements of the BCA and the relevant AS1668.1

Stair Pressurisation Systems

The protected stairwell shall be supplied with fresh air to maintain and positive pressure relative to the fire zone, ensuring smoke moves towards the fire away from the protected zone. Stair pressurisation systems shall be provided to ensure that a minimum air velocity of no less than 1m/s across the open fire door on the fire affected floor, plus the egress door, for each of the two stairs.

Stair pressurisation fans shall operate via variable speed drives controlled by static pressure sensors in the stairwells.

An air leakage path to outside is required to maintain continuous flow away from the protected zone. The positive pressure should be maintained for the full duration of the evacuation process.

The stair pressurisation system shall comprise of the following:

- Fans and drive mechanisms (Fire Rated)

- Multiple supply air grilles every other floor level
- Pressure Relief Vents and route to outside
- Actuation Systems
- Fire rated Ductwork Distribution System

The pressure differential systems for stairways is should be ensured that there is an even distribution of pressurising air throughout the stair and that there is no likelihood of the air supply being short-circuited.
During operation of the system, air flows from the pressurised space into adjacent areas.

Provision shall made for the air that has leaked into the unpressurised spaces on the fire floor to escape from the building to ensure that the pressure differential is maintained.

Where smoke shafts are provided they shall be fully open to outside air discharging at ground floor level (from basement) or at top and bottom (ground floor and above).

2.7 Building Management and Control System (BMCS)

A BMCS shall be provided to include all the controls and monitoring of the chillers, cooling towers, pumps, heat exchangers, heating hot water generators, AHUs, FCUs, fans, etc.

The system shall be open protocol (to be in an agreed data communications protocol and data format as defined by the Control System Integrator (CSI)) providing all automatic control (plus keyboard manual override) and monitoring of the HVAC systems.

The BMCS shall include all the automatic control and monitoring necessary to affect the fully automatic operation of the Mechanical Services in accordance with the control and energy requirements and communicate via the building Integrated Communication Network (ICN)

All data points from the BMCS shall be made available to the Integration Platform which should include the provision of the following:

- Main mechanical heating and cooling plant and system thermal meters
- Monitoring of external and internal space conditions and adjusting the mix of outside air and recirculated air accordingly to reduce energy consumption
- Interface with electrical, mechanical and hydraulic system meters
- Interface with the Fire Systems
- Interface with the Vertical Transport Systems
- Interface with the Lighting controls
- Interface with the Hydraulic systems

3 Electrical Services

3.1 Overview

The main features included within the electrical systems for this building are:

- Basement Substation (Chamber triplex substation in accordance with Ausgrid requirements)
- Low Voltage Consumer Mains & Support
- Surge Protection at the incoming side
- Main Switch Board
- Power Factor Correction Unit
- Floor Distribution Switchboards, on every level
- Earthing (incl. Lightning Protection System)
- Power Reticulation (Submains and sub-circuit distribution)
- Hotel Room electrical (incl. Lighting, power, comms, MATV/IPTV etc.)
- General and special purpose power outlets
- Internal general lighting
- External general lighting (to be confirmed and reviewed further)
- AS2293 compliant Exit and Emergency Lighting (centrally monitored with computer controlled testing facility)
- Lightning Protection System
- Distributed Antenna System (DAS)
- Backbone Communications System incorporating structured cabling throughout for IP phone, IP TV, WiFi and general internet connection (incl. Comms Room to support integrated ICT)
- Security Access Control System (and room access control and lift/floor access control)
- Security CCTV Surveillance System to all common and general access areas
- Specialist Lighting Design is currently not within the base scope (to be confirmed)

3.2 Regulations and Authorities

The building will be designed in accordance with –

- The National Construction Code 2019 (NCC 2019)
- Service Rules and Regulations of the local Supply Authority (Ausgrid)
- AS 3000 Wiring Rules
- The requirements of the Australian Communications and Media Authority (ACMA).
- New South Wales Services
- Environment Protection Agency (EPA)
- AS1680.0 Interior Lighting -Safe Movement
- AS2293 Emergency Lighting and Exit Signs
- AS1940 The Storage and Handling of Flammable and Combustible Liquids

3.3 High Voltage Incoming Supply and Substations

The development will have High Voltage connection to the Ausgrid Triplex Network through incoming HV feeders terminating in a Hv Switchboard located within the Basement Chamber Substation. The Chamber substation will be constructed to Ausgrid requirements and will house the transformers which will have consumer mains terminating at the Main Switchboard.

3.4 Standby Diesel Generator System

At present, no on-site power generation system is proposed or located spatially.

3.5 UPS System

UPS systems will only be limited to the main distributor/computer room that houses the termination of main incoming lead-ins, distribution servers, main headend for IPTV and Security, and all hotel operation servers (i.e. room bookings etc.)

3.6 Main Switchboards

The main switch room is located in basement. The room will house new main switch board, new power factor correction unit and new metering panels. Two (2) points of egress will be required to comply with regulatory and authority requirements..

The new main switch board will be rated to match allocated rating from substation. It will be Form 3b, IP42 with bottom cable entry and to be equipped with 25% spare circuit breaker space, plus additional equipped circuit breaker spaces for separate submains for connection of mechanical, hydraulics, fire protection services and life safety services.

Earthing will be provided to the building in accordance with AS3000 for a Multiple Earth Neutral (MEN) system.

3.7 Power Factor Correction

Power factor correction equipment will maintain the power factor at a minimum of 0.95 within the building under normal network power supply condition.

3.8 Metering

The building will be bulk CT metered with meter panel located within main switch room in basement.

Sub-metering is to be provided in each switchboard to meet the requirements of NCC 2019. This includes installation of digital multi-function meters for lighting, power and mechanical equipment accordingly that can be monitored by Building Monitoring and Control System (BMCS).

3.9 Distribution Switchboards

Distribution switchboards incorporating circuit breaker controls for the protection of final sub circuits, are typically located in electrical riser cupboards on each level.

Distribution boards to be IP42 with minimum Form 1 construction and be provided with surge protection (pending outcome of lightning protection assessment during detailed design)

Separate metering will be provided to lighting, power and mechanical services chassis of the general distribution boards. Interface to be provided between the meters and BMCS for energy monitoring in accordance with NCC 2019

Switchgear throughout the building to be of same make and manufacturer to ensure proper discrimination and cascading of the protection system.

3.10 Consumer mains and Sub-mains

Consumer mains reticulating from substation to main switch board will be provided.

From main switch board, new submains are reticulated via overhead cable trays to various riser locations within the building.

Submains to air conditioning plant will be suitable for the ultimate configuration, plus 20% spare capacity.

Fire rated submain cabling to be provided for all life safety services in accordance with AS3000 Wiring Rules and have WS52W or above fire performance.

3.11 Hotel Room Light and Power

Lighting and Power (incl. Communications outlet) to the hotel room.

The supply for the hotel room shall be supplied from the floor Distribution Switchboard to a local isolation point located/accessible within the ceiling space from the corridor for each room.

The Hotel Room electrical comprise of:

- New lighting to ensuite, entry, and joinery per the interior design layout
- Lighting control strategy to be coordinated with interior designer
- Power and Data per the interior design layout
- IP TV to wall mounted TV unit (no border or box provided)
- No motorised blinds required

3.12 General and special purpose outlets

Cleaner's outlets to be provided at 15m interval within hotel floor corridors and lift lobby.

Outlets in plant rooms will generally be IP56 or above.

Specific power requirements to individual spaces to be coordinated in detailed design phase.

Residual current protection to be provided in accordance with AS3000 and where appropriate.

3.13 Lighting

In general, lighting levels throughout the building will be designed in accordance with recommendations of AS1680 based on usage of space and required lux levels.

The building will be provided with LED luminaires throughout. Lighting control system such as Dynalite Dali or equivalent will be used to control lighting in public spaces.

The lighting control system will be addressable and be capable of interfacing to all luminaires and expansion to incorporate additional sensors, luminaires post day one construction.

Motion sensors to be provided to automatically control lighting within public amenities and back of house areas.

Lighting within plant rooms to be individually switched adjacent entry doors (consideration for motion detection control where appropriate)

Lighting within fire stairs will be alternatively circuited and will be dimmed to 20% when no motion is present in the fire stairs. Motion sensor will be provided at every entry / exit landing, which upon detection of motion will increase the lighting level to 100%.

Carpark lighting will be capable of detecting vehicular movement and be activated both by cars and pedestrians to provide suitable lighting period run-on following movement detection and appropriately light up a safe path of travel.

3.14 Emergency Evacuation Lighting

Exit and emergency lighting will be provided to comply with NCC 2019 and AS2293 and will be LED type.

All exit and emergency lighting will be monitored via a centrally controlled system. The system will automatically provide testing and monitoring of all exit and emergency lighting within the building.

3.15 Lightning Protection and Surge Suppressors

Lightning protection system will be provided in accordance with AS1768. The design will seek to maximise utilisation of the building structure and cladding along with the use of air terminals, horizontal and vertical down conductors where appropriate.

Surge/over-voltage protection will be provided in new main switch board, new distribution boards (where required base on lightning protection assessment outcome) as well as to critical communications infrastructure.

3.16 Information and Communication Technology (ICT)

3.16.1 Building Distribution

The main comms room is located in basement level B1.

New communications system includes:

- Data Cabling Networks (Category 6A)
- Optical Fibre Networks (Single mode / Multimode, etc)

Both systems will be completed from one manufacturer with certified installing vendor and warranty.

Category 6A is the recommended standard for data cabling terminated in patch panels contained within comms racks. A colour coded cabling standard will be adopted in consultation with the superintendent.

Horizontal cabling will consist of an end-to-end Category 6A / Class EA system. Termination will be via a modular system and RJ45 Outlets.

A Wi-Fi network will be provided throughout the building offering wireless capabilities to staff and guests who will connect through a range of mobile devices.

The wireless network will form a secure extension of the building's data network comprising of fibre and copper cabling which will be available 24/7 to support building requirements.

Wireless Access Points (WAPs) specific for purpose will be distributed to optimal locations to achieve the coverage and signal strength required.

The ICT services will integrate and interface with the Hotel Property Management Services (PMS) nominated/adopted by the operator.

3.16.2 DAS

The Distributed Antenna System (DAS) headend equipment will be located within a separate DAS room in accordance with carrier requirements.

4G aerial on roof and antennas throughout the building will be required.

3.16.3 IP TV

A master antenna (MATV) system will be provided on the roof. The system will incorporate a Free to Air Antenna and Satellite dish (Foxtel) arrangement. The system will terminate in the Building Distributor

room in the Basement and have its signal distributed throughout the building per the building floor distributor scheme, which is in a similar arrangement to the Building Communications. All MATV signal will be switched and patched in the Floor Distributor/Comms Room for delivery into the Hotel Room Entertainment System.

Space provision will be made for additional RG11 cables for extra satellite services.

3.16.4Integrated ICT

The following building services will be incorporated in ICT:

- Building Management Control System (BMCS)
- Electronic Security Systems, including Access Control and CCTV
- Exit and emergency lighting central testing and monitoring system
- Lighting Control System
- MATV System

Fibre optic backbone will reticulate from building distribution room to each floor distributors, comprising of multimode optical fibre cable for service provision.

3.17 Security Services

3.17.1Security Control Room (SCR)

The hotel Security Control Room is proposed within the new office areas. Security systems operated from within the SCR will provide the following core functions:

- Electronic Access Control System (EACS), incl. guest room and floor access control
- Video Surveillance (CCTV)

3.17.2Access Control

An Electronic Access Control System (EACS) using programmable proximity access cards shall be provided to control access to public spaces such as, but not limited to, the following:

- Main entrance (after hours only)
- All perimeter doors
- Lifts
- Fire stair re-entry on each level
- Hotel rooms
- Carpark
- Offices

The key components of EACS are:

- Security Control Panels
- Access Cards, Card Readers and Keypads
- Electric Locking
- High-Level Interface to Lift Control System

- Fire Door Control

In the event of power outage, hotel room access control equipment will have local battery backup.
In addition, all security panels will have battery backup of eight (8) hours.

3.17.3 Video Surveillance (CCTV)

A digital, IP based, colour CCTV monitoring system is to be provided with cameras monitoring the following areas:

- All external perimeter entry / exit points
- Ground floor general lobby areas
- All lift lobbies, including carpark lift lobbies
- Lift cars
- All fire stair doors
- Carpark entry / exit
- Carpark to cover major thoroughfares

The CCTV design will allow for:

- CCTV archiving
- Web based remote access
- Head-end NVR equipment shall be UPS backed locally and will be located within Building Manager's office.

CCTV cameras shall be provided for surveillance purposes with control from Building Manger's Office. CCTV cameras shall be minimum High Definition resolution. Internal lighting will be designed to meet minimum requirements of the selected CCTV cameras.

Digital CCTV recording equipment shall be provided to allow recording of 30 days minimum at variable frame rates and compression methods. CCTV system shall be backed up by local in-rack UPS, which is sized to provide 2 hours back up.

Surveillance warning and information signage shall be placed in appropriate locations, subject to approval by superintendent.

4 Fire Services

4.1 General

The fire services systems to be provided for this building are:

- Combined fire sprinkler and hydrant system
- Fire Hose Reels (not provided to Class 3 portions of the building as per BCA E1.4) ;
- Fire detection and alarm system;
- Emergency Warning and Intercom System;
- Portable fire extinguishers and fire blankets.

4.2 Design Basis

References, codes and standards

The design of fire services will be in accordance with the following documents:

Item	Standards
	Building Code of Australia, BCA 2019 Amendment 1
Fire Engineering	TBC
Fire Detection & Alarms	BCA, Spec E2.2a, clause 4 & 6 AS 1670.1:2018 – Fire detection, warning, control and intercom systems – System design, installation and commissioning; Part 1: Fire
Emergency Warning and Intercom System	BCA, Spec E4.9 AS 1670.4:2018 – Emergency warning and intercommunication systems in buildings; Part 1: Equipment design and manufacture
Combined Fire Sprinkler and Hydrant Systems	BCA, Part E1.3, E1.5, Spec E1.5 AS 2118.1:2017 – Automatic fire sprinkler system AS 2118.6:2012 – Combined sprinkler and hydrant systems in multistorey buildings AS 2304-2019 – Water Storage tanks for fire protection AS 2419.1:2005 – Installation of fire hydrant system
Fire Hose Reel	BCA, Part E 1.4 AS 2441.1:2005 – Installation of fire hose reels
Fire Extinguishers	BCA, Part E 1.6 AS 2444:2001– Portable fire extinguishers and fire blankets – Selection and location
Wiring	AS/NZS3000:2018 - Wiring rules
Cabling	AS 3013:2005 – Electrical installation
Customer cabling	AS/CA S009:2013 – Installation requirements for customer cabling

4.3 Fire Detection

Automatic fire detection and alarm system to be provided throughout the building in accordance with BCA, AS 1670.1, AS 1668.1 and the Fire Engineering Report

Main fire indicator panel (MFIP) to be located within the dedicated fire control room for the building and fitted with alarm signalling equipment connected to a 24 hr manned monitoring service

The main fire detection and alarm system to comprise of:

- Fire detection control and indicating equipment (FDCIE) with a minimum 20% spare capacity located in the fire control room
- Fire detectors to AS1670.1 and additional detectors to the requirements of AS1668.1 for the smoke hazard management systems
- Manual call points
- Fire alarm audible and visual indicators
- Magnetic door holders
- Repeater panel or graphics terminal in locations nominated by the user
- Networked fire detection control and indicating equipment with minimum 20% spare capacity
- Fire fan and damper control panel (FFCP) with minimum 20% spare capacity located in the fire control room
- Interface wiring, relays and terminations to the combined fire hydrant and sprinkler system valve monitoring devices (tamper switches), flow switches, solenoid valves, pressure switches, pump control panels, tank level indicators, etc.
- Interface wiring, relays for BMS, security and access control devices, general air conditioning systems, mechanical services smoke hazard management, door controls and AV
- Alarm signalling equipment (ASE)
- All necessary circuit wiring, conduit, fittings and equipment
- Connection to power supplies provided and final cabling protection

4.4 Emergency Warning and Intercom System (EWIS)

An EWIS shall be provided throughout the entire building in accordance with the latest BCA, AS 1670.4 and the Fire Engineering Report.

A new Master Evacuation Control Panel (MECP) shall be located adjacent to the main FDCIE in the fire control room, programmed to match the evacuation strategy prepared by the Fire Safety Engineer.

Emergency warning speakers shall be provided throughout the building to provide required sound pressure levels and speech intelligibility. Supplementary visual warning devices to be provided where deemed necessary.

Emergency Call Points shall be provided adjacent to fire stairs where required.

Warden Intercom handsets shall be located as directed by the Building Surveyor but at least one per fire compartment is required for compliance.

4.5 Combined Fire Sprinkler and Hydrant System

The combined fire sprinkler and hydrant system to include but not be limited to the following:

- 1 -off electric pump, 1-off standby diesel pump and 1 – off diesel relay pump to be provided in accordance with AS2118.1 and AS2118.6 to supply water to the combined sprinkler and hydrant system. The pumps to comply with the requirements of AS2941.
- Jockey pump for pressure maintenance
- Dual water supply. See section 2.5.5.1 for more detail.
    - 1-off 80kL effective capacity combined sprinkler and hydrant tank adjacent to the pumps

- 1-off town main connection (TBC with Sydney Water)

- Combined sprinkler and hydrant fire brigade booster assembly located to meet the following requirements:
  - Readily accessible to fire fighters
  - Operable by fire brigade pumping appliances located within 8m.
  - Within sight of the main entrance of the building
  - In a position not less than 10m from any high voltage main electrical distribution equipment such as transformers and distribution boards, and from liquefied petroleum gas and other combustible storage
- Internal fire hydrants to be located at the following locations:
  - Within each fire isolated exit at each storey.
  - Within 4m of required non-fire isolated exits. Fire hydrants outlets need not to be located adjacent to each required non fire isolated exit provided coverage can be achieved by fire hydrants located elsewhere, e.g. within a required fire-isolated exit or external fire hydrants
  - If floor coverage cannot be achieved by the locations above, additional fire hydrants to be installed throughout the floor plate
- Sprinkler control assemblies to be located at each storey within the fire stairs.
- Combined sprinkler and hydrant vertical ring mains and isolation valves to be located within the fire stairs.
- Fire Sprinkler System throughout.
- Flow switches.
- Pipework and associated valves, equipment, fittings and fixings.
- Pressure switches.
- Pressure gauges.
- Fire brigade alarm line.
- Monitoring and controls.
- Combined sprinkler and hydrant block plan.

4.5.1 Water Supply

A dual water supply shall be provided to the building to serve the combined fire sprinkler and hydrant system as per AS2118.1 and AS2118.6

There is an existing 150ø mm Towns main along Valentine St and a 300ø mm Town main along George (see Figure 1). One of the water supplies for the combined system shall be provided from either the 150 or 300mm main (TBC with Sydney Water).

For the second water supply, a water storage tank of 80kL effective capacity shall be provided to form the dual supply in accordance with AS2118.6. The tank size has been based on an Ordinary Hazard 3 classification for the sprinkler component. The tank size may increase in size if drenchers are required in simultaneous operation.

External sprinklers may be required to the external bounding walls due to the close proximity to the boundary line. If external sprinklers are required as per the BCA, external sprinklers are to be designed in accordance to section 3 of AS2118.1-2017. If the number of external sprinklers in operation exceeds

the internal sprinkler water demand, the sprinkler component of the tank to be increased to cover the excess.

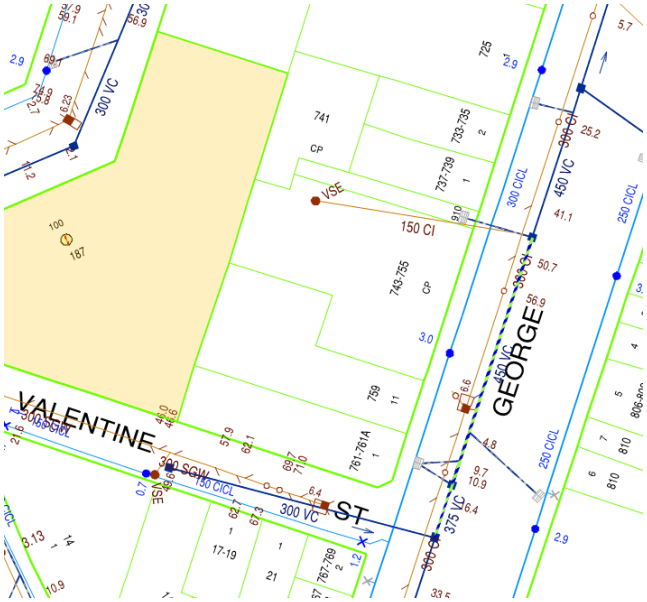


Figure 1: Water Authority inground services drawing

4.5.2 Design Criteria

Table 1: Sprinkler, hydrant and fire hose reel system design criteria

Occupancy	Hazard Class	Assumed Operation Area Comply to AS2118.1-2017, AS2419.1-2005 & AS2441-2005
Amenity hotel areas and End of Trip facilities	Light Hazard	6 most hydraulically unfavourable sprinklers with minimum operating pressures of 70 kPa each
Hotel	Light Hazard (residential sprinklers)	4 most hydraulically unfavourable sprinklers with minimum discharge density of 4.1 mm/min/m²
Retail	Ordinary Hazard Group 3	18 most hydraulically unfavourable sprinklers heads operating at a minimum 60 L/min each
Plant	Ordinary Hazard Group 1	6 most hydraulically unfavourable sprinklers heads operating at a minimum 60 L/min each.
Loading Bay	Ordinary Hazard Group 2	12most hydraulically unfavourable sprinklers heads operating at a minimum 60 L/min each.
Hydrants		2 discharging outlets each flowing 5 L/sec @ 700 kPa (site booster pumps) 2 discharging outlets each flowing 10 L/sec @ 700kPa (relay booster pump)
Fire Hose Reels		2 discharging fire hose reels each discharging 19 L/min @ 220 kPa

4.6 Fire Hose Reels

Fire hose reels are not required for Class 3 portions of the building. On levels where fire hose reels are required, such as the basement, the fire hose reels will be provided in compliance with AS2441 and BCA E1.4. Fire hose reels to be located as follows:

- Located within 4m of an exit, except that a fire hose reel need not be located adjacent to every exit, provided system coverage can be achieved
- If floor coverage cannot be achieved by the locations above, additional fire hose to be installed throughout the floor plate along the normal paths of travel to an exit

4.7 Fire Extinguishers and Fire Blankets

Portable fire extinguishers are to be provided throughout the development to comply with BCA table E1.6 and selected, located and distributed in accordance with sections 1 to 4 of AS 2444.

On hotel accommodation floors, fire extinguishers to be provided outside the hotel rooms within 10m of each SOU entry door.

All extinguishers shall be complete with appropriate mounting boards, mounting brackets, nozzles, hoses, operation instructions and location signs.

Fire Blankets are to be provided throughout the development to comply with the relevant Codes and Standards.

5 Hydraulic Services

5.1 Overview

The Hydraulic works comprises of the following services:

- Hydraulic services connections to the public infrastructure
- Sanitary Drainage System
- Trade Waste Drainage System
- Roof Drainage, Downpipes and Balcony Drains
- Rainwater reticulation, treatment and Re-use System
- Recycled Water Systems
- Cold-Water Service
- Cold and Hot Water Metering
- Gas Metering
- Hot Water Systems
- Sanitary Fixtures, Taps and Faucets

5.2 Design Criteria

The Hydraulic services systems shall be designed to provide a quality service for this type of building that meets Code and Local Authority requirements and represents a coordinated scheme to accept industry standards. In particular, the systems shall be designed and installed to conform with/to the approval of:

- Building Code of Australia (BCA) / National Construction Code (NCC) 2019
- AS/NZ.3500 - The Plumbing Code of Australia (PCA; part of BCA)
- National and Local Plumbing Regulations
- Department of Fair-Trading requirements
- The Council requirements
- Sydney Water Regulations (Water and Sewer Authority)
- Jemena Regulations (Gas Authority)
- Sustainability Requirements and Regulations
- Acoustic Report
- All applicable Australian Standards associated with the works
- All requirements of Authorities having jurisdiction over the project

Item	Design Criteria
Sanitary Drainage/Trade Waste	In accordance with AS3500 Sydney Water Authority Requirements
Roof Drainage & Downpipes	In accordance with AS3500 and manufacturers manuals and specifications
Cold Water Services	In accordance with AS3500 Sydney Water Authority Requirements
Hot Water Services	In accordance with AS3500 Minimum Hot Water temperature 60°C
Sanitary Fixture, Taps and Faucets	Refer Council requirements and architectural fixture schedule
Gas Service	In accordance with AS5601 Jemena Authority Requirements
Noise criteria	In accordance with acoustic engineers' recommendations.

5.3 Infrastructure Connections

5.3.1 Potable Water and Fire Water Connections

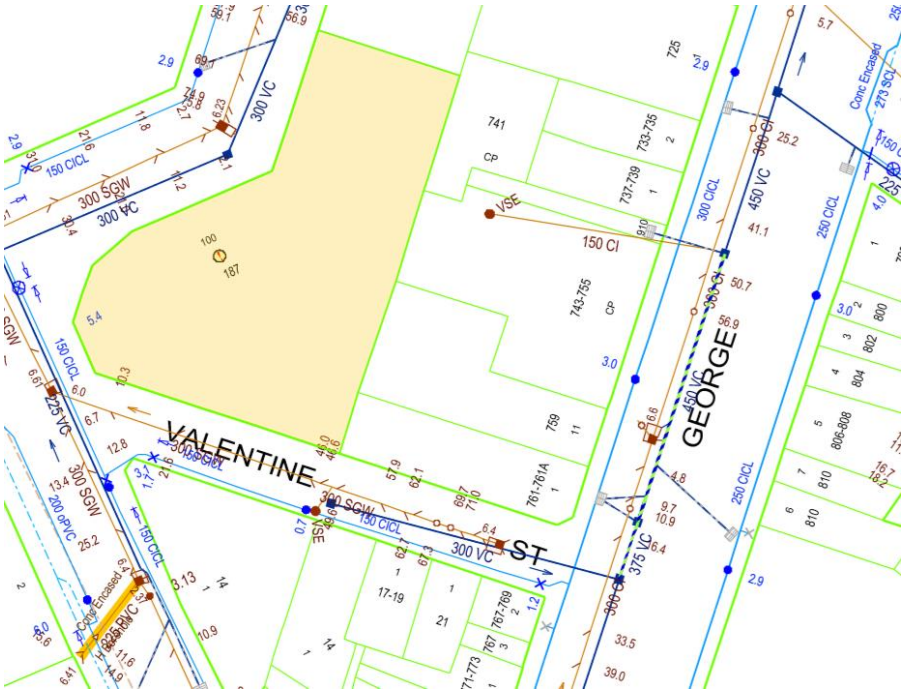


Figure 5.3.1: Sydney Water Dial Before You Dig information

We propose that a Sydney Water Coordinator is engaged during early stages of the project and that a Feasibility Section 73 application is submitted as soon as possible.

Sydney Water will review the capacities of the existing Water connections and will provide a feedback and directions on the connection location.

Feasibility Section 73 is a pre DA application that will result with a NOR (Notice of Requirements), a document that will confirm the Infrastructure capacities around the site and provide better design directions before the DA lodgement.

NOR will also provide more information about the Infrastructure capacities for Fire Water Connection which will precisely define Fire services spatial requirement (Fire Tank capacity).

5.3.2 Sewer Connection

Figure 5.3.2: Sydney Water Dial Before You Dig information – Sewer (highlighted in Yellow)

There are Sydney Water Sewer mains reticulating in front of the building through George Street and Valentine street. The exact connection point will be confirmed during the Feasibility Section 73 process with Sydney Water, however we propose that the sewer connection design should be focused to locate the sewer connection vis a boundary trap located in the Loading dock entrance.

5.3.3 Gas Connection

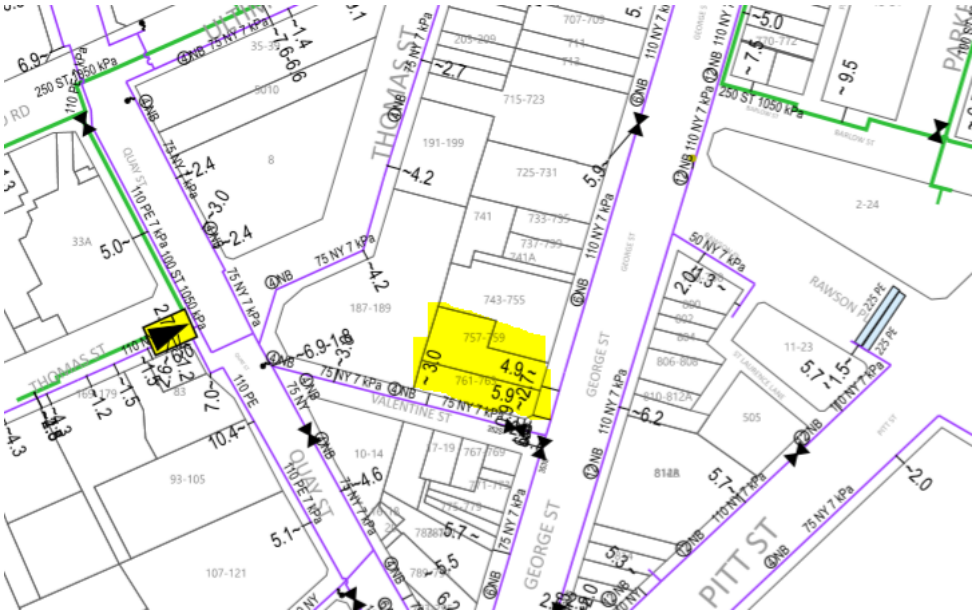


Figure 5.3.3: Jemena Dial Before You Dig information – Gas Infrastructure

There are two 7 kPa Jemena Gas mains reticulating in front of the building through George Street and Valentine street. The exact connection point will be confirmed during the planning stage with Jemena, however we propose that the Gas connection design should be focused to locate the connection via boundary regulator located next to the Loading dock entrance.

We would like to highlight that anticipated Gas requirement should be projected by the design team and Jemena engineers should be asked to review the requested loads and to provide a feedback on the possibility to connect to the 7 kPa main or to advise on potential infrastructure upgrade requirements.

5.4 Sanitary Drainage System

Generally, the building sewer drainage system will gravitate towards the authority sewer branch installed to the authority sewer main. The new sewer connection shall be complete with boundary trap and reflux valve.

Sewer collection pits with dual pump out system shall be provided to collect the discharge from any lower level fixtures which are unable to gravitate to the sewer main.

Sewer system will consist of:

- Horizontal branches gravity draining individual fixtures and reticulating towards sewer stacks
- Sewer stack system
- Code compliant sewer venting system
- Sewer connection to the Authority main
- Sewer lines draining fixtures located below the level where gravity drainage is technically feasible
- Sewer pumping system

Sewer stack and venting systems used will be designed in the way to increase the functionality and to reduce the spatial requirements.

The sewer drainage system shall be acoustically treated where pipework passes over or through noise sensitive areas. All shall be in accordance with the acoustic engineers' requirements.

Drainage outlets and tundishes will be provided for mechanical condensate drainage and shall discharge to the sanitary plumbing via trapped connections. Where trap seals on floor drains are required, the traps are maintained via fixture and/or equipment connections to the trap riser. In areas where fixtures and/or equipment cannot be connected to provide a suitable method of priming, an automated trap priming device will be incorporated. These devices discharge a small volume of water at regular intervals to maintain the trap seals and prevent odours escaping from the drain into the building.

5.5 Trade Waste Drainage System

The treatment of the wastewater from food outlets should be designed according to Sydney Water "Plumbing for retail food businesses" manual approved by Sydney Water.

If hot food is cooked or served, the client must have a grease trap (grease arrestor/separator) and a trade waste agreement with Sydney Water. Wastewater from food preparation areas, floor wastes, kitchen sinks, dishwashers and garbage areas should all flow to the grease arrestor.

Grease arrestors must be at least 1,000 litres, because this is the minimum size to capture grease efficiently. The maximum size is 5,000 litres to ensure ease of pump outs and clean outs. If more capacity is required to serve the site, more units should be provided.

The trade waste drainage for the project shall collect greasy waste effluent from Kitchen areas to discharge by gravity to grease arrestor system located in the Basement.

Grease arrestors will be installed in the separate room. Above Ground types of GA's should be provided.

Provision of greasy waste suction lines will be incorporated on Ground floor for pumping out and ongoing maintenance.

5.6 Stormwater Drainage System

The stormwater drainage system will consist of collection of all rainwater from the site.

Two fundamentally different rainwater systems will be provided:

- Rainwater drainage of Balcony Drains and all pedestrian (trafficable) areas will be reticulated towards the site Stormwater collection point
- Roof rainwater from non-trafficable areas will reticulate towards Rain water harvesting tank. Water from the tank will be treated and reused for Irrigation and toilet flushing.

If possible, both systems will be designed as Siphonic drainage which will reduce the number of required downpipes and will increase flexibility and spatial planning, especially bringing benefits with reduced requirements for basement head high clearances required for the horizontal reticulation towards the harvesting tank.

The downpipe system will be acoustically treated where required in keeping with standard acoustic treatment specified by the acoustic consultant.

5.7 Rainwater Collection and Reuse System

The Rainwater collection system shall collect the rainwater from the roof level outlets and gutters and transfer it to a rainwater storage tank located in the Basement. Rainwater harvesting plant will be in the basement next to the rain harvesting tank.

Rain water harvesting tank should be located on the level where gravity overflow system is achievable.

In situ concrete or Panel tank can be used for both rainwater harvesting and potable water storage tanks.

Collected rainwater shall be pre-treated and reticulated throughout the building for the following uses:

- Irrigation
- Toilet flushing
- Cooling tower make-up
- Urinals

5.8 Potable Cold Water System

Generally, the domestic cold water supply to the building shall be fed via a new 150mm diameter water supply tapping from a precinct water main (noting that currently details of this have not yet been finalised). The domestic water supply tapping shall extend to the water meter located at Ground level and be fitted with meter assembly and backflow preventer to comply with AS3500 and Sydney Water requirements.

Domestic cold water supply will be extended to the domestic water pumpset, located in the Basement plant room. Domestic cold water is then pressurised and reticulated to cold water storage tank located on the roof plant area. This will then be pressurised and reticulated to supply the centralised domestic hot water system as well as all fixtures, fittings and outlets throughout the building as required.

An authority meter is to be provided for the building. Private water meters connected to the BMS are to be installed on all major water uses in accordance with ESD/NABER's requirements including

- Base building;
- Landscaping;
- Mechanical Plant and Equipment; and
- Domestic Hot Water Plant
- Recycled Water top up feed

5.9 Stormwater Drainage Hotel Suites Upgrade

Domestic hot water for the development will be via central rooftop plant level water system and will utilise flow and return reticulation. Domestic hot water supply will be extended from the central hot water system to all fixtures in accordance with AS3500. Temperature control will be provided in accordance with AS3500 requirements.

Consideration to be given to the location of the pipe work in relation to access for maintenance, as well as the existing building form.

Hot water will be recirculated at a 60°C with maximum allowed temperature drop of 5 degrees before connecting to the temperature control device. Domestic hot water supply will be extended from the hot water systems to all fixtures in accordance with AS3500. Temperature control will be provided to suit

personal hygiene fixtures not exceeding 45°C as nominated in AS 3500. Circulation pump velocities shall limit return line velocities to be between 0.5-0.9m/s whilst maintaining the required minimum temperature drop.

All dead legs greater than 10m in length should be avoided.

5.10 Natural gas System

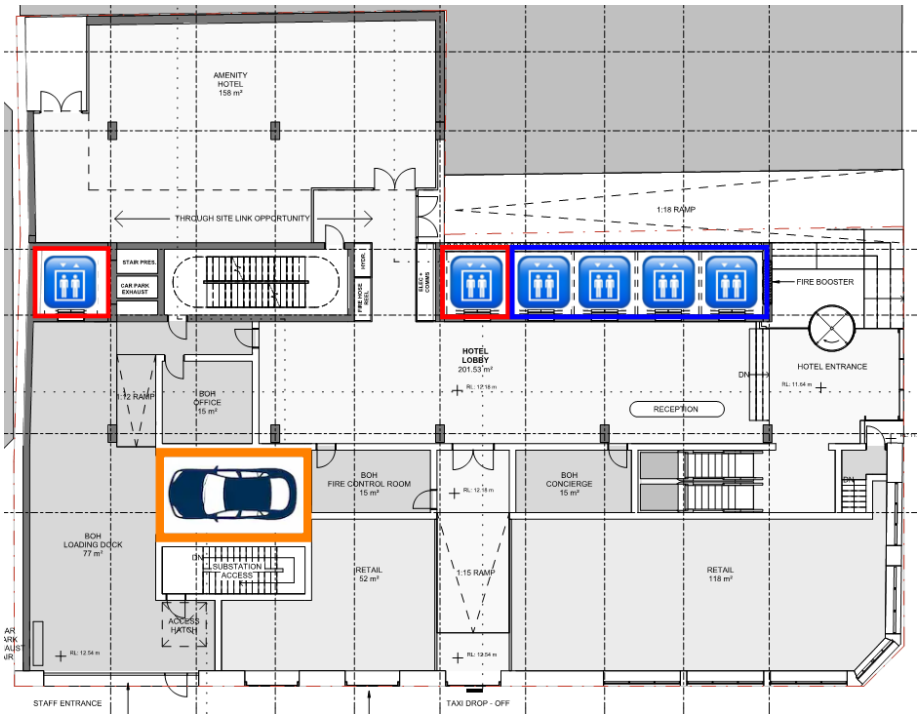
A gas line is to be connected to the existing Jemena main. This will reticulate to the building gas meter room located on the street level. All tappings, meters, sleeves and manifolds are required to be installed by the Gas Network Authority. The gas boundary/meter room shall be ventilated to comply with AS5601, Jemena, and Department of Fair-Trading requirements. Natural gas will then be reticulated from the meter outlet to each appliance and area requiring gas. Gas pipework shall be installed within a fire rated riser with access panels on each level.

5.11 Sanitary Fixtures, Taps and Faucets

Selection of fixtures will be in accordance with the architectural fixture schedule and the Sustainability design requirements.

6 Vertical Transport

6.1 General



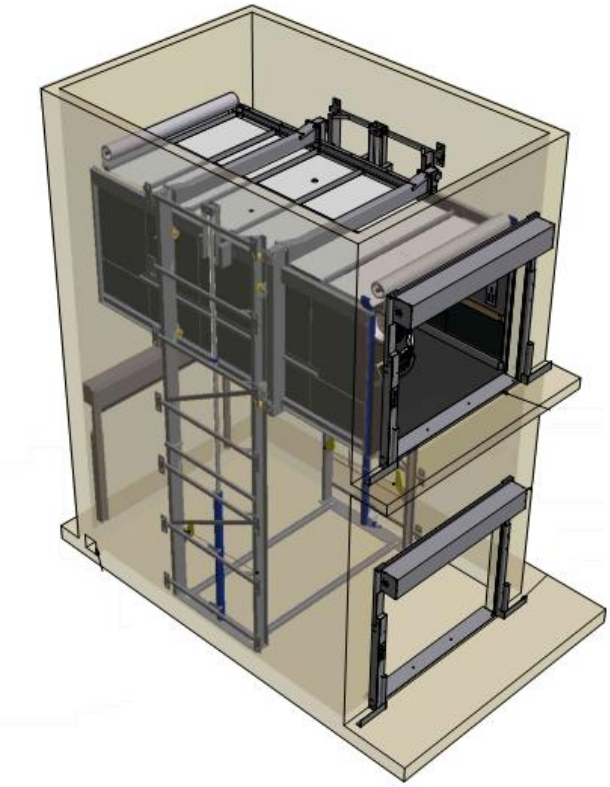
Ground Floor

6.1.1 Lifts

The lift services to be designed shall be six (6) gearless traction lifts without machine rooms (MRL), these lifts shall be BCA complying electric passenger lifts installed to AS1735.1 and AS1735.12 for DDA accessibility, and one (1) electrohydraulic vehicle hoist, the below images detail the typical arrangement for component layout in model design.

- Lift system shall feature the latest design and safety innovations
- Smooth, quiet operation with variable voltage variable frequency (VVVF) AC drive technology
- Sustainable design features including low energy LED lighting, automatic car lighting, ventilation control, signalization dimming and standby mode
- Emergency backup power systems in the event of mains power failure.
- Quality assured with professional life cycle maintenance.

Typical MRL Model Design



Typical Vehicle Hoist Model Design

6.2 Codes and Standards

The installation shall comply with the National Construction Code requirements and relevant Australian Standards, the documents referenced therein, and relevant rules, regulations and by-laws of State, Federal and Local Authorities;

Australian Standards	Lifts, Escalators and Moving Walks	AS 1735
	General Requirements	AS 1735.1
	Escalators and Moving Walks	AS1735.5
	Fire-rated landing doors	AS 1735.11
	Facilities for persons with disabilities	AS 1735.12
	Cranes, hoists & winches	AS1418
	Special purpose appliances	AS1418.8
	Guidelines for Safe Working on New Lift Installations in New Constructions Building Code of Australia	AS 4431
	Design for Access and Mobility; Part Two: Enhanced and Additional Requirements – Buildings and Facilities	AS 1428.2

	Ventilation and Air-conditioning in Buildings – Fire and Smoke Control	AS 1668.1
	Acceptable Ventilation Guidelines	AS1668.2
	Fire detection, warning, control and intercom systems - System design, installation and commissioning - Sound systems and intercom systems for emergency purposes	AS1670.4
	Fixed platforms, walkways, stairways and ladders - Design, construction and installation	AS1657
	Earthquake actions in Australia	AS1170.4
	Electrical Installations (known as the Australian/New Zealand Wiring Rules). Wiring requirements for lift installations	AS/NZ 3000
	Electrical Installations – Selection of Cables – Cable sizes for lift installations	AS/NZ 3008
	Passenger lifts and service lifts - Guide rails for lift cars and counterweights	ISO 7465
	Quality Systems	ISO 9001
Authorities	National Construction Code *(NCC)* 2019 Amendment 1	
	SafeWork NSW	

6.3 Design Features

The table below details some of the key design features that shall be included in the vertical transportation systems specific to requirement;

Passenger and passenger goods lifts Complying too AS1735.1-2016 Lifts escalators and moving walks - General requirements.

Passenger Lifts – 18 Person
Passenger Goods Lifts – 26 Person

Passenger Lifts – 1350 Kg
Passenger Goods Lifts – 2000 Kg
Vehicle Hoist – 3000 Kg

Passenger Lifts – 3.50 m/s
Passenger Goods Lifts – 1.00 m/s & 2.50 m/s
Vehicle Hoist – 0.15 m/s

Compliant with all relevant authorities & standards including but not limited to the National Construction Code / Building Code of Australia and Australian Standard AS1735: Lifts, Escalators & Moving Walks.

Latest industry standard technological innovations.

Energy efficient permanent magnet (PM) motors with variable voltage variable frequency (VVVF) AC drives, low energy LED lighting, automatic car lighting, ventilation control, signalisation dimming and standby modes.

Proven reliability and serviceability under the anticipated traffic loads and environment with quality assured professional life cycle maintenance.

Designed for optimised occupant circulation and utilisation within the built environment with destination control and collective control systems for dispatch

Enabled facilities for persons with disabilities and in compliance with the Disability - Access to Premises — Buildings - Standards 2010.

Spatially provisioned for BCA complying stretcher carrying facility.

Interface & integration with building signal systems *(comms, media, DAS etc…….)* where required.

Tactile interfaces in the lift cars and on the landing levels to assist visually impaired passengers.

Visual signalisation in the lift cars and on the landing levels to assist impaired passengers.

Audible announcement in the lift cars and on the landing levels to assist impaired passengers.

Fire service control operation in the lift cars and main lobby level recall function.

Emergency Lifts 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.

Emergency alarm with two-way communication system installed in each lift car.

Emergency battery backup power systems for safe egress from the lift in the event of mains power failure.

Provision for interfacing to the building security system from within the lift cars and on the hall landings for lift access control

Provision for CCTV monitoring from within the lift cars where required.

Provision for real time monitoring of lift system operational status where required.

Lift finishes specified fit for purpose, durable and of hardwearing quality with aesthetic appeal selected from the manufacturers standard range or architecturally specified for approval by authority.

Where lifts are to be utilised for material handling, finishes shall be specified fit for purpose, robust, durable and of hardwearing quality.

Where lifts are to be utilised for material handling they shall be duty rated with capacity for the loading forces of the material and handling device to be loaded onto the platform of the lift car.

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