

Services Design Intent Report

Project Details

Project Name: 5-9 Cowan Road, St Ives

Project Address: 5-9 Cowan Road, St Ives

Author: Alexander Raad

Date: 28-Jul-2025

Produced For: **Natalie Bocock**
Assistant Development Manager
0473890616
n.bocock@prospercollection.com.au

Reference: 25154_SDIR_02

1300 979 667

info@goldfishbay.com.au

Shop 1/432 Parramatta Rd, Petersham

Contents

1	INTRODUCTION	3
1.1	Purpose	3
2	PROJECT BACKGROUND.....	4
2.1	Proposed Development Site.....	4
2.2	Stratums.....	5
2.3	Qualifications	6
2.4	Authority Utilities	6
3	HYDRAULIC SERVICES	7
3.1	Standards and codes.....	7
3.2	Sanitary drainage.....	7
3.2.1	Required Development Load	7
3.2.2	Utilities.....	8
3.2.3	Residential	8
3.2.4	Material	10
3.2.5	Plant and Equipment	10
3.3	Potable Cold water Supply	11
3.3.1	Required Development Load	11
3.3.2	Utilities.....	11
3.3.3	Material	15
3.3.4	Plant and Equipment	15
3.4	Potable Hot water Supply	16
3.4.1	Required Development Load	16
3.4.2	Residential Hot water System Options	17
3.4.3	Material	18
3.4.4	Plant and Equipment	18
4	FIRE SERVICES.....	19
4.1	Standards and codes.....	19
4.1.1	Proposed Fire Systems.....	19
4.1.2	Utilities.....	21
4.1.3	Automatic Fire Sprinkler Component	21
4.1.4	Sprinkler Control Valve Assemblies	21
4.1.5	Fire Hydrant Component	22
4.1.6	Fire Hydrant Parameters.....	22
4.1.7	Smoke Detection System	23
4.1.8	Emergency Warning and Intercom System	23
4.1.9	Portable Fire Extinguishers	25
4.1.10	Portable Fire Extinguisher Selection and Location	25
4.1.11	Interface with Other Systems	25
5	ELECTRICAL SERVICES	26
5.1	Standards and codes.....	26
5.2	Design overview	26

5.3	Electrical design criteria	26
5.3.1	site main electrical low-voltage infrastructure.....	27
5.3.2	Site Wide LV Cabling and Distribution	29
5.3.3	General Indoor and External Lighting	29
5.3.4	Emergency and Exit Signage	31
5.3.5	Security, CCTV and Access Control	31
5.3.6	Lightning Protection	32
5.4	TELECOMMUNICATIONS	33
5.4.2	Residential Tenancies Electrical Provisions	34
	Apartment Electrical Provisions	34

1 Introduction

1.1 PURPOSE

The Services Design Intent Report serves as a formal reference outlining the agreements between Goldfish and Bay and the Client and/or their representatives. This document encapsulates the commitments and understandings reached during the planning phase, ensuring all parties have a clear and consistent framework to follow.

Our primary objective in developing the concept design is to provide value-added advice, focusing on value engineering, comprehensive assessment of authority service utilities, and enhancing constructability. By integrating these elements, we aim to deliver solutions that are both cost-effective and practical for implementation.

This report strives to present a clear, concise, and coherent description of the scope of services to be designed. It is not meant to serve as a Specification or Bill of Materials, nor does it include detailed selections of the primary equipment. Rather, it offers a comprehensive overview of the services to be implemented within the building, ensuring that the end outcomes align with the client's expectations and requirements.

The intent of this document is to formalize and confirm the agreed-upon building services to be provided by Goldfish and Bay Service Engineers for this development. It stands as a testament to our commitment to delivering high-quality, efficient, and effective building services tailored to the development's needs.

This report will also provide hydraulic Infrastructure Requirements and Utilities in consultation with relevant service providers:

- assess the impacts of the development on existing utility infrastructure and service provider assets surrounding the site.
- identify any infrastructure required on-site and off-site to facilitate the development and any arrangements to ensure that the upgrades will be implemented on time and be maintained.
- provide an infrastructure delivery and staging plan, including a description of how infrastructure requirements would be coordinated, funded and delivered to facilitate the development

2 PROJECT BACKGROUND

2.1 PROPOSED DEVELOPMENT SITE

The site is located at 5-9 Cowan Road, St Ives, within the Ku-ring-gai Local Government Area, and is legally described as SP30097. The site has an area of approximately 3,467.7sqm and is rectangular in shape.

The site currently contains a single row of ten, two-storey attached townhouses. The site is defined by large mature trees along the northern, eastern and western boundaries. Vehicular access to the site is provided at the southern boundary of the site from Cowan Road. The site is relatively flat.

The site adjoins St Ives Shopping Village to the north and east. Existing residential development (No. 3 Cowan Road) and St Ives Christ Church border the site to the south. To the west, two storey detached houses are located along Cowan Road.

The proposed works include demolition of existing structures, site preparation works, excavation and construction of the building and associated landscaping works. Specifically, the SSDA seeks development consent for:

- demolition of the existing row of 10 attached townhouses at the site;
- construction of an 9-storey residential flat building comprising:
 - 74 new dwellings (62 market residential units and 12 affordable housing units)
 - 3 basement levels for car parking
 - Communal open space at Ground Level and Level 7
- landscaping; and • associated site works.



Figure 1- Aerial view of the site (Source: SIX MAPS)

2.3 Qualifications

This report has been prepared without the availability of crucial information, including the BCA (Building Code of Australia) report, Fire Engineering report, BASIX (Building Sustainability Index) report, and Hydraulic load requirements. Therefore, additional considerations should be made once this relevant information becomes available to ensure a comprehensive assessment.

All analyses conducted for this report are based on the premise of achieving a high level of seamless integration with the overall development.

Information regarding the existing infrastructure detailed within this report has been sourced from Dial-Before-You-Dig (DBYD), Utility Geographic Information Systems (GIS), provided survey documents, and discussions with utility companies, which include:

- **Electricity Utility:** Ausgrid
- **Water Utility:** Sydney Water

The electrical utility requirements for the development have been evaluated with the following considerations:

- **Assessment of Existing Utility Infrastructure and Assets:** The Accredited Service Provider level 3 is currently undertaking this assessment.
- **Coordination with Ausgrid:** It is advised to initiate early coordination with Ausgrid to facilitate the implementation of upgrades and new infrastructure in alignment with the current development program. Early engagement will assist in ensuring that all necessary adjustments and installations are planned and executed effectively.
- **Infrastructure Delivery and Staging Plans:** These plans will be developed at a later design stage through further consultation with Ausgrid. This will ensure that all infrastructure delivery and staging are synchronized with the overall development timeline.

The Hydraulic utility requirements for the development are mentioned in the hydraulic section of this report.

Any potential works on existing utility infrastructure services are subject to negotiation and approvals from the respective utility companies. Liaison with each utility company will be conducted as part of the detailed design phase for the site to secure the necessary approvals and coordinate the required works.

2.4 Authority Utilities

The table below are the Authority of utilities in this area of the proposed development

Referral ID (Seq. no)	Authority Name	Phone	Status
256732627	Ausgrid	(02) 4951 0899	NOTIFIED
256732629	Jemena Gas North	1300 880 906	NOTIFIED
256732628	Ku-ring-gai Council	(02) 9424 0954	NOTIFIED
256732626	NBN Co NswAct	1800 687 626	NOTIFIED
256732631	Sydney Water	13 20 92	NOTIFIED
256732630	Telstra NSW Central	1800 653 935	NOTIFIED

END OF UTILITIES LIST

3 Hydraulic Services

3.1 STANDARDS AND CODES

The hydraulic assessment is based on the below relevant standards and codes

Referencing Document	Description
AS3500.1:2021	Plumbing and Drainage Part 1: Water Services
AS3500.2:2021	Plumbing and Drainage Part 2: Sanitary Plumbing and Drainage
AS3500.3:2021	Plumbing and Drainage Part 3: Stormwater Drainage
AS3500.4:2021	Plumbing and Drainage Part 4: Heated Water Services
AS5601:2022	Gas Installations
AS2441:2005	Installation of Fire Hose Reels
NCC 2022	National Construction Code
Sydney Water Regulations	
Jemena Network Operating Rules	
Burwood Council	
Canada bay Council	
Fire & Rescue NSW	

3.2 SANITARY DRAINAGE

3.2.1 REQUIRED DEVELOPMENT LOAD

The main reticulated sewer drainage line serving the development will be designed in accordance with

AS/NZS 3500.2-2021 and preliminary proposed fixture unit calculations are as follows:

Area	Units	Fixture Units
Residential	74	1500
Non-residential	n/a	0
Subtotal sewer connection		1200
150mm @ 1% Capacity		855
225mm @ 1% Capacity		4,500

A network of sewer drainage systems will transfer sewerage waste from all levels of the proposed building to the nominated sewer connection. It is expected that only 1 connection to the authority main is required.

As illustrated in Figure 4, the proposed site is surrounded by the following sewer mains:

- During the detailed design phase, it is crucial to coordinate with the Water Servicing Coordinator (WSC) to finalize the point of connection. This coordination will ensure that the necessary adjustments are made to accommodate the proposed development.

In summary, the existing sewer infrastructure should be able to cater for this development, subject to WSC assessment



All sanitary fixtures located within the residential buildings will direct wastewater to the new sewer connection point using pressure attenuator systems. These systems are essential for managing the flow and pressure of wastewater to ensure efficient and safe transport within the sewer network.

Pressure attenuator systems, help to regulate and control the pressure of wastewater as it moves from various sanitary fixtures to the main sewer line.

1. Gravity Flow and Pressure Regulation:

- In residential buildings, wastewater from sanitary fixtures such as toilets, sinks, and showers generally flows downward by gravity to lower points within the plumbing system.
- As wastewater collects and moves through the system, it can build up pressure, particularly in high-rise buildings or large complexes.
- Pressure attenuators are installed at strategic points to reduce this pressure to a safe and manageable level before the wastewater enters the main sewer line. This prevents potential damage to the infrastructure caused by high-pressure surges.

2. Flow Control and Consistency:

- Pressure attenuators ensure a consistent flow rate of wastewater, which is vital for the proper functioning of the sewer system.
- By maintaining an even pressure, they help prevent issues such as backflow (where wastewater flows backward into the building) and ensure smooth transport of waste to the sewer connection point.

3. Protection of Sewer Infrastructure:

- High-pressure wastewater can cause significant wear and tear on pipes and fittings, leading to leaks, bursts, and other maintenance issues.
- Pressure attenuators absorb and dissipate excess pressure, thereby protecting the sewer infrastructure and extending its lifespan.

4. Enhanced Wastewater Management:

- With pressure attenuator systems in place, the entire sewer system operates more efficiently. This leads to fewer blockages and reduces the need for frequent maintenance.
- It also ensures that wastewater is effectively directed to the main sewer connection point without causing disruption or damage.

Implementation in Residential Buildings

In the context of residential buildings, the pressure attenuator systems are typically implemented as follows:

- **At Individual Fixtures:** Each sanitary fixture can be equipped with a pressure attenuator to regulate the pressure of wastewater as it enters the sewer pipes. This is especially useful in large or high-rise buildings where the pressure can vary significantly at different levels.
- **Main Sewer Lines:** Larger pressure attenuators are installed along the main sewer lines that collect wastewater from multiple fixtures. These attenuators ensure that the combined flow of wastewater from all fixtures is maintained at a consistent pressure level before it reaches the primary sewer connection point.

By employing pressure attenuator systems, the residential buildings ensure that all sanitary fixtures efficiently and safely direct wastewater to the new sewer connection point. This systematic approach not only enhances the reliability and longevity of the sewer infrastructure but also contributes to better overall wastewater management.

3.2.4 MATERIAL

Piping System	Use / Location	Material	Nominal Pipe Size (mm)
Sewer Drainage	Below Ground	uPVC ¹ Class DWV SCJ SN8	100 – 225
Sewer Drainage	Above Ground	uPVC ¹ Class DWV SCJ SN4	100 – 150
Sanitary Plumbing	Above Ground	HDPE Electrofusion joints	40 – 100
Sewer Vent	Above Ground	uPVC ¹ Class DWV SCJ SN4	40 – 100
Sewer Drainage/Plumbing	High temperature	HDPE Electrofusion joints	40 – 100
Sewer Rising main	Below/Above Ground	Class 12 Pressure PVC	50–65
¹ uPVC to comply with 'Best Practice Guidelines for PVC in the Built Environment'			

All materials are subject to change based on application and load requirements.

3.2.5 PLANT AND EQUIPMENT

All sanitary fixtures located within the residential buildings will direct wastewater to the new sewer connection point using pressure attenuator systems. These systems are essential for managing the flow and pressure of wastewater to ensure efficient and safe transport within the sewer network.

System	Proposed Equipment
Sewer Pump Stations	Kwikflo polyethylene tank with with submersible macerator pumpset in duty/standby arrangement connected to BMS. Pumps will be located in ground for SID purposes.

3.3 POTABLE COLD WATER SUPPLY

3.3.1 REQUIRED DEVELOPMENT LOAD

The main reticulated water supply serving the development will be designed in accordance with AS/NZS 3500.1-2021. The parameters for sizing cold water services have been determined utilizing the following criteria:

Location	Design Velocity	Maximum Velocity	Minimum Pressure	Maximum Pressure
In ground	2.4 m/s	3.0 m/s	250kPa	500kPa
Internal in walls and ceilings	1.6 m/s	3.0 m/s		

Potable cold-water services will be sized with adequate capacity to convey water supply to all fixtures and appliances. A preliminary assessment of the probable simultaneous flow rates has been calculated as follows:

Area	PFSR (L/s)	Pipe Size (mm)
Residential	5.32	65

3.3.2 UTILITIES

As illustrated in Figure 6, the proposed site is surrounded by the following water mains:

- The DN100 CICL water main located in Cowan Street, which could serve as a potential connection point.
- The DN150 CICL water main located in Cowan Street, which could serve as a potential connection point.

During the detailed design phase, it is crucial to coordinate with the Water Servicing Coordinator (WSC) to finalize the incoming water connection point. This coordination will ensure that the necessary adjustments are made to accommodate the proposed development.

Engaging a Water Servicing Coordinator (WSC) at the earliest opportunity is highly recommended. The WSC will provide a design proposal to Sydney Water for consideration, facilitating a streamlined approval process and ensuring the water infrastructure meets the requirements of the development.

In summary, the existing water supply infrastructure will be able to cater for this development.



Given the limited pressure available from the incoming water service, it is essential to implement measures to ensure that residential areas receive adequate water pressure. This will be achieved through the installation of variable speed pump sets, which will boost the pressure of the incoming water supply to meet the minimum pressure requirements specified in the project brief.

In figures 4 and 5 are the pressure and flow results from the municipal street mains, which serve as the primary water source for the development. These values provide a baseline for designing the water supply system within the building. The variable speed pump sets will be calibrated to boost these pressures appropriately, ensuring consistent and adequate water supply across all levels of the building.

Pressure & Flow Application Number: 2181191
Your Pressure Inquiry Dated: 2025-07-11
Property Address: 5-9 Cowan Road, St Ives 2075

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Cowan Road	Side of Street: West
Distance & Direction from Nearest Cross Street	125 metres South from Village Green Parade
Approximate Ground Level (AHD):	173 metres
Nominal Size of Water Main (DN):	150 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	92 metre head
Minimum Pressure	26 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	25
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	10	28
	15	24
	20	19
	25	13
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)	10	23
	15	19
	20	15
	25	8
Maximum Permissible Flow	28	4

(Please refer to reverse side for Notes)

Figure 4 - Pressure and Flow Statement for DN150 main in Cowan Street

Fadi Taouk
432 Parramatta Road
Petersham, 2049

Attention: Fadi Taouk

Date: 29/07/2025

Pressure & Flow Application Number: 2183232
Your Pressure Inquiry Dated: 2025-07-15
Property Address: 5-9 Cowan Road, St Ives 2075

The expected maximum and minimum pressures available in the water main given below relate to modelled existing demand conditions, either with or without extra flows for emergency fire fighting, and are not to be construed as availability for normal domestic supply for any proposed development.

ASSUMED CONNECTION DETAILS

Street Name: Cowan Road	Side of Street: West
Distance & Direction from Nearest Cross Street	125 metres South from Village Green Parade
Approximate Ground Level (AHD):	173 metres
Nominal Size of Water Main (DN):	100 mm

EXPECTED WATER MAIN PRESSURES AT CONNECTION POINT

Normal Supply Conditions	
Maximum Pressure	92 metre head
Minimum Pressure	26 metre head

WITH PROPERTY FIRE PREVENTION SYSTEM DEMANDS	Flow l/s	Pressure head m
Fire Hose Reel Installations (Two hose reels simultaneously)	0.66	25
Fire Hydrant / Sprinkler Installations (Pressure expected to be maintained for 95% of the time)	9	9
Fire Installations based on peak demand (Pressure expected to be maintained with flows combined with peak demand in the water main)		
Maximum Permissible Flow	9	5

(Please refer to reverse side for Notes)

Figure 5- Pressure and Flow Statement for DN100 main in Cowan Street

3.3.3 MATERIAL

Piping System	Use / Location	Material
Water Supply	Incoming Supply	MDPE Blue Stripe PN16
Cold Water	Below Ground	MDPE Blue Stripe PN16
Cold Water	Above Ground	Type A & B copper Tube Grade 316 stainless steel
Cold Water	Above Ground	Peroxide cross linked polyethylene with compression sleeve connections for roughin pipework
Reuse Water	Below Ground	MDPE Lilac Stripe PN16
Reuse Water	Above Ground	Type B copper Tube
Reuse Water	Above Ground	Peroxide cross linked polyethylene with compression sleeve connections for roughin pipework

All materials are subject to change based on application and load requirements.

3.3.4 PLANT AND EQUIPMENT

Stratum	Title	Description/ Performance
Residential	Supply Pumps	variable speed booster pumps complete with control panel and pressure vessel

3.4 POTABLE HOT WATER SUPPLY

3.4.1 REQUIRED DEVELOPMENT LOAD

The main reticulated hot water supply serving the development will be designed in accordance with

AS/NZS 3500.4-2021. The parameters for sizing hot water services will be determined utilizing the following criteria:

Pipework	Design Velocity	Maximum Velocity	Minimum Pressure	Maximum Pressure
Hot water service	1.2 m/s	3.0 m/s	250kPa	500kPa
Circulating pipework	1.0 m/s	1.2 m/s		

Potable hot water services have been sized with adequate capacity to convey water supply to all fixtures and appliances.

Typically, the loading unit method of calculated has been utilized from AS3500.1-2021.

Dead legs will be minimized and the industry standard of maximum of 30 seconds will be targeted, and we intend to minimize deadlegs further with implementing the Comet product by Meteorite which will be further developed in detailed design. This system will deliver hot water within 10 sec. Pressure reduction valves will be supplied adjacent to ensure 500kPa is not exceeded at any fixture along with the cold-water services.

3.4.2 RESIDENTIAL HOT WATER SYSTEM

Electric Heat Pumps will be proposed as a centralized hotwater plant



Figure 6- Typical heat pump set up

Metering of hot water will be provided for each unit in the lobby areas via meter cupboards and supplied by the embedded network provider.

Fixture outlet temperatures shall be provided in accordance with the following table:

Area	Fixture Outlet	Temperature Set
Accessible amenities	Wash basins, baths and showers	43.5°C
BOH areas	Dirty utilities cleaner sink, dispensers	60°C
Ablution fixtures	Wash basins, baths, showers, sink, laundry tub	50°C

Temperature control for all fixtures at 43.5°C will be provided via thermostatic mixing valves located in recessed wall boxes located at 1500mm AFFL and tempering valves for all fixtures requiring tempering to 50°C.

Potable hot-water services will be sized with adequate capacity to convey water supply to all fixtures and appliances.

It is important to note all stratum's usage will be metered individually to provide accurate consumption figures for each. The stratum will have separate water supply grids to ensure undependability.

3.4.3 MATERIAL

Piping System	Use / Location	Material
Hot Water	Above Ground	Type B copper Tube/ stainless steel 316
Hot Water	Above Ground	Peroxide cross linked polyethylene with compression sleeve connections for roughing pipework

All materials are subject to change based on application and load requirements.

3.4.4 PLANT AND EQUIPMENT

Area	Title	Description/ Performance	Selected Item
Residential Stratums	Hot Water Plant- Apartments Option 1	External Heat Pump System	Rheem heat pump air to water
	Secondary Hot Water Circulating Pumps	Secondary circulating system to maintain +- 5°C within loop.	Dual Grundfos UPS 32-80B (Duty & Stand-by), complete with control panel.
	Tempering Valves	Regulate temperature to all Sanitary fixtures	Caleffi series 5213
Carpark	Garbage Rooms	electric hot water storage tank	Electric Rheem 50L

4 Fire Services

4.1 STANDARDS AND CODES

The fire assessment is based on the below relevant standards and codes.

Referencing Document

Description

National Construction Code (NCC) – 2022	
AS 2118.1-2017	Automatic Fire Sprinklers Systems – General systems incorporating amendment 1 and 2 (Ref. NCC Clause Specification 17)
AS 2419.1-2021	Fire Hydrant Installations – System design, installation, and commissioning (Ref. NCC E1D2)
AS 2118.6-2012	Automatic fire sprinkler systems – Combined sprinkler and hydrant systems (Ref. NCC Clause: E1D4 & Specification 17)
AS 2941 – 2013	Fixed Fire Protections – Pumpset Systems
AS 2444-2001	Portable Fire Extinguishers and Fire Blankets – Selection and location (Ref. NCC Clause E1D14)
AS 1670.1-2018	Smoke Detection, Warning, Control, and Intercom Systems incorporating amendment 1 (Ref. NCC Clause Specification 20, S20C4 & S20C5)
AS 1670.4-2018	Emergency Warning and Intercom Systems incorporating amendment 1 (Ref. NCC Clause E4D9)
NSW Service and Installation Rules	
Work Cover Authority requirements;	
Local Council regulations having jurisdiction on this project;	
Requirements of the NSW Fire Brigade via FEBQ and FER reports	
Principals Project Requirements (PPR),	

4.1.1 PROPOSED FIRE SYSTEMS

The installation of a Combined Fire Hydrant and Fire Sprinkler system is proposed throughout the building. This system will comply with AS 2118.6:2012, AS 2419-2021, and AS 2118.1-2017 standards.

A new combined system fire brigade booster assembly will be installed in a dedicated adjacent to the site boundary to Cowan Road. This booster will be positioned for easy access by the fire brigade and will be located no more than 4.5 meters from a truck hardstand. The booster assembly will include a compliant double check valve (backflow prevention device) as the fire truck will draw water from the on-site fire tanks. The assembly will consist of a fire tank large-bore suction and 4-point booster connection standpipes to pressurize the building's pressure zones.

This booster assembly's arrangement and location will be part of a performance solution prepared by a Fire Safety Engineer, based on the following considerations: (a) allow the large-bore suction to have a flow rate of 45L/s, and (b) as the fire tanks are located on B1, allow the vertical lift between

suction point and low water level to be 5.5 m and have a maximum volume of permanent fixed on-site dry pipe more than 0.07m³.

The primary water and secondary water supply for the combined fire hydrant and sprinkler systems will be two reduced capacity on-site tank, installed in basement 1. These tanks will be sized to hold the primary sprinkler supply (12 operating sprinkler heads) and at least 36 kL of fire hydrant water supply. The preliminary calculated size of the primary fire water tank will be 75 kL, subject to the water main connections being able to provide 25 L/s.

The fire water tank will feature an automatic infill from the water main, with an infill rate of 25 L/s during fire system operation. This infill will ensure the provision of hydrant water for 4 hours and 2/3 sprinkler water for 1 hour.

The fire services pump room will be located on B1 and accessible via a dedicated stairway from the ground floor. This pump room will house the multi-outlet diesel pumps (two required for the combined system), the electric jockey pump, pressure reducing valves, and the pump test pit.

4.1.2 UTILITIES

Refer to section 3.3.2 for existing water utilities.

4.1.3 AUTOMATIC FIRE SPRINKLER COMPONENT

An Automatic Fire Sprinkler System will be installed throughout the development in compliance with AS 2118.1-2017 standards. The hazard classification will vary across different areas: majority of the residential and commercial spaces will be classified as Light Hazard, plant rooms and storage areas will be classified as Ordinary Hazard 1, carpark areas as Ordinary Hazard 2. An addition of wall wetting sprinklers may be required as part for fire engineer solutions the total water flow for wall wetting sprinklers will be confirmed during the detailed design stage of the project.

The sprinkler system will require a water supply with a demand of 12 L/s, sourced from a water storage tank proposed to be installed in the basement. The hazard classifications for different areas are as follows:

Occupancy	Hazard Class	Assumed Area of Operation
Residential	Light Hazard	4 Residential Heads
Car park	Ordinary Hazard 2	12 heads
Plant Spaces	Ordinary Hazard 1	6 heads

A combined Fire Hydrant/Sprinkler system will feature a 100 or 150 mm diameter main pipe that will run through each fire stair of the building. Typically, in each building's fire stair, a sprinkler alarm valve assembly will be connected to this main riser on each level. From these alarm valves, sprinkler distribution pipes will branch out and extend throughout the building. Isolation valves will be installed to minimise service disruptions during tests or alterations. Sprinkler heads will utilize the latest fast/quick response technology.

A horizontal ring main will run at high level of B1. Vertical ring mains will be installed for south wing, north wing and basement carpark.

The sprinkler distribution pipes, branching from the alarm valves, will supply water to both concealed space and ceiling-mounted sprinkler heads, ensuring comprehensive coverage throughout the building.

4.1.4 SPRINKLER CONTROL VALVE ASSEMBLIES

Sprinkler control assemblies will be strategically positioned on each floor within a common, fire-rated exit as stipulated by AS 2118.6.

The sprinkler control valve assembly will include all necessary components for system functionality, which must include, but are not limited to:

- Main Stop Valve: A butterfly valve with either a flange or roll-grooved connection, equipped with a handwheel and designed for right-handed operation.
- A connection to the fire indicator panel.

- An arrangement of flow switch and solenoid valve with a system test drain.
- Installation pressure gauges.
- A block plan.
- Emergency instructions.
- A location plate.
- A prominently placed notice above the main stop valve that details the installation and the area served by it.

Each flow switch will be individually wired to the Fire Indicator Panel under separate alarm zone facilities, in line with AS 1670.1. These specific alarm zones will trigger the Gas Guards (installed by the hydraulic trade) to cut off the gas supply to the building in the event of sprinkler activation.

4.1.5 FIRE HYDRANT COMPONENT

The fire hydrant system throughout the building will adhere to the requirements of AS 2419.1:2021 and AS 2118.6:2012 standards. The primary locations for hydrants will be within fire-isolated stairwells and external to the building adjacent to the site boundary to Cowan Road, to ensure they are protected and accessible during an emergency. This strategic placement ensures comprehensive coverage and quick access in case of an emergency.

The hydrant system will include all necessary components to ensure full functionality and compliance with the standards, including:

- Fire hydrant outlets located in accessible areas for easy operation by fire brigade personnel.
- Signage and indicators to clearly mark the location and operational instructions for each hydrant.
- Appropriate protective enclosures and cabinets to safeguard the hydrants while ensuring they remain readily accessible.
- Integration with the building's fire safety systems to ensure coordination and efficiency during emergency responses.

4.1.6 FIRE HYDRANT PARAMETERS

Application	Criteria
Operating pressures at fixture outlets.	Minimum – 700kpa Maximum – 1200kpa
Operating Velocities through pipework.	Maximum – 4m/sec
Maximum number of Hydrants to operate simultaneously	3
Maximum operating flow rate	30L/s

4.1.7 SMOKE DETECTION SYSTEM

A smoke detection and alarm system will be installed in accordance with the National Construction Code (NCC) and AS 1670.1-2018 Amendment 1. This system will be an automatic, fully addressable fire detection and alarm system, controlled and monitored by a fire detection control and indicating equipment (FDCIE) located in the ground floor entry lobby.

The FDCIE will be equipped with Alarm Signalling Equipment (ASE). The ASE will facilitate the fire brigade call-out and provide the brigade with the address, directing them to the Fire Control Room and booster assembly using visual alarm strobes.

Site block plans and the addressable detection system notification on the FDCIE will guide Fire and Rescue NSW (FRNSW) around the site and directly to the alarm source.

A fully addressable fire detection system, designed and installed in compliance with AS 1670.1-2018, will be installed throughout the buildings. Smoke detectors will be placed in all non-residential areas, including car parks, commercial and retail spaces, plant rooms, and any residential areas outside of sole occupancy units (SOUs). Each SOU will have an independent mains-powered residential smoke alarm, not connected to the dry fire system, providing local alarms to the residents.

The smoke detection system will interface with mechanical, electrical, and security systems to initiate hazard management operations such as equipment shutdown and door security. The Fire Fan Control Panel (FFCP) interface will be integrated within the Main Fire Indicator Panel in the fire control room, incorporating all necessary interfaces with the smoke hazard management systems in accordance with AS 1668.1.

The fire alarm system will also interface with wet fire system components to provide monitoring and annunciation functions as required by relevant Australian Standards. The Fire Indicator Panels will be designed with a minimum of 20% spare capacity to allow for future expansion.

4.1.8 EMERGENCY WARNING AND INTERCOM SYSTEM

An emergency warning and intercom system (EWIS) will be installed throughout the entire building, designed and implemented in compliance with AS 1670.1-2018 Amendment 1, as required for buildings exceeding 25 meters in height.

The system will be controlled and monitored by a emergency warning control and indicating equipment located in the ground floor entry lobby, positioned adjacent to the FDCIE.

The EWIS will activate an audible and visual warning system throughout the building, in accordance with AS 1670.4-2018 Amendment 1. Speakers will be installed throughout the building to provide the required sound pressure levels and speech intelligibility as specified by the code. In areas where speech intelligibility cannot be achieved due to layout constraints, visual indicators will be used instead. Warden Intercommunication Phones (WIPs) and manual call points will be installed in each alarm zone within 4m of an exit.

Visual indicators will be placed in areas where speech intelligibility is not feasible, such as car parks, plant rooms, and service areas. EWIS speakers will be installed in apartments to achieve a sound level of 75 dBA throughout each unit. Typically, this will include one speaker per bedroom and two speakers in the main living area, depending on the apartment size. Evacuation diagrams will be displayed around the building to highlight fire equipment locations and exits, ensuring compliance with standard requirements.

EWIS speakers, horns, and visual alarm devices will also be installed in common areas outside the apartments, including car parks, commercial spaces, retail areas, and plant/service rooms.

The EWIS system will be automatically triggered by the combined sprinkler and hydrant system, as well as the Automatic Smoke Detection System. Manual activation will be possible via white emergency manual call points (MCPs). The EWIS panels will include a minimum of 20% spare capacity to accommodate future needs.

4.1.9 PORTABLE FIRE EXTINGUISHERS

Portable fire extinguishers and fire blankets will be provided throughout the development to meet the requirements of the Building Code of Australia, Fire & Rescue NSW, and local authorities. These provisions will comply with AS 2444-2001 and NCC Clause E1.6 standards.

In the residential areas, dry chemical powder extinguishers will be installed within unlocked hydraulic water meter cupboards, ensuring they are within a 10-meter travel distance from the entrance doorway of any sole-occupancy unit.

4.1.10 PORTABLE FIRE EXTINGUISHER SELECTION AND LOCATION

Risk	Equipment Type and Rating	Preferred Location
Essential Service Switchboards	4.5 kg Dry Chemical Powder (4A 60B:(E)) or Carbon Dioxide 5 kg (5B(E))	Between 2m and 20m from essential service switchboards.
Electrical Switch Rooms	4.5 kg Dry Chemical Powder (4A 60B:(E)) or Carbon Dioxide 5 kg (5B(E))	Adjacent to and internal side of entry door between 2m and 5m maximum.
Plant Rooms	4.5 kg Dry Chemical Powder (4A 60B:(E)) or Carbon Dioxide 5 kg (5B(E))	Adjacent to and internal side of entry door between 2m and 5m maximum.
Commercial Kitchens (cooking oils and fats)	7Ltr Wet Chemical (2A:4F) including 1.8 m x 1.8 m Fire Blanket.	Adjacent to exit door and accessible from cooking area, between 2m and 20m maximum.
Residential levels	2.5kg Dry Chemical Powder	Within 10m of all residential entry points
Throughout the entire site	4.5kg Dry Chemical Powder (4A 60B:(E))	Within 2m of each Fire Hose Reel.

4.1.11 INTERFACE WITH OTHER SYSTEMS

The operation of the building services in fire mode necessitates integration with other systems. Interfaces will be established between the fire detection system and the following building services:

- Mechanical ventilation systems used for smoke hazard management.
- General air conditioning systems
- Electric vehicle switchboards
- Security and access control devices
- Automatic door operators

5 Electrical Services

5.1 STANDARDS AND CODES

The electrical design for this development will adhere to the following standards and codes

1. Building Code Australia 2022 and the referenced Australian Standards
2. DA conditions, to be met and exceeded where required by the BCA
3. AS/CA S009 – Telecommunications Wiring Rules

Standards

1. AS3000 – Wiring Rules
2. AS3008 – Selection of Cables
3. AS2293 – Emergency Lighting and Exit Signs for Buildings
4. AS 1768 – Lightning Protection
5. AS1158 – Lighting for Roads and Public Spaces
6. AS1680 – Interior and Workplace Lighting
7. AS4282 – Control of Obtrusive Effects of Outdoor Lighting
8. AS 61439 – Switchgear and Control gear Enclosures
9. AS 62386 – Digital Addressable Lighting Interface
10. Ausgrid NS109 for the location of the main switch rooms adjacent to the substations.
11. NBN Design Guidelines

5.2 DESIGN OVERVIEW

This document will outline key electrical infrastructure and systems proposed for the subject development and provide technical design characteristics forming GFB design intent while considering, cost optimization, performance, end-user satisfaction, safety and compliance to necessary local and national rules, regulations and standards listed above:

1. Site Main Electrical Low-Voltage Infrastructure
2. Site Wide LV Cabling and Distribution
3. General Indoor and External Lighting
4. Emergency and Exit Signage
5. Security, CCTV and Access Control
6. Lightning protection
7. Telecommunications
8. Residential Units Electrical Provisions

5.3 ELECTRICAL DESIGN CRITERIA

GFB have performed a maximum demand calculation with consideration of no gas provision to the development and utilization of electrical distribution system for the overall site services provisions including cooking and hot water generation. Summary of the maximum demand allowances are included in the table below following by a summary table indicating the overall demand across the two lots:

Full electric building

Area/ Equipment	Design Allowance	Calculation Method
Basement Carpark (Including Mechanical Ventilation)	10 VA/m2	Power Density
Communal Internal Areas	10 VA/m2	Power Density
Lobbies & Corridors	10 VA/m2	Power Density
BOH	10 VA/m2	Power Density
Residential SOU's	3.5kVA	Per Unit
Lifts & Escalators	25A/each	125% rating of first lift + 75% rating of second lift + 50% rating of the remainder
Hot Water Generation – Residential Electric heat pump	10.8kW/per unit	Allowance
EV Charging	1.5kW	Per Bay
Site Wide Diversity	70%	Utilisation Allowance

Gas Provision for cooking and hot water generation

Area/ Equipment	Design Allowance	Calculation Method
Basement Carpark (Including Mechanical Ventilation)	10 VA/m2	Power Density
Communal Internal Areas	10 VA/m2	Power Density
Lobbies & Corridors	10 VA/m2	Power Density
BOH	10 VA/m2	Power Density
Residential SOU's	1.5kVA	Per Unit
Lifts & Escalators	25A/each	125% rating of first lift + 75% rating of second lift + 50% rating of the remainder
EV Charging	1.5kW	Per Bay
Site Wide Diversity	70%	Utilisation Allowance

Based on the latest architectural concept plans received, GFB have produced two maximum demands as per below: -

- Full electric building
- Gas provision for cooking appliances and hot water generation

A copy of both estimated maximum demands are provided in the appendix section.

5.3.1 SITE MAIN ELECTRICAL LOW-VOLTAGE INFRASTRUCTURE

5.3.1.1 SITE MAIN SWITCHROOM

It is projected that a potential external substation will be required for this project, pending confirmation from the ASP Level 3 consultant. Accordingly, one main switchroom will be allocated to house necessary main switchboard and other LV distribution boards and meter panels. switchroom must adhere to the requirements outlined in NCC section C3D14 and AS3000, which includes providing 2hrs FRL and two separate egress paths with a minimum of one double-swing

door per path, having minimum door dimensions of 0.9 meters in width and 2.2 meters in height. To prevent unnecessary increases in the switchgear's IP rating, no services, aside from mechanical ventilation serving the room, shall traverse these rooms, particularly hydraulic and other water services.

The preference is for the electrical main switch rooms to be centrally located within the lot footprint to ensure efficient and cost-effective cable installation while emphasising on shorter runs and star distribution.

5.3.1.2 ELECTRICAL RISER ARRANGMENT

It is anticipated that each common area will have dedicated residential electrical riser for equipment installation vertical cable reticulation, tee-off boxes and access provisions.

The preference is for the electrical riser to be located adjacent to lift cores and not immediately close to mechanical risers to minimise transition points and potential services clashes during detailed design. Access to be provided to all electrical risers at each rise in the floor including construction in accordance with NCC section D3D8. Safe work zone of 600mm-1000mm is to be maintained to the front of each riser access door in accordance with AS3000 requirement.

5.3.1.3 ELECTRIC VEHICLE CHARGING INFRASTRUCTURE

In accordance with latest NCC revision, EV charging infrastructure will be in designed and documented to ensure compliance is achieved inline with section J9. Considering the size if the basement level and quantity of carpark bays subject to receiving such infrastructure, it is proposed to provide necessary EV distribution boards. The supply to the future EV charging distribution boards will be from un-metered section of the main switchboards. This is to provide flexibility for the future development starta management to facilitate such infrastructure or have the capacity to hand over to EV charging management companies (charge point operator) if necessary.

An EV dynamic load management system including utility management system will be documented to further assist with maximising charging capacity of the infrastructure to the benefit of the tenants and ensure electricity usage is captured accordingly for billing and financial purposes.

A local addressable network infrastructure comprising of distribution communications cabinets, patch panels, cable management and break out trays will be documented to assist with data reading and transferring information locally to necessary head-end units accordingly. these infrastructures are to be placed in necessary EV charging cupboards.

5.3.1.4 Photo-Voltic Solar System

The proposed site is to receive spare compartment within each main switchboard on the house services section for future PV system including battery storage installation.

As part of this project, there is a potential of a small scale PV system to be proposed by the BASIX certificate. This requirement is to be captured accordingly at a later stage. GFB intention is to connect the generated power back to the house services to benefit the tenants and reduce the cost of electricity usage within the common areas accordingly. all necessary inverters, DC/AC switches and panels are to be roof mounted in an accessible area for future maintenance.

5.3.2 SITE WIDE LV CABLING AND DISTRIBUTION

5.3.2.1 House Services

General house services will be provided via rising main arrangement and tee-off boxes installed inside respective risers. Dedicated rising mains will be nominated per respective stratum.

Safety services will be provided by dedicated supplies and from safety chassis of respective main switchboards.

Major submains will reticulate via suspended cable tray/ladder arrangement. Cable tray installation will extend within the risers for vertical reticulation for the full extend of the cable. Fire rated cabling and trays to NCC section C3D14 and AS3013 will be nominated for safety house services.

Sub-circuit cabling for lights and general power within basement levels will be via cast-in power conduits and junction boxes. Where ceiling void is available, GFB will document for electrical cabling to run within the void accordingly for ease of access and maintenance in the future.

In-ground cable reticulation will be in accordance with AS3000 underground wiring systems requirement to nominate minimum dept of cover and further detailing the trench layout.

This site is subject to overall 7% voltage drop from the point of supply to the final sub-circuit if dedicated substation is to supply this development. All cabling will be sized to achieved VD below nominated number accordingly. all cabling will be sized to their respective maximum demand and circuit breaker size plus 25% spare capacity throughout the site. General supply cabling will be of XLPE/PVC type and Safety services will have 2hrs fire rating accordingly.

5.3.2.2 Un-metered Services

Residential units are to be supplied via riser meter panel arrangement. Residential rising mains and tee-off box arrangement is to be documented. Each riser meter panel can supply up to 16 units depending on final equipment provisions and hot-water generation strategy.

5.3.2.3 Power Factor Correction Unit

Service and installation rules NSW indicates the necessity of power factor correction units if the site power quality is not achieved accordingly. since at design stage this can not be calculated accordingly. GFB will be documenting space provision for CT chamber and circuit breaker for future installation. It is landlord responsibility to test ad measure power factor across all main switchboards after 12 months of practical completion and if compliance is not achieved, engage a consultant to design a system accordingly. GFB to allow for removable links within the MSB for future PFC connection if deemed necessary.

5.3.3 GENERAL INDOOR AND EXTERNAL LIGHTING

The preliminary lighting services design shall be configured generally as follows.

- Internal lighting will be designed in accordance to Australian Standard AS1680 and Section J7 of the NCC. Consideration to people with disability lighting levels and glare will be emphasized and implemented.
- Intelligent lighting controls is proposed throughout the building.
- External lighting will be designed in accordance to Australian Standard AS1158 and AS4282 as well as Section J6 of the NCC. These standards focus on road lighting and consider public safety regarding:
 - better visibility during the night,
 - theft,
 - security and crimes within a given suburb and
 - preventing disturbances via glare emitting from the luminaires to the neighboring sites.
- Where security and CCTV coverage is of paramount importance, post-top lighting will be in place to provide vertical illumination accordingly.
- Lighting control strategy is to provide combination of motion sensors, timeclock, PE cells and local switches to comply with NCC Section J7 requirements.
- Power to external lighting will be reticulated via flexible conduit pathways within soft-landscaped areas for ease of installation, access and maintenance.

Table below is provided to summarise the design criteria, require light levels and control accessories:

Area	Lighting Performance	Luminaires	Control System	Maximum Power Density
Carpark Entry	800 Lux for first 15m during daytime 160 Lux for first 15m during night-time 160 Lux for next 4m	LED	Time Clock Daylight Sensor Motion Sensor	NCC Section J7
Car Park Isles and Parking Spaces	100 Lux	LED	Time Clock Motion Sensor	NCC Section J7
Entrance Lobbies/ Foyers	240 Lux	LED	Time Clock Motion Sensor	NCC Section J7
Egress Corridors	160 Lux	LED	Time Clock Motion Sensor	NCC Section J7
Stairs/ Fire Stairs	120 Lux	LED	Motion Sensor	NCC Section J7
Services Plant Rooms	240 Lux	LED	Light Switch	NCC Section J7
Amenities/ Toilets	120 Lux	LED	Motion Sensor	NCC Section J7
Balconies	N/A	LED	Light Switch	NCC Section J7
External Security	50 Lux	LED	Time Clock Daylight Sensor	NCC Section J7
External Lighting	To AS1158 & AS4282	LED	Time Clock Daylight Sensor	NCC Section J7

Note that AS1680 does not provide guidance associated with lighting levels within SOUs, however, below table is included to ensure consistency is achieved across all units and the client is to receive a cost-effective and optimised solution within the residential section.

Area	Lighting Performance	Luminaires	Control System	Maximum Power Density
Bedrooms	160 Lux	LED	Light Switch	NCC Section J7
Bathrooms/ Ensuites	80 Lux	LED	Light Switch	NCC Section J7
Laundries	80 Lux	LED	Light Switch	NCC Section J7

Lounge/ Dining	160 Lux	LED	Light Switch	NCC Section J7
Studies	160 Lux	LED	Light Switch	NCC Section J7

5.3.4 EMERGENCY AND EXIT SIGNAGE

The preliminary lighting services design shall be configured generally as follows.

- Emergency luminaires and exit signs shall comply with AS2293 and be National Construction Code (NCC).
- Each emergency lighting unit will be of the self-contained single point type complete with LED light source, batteries, dual rate battery charger, inverter, test switch and light emitting diode to indicate that the charger is operating.
- Where emergency lighting units are contained within normal luminaires, the batteries and associated control equipment will be housed on a separate metal enclosure attached to the luminaire and located so that the batteries are not affected by the high temperatures generated within the luminaire during normal operation.
- Emergency exit luminaires will be of the 'Running Man' pictorial type complete with arrows as required and classified by an approved authority in accordance with AS/NZS2293.1, with the classification being clearly identified on the luminaire label.
- Where exit signage is to be mounted above nominated height in AS2293, GFB will be documenting jumbo fittings with increased viewing distance (typically 40m).
- Where exit signage is has potential of obstruction via other services provisions, GFB will be documenting signage installation wall mounted at lower height below the services to ensure visibility is achieved accordingly.
- If suspension is deemed necessary, rod suspension is to be documented instead of wire suspension.

5.3.5 SECURITY, CCTV AND ACCESS CONTROL

Provision of security system is typically driven by client's direction and SSDA consent, having said that, GFB approach to design the system will be in accordance with below table unless advised otherwise.

System	System Type & Description
Access Control	Proximity card access control for; • Main entry doors residential • Carpark entry doors • Carpark entry boom gates • Lifts • Stair doors (only monitoring)
Intercom	Video intercom to; • Carpark entry doors • Loading docks • Receiver station with door release function to the building managers office
CCTV	Closed circuit television to; • Main entry points • Entry lobby

	• External surrounding and hiding spots • Car park entry • Car park circulation aisles • All common areas • Loading docks • All lifts • Building managers office
--	--

The overall system is a networked based (IP)solution with capabilities to have third-party system integration in the future. All head end units will be located within the main communications room and integrated via local addressable network.

An un-interruptible power supply system will be proposed for 1hrs autonomy in case of power failure to maintain system integrity accordingly.

A fire trip signal will be provided to the system from the fire control room to ensure that access-controlled doors are released accordingly in fire mode to ensure safe evacuation of the buildings accordingly.

5.3.6 LIGHTNING PROTECTION

Considering the height of proposed buildings, electrical infrastructure to be installed on site to provide electricity and extend of the site, it is very likely that this development will require lightning protection system. This is to be further confirmed by GFB through lightning risk assessment. Having said that, if such system is required. GFB will be designing a conventional system in accordance with AS1768. Conventional lightning protection system is designed to safeguard buildings and structures from lightning strikes by providing a controlled path for the electrical discharge to follow, thereby minimising damage and ensuring safety. The key components of a conventional lightning protection system include:

Air Terminals (Lightning Rods):

These are pointed metal rods placed at the highest points of the structure, such as rooftops, chimneys, and towers. They serve as the initial contact point for lightning strikes, capturing the electrical charge and directing it safely towards the ground.

Conductors:

These are thick, conductive wires or cables that connect the air terminals to the ground. They provide a low-resistance pathway for the electrical current to travel from the air terminals to the ground electrodes. Conductors are typically made of copper or aluminum.

Ground Electrodes (Grounding Rods):

These are metal rods or plates buried deep in the ground, often made of copper or galvanized steel. They dissipate the electrical charge into the earth, away from the protected structure. Ground electrodes are crucial for safely transferring the lightning current into the ground.

Bonding:

Bonding ensures that all metal parts of the structure are electrically connected, preventing potential differences that could lead to side flashes. This includes metal roofs, pipes, and other conductive materials within the building. Proper bonding reduces the risk of electrical hazards and ensures the system's effectiveness.

Surge Protection Devices (SPDs):

SPDs are installed at key points within the electrical system to protect against surges caused by lightning strikes. These devices help prevent damage to electronic equipment and electrical systems by diverting excess voltage and current away from sensitive components.

Inspection and Maintenance:

Regular inspection and maintenance of the lightning protection system are essential to ensure its ongoing effectiveness. This includes checking for corrosion, loose connections, and damage to components. Proper maintenance ensures that the system remains capable of handling lightning strikes.

Overall, a conventional lightning protection system provides a comprehensive approach to mitigating the risks associated with lightning strikes, protecting both the structure and its occupants.

5.4 TELECOMMUNICATIONS

5.4.1.1 Incoming Telecommunications Infrastructure (NBN/Opticomm)

NBN and Opticomm are widely used within Australia to provide FTTP (Fibre to the Premises) infrastructure. NBN Co has requirements to install their passive equipment on premises inside a secured and dedicated room. This service is reticulated from available street provisions into the development via in-ground conduits and further reticulate on cable tray to building fibre device (BFD). Topology of NBN distribution internally is via star distribution comprising of equipment installed in communications risers such as Fibre Distribution Terminals (FDT) and Splitter Distribution Terminals (SDT) with final fibre termination inside tenancies via Network Terminal Devices (NTD). NBN does not require dedicated NTDs for safety services such as emergency lifts and fire control rooms as a mobile sim coverage will provide connectivity to necessary emergency department and services. GFB will be documenting NTDs associated with security, house and base building services to maintain segregation between different strata.

Additionally, Opticomm has provisions for communications rack installation to accommodate active equipment on site. Depending on Deicorp preference, GFB can document spatial provisions accordingly.

Note that all necessary conduit reticulation to tenancies (residential) from associated communications risers at each level is via in-slab 25mm communications conduit in coordination with structural engineer's approval. This is to minimise clashes with other services and provide a less Labour-intensive installation.

5.4.1.2 Base Building Communications Equipment

In order to facilitate different network infrastructure and provide connectivity within the overall site, it is necessary to install passive communications infrastructure to provide such connection points. GFB will be documenting communications racks in main communications room to distribute fibre cabling throughout. Communications risers within basement, ground

and level 1 will have small communications racks installed to provide connection link back to the base building head-end units in basement level. Each rack will receive fibre-breakout tray, patch panels, cable management and power rail including dedicated captive screw power outlet at high level connected to house services. Small, localised UPS system will be documented if a communications rack has connection link to CCTV, Access Control and Security system at that level/area.

5.4.1.3 Fibre TV

Since NBN and Opticomm provide TV over fibre, GFB will be documenting a fibre TV system instead of traditional MATV/PayTV infrastructure. This approach will provide TV connections with no coaxial cabling and additional TV equipment inside risers. Media conversion will take place within tenancies through NTDs accordingly to achieve the same outcome as the traditional system.

This will also remove provisions of any roof top antenna and dish installations.

5.4.2 RESIDENTIAL TENANCIES ELECTRICAL PROVISIONS

Table below is summarising electrical, communications and lighting provisions to residential tenancies.

APARTMENT ELECTRICAL PROVISIONS

Services	Power	Communications	Lighting
Living	2 x DGPOs for TV 2 x DGPO general use	1 x Double Data 1 x TV Outlet	downlights with local light switches
Dining	1 x DGPOs	1 x NTD 1 x Double Data	downlights with local light switches
Kitchen	2 x DGPOs above bench 1 x GPO for dishwasher in-joinery 1 x GPO for microwave in-joinery 1 x GPO for others in-joinery 1 x GPO for oven in-joinery 1 x GPO for cook-top in-joinery	1 x Double Data above bench	Downlights, pendant and in-joinery strip lighting with local light switches
Master Bedroom	1 x DGPOs for TV 2 x DGPO general use	1 x Double Data 1 x TV Outlet	downlights with local light switches
Bedroom 2	1 x DGPOs for TV 2 x DGPO general use	1 x Double Data 1 x TV Outlet	downlights with local light switches
Bedroom 3	1 x DGPOs for TV 2 x DGPO general use	1 x Double Data 1 x TV Outlet	downlights with local light switches
Study	1 x DGPOs for TV 1 x DGPO general use	1 x Double Data 1 x TV Outlet	downlights with local light switches
Bathrooms	1 Double GPO integrated in joinery	NA	Downlights and in-joinery strip lighting with local light switches
Laundry	1 x DGPOs for washer/ dryer 1 x DGPO general use	NA	Downlights and in-joinery strip lighting with local light switches
Hallway	NA	Intercom	downlights with local light switches

Appendix A – Maximum Demands Full Electric

25154_EMD_Full Electric_Rev 02.xlsx

GOLDFISH AND BAY SERVICES MAXIMUM DEMAND



MAXIMUM DEMAND RESIDENTIAL INSTALLATION - FULL ELECTRIC PROVISION (AS/NZS 3000:2018 TABLE C1, COLUMN 5 BLOCK OF UNITS)					
PROJECT :		5-9 Cowan Road, St Ives			
JOB No. :		25154	DATE : 20/08/2025		
LOAD GROUP		BLOCKS OF LIVING UNITS PER PHASE			
		Select number of total units			
		74	1	3	
		A	B	C	
		25.00	25.00	24.00	
		Heaviest load is : 25.00			
		MAXIMUM BLOCKS OF LIVING UNITS PER PHASE: 25			
Load Group		Amperes	KVA	Remarks	
A	(i) Except (ii) and Load group H below (d.e) (ii) Outdoor lighting	13 -	9 -	For lighting load in every unit (no assessment for the purpose of maximum demand)	
B	(i) socket outlets not exceeding 10A (ii) socket outlets 15A (iii) socket outlets 20A	98 - -	68 - -	For 10A socket outlet load in every unit	
C	Ranges, cooking appliances, laundry equipment or socket outlets rated at more than 10A for connection thereto Electric Induction Cooktop	70 225	48 196	For electric oven in every unit Allowance provided to 7KW induction cooktop in every unit with 30% utilisation	
D	Mechanical (Cooling and Heating) in KW	3.5	KW Total	280 194	Mechanical design for units are based on Day & Night mode operation
E	Instantaneous water heaters	10.8	KW Total	347 241	For electric heat pump per living unit with 30% utilisation
F	Appliances rated at more than 10A and socket-outlets for the connection thereof - (iv) Charging equipment associated with electric vehicles	169	Car Parkings	366 254	1.5kW allowance for each carpark to meet NCC
G	Lifts (x2) - 32A three phase per lift estimated	32	A/Phase Each	64 44	A total of 2 lifts
Others					
Base Building	VAlm2 P+L	VAlm2 Mech	m2 Area		
Basement 3	5	10	1190	26 18	
Basement 2	5	10	2095	45 31	
Basement 1	5	10	2095	45 31	
Communal Areas	2	10	1060	18 13	
Total:		1598	1107		
85% Diversity		1358	941	Request 1400A from supply authority	

Clarifications & Assumptions:-

- Our estimate for lift (2-08) is inline with similar type development
- We have considered electric for hot-water generation and cooking appliances
- Our estimate for mechanical for residential units is inline with similar type development

Appendix B – Maximum Demands Gas Provision

25154_EMD_Gas Provision_Rev 02.xlsx

GOLDFISH AND BAY SERVICES MAXIMUM DEMAND



MAXIMUM DEMAND RESIDENTIAL INSTALLATION - GAS PROVISION (AS/NZS 3000:2018 TABLE C1, COLUMN 5 BLOCK OF UNITS)					
PROJECT :		5-9 Cowan Road, St Ives			
JOB No. :		25154	DATE :		21/08/2025
<u>LOAD GROUP</u>		<u>BLOCKS OF LIVING UNITS PER PHASE</u>			
		Select number of total units			
		74	/	3	
			A	B	C
			25.00	25.00	24.00
		Heaviest load is : 25.00			
		MAXIMUM BLOCKS OF LIVING UNITS PER PHASE: 25			
Load Group		Area	KVA	Remark	
A					
(i) Except (ii) and Load group H below (d.a)		13	9	For lighting load in every unit	
(ii) Outdoor lighting	(no assessment for the purpose of maximum demand)	-	-		
B					
(i) socket outlets not exceeding 10A		96	68	For 10A socket outlet load in every unit	
(ii) socket outlets 15A		-	-		
(iii) socket outlets 20A		-	-		
C					
Ranges, cooking appliances, laundry equipment or socket outlets rated at more than 10A for connection thereof		70	48	For electric oven in every unit	
Electric Induction Cooktop	0 kW	0	0	Gas cooktop provision	
D					
Mechanical (Cooling and Heating) in kW	3.5 kW Total	290	194	Mechanical design for units are based on Day & Night mode operation	
E					
Instantaneous water heaters		0	0	Gas generated water heaters per living unit	
F					
Appliances rated at more than 10A and socket-outlets for the connection thereof -					
(iv) Charging equipment associated with electric vehicles	169 Car Parkings	366	254	1.9kW allowance for each carpark to meet NCC	
G					
Lifts (x2) - 32A three phase per lift estimated	32 A/Phase Each	64	44	A total of 2 lifts	
<u>Others</u>					
	VAlm2 P+L	VAlm2 Mech	m2 Area		
Base Building					
Basement 3	5	10	1190	26	18
Basement 2	5	10	2095	45	31
Basement 1	5	10	2095	45	31
Communal Areas	2	10	1060	18	13
				Total:	1025 710
85% Diversity				871	604 Request 900A from supply authority

Certifications & Assumptions -

- Our estimate for lift (2-off) is inline with similar type development
- We have considered gas for hot-water generation and cooking appliances
- Our estimate for mechanical for residential units is inline with similar type development