

DESIGN BRIEF



Building Services

UNIVERSITY AVE / MARCUS CLARK
Bulum Group

CONFIDENTIAL

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1 INTRODUCTION

1.1 Purpose

Norman Disney & Young has been engaged by Bulum Group to undertake the development approval advice of the Mechanical, Electrical, Communications, Fire Protection and Hydraulics services for the University Ave / Marcus Clark residential project.

The purpose of this document is to highlight the Design Brief for this project. Included is a description of the Mechanical, Electrical, Communications, Fire Protection and Hydraulics systems required for the building.

This design brief is intended to be a dynamic document, which is upgraded through the Schematic Design and Design Development phases, and if necessary, through the Documentation and Construction phases. It is intended the brief will be made available to all stakeholders in the project, including the Management, Design, Construction and Marketing teams. All parties are encouraged to review the brief in detail. They should question and satisfy themselves as to the appropriateness of the services defined in the brief and provide feedback to NDY, as appropriate.

1.2 Authority

Authority to undertake this brief was provided by Peter Morley of Bulum Group.

1.3 Information Sources

The report is based upon the following information:

- Architectural drawing set from KUD Architecture
- Project meetings

1.4 Revision History

Revision	Date Issued	Comment
1.0	14 October 2022	Preliminary Issue for Comment



2 MECHANICAL SERVICES

2.1 General

This section outlines proposed Mechanical Services for the residential and commercial complex.

2.1.1 Residential

The mechanical services are based on the following air conditioning/ventilation strategy

- Natural outside air ventilation to the apartments (to be documented by the Architect)
- Individual air cooled reverse cycle split air conditioning system for each apartment, with outdoor units located on the roof and basement carpark.
- All apartment kitchens to be supplied with ducted range hoods to the façade (range hood by builder)
- Apartment toilets, laundries and ensuites will have individual exhaust systems per apartment
- Cold shell for the fitout of retail spaces. Along with the respective outdoor unit for retail tenancies. It is proposed to provide an air conditioning strategy will allow installation to be delayed until fitout.
- Kitchens serving the ground floor retail space will have exhaust provisions in place. Final design and installation by tenant.
- Ventilation to the following areas:
 - Basement car park
 - Residential waste
 - Plantrooms

2.2 Design Criteria

The below design criteria are based on initial discussions with the client as well as industry standards for similar spaces:

2.2.1 Residential

Item	Design Criteria	
Ambient Conditions	Summer	34.3°C dry bulb/19.6°C wet bulb
	Winter	-2.2°C dry bulb



Internal Conditions	Cooling 24°C dry bulb Heating 21°C dry bulb Design Tolerance ±2.5°C dry bulb adjacent temperature sensor Design Set Point 22.5°C dry bulb There is no direct humidity control provided, however dehumidification is provided as part of the cooling process The internal conditions noted are after the air conditioning system has stabilized the room condition after starting up.
Internal Heat Gains	Kitchen and living areas in apartments: Lighting and equipment load: 350 watts Apartment bedrooms: Lighting and equipment load: 5 watts/sqm People load in general: Sensible: 80 watts/person Latent: 60 watts/person
Occupant Density	Two people per main bedroom One person per minor bedroom Living area population taken as the sum of all the bedrooms.
Outside Air	Apartments will be naturally ventilated. No smoking allowed in all areas. Doors and windows are assumed to be operable and closed when air-conditioning unit will be in operation.
Apartment Kitchens	All range hoods to be ducted to outside.
Toilet Exhaust	To AS 1668.2 2012. Generally individual systems per townhouse ducted to the unit facade.
Air Distribution	Direct blow via ceiling or wall mounted registers.
Noise Levels	To be confirmed by Acoustic Consultant
Facade	The façade will be detailed in the architectural component work and is understood to be compliant with current BCA requirements. • Maximum vision panel: TBC



	• Maximum shade coefficient: TBC (recommend SC < 0.35) • Double glazing throughout (pending extent and shading of glazed elements) • Light coloured Venetian blinds closed on sunlit facades or similar (e.g., closed weave light coloured fabric curtains)
Applicable Standards	Key standards governing Mechanical Services design include: • Building Code of Australia National Construction Code • AS/NZS 1668.1 2015 • AS/NZS 1668.2 2012

2.3 Systems Descriptions

2.3.1 Apartment Air Conditioning Systems

Individual air cooled VRF air conditioning units will be provided to each apartment. The outdoor units will be located on the roof and basement carpark of the building. Each apartment will have ducted indoor units, with the air distributed to the living space and subsequent bedrooms. Other areas of the apartment (multi-purpose rooms, toilets, laundries etc) are not proposed to be air conditioned. All units will be controlled via a wall mounted controller.

Refrigeration piping from the indoor unit to the outdoor unit and all cabling is to be concealed within bulkheads, walls, risers or ceiling cut outs (to be documented by the Architect).

Reversible summer/winter ceiling fans to be included subject to ESD analysis.

2.3.2 Range Hood Exhaust

Kitchen areas within apartments will be provided with range hoods. Hoods will be ducted to the outside via the facade. The range hoods will have approved filters which will be included in the kitchen appliance package (specified by others).

Range hood exhaust will be controlled either by a hood controller or a local switch located near the stove (on a wall).

2.3.3 Residential Toilet/Laundry/En-suites Exhaust

Individual apartment toilets, laundries and en-suites will have (per apartment) exhaust systems ducted to the discharge point on the facade. The toilet & ensuite exhaust systems will utilise the fans included in the tastic appliance packages (specified by others)

Toilet exhaust will be controlled manually by a local switch, adjacent to the light switch.

2.3.4 Retail Tenancies

Retail tenancies will be provided as a cold shell. Air-conditioning units will be sized during the tenancy fitout stage of the project to match specific requirements. Provision for outside air is proposed via external louvres incorporated into design.

Exhaust systems for commercial kitchens (including hoods, ductwork, filtration systems, fan, etc) where required will need to be provided by the tenant. The tenant kitchen exhaust system will include provision for



exhaust to either riser through the building and discharge at the roof level or to discharge through the façade at ground level at nominated exhaust points.

All tenant kitchen systems shall be provided with appropriate filtration systems to allow for discharge as per AS1668.2:2012 allowances. Make-up air to kitchen exhaust will be provided through the façade with appropriate separation from any exhaust points as per AS 1668.2:2012.

2.3.5 Basement Carpark

Basement car parks are proposed to be mechanically ventilated. Exhaust from basement car parks will be discharged at ground level. Computational fluid dynamics (CFD) modelling is not expected to be required at this stage.

2.3.6 Residential Waste Room Exhaust

Waste areas are proposed to be mechanically ventilated as required under AS1668.2

2.3.7 Electrical for Mechanical

Electrical power for mechanical services within apartments will be provided from the tenant electrical services provision point.

2.3.8 Stair Pressurization

Each fire stair will be provided with a stair pressurization system. The system will be designed in line with the requirements of the NCC and AS 1668. The system will comprise of suitably sized supply fan, relief fan, motorized dampers, sub ducts and ductwork. The stair pressurization systems are separated and dedicated to the basement levels and the apartment levels.

2.3.9 Smoke Management

Smoke management systems due to size and functionality of the proposed development are believed not to be required at this stage. The building is proposed to be shutdown in fire mode with carpark exhaust systems set to run to destruction.

2.3.10 Controls

It is proposed all apartment A/C units are controlled via local wall mounted proprietary controller.

Building ventilation systems (Car Park, Waste Room, toilet exhaust) are proposed to be controlled via local controller. Location of the controller is to be agreed in the next stage of the project.

Air conditioning systems associated with commercial and retail tenants are proposed to be controlled via local controller within specific tenant space.



3 HYDRAULIC SERVICES

3.1 General

The Hydraulic Services will comprise of the following major items

Inclusion

- Sewer drainage and sanitary plumbing system.
- Tenancy waste points for future connection of tenant facilities.
- Greasy waste points for future tenant connection.
- Provision of grease traps to serve food retail areas.
- Domestic cold-water supply and distribution systems utilising pumping systems
- Domestic hot water reticulation within individual apartments.
- Cold water valved branches for future connection of tenant facilities.
- Rainwater harvesting pump.
- Non-potable cold-water supply from rainwater tank to fixtures based on ESD report.
- Sizing of downpipes and roof drainage.
- Provision of water supply points for landscape irrigation (by others) on building roofs and balconies.

Exclusions

- Black or Grey water treatment.
- Connection to the Authority water supply and drainage assets.
- Basement Subsoil drainage, stormwater drainage and stormwater pump out.
- Stormwater detention
- Stormwater filtration
- Rainwater tank
- Inground stormwater pipes including pipes from downpipes to rainwater tank.
- Landscape irrigation and drainage. Refer to Specialist Consultant.
- Acoustics. Refer to Specialist Consultant.
- Authority sewer infrastructure. Refer to the Civil Consultant's documentation.
- Gross pollutant traps and retention tanks. Refer to the Civil Consultant.

3.2 Design Criteria

Item	Design Criteria
Sanitary Plumbing	• In accordance with AS/NZS 3500 • Authority requirements • Retail Tenancies - Provision of waste points
Sewer Drainage	• In accordance with AS/NZS 3500.2 • Authority requirements
Trade Waste	• In accordance with AS/NZS 3500.2 • Local Authority requirements • Food Tenancies - Provision of greasy waste and vent points
Domestic Cold Water	• In accordance with AS/NZS 3500.1 and The Institute of Plumbing Australia "Selection and Sizing of Copper Tubes for Water Piping Systems" • Pressure range between 250 kPa - 500 kPa • Food/Retail Tenancies - Provision of valved branch points • Authority requirements
Domestic Hot Water	• In accordance with AS/NZS 3500.4 and The Institute of



	Plumbing Australia - "Selection and Sizing of Copper Tubes for Water Piping Systems" • Authority requirements • Pressure range between 250 kPa - 500 kPa. • Instantaneous Hot Water Heater
Roof Drainage	• In accordance with AS/NZS 3500.3. • Local authority requirements.
Rainwater Reuse	• In accordance with AS/NZS 3500.1. • Local authority requirements • Sustainability consultant report

3.3 Systems

3.3.1 Domestic Cold Water

The domestic cold water service for Building A & B will be connected to an extension of the existing Authority supply within the adjacent Marcus Clarke Street.

At the property boundary, the incoming Authority supply will divide to provide separate valved branches for the hydrant, fire sprinkler (as applicable) and domestic services, be metered and protected from cross contamination/connection by fitting the appropriate level of back flow prevention device.

Backflow prevention devices will be fitted where applicable throughout the system to ensure cross contamination/connection of the potable water system is eliminated.

The fire hydrant/fire sprinkler service (as applicable) will be left terminated with sealed Table "E" flanges for extension by the Fire Protection Contractor.

The incoming domestic water supply will extend to fixtures and fittings within the property and will reticulate under mains pressure to supply all taps, outlets, appliances and other associated services requirements. Where design pressures are unable to be obtained a duplex inline pressurisation pump system will be installed to boost reticulation system to meet design pressures.

Pressure limiting valves and isolation valves shall be installed at each level on all branch off takes to maintain a minimum delivery pressure of 250 kPa with a 500 kPa maximum and shall be provided with localized isolation at each floor level and at apartments.

Isolation valves will be installed throughout to provide independent isolation of all buildings and floor levels including specialist areas.

Tenancy valved branches (25 mm diameter to food tenancies and 20 mm diameter to retail tenancies) will be provided at high level above sealed waste points.

All reticulation pipework will be designed ensure it is free to absorb any expansion or contraction within the system.



3.3.2 Domestic Hot Water System

Domestic hot water for the apartments will be provided by electric instant hot water heaters installed in each apartment. Domestic hot water for the retail/commercial tenancies will be provided by electric instant hot water heaters installed by the tenant.

3.3.3 Sewer Drainage

The sewer drainage system will accept discharge from the sanitary plumbing system and connect to an extension of the existing Authority sewer reticulation system at the property boundary (to be designed by others).

Fixtures, fittings and appliances located below the connection level shall discharge to sewerage wet well located within the basement and the sewage shall then in turn be pumped back up and connect into the gravity drainage system before connecting into Authority sewer.

The wet well system shall be provided with duplex submersible pumps and automatic level controllers.

3.3.4 Sanitary Plumbing

The sanitary plumbing system within the building A & B will connect all sanitary fittings, fixtures and appliances and discharge via graded waste pipes to vertical stacks, dropping throughout the building and connecting to sewer main running through easement via separate connection.

Venting to stacks and waste pipes shall be provided to maintain fixture trap seals and adequate flow throughout the systems. The systems will be maintained independently until combining within a common drainage system below the ground floor level.

Air admittance valves (AAV's) and or hard piped venting (where applicable) will be provided to all fixtures and fittings.

Provision shall be made for one 100 mm diameter sealed waste point in each tenancy.

Tundishes are to be provided to service mechanical plant condensate drains.

3.3.5 Trade Waste

A greasy drainage, waste and vent system including grease interceptor trap (1000 litre effective capacity per commercial tenancy) will be provided to serve the commercial food tenancy kitchens and food preparation areas. Provision will be made to facilitate the hygienic removal and disposal of the grease from the grease interceptor traps.

Provision shall be made for one 100 mm diameter sealed greasy waste point in each food tenancy.

Silt traps will be provided in areas such as bin wash and equipment cleaning and car park floor drains.

Wastes emanating from greasy sources (restaurant kitchen fixtures/fittings and garbage areas) will discharge to the sewer via grease interceptor traps.

3.3.6 Fixtures and Fittings



All fixtures and appliances throughout the building will be of a high to premium grade quality. All fittings will be of a minimum AAA rating and will incorporate water flow restrictors to control usage and reduce water consumption.

Selections will be determined in conjunction with the Architect and the Client.

3.3.7 Stormwater Drainage

The stormwater drainage and downpipe system will be designed for a minimum 100-year ARI. Stormwater will gravitate from Roof to the ground floor and discharge to a stormwater drainage system provided by the civil trades.

Balcony drainage will be provided by the installation of a 50 mm pipe connected to downpipes. Basement drainage and sub soil drainage will discharge to the stormwater system via a pumped system.

3.3.8 Landscape Irrigation & Drainage

Provision of 25 mm valved branch complete with backflow prevention device will be provided for extension by the Landscape Irrigation Contractor.

Landscape drainage provisions - refer to Civil Consultant's documentation.

3.3.9 Acoustics

All hydraulic systems, plant and equipment will be acoustically treated to meet the Acoustic Consultant's recommendations.

3.3.10 Rainwater Reuse

Rainwater reuse pumpset including the bag filter/back wash/UV filter to be documented for provision of non-potable recycle water to irrigation and toilet flushing.



4 ELECTRICAL SERVICES

4.1 General

This section outlines the electrical services for the proposed residential and commercial complex.

The Electrical Services will comprise of the following:

- One (1) Chamber Substation
- Main Switchboard
- Metering
- Power reticulation
- Distribution switchboards
- Distribution load centres for apartments
- General lighting and power
- Emergency and exit lighting
- No generator back up of systems
- Lightning protection
- Cable reticulation

4.2 Design Criteria

Item	Design Criteria
Substation	One Transformer within a new Chamber Substation within the building footprint on ground floor. Evoenergy to confirm size of transformer
Main Switch Room	Single main switchboard (MSB) for all buildings, located on Basement 1. Supply to MSB is via new incoming mains from a new substation within building on ground level.
Electricity Metering	Individual meters for each apartment through metering panels located within the electrical cupboard of each floor. Individual meters for each retail space through metering panels located within Basement 1. Single authority meter for the house services (body corporate) including basement car park, located on Main Switchboard.
Riser Space	Space provision in riser on each apartment level for rising mains and distribution boards.



Loads	Service / Back of House Areas – 50VA/m². Lobbies and Lounge Areas - 70 VA/m². Underground carparks – 20VA/m². Circulation Corridors and common areas – 25VA/m². Apartments – minimum 63 Amp three phase supply to each apartment load centre. Retail Space (General) – 100VA/m². Retail Space (Food & Beverage) – 200 Amp three phase supply to each retail space distribution board.
Socket Outlet Installation	Apartments – to suit apartment layout Tenancies – by tenant Carparks – lockable to facilitate cleaning and maintenance Common Corridors – to facilitate cleaning and maintenance
Distribution Switchboards	All light and power distribution switchboards shall be sized to incorporate 20% spare capacity. House distribution boards for apartments to provide power supply to house services such as corridor lighting.
EV Charging	The provision of EV charging outlets at 2 allocated parking bays which are separately metered to the user.
Water Heaters	Individual three phase hot water systems, one per apartment
Basement Cable Support System	Provide cable support system at basement carpark for power, data cable reticulation
Lighting Levels	Car park - lighting to comply with AS/NZS 1680 utilising LED Batten luminaries to obtain a minimum of 40 lux. 800 lux for underground carpark entrance during daytime, adaptable to 160 lux for night-time Apartments – to be coordinated with architects Common Corridors – 80 lux Stairwells – 80 lux External lighting: Detailed external lighting schemes incorporating feature requirements to be coordinated with Architect Lighting throughout common areas and apartments/townhouses to be 3000K CCT (Corelated Colour Temperature).



	External lighting to be maximum of 2700K.
Applicable Standards	Key standards governing Electrical Services design include: • National Construction Code (NCC) 2019 • AS/NZS 3000 – Electrical Installation • AS/NZS 3008.1.1 – Electrical Installation – Selection of Cables • AS/NZS 1680 – Interior Lighting • AS/NZS 2293 – Emergency Escape Lighting & Exit Signs for Buildings • AS/NZS 1768 – Lightning Protection • AS/NZS 1158 – Lighting for roads and public spaces • AS/NZS 4282 – Control of the obtrusive effects of outdoor lighting All other codes and standards required by the above

4.3 Systems

4.3.1 Incoming Electrical Supply

The incoming electrical supply to the building will originate from the high voltage underground reticulation network of the local distribution company.

One new HV chamber substations is proposed to be installed by Evoenergy to supply the residential buildings subject to negotiations with Evoenergy.

4.3.2 Substation

One new chamber substation to be installed to supply the building, subject to negotiations with Evoenergy.

Existing chamber substation to be decommissioned. To be negotiated with Evoenergy.

4.3.3 Main Switchboard

A main switch board will be provided within Basement 1, to be located within a main switch room.

There will be a combined switchboard for the apartments, retail spaces and house services. It will be unmetered for apartment and retail space sections and metered for the house service (all common corridors, carparks, and lifts) section.

The main switchboard is to be supplied from a new substation.

The main switchboards will be minimum form 3B construction.

Load current and fault current ratings will be sized for the maximum substation capacity.

The main switchboards will be provided with unequipped mountings to cater for 20% additional future controls.



The main switchboards will be fitted with surge protection units with capacity for power factor correction equipment.

4.3.4 Submains

Submains reticulation will be provided from main switchboards to lifts, mechanical switchboards, meter panels, and house distribution boards.

Reticulation to individual apartments is provided from metering panels located within the electrical cupboard of each floor.

Reticulation to retail spaces is provided from metering panels located within Basement 1.

Fire rated cables supported by fire rated cable trays shall be installed where required by AS3000 to support fire rated safety services cabling. All other cabling shall be non-fired rated and supported by non-fire rated cable support systems.

All submains will be sized to comply with regulatory requirements for voltage drop and safety disconnection times.

4.3.5 Distribution Boards

Electrical house distribution boards (DB's) shall be installed on ground floor and each level of the apartments.

DB's to be installed on basement level to supply general lighting and power and plant requirements on basement levels.

Individual load centres shall be provided in each apartment for final circuit distribution.

All electrical DB's shall incorporate separate light and power sections and metering.

Separate supplies from MSB shall be provided for distribution boards which are to be installed by others and include but may not be limited to Mechanical Services Switchboards, Lifts, Hydraulic control panels, etc.

Spare space of 20% shall be provided on each DB to allow additional circuits to be run in the future if required.

Local DB's shall be Form 1 and will incorporate private metering as nominated above.

4.3.6 Electricity Metering

Electricity meters for body corporate services – such as lifts, common area lighting, and power and carpark ventilation – will be provided at the meter panel area in the main switchboard.

Meters for apartments will be provided at the meter panels located within the electrical cupboard of each floor. Upstream of these metering panels is unmetered to simplify electrical distribution.

Meters for retail spaces will be provided at the meter panels located within Basement 1. Upstream of these metering panels is unmetered to simplify electrical distribution.

4.3.7 Artificial Lighting – General Areas

Lighting in common spaces to be controlled by motion detectors.

Lighting in plant rooms will be controlled by motion detectors and manual override switches.



External lighting for communal garden will be provided. Supplementary lighting may also be provided near entrance ways. External lighting will be controlled by photoelectric cells. Luminaires will be selected based on maximum efficiency, ease of maintenance and compliance with the cost plan.

Luminaires will be selected based on maximum efficiency, ease of maintenance and compliance with the cost plan, and appropriate environmental and vandalism protection. LED luminaires will be selected.

Selected luminaires throughout the installation will be connected to 24-hour circuits to provide security access lighting, particularly surrounding fire stairs.

Any architectural lighting shall be selected and designed in coordination with project architect.

Manual switching will be provided to services areas and plant rooms.

Carpark lighting shall be controlled via motion sensors with percentage of 24-hour lights provided for security lighting.

4.3.8 Emergency Evacuation Lighting

The emergency lighting system will comply with Australian Standard AS/NZS 2293 and building Regulations and will include emergency lights and illuminated exit signs.

A self-contained type of emergency and exit system is proposed for the building.

Exit signs are proposed to utilise LED lamps for efficiency and long service life.

Emergency lighting in carpark and stairwell areas will be integrated into the general lighting scheme through combined-maintained luminaires, with finishes to match surrounding fittings. In areas such as lobbies and corridor area, emergency lighting will utilise minimal spitfire type recessed luminaires.

Emergency lighting test switches will be provided at the house distribution boards.

4.3.9 Apartment Fitout

Light switches will incorporate simple dimming functions. There is no provision to install automatic lighting control.

Lighting schemes are to be determined in coordination with architectural preference.

Socket outlets will be provided for dishwasher, refrigerator, microwave, washing machine and clothes dryer.

All lighting and socket outlet circuits in apartments will be RCD protected.

4.3.10 Permanently Connected Equipment

Wiring will be provided to all items of permanently connected equipment, eg. auto doors, fans, pumps, etc.

In apartments, wiring will be provided to ovens, range hoods, air conditioners and bathroom exhaust fans.

4.3.11 Wiring

Wiring between switchboards and outlets will be installed over defined routes in false ceiling spaces and drop down within walls, cavities, and partitions to switch and outlet positions.

Large groups of cables will be installed on cable trays, wiring ducts or cable ladders and small groups will be secured to catenary wires.

In areas without false ceilings, e.g., carpark and plantrooms, wiring conduits will be cast in the concrete slab where practical or installed within surface conduits and wiring ducts.



Cable management strategies will be developed in association with wiring for other disciplines, e.g., communications, fire alarms and the structural features of the building.

Dedicated risers shall be provided for electrical services cabling between all floors.

4.3.12 Lightning Protection

Following an assessment, a lightning protection system will be required for the proposed. Details of the system will be developed in the design phase.

Lightning protection for the buildings will comply with Australian standard AS/NZS 1768.

4.3.13 Electric Vehicle Charging

NDY understands that the development is looking to include 2 off electric chargers for this development. The details of EV charging to be confirmed later in the design phase.

4.4 Items to be Resolved

- Substation location to be confirmed with architect and Evoenergy.
- External Lighting to be confirmed with landscape architect.



5 COMMUNICATION SERVICES

5.1 General

The Communication Services for the residential and commercial complex will comprise:

- Connection to incoming carrier services and housing of carrier services in the dedicated communications room.
- Capacity to meet requirements for NBN Fibre Distribution Hubs in communications rooms, and risers to suit NBN Floor Collection Boxes.
- Fibre reticulation to apartments to NBN requirements.
- Network Termination Device (NTD) to be provided in each commercial tenancy.
- Roof-top MATV head end on top of building with distribution to all required outlets.
- Quantity of MATV outlets per apartment to be resolved.
- Video Intercom to each apartment.

5.2 Design Criteria

Item	Design Criteria
Telecommunications	Incoming fibre supply from existing infrastructure on surrounding streets via underground conduits. • Minimum one fibre connection to each apartment. • Fibre connection for retail spaces. Quantity of fibre optics in accordance with NBN requirements • No provision for active equipment • Provision of space for fibre optic equipment and cabling on vertical riser.
Voice Cabling	Voice over IP (VOIP) system proposed.
Intercom	One audio/visual intercom to each dwelling.
Communications Outlets	Communications outlets to suit architectural layouts for apartments. Communications outlets for commercial tenancies to be by tenant.
MATV	Retail Spaces: MATV requirements and Foxtel requirements to be confirmed. Apartments: MATV head end on building roof to incorporate Free-to-Air and Foxtel networks. Distributed through core communications distribution risers as stand-alone systems.



	To Foxtel latest requirements. Quantity per apartment to be resolved.
Applicable Standards	• ACMA requirements, ACIF 008, ACIF 009. • AS/NZS 3080 – Telecommunications Installations – Generic cabling • AS/NZS 3084 - Telecommunications Installations – pathways and spaces • AS/NZS ISO/IEC 15018 – Information Technology – Generic Cabling for homes • All other codes and standards required by the above

5.3 Systems

5.3.1 Lead in Services

The Communication Services will comprise of lead in conduits to the carrier's cupboard for the installation of cabling from the carrier's external networks, and reticulation and distribution throughout the building via communications room.

Data services will be provided by design to NBN requirements. One Fibre Premises Distribution Hubs (PDH) will service the site. The PDH will provide fibre connections to separate network termination devices (NTD) for lifts and security for all buildings.

For apartments and retail spaces, data will be reticulated in ceiling and wall cavities. An NBN (NTD) will be provided to each apartment and retail space, for the residents and tenants to set up their own network.

5.3.1 Intercoms

A colour video/audio intercom system is required for visitor access at ground floor entries for each building, as well as at the vehicle entrance to each building (i.e., boom gate or roller door) in addition to the pedestrian entrance.

Visitor access will be restricted to entrance at the front door via door release from the apartment intercom push button. Vehicle access will be restricted to entrance of the carpark via door release from the apartment intercom push button.

5.3.2 MATV/Pay TV

An integrated MATV system will be provided which will meet the requirements of Foxtel to enable the distribution of Free to Air (FTA) and Pay TV.

The MATV amplifiers will be provided to each apartment. The cabling system will be suitable for digital TV.

MATV and Foxtel requirements for the retail spaces are to be confirmed.

5.3.1 Home Automation

There is no provision to install home automation systems equipment.



5.3.2 Home Entertainment

There is no provision to install home entertainment systems equipment.

5.3.3 Retail Areas

Each retail area will be serviced via an NTD.

5.4 Items to be Resolved

- Exact details of MATV distribution, particularly quantity and location of outlets to be developed in design phase.



6 FIRE PROTECTION SERVICES

6.1 Overview

The Fire Protection Services for the residential and commercial complex will comprise:

- Sprinkler System
- Hydrant System
- Fire Hose Reels
- Smoke detection system including associated interface with smoke hazard management, occupant warning system, security, and ancillary equipment, including all cabling, equipment and connections
- Emergency Warning and Intercom System (EWIS)
- Portable fire extinguishers and fire blankets

5.1.1 Applicable Standards

Key Standards and Codes governing the fire protection system design and installation include:

- National Construction Code (NCC) 2019
- AS 2118.1-2017 Automatic Fire Sprinklers
- AS/NZS 1221-1997 and AS 2441-2005 Fire Hose Reels
- AS 1670.1-2018/AS 1670.4-2018 Fire Detection, Warning, Control and Intercom Systems
- AS/NZS 1841.1-2007 and AS 2444-2001 Portable fire extinguishers and fire blankets
- AS 2419.1-2005 Fire hydrant installations
- AS/NZS 1668.1-2015 The Use of Mechanical Ventilation and Air Conditioning in Buildings
- AS/NZS 3000 -2018 Electrical Installations (Wiring Rules)
- AS 1851-2012 Maintenance of Fire Protection Equipment
- Any applicable fire engineering report

6.2 Design Criteria

	Residential/Retail	Car park
Automatic Fire Sprinkler System Type	■ AS 2118.1-2017 ■ AS 2118.6-2012	■ AS 2118.1-2017 ■ AS 2118.6-2012
Sprinkler Water supply	■ Combined sprinkler & Hydrant system ■ Supply 1 – Direct boost from town main with electric pump (Subject to ICON water approval) ■ Supply 2 – Water storage tank with diesel engine pump ■ AS 2118.6-2012	
Classification of occupancies to AS2118	■ Retail - Ordinary Hazard Group 2 ■ Residential – Light Hazard	■ Ordinary Hazard Group 2



	Residential/Retail	Car park
Sprinkler Heads	Type - Semi recessed Colour - White/Architectural specification Temperature Rating 68°C Response Time Index 50 Australian Standard - AS 2118.1-2017	Type - Exposed Colour - Bronze Temperature Rating 68°C Response Time Index 50 Australian Standard - AS 2118.1-2017
Fire Hydrant and Hose Reel System	- Hydrant to be located within each fire isolated stair - Hose Reels will not be provided for Class 2 and 3 areas Australian Standard - AS 2419.1-2005, AS2441-2005	- Hydrant to be located within each fire isolated stair - Hose Reel to be located within four (4) meters of each exit Australian Standard - AS 2419.1-2005, AS2441-2005
Hydrant Water supply	- Combined sprinkler & Hydrant system - Supply 1 – Direct boost from town main with electric pump (Subject to ICON water approval) - Supply 2 – Water storage tank with diesel engine pump - AS 2118.6-2012	
Smoke Detection System	AS 1670.1-2018	AS 1670.1-2018, Section 07
Smoke Detectors	Photoelectric type with sensitivity not greater than 5% ob/m	Photoelectric type with sensitivity not greater than 5% ob/m
Occupant Warning System	Speaker Type - Cone speakers Location - Throughout Sound Pressure Level - A weighted not less than 75db Australian Standard - AS 1670.4-2018	Speaker Type - Horn speakers Location - Throughout Sound Pressure Level - A weighted not less than 75db Australian Standard - AS 1670.4-2018

6.3 Systems Description

6.3.1 Water Supply

Dual water supply is required for the building as the building is over 25m in height. The proposed system is a combined hydrant and sprinkler system.

Supply 1 – Town main supply direct boost with an electric pump. If ICON water rejects the direct boosting from town main, additional 50kL water storage tank is required.



Supply 2 - Water storage tank (88kL effective capacity) with town main incoming supply and a diesel engine booster pump

6.3.2 Automatic Fire Sprinkler System

An automatic fire sprinkler system generally complying with NCC deemed-to-satisfy specification E1.5 will be provided throughout the building.

The proposed system is a combined sprinkler and hydrant system. Sprinkler control valve and hydrant to be located inside the fire stair in each floor.

6.3.3 Automatic Fast Response Sprinklers

Automatic fast response sprinklers provide faster sprinkler operation and are proposed to be located throughout the building. The sprinkler design will be based on AS 2118.1 utilizing fast response type sprinklers.

6.3.4 Fire Hydrant System

Fire hydrant for effective operation by the fire-fighting personnel will be provided throughout the building in accordance with the relevant Fire Authorities requirements.

The fire hydrant system will comprise of the following:

- Hydrants located within each fire escape stair or corridor or to the approval of the Fire Brigade
- Hydrant outlets fitted with approved couplings as required by the Fire Brigade
- System test drains installed adjacent to each hydrant riser located within fire stairs

Performance solution by Fire Engineer may be required to use two fire hoses to achieve hydrant coverage in some areas.

6.3.5 Fire Hose Reel System

Fire hose reel protection for effective operation by the building occupants will be provided throughout the basement and retail areas in accordance with the relevant Fire Authorities requirements.

The fire hose reel system will comprise of the following:

- Fire hose reels with 4 m of a fire exit or to the approval of the Fire Brigade and extra hose reels to achieve full coverage if required.

Hose reel provisions to be further reviewed in retail areas when the partition layouts are available.

6.3.6 Fire Brigade Booster Assembly

Fire Brigade booster and suction connections will be installed at the boundary within sight of the main entry to the premises.

Combined Fire Brigade boosters will be provided for sprinkler and hydrant systems.

Booster assembly to be located within sight of the main entrance of the building.



6.3.7 Fire Detection and Alarm System and Occupant Warning System

Control and Indicating Equipment (CIE) will be provided in a location that is clearly visible and readily accessible within the designated building entry. Main CIE will be located inside the fire control centre and a sub CIE will be located in foyer area of Building B.

High sensitivity smoke detectors of the analogue/addressable type will be installed in accordance with AS 1670 throughout the following areas to provide early fire detection and alarm for occupant evacuation.

- As part of the smoke hazard management system
- The fire detection and alarm system will transmit coded signals to the Fire Indicator Panel, Fire Brigade, Security system, Occupant Warning System and mechanical smoke hazard management systems.

6.3.8 EWIS (Emergency Warning and Intercom System)

Reliable alarm annunciation and communication is required to enable the effective evacuation of occupants in the event of an emergency.

Main EWIS panel will be located inside the fire control centre and a sub EWIS panel will be located in foyer area of Building B.

The system will be configured to provide capability for announcements.

Surface mounted speakers/ horn speakers will be installed within basement car park and plant room areas and flush mounted speakers below false ceilings.

6.3.9 Portable Fire Extinguishers

Portable fire extinguishers will be located maximum 10 meters from any SOU entry in accordance with BCA 2019.

Portable fire extinguishers will be installed to provide special risk protection against potential ignition sources.

Portable fire extinguishers will be certified as meeting the requirements as AS/NZS 1841.1 and AS/NZS 1841.5 and installed in accordance with AS 2444.

Locations and types generally as shown below:

Risk	Minimum Rating and Classification	Minimum Size	Location
Electrical Switchboards	2A 20B(E) DP	2 kg	Adjacent to each switchboard
Electrical Switch Rooms	2A 40B(E) DP	4.5 kg	External and adjacent to exit door and accessible to electrical equipment
Plant Rooms	80(E) DP	9.0 kg	External and adjacent to entry door
Kitchen (Without deep fat fryer)	2A 40B(E) DP	4.5 kg	Adjacent to exit door and accessible to cooking areas
Lift Motor Room	2A 40B(E) DP	4.5 kg	Adjacent to exit door



Lift Control Panel	2A 40B(E) DP	4.5 kg	Adjacent to each Lift Control Panel
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6.4 Items yet to be Resolved

- Fire Engineering Report
- Fire Brigade in principle approval
- Performance solution to use two fire hoses to achieve hydrant coverage in some areas
- ICON water acceptance for direct boosting from town main.
- BCA Certifiers report



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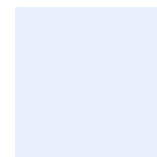
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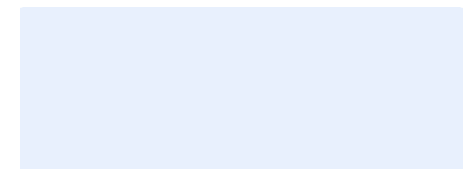
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