



## 101 North Steyne, Manly

# Ecologically Sustainable Development Report

|             |              |
|-------------|--------------|
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## E-LAB Consulting

Where science and engineering inspire design.



# ISSUE AND REVISION RECORD

## DESIGN FINALISATION

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# 1 EXECUTIVE SUMMARY

This report has been prepared by E-LAB at the instruction Time & Place to explore sustainability, health and wellbeing opportunities for the proposed development located in 101 North Steyne, Manly, NSW 2095. The intent of this report is to establish an Ecologically Sustainable Design (ESD) strategy for the assessment of the DA application and to meet the relevant planning frameworks for the 101 North Steyne, Manly development. The sustainability elements to be considered include:

- Achieving the BASIX benchmarks in line with Sustainable Buildings SEPP 2022 requirements for mid/high-rise residential building:
  - **BASIX Energy 61%**
  - **BASIX Water 40%**
  - High level of NatHERS thermal performance rating
  - Use of low impact materials and minimisation of resources to reduce embodied emission.
- Fossil-fuel free design to allow for carbon neutrality by 2035.
- Maximise on-site renewable energy
- Following a range of sustainability initiatives across the site spanning **energy efficiency, water efficiency, indoor environment quality, waste management and comfort.**
- Biophilic excellence through plants and embedding nature in the design.
- Provision of Heat Island Mitigation measures.

The strategies and initiatives presented in this report demonstrate a strong commitment to sustainability in line with the Northern Beaches council development guidelines and are to be further developed during subsequent stages of the project.



## 2 INTRODUCTION

### 2.1 SITE OVERVIEW

The project is located at 101 North Steyne, Manly NSW, within the Northern Beaches Council. The development borders North Steyne to the east and Pine Lane to the west, as shown in Figure 1 below. It's northern and southern site borders are adjacent to other residential apartment buildings. The site is located opposite the North Steyne Reserve and Queenscliff Beach. The immediate surrounding of the site is predominately a mix of residential and recreational land uses, with retail and hospitality venues within close proximity. This includes the Manly Corso, Manly beach, Manly Warf, Ivanhoe Park and Manly Oval.

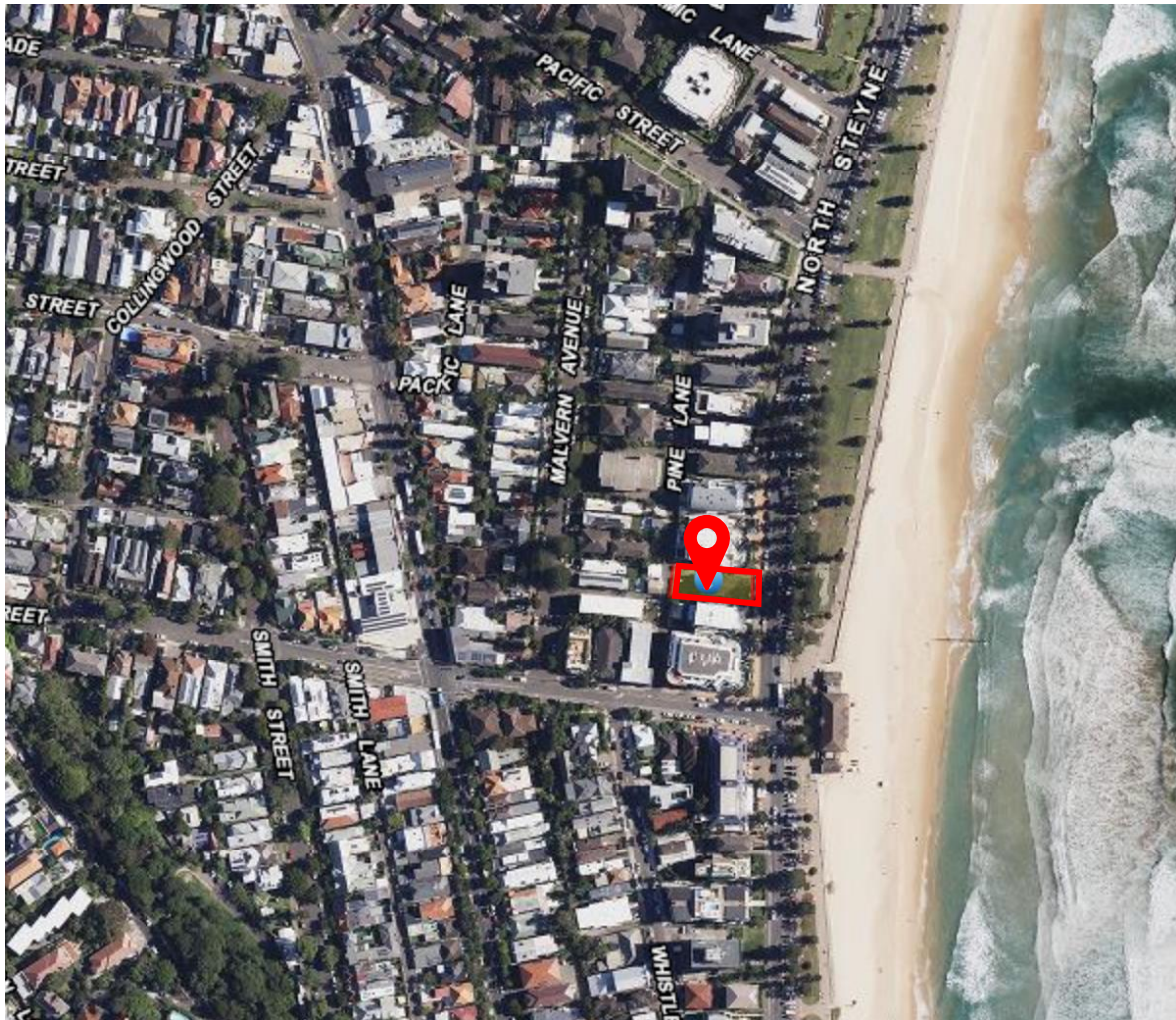


Figure 1 Site Location. Source: SIX Maps, 2024

### 2.2 DEVELOPMENT OVERVIEW

The proposed residential development located at 101 North Steyne, Manly, NSW 2095 consists of 7 units across 5 levels (Ground floor to Level Four).

- 7 apartments of 3- and 4-bedroom composition.
- Basement level with 13 residential car spaces.
- Resident and visitor bicycle storage.



- Associated landscape and public domain works.
- Site area of 638sqm.



*Figure 2. Perspective of Development (Source: Smart Design Studio 2024)*

### 3 SUSTAINABILITY FRAMEWORKS

The 101 North Steyne, Manly NSW development's sustainability outcomes are influenced & aligned by the following key frameworks:

- Northern Beaches Council – Manly Development Control Plan 2013 – Sustainability
- State Environmental Planning Policy - Sustainable Buildings (SEPP) 2022
- Compliance with NCC/BCA Section J 2022

#### 3.1 MANLY DEVELOPMENT CONTROL PLAN (DCP) 2013

The Council encourages all applicants to integrate the principles of ecologically sustainable development (ESD) into their proposed projects. Part 3.5 of the DCP outlines the sustainability requirements, which aim to foster innovative design solutions that enhance the urban environment while minimising energy and water consumption. Below are the ESD requirements from Part 3.5 of the Manly DCP 2011:

- **Ecological Sustainability in Planning:** Ensuring all developments consider environmental, social, and economic sustainability within an integrated framework.
- **Adaptive Reuse of Buildings:** Encouraging the preservation and adaptation of existing structures to minimize demolition, promoting environmentally sustainable materials and methods when adaptation is not feasible.
- **Waste Minimization in Development:** Reducing the waste generated during development, particularly through demolition processes.
- **Use of Recycled Materials:** Promoting the use of recycled materials in landscaping and construction.
- **Promoting Sustainable Landscaping:** Encouraging the planting of vegetable gardens and fruit trees to promote sustainability.
- **Energy Efficiency in Design:** Supporting energy-efficient design and construction to lower energy consumption, reduce reliance on fossil fuels, and minimize greenhouse gas emissions.
- **Solar Access Optimization:** Requiring residential developments to maximize solar access for energy efficiency.
- **Exceeding BASIX Requirements:** Encouraging developers to exceed energy conservation standards set by BASIX, especially for internal heating and cooling.
- **Energy Conservation Beyond BASIX:** Ensuring energy efficiency in developments not covered by BASIX through strategic site planning and design.
- **Energy Performance in Large Developments:** Requiring developments over 500 sqm to meet specific energy performance criteria via an Energy Performance Report.
- **Compliance with Building Code:** Ensuring non-residential developments meet the energy efficiency provisions of the Building Code of Australia.





## 3.2 STATE ENVIRONMENTAL PLANNING POLICY - SUSTAINABLE BUILDINGS (SEPP) 2022

NSW has whole-of-economy targets to reduce greenhouse gas emissions by 50 per cent by 2030 compared to 2005 levels, and net zero emissions by 2050. Achieving these targets will require all new and existing buildings in NSW to be operating at net zero well before 2050. Energy efficiency, conserving potable water and improving thermal performance are also high priorities.

The NSW Government has introduced the State Environmental Planning Policy (Sustainable Buildings) 2022 to ensure new and renovated buildings are sustainable and resilient for future climate and bring NSW towards net zero emissions. This policy covers all types of buildings from residential to key types of non-residential.

### 3.2.1 NSW Residential Buildings

The Building Sustainability Index (BASIX) is a legislative requirement for all residential dwelling types within NSW to assess the potential performance of certain residential buildings against a range of sustainability indices including thermal comfort, water, embodied emission and energy.

BASIX sets water and greenhouse gas reduction targets relative to the NSW average benchmark for per person potable water consumption & greenhouse gas emissions within the residential sector. It also sets the minimum performance levels for thermal comfort of the dwelling and embodied emission of materials.

The new targets are sets into place from October 2023 that increased the standards according to SEPP 2022.

The project is committed to meet requirements in line with Sustainable Buildings SEPP 2022 at the time of delivery:

| BENCHMARK                            | REQUIREMENT   |
|--------------------------------------|---|
| <b>Thermal Performance Benchmark</b> | Required to achieve minimum 7 NatHERS Star average rating for whole development and minimum 6 NatHERS star individual apartments for development over 5 levels. |
| <b>Energy Benchmark</b>              | Required to achieve 61% reduction in energy consumption of whole development through energy efficient design.   |
| <b>Materials Index</b>               | Required to estimate the volume of different materials used in the construction and applying the emissions factors for the materials.                           |
| <b>Water Benchmark</b>               | Required to achieve 40% reduction in water consumption of whole development through water efficient design.   |

## 4 SUSTAINABLE DESIGN RESPONSE

### 4.1 OVERALL STRATEGY

To demonstrate excellence in sustainability, the development is committed to the following external sustainability guidelines and rating schemes. These include:

- Design to meet Manly Development Control Plan 2013
- Design to meet & exceed the State Environmental Planning Policy requirements.



**Photovoltaic array** on rooftop to reduce operational energy consumption and carbon emissions



**Fully electrified and powered by renewables** Fossil fuel free services



**High Star NatHERS Average**  
High-performance facades with optimised window to wall ratio



**Low Embodied Carbon structure and materials** to reduce upfront carbon emissions



**Efficient Potable water conservation** through efficient fixtures and rainwater collection



**Heat island effect mitigation** through green areas and light coloured surfaces.



**Responsible finishes with low emissions**



**Biophilic elements for** connection to nature, to improve wellbeing and reduce stress



**Energy efficient HVAC equipment and design** to achieve energy efficient development



## 4.2 EPA PRINCIPLES

The proposed development will follow the golden standard in sustainability principals throughout the development. This includes the design, construction, and operational elements of the project. The key overarching principals are aligned with the definition of Ecologically Sustainable Development as defined in clause 7(4) of Schedule 2 of the Environmental Planning and Assessment Regulation 2021. These include:

### The Precautionary Principle:

**Philosophy:** Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

**Project Response:** The project is committed to incorporating elements to minimise impacts on the environment, as outlined below in this section of this report. A commitment to improvement on minimum benchmarks demonstrates the development's commitment to sustainability.

### The Principle of Inter-generational Equity:

**Philosophy:** The present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

**Project Response:** The project is committed to incorporating careful selections into the project design. The design team will address key elements such as energy, potable water, and material consumption to do what is within the project's control to allow each following generation to have an opportunity for ecological equality.

### The Principle of the conservation of biological diversity and ecological integrity:

**Philosophy:** Conservation of biological diversity and ecological integrity should be a fundamental consideration

**Project Response:** The project is committed to planting native vegetation and using integrated landscaping to enhance the overall ecological and biodiversity of the site. Rainwater and stormwater will be carefully managed and controlled to minimise impacts on surroundings.

### Principles relating to improved valuation, pricing, and incentive mechanisms:

**Philosophy:** Environmental factors should be included in the valuation of assets and services. The users of goods and services should pay prices based on the full life cycle costs of providing goods and service.

**Project Response:** The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. These combine to ensure the project pays for the waste and damage it creates. Further, it is designed to be low-energy and low-water consumption, which provides an incentive for residents through lower utility bills.

### The Principle of Waste Minimisation:

**Philosophy:** All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.

**Project Response:** The project will target a construction waste diversion target of 90%, as well as developed specific project waste management strategies. Construction materials are chosen to be low impact in their manufacture, including best practice PVC and FSC/PeFC timber throughout where possible. This impacts waste both created by the site, as well as upstream and downstream waste categories.

The above principles are addressed by 5 key themes, being **Sea, Land, Water, Air and People**. These 5 key themes are centred around reducing harm as far as practicable across the practice of buildings and infrastructure, both in their construction and operation.

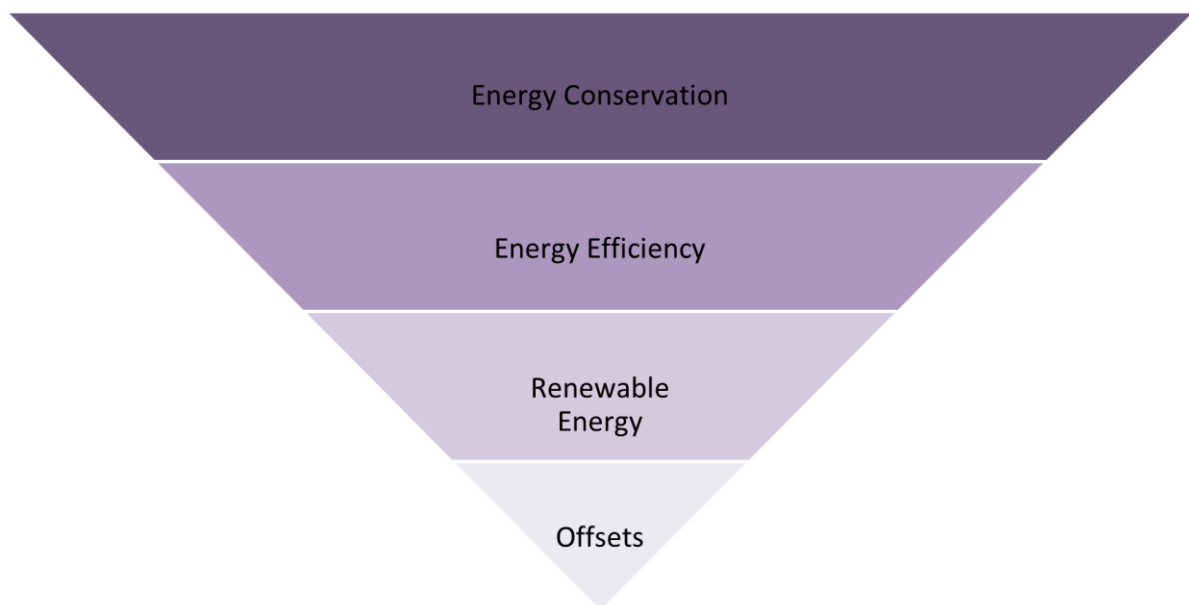
## 4.3 SUSTAINABILITY ACTIONS & RESOURCES

The only path to a low carbon economy and achieving a “2°C world” where the average global temperature is kept to less than 2°C above pre-industrial levels is through comprehensive and complete consideration of how the development consumes resources. As part of this, the project has elected to measure the consumption, so it can track and improve upon the performance. The strategy focusses on energy, water and materiality to ensure resource use is appropriate in line with SEPP 2022 requirements.

### 4.3.1 ENERGY CONSUMPTION

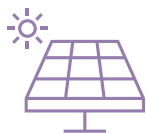
The energy efficiency strategy generally follows the energy efficiency pyramid of the design below. In the first instance demand for Greenhouse Gasses should be reduced. Consideration should be to remove the need for energy to be consumed where possible. Beyond this, energy can be more efficient, through efficient lighting, mechanical systems and appropriate services.

Once the system has reduced all available energy-consuming elements and made the remaining systems as efficient as possible, renewable energy sources will be considered. If space allows on the roof, PV will be installed. Only after all of the above major steps have been completed should offsets be used to close the gap and achieve neutrality.



*Figure 3 Hierarchy of Design - Energy Efficiency*

To achieve the above, the following initiatives are proposed:



**Renewable Energy** – The roof area provides an excellent opportunity for installation of a solar photovoltaic system. The sizeable system will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. PV will be installed at a rate that maximises the coverage of the non-trafficable roof area. This system size will be confirmed during design development.



**Efficient Lighting Systems** – High efficiency LED lighting throughout, including in common areas with efficiency controls to meet the requirements of BASIX. Controls will include motion sensors, time clocks and zoned switching which will

help reduce consumption of energy. Lighting power density to be at least 10% below Section J.



**Controls, Energy Metering and Monitoring** – Energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J8 requirements. Preference for natural ventilation and comfort through adaptive cooling and shading.



**Facade** – façade systems and shading systems will reduce load on the HVAC system with selection of insulation and glazing through new BASIX requirements. Aiming for high Star NatHERS average with consideration of window to wall ratio.



**Hot Water** – Hot water is to be provided by energy efficient individual electric heat pump-air sourced system.



**Appliances & Equipment** – Apartment appliances and equipment will be selected with high energy rating to ensure reduced consumption which will be in line with BASIX energy targets requirements. Additionally, site will be fully electric with no gas combustion for ovens and cooktops allowing for operational net zero.

#### 4.3.2 WATER CONSUMPTION

To achieve responsible water consumption and water sensitive urban design, best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

**Sanitary Fixtures** – By implementing low-flow water fixtures, the consumption will be significantly reduced. All sanitary fixtures are to be provided with the minimum WELS ratings identified below:

Taps – 6 Star WELS

Toilets – 4 Star WELS

Showers – 4 Star WELS ( $\leq 6$  L/min)

Refer to the BASIX report by E-IGS Consulting for further details on residential water consumption measures.



**Landscape Irrigation** – Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Native plants have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. They typically require less water and are more likely to survive the predicted increase in extreme drought conditions due to climate change. Native vegetation also stores a significant amount of carbon, helping to mitigate climate change. The project will aim to use these strategies in the communal spaces with gardens and landscaping.



The development's design is deliberately working to reduce potable water consumption by in the first instance reducing water use.

#### 4.3.3 MATERIALS

In line with the principals of sustainability outlined in the EPA, the project will have a significant focus on materiality. The scope of consideration includes the following action items within the project response:



- **Construction Waste** – 90% of construction and demolition waste is to be diverted from landfill. This diverts and ensures reuse or recycling of a high portion of site waste.
- **Low VOC and Low Formaldehyde Materials** – paints, adhesives, sealants, floor coverings, carpets and engineered wood will be selected appropriately to provide a healthier and low-impact environment. Such efforts provide a cleaner and better environment for all. Additionally, the project will aim to utilise ultra-low VOC paints.
- **Best-Practice PVC** – cables, pipes, flooring, and blinds will be selected and specified to be Best Practice PVC. This ensures upstream performance will be met and has significant benefit for the overall environment during the construction process.
- **Best Practice Steel** – Where possible, steel will come from a sustainable steel manufacturer, who has an action plan. Steel supplied will aim to have energy reducing processes in manufacturing and recycled content.
- **Sustainable Products** – Where possible, products selected for the project will be sustainable which are verified through recycled content, re-use, environmental product declarations, certifications and more. This will ensure reduced toxicity and improve environmental quality while reducing waste.

## 4.4 WASTE MANAGEMENT

### 4.4.1 CONSTRUCTION WASTE

Construction and demolition waste are becoming much easier to recycle as the traditional landfill evolves into waste recovery centres, which are able to recycle the majority of all construction and demolition waste. The development will achieve a minimum of 90% recycling for the construction and demolition waste produced. Construction waste will be managed through contractual requirements outlining the target recycling rate.

### 4.4.2 OPERATIONAL WASTE

Operational waste which involves the waste produced in the day-to-day operations can also be minimised through effective sorting methods. The two bins likely to receive the most use will be the garbage and paper recycling. It is important to provide accessible bins in many areas and locate the types of bins in the areas where the particular waste stream is likely to arise. A waste management plan will be developed to appropriately size and allocate resources for recycling and general waste. General waste comingled and at least one other waste stream will be collected.

## 4.5 COMFORT AND QUALITY

To ensure the best quality for occupants and visitors inside the space, the following key initiatives will be committed to by the Principal:

- **Visual Comfort** – Maximising high-quality light into the living spaces, with views to the sky and ocean/nature where possible.
- **Indoor Air Quality** – Ventilation to be easily cleaned and elimination of pollutants to improve air quality within internal spaces.
- **Acoustic Excellence** – Designing the building layout to be protected from noise from external sources. Delicate material selection, acoustic attenuation, and designing the shape of the building and openings accordingly achieves the performance.
- **Thermal Comfort** – Appropriate mix of vernacular design, overhangs, adaptive comfort and high levels of insulation in the roof and facades.
- **Lighting Comfort** – Use of high colour rendering index (CRI > 80) LED lighting throughout the entire development. Low-glare lighting with baffles or louvres to limit UGR.

- **Biophilic Design** – Greenery through natural planting throughout the development assists in a connection to nature for users and passers-by. It also has a cooling effect, reducing the Urban Heat Island burden on the project. This will be applied in the communal spaces.
- **Accessibility** – Ensure that the building is accessible to people of all abilities, with features such as ramps,
- **Safety and Security** – Prioritise building safety and security measures to provide a sense of comfort and protection for occupants.
- **Natural Materials** – Use natural and sustainable building materials that are non-toxic and promote a healthy indoor environment.
- **User-Friendly Technology** – Integrate user-friendly technology that enhances occupant comfort and convenience, such as smart lighting and temperature control systems.

The above combine to ensure the development is responsible, efficient, beautiful, and in the best interest of not just the developers, but the residents aswell.

## 4.6 ACTIVE TRANSPORT

The adoption of sustainable transport methods is encouraged by building designs which provide appropriate facilities for occupants and visitors. Site proximity to major transport infrastructure also lends itself to building occupants adopting and utilising sustainable methods of transport. The development provides easy access to the bus network with bus stops located close by to have an access to city easily.

**Bicycle Parking** - Secure bicycle spaces to be provided inside the development for use by residents.

**Electric Vehicle Infrastructure** - Project is supportive of the transition to electrification in transport. The carpark can accommodate EV charging infrastructure powered by renewable energy from photovoltaic installation on the building's roof and additional electrical infrastructure to aim for the provision of EV charging points for future uptake wherever possible.

## 4.7 RENEWABLE ENERGY

Photovoltaic (PV) renewable energy enables the development to have production of emissions-free electricity directly at the location of usage and reduce energy and environmental impacts of project.

## 4.8 HEAT ISLAND MITIGATION

Integrating climate resilience strategies into building design and operations to ensure preparedness for extreme weather events and changing climate conditions. Project site is located in a position that experiences a high level of urban heat island impact. Figure below shows the variation of temperature to a non-urban vegetated surface, such as the North Steyne Reserve. The site experiences temperatures of 6-9°C above baseline as defined by the NSW government for Urban Heat Island Effect (<https://geo.seed.nsw.gov.au/Public Viewer>)

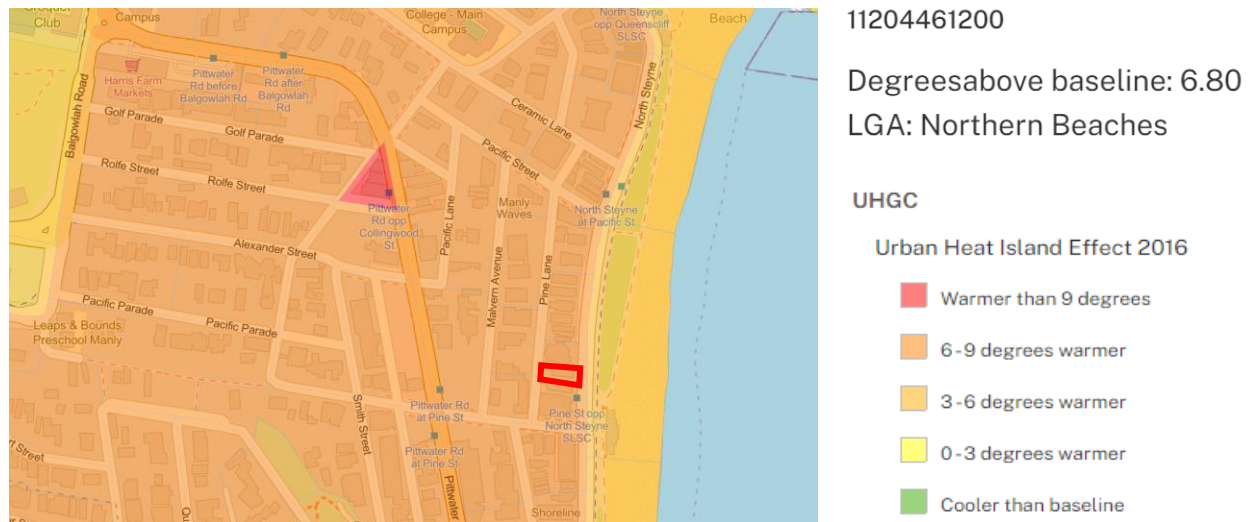


Figure 5: Urban Heat Island Effect at the site (Source: SEED Database, 2016)

To minimise the urban heat island effect and provide a more comfortable environment for occupants, the development can implement the following initiatives:

- Green gardens with drought tolerant planting;
- Light coloured external materials and roof; and
- Plant trees with wide tree canopies.

## 4.9 BIOPHILIC DESIGN

Until relatively recently in human history, people had constant interaction with living things and their natural surroundings. Biophilia, or the idea that humans have an affinity towards the natural world, is an emerging field that aims to address our psychological need to be around life and life-like processes. Exposure to views and images of nature can help to speed up healing and recovery time, boost positive feelings and reduce negative ones. Interior environments that are cold, sterile and devoid of life, on the other hand, can diminish our experience, mood and happiness.

## 5 BASIX COMPLIANCE

The Building Sustainability Index (BASIX) is a legislative requirement for all residential dwelling types within NSW to assess the potential performance of certain residential buildings against a range of sustainability indices including thermal comfort, water, embodied emission and energy.

BASIX sets water and greenhouse gas reduction targets relative to the NSW average benchmark for per person potable water consumption & greenhouse gas emissions within the residential sector. It also sets the minimum performance levels for thermal comfort of the dwelling and embodied emission of materials.






The new targets are sets into place from October 2023 that increased the standards according to SEPP 2022.

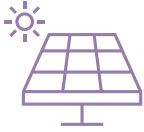



The project is committed to meet requirements in line with Sustainable Buildings SEPP 2022 at the time of delivery:

- **Thermal Performance Standards:** Required to achieve minimum 7 NatHERS Star average rating for whole development and minimum 6 NatHERS star individual apartments.
- **Energy Standards:** Required to achieve minimum 61% reduction in energy consumption of whole development through energy efficient design.
- **Materials Index:** Required to estimate the volume of different materials used in the construction and applying the emissions factors for the materials.
- **Water Standards:** Required to achieve 40% reduction in water consumption of whole development through water efficient design.

### 5.1.1 BASIX ENERGY TARGET




The project aims to achieve minimum **BASIX Energy target of 61%**, which fulfills the minimum legislative requirement. To ensure prudent energy consumption, the project will incorporate top-tier energy-saving practices. The following strategies will be considered to attain the energy targets:

|   |   |
|---|---|
|  | <b>BASIX Energy Target of 61%</b> - In line with council targets and new Sustainable Buildings SEPP 2022, the development is targeting an Energy target of 61% reduction compared to an equivalent development.   |
|  | <b>Thermally-Efficient Construction</b> – Insulation through the roof, walls and floor, with proper sealing to reduce bulk airflow. Light-coloured materials will be used to reflect solar heat gains. Delicate consideration will be given to the height of the windows, shading and overall window-to-wall ratio.<br><br>Provide air movement through ceiling fans in bedrooms. |
|  | <b>Electrification</b> – no gas will be used on site, enabling the development to be 'net zero ready' and allow the benefits of decarbonisation of the grid to be realised.   |
|  | <b>Energy Efficient Appliances</b> – energy efficient appliances such as electric cooktops and dryers will be provided to reduce operational energy consumption.  |
|  | <b>Efficient Lighting Systems</b> – high efficiency LED and fluorescent lighting in common areas with efficiency controls to meet the stringent requirements of NCC 2022 Section J. Controls will include motion sensors, time clocks and zoned switching.  |

|   |   |
|---|---|
|  | <b>Renewable Energy</b> – The roof area provides a good opportunity for installation of a solar photovoltaic system. This will generate renewable electricity to offset grid use and minimise stress on the grid at peak times. Design team will maximise the PV system size, however the exact size of the system will be further developed, taking into consideration roof design, spatial allowance and building demand. |
|  | <b>Lift</b> – Lifts to be provided with regenerative braking.   |
|  | <b>Controls, energy metering and monitoring</b> – energy meters and monitoring systems will be provided to comply with NCC 2022 Section J Part J9 requirements. Exhaust fans will be connected to light switches to ensure they do not run when not required.   |
|  | <b>Hot water</b> is to be provided by energy efficient heat pump systems. These systems provide an output three times their input energy and can be run off the solar PV system to reduce the operational carbon of the development.  |

### 5.1.2 BASIX WATER TARGET

The project will target minimum **BASIX Water target of 40%**, meeting the minimum legislative requirement. To achieve responsible water consumption, best practice water-saving initiatives will need to be implemented throughout the project. The following initiatives will be explored to achieve the potable water targets:

|   |  |
|---|--|
|  | <b>Sanitary Fixtures</b> - By implementing low-flow water fixtures, the consumption associated with apartments will be significantly reduced. All sanitary fixtures are to be provided to the WELS ratings identified below: <ul style="list-style-type: none"> <li>▪ Taps – 6 Star WELS</li> <li>▪ Toilets – 4 Star WELS</li> <li>▪ Showers – 4 Star WELS (<math>\leq 6</math> L/min)</li> </ul>  |
|  | <b>Landscape Irrigation</b> - Efficient irrigation systems will be considered, including underground surface drip systems, moisture sensors, and the use of native plants in the landscaping plan. Natives have evolved to thrive in the Australian environment and are typically more resilient than their exotic counterparts. Native vegetation also stores a significant amount of carbon, mitigating the impacts of climate change. |
|  | <b>Water Efficient Appliances</b> – water efficient appliances with low-flow and High WELS ratings will be provided to reduce potable water consumption.   |

### 5.1.3 MATERIALS INDEX

Material Index commitment involves sourcing and utilizing construction materials that have a lower environmental impact, thereby reducing the carbon footprint associated with the project's construction and operation. This approach aligns seamlessly with the principles of SEPP 2022, demonstrating the development's dedication to sustainable construction practices. In line with the principals of SEPP 2022 for BASIX, the project will have a significant focus on materiality to reduce the embodied emission.

## 6 SUMMARY

This report summarises the sustainability targets and commitments for the new proposed development located at 101 North Steyne, Manly, NSW 2095. The requirements for sustainability have been coordinated with the design team to allow the development to achieve a high level of sustainable practice across the entire development.

As part of its commitment to sustainability, the development has committed to the following:

- Achieving the BASIX benchmarks in line with Sustainable Buildings SEPP 2022 requirements for mid/high-rise residential building:
  - **BASIX Energy 61%**
  - **BASIX Water 40%**
  - High level of NatHERS thermal performance rating
  - Use of low impact materials and minimisation of resources to reduce embodied emission.
- Fossil-fuel free design to allow for carbon neutrality by 2035.
- Maximise on-site renewable energy
- Following a range of sustainability initiatives across the site spanning **energy efficiency, water efficiency, indoor environment quality, waste management and comfort.**
- Biophilic excellence through plants and embedding nature in the design.
- Provision of Heat Island Mitigation measures.

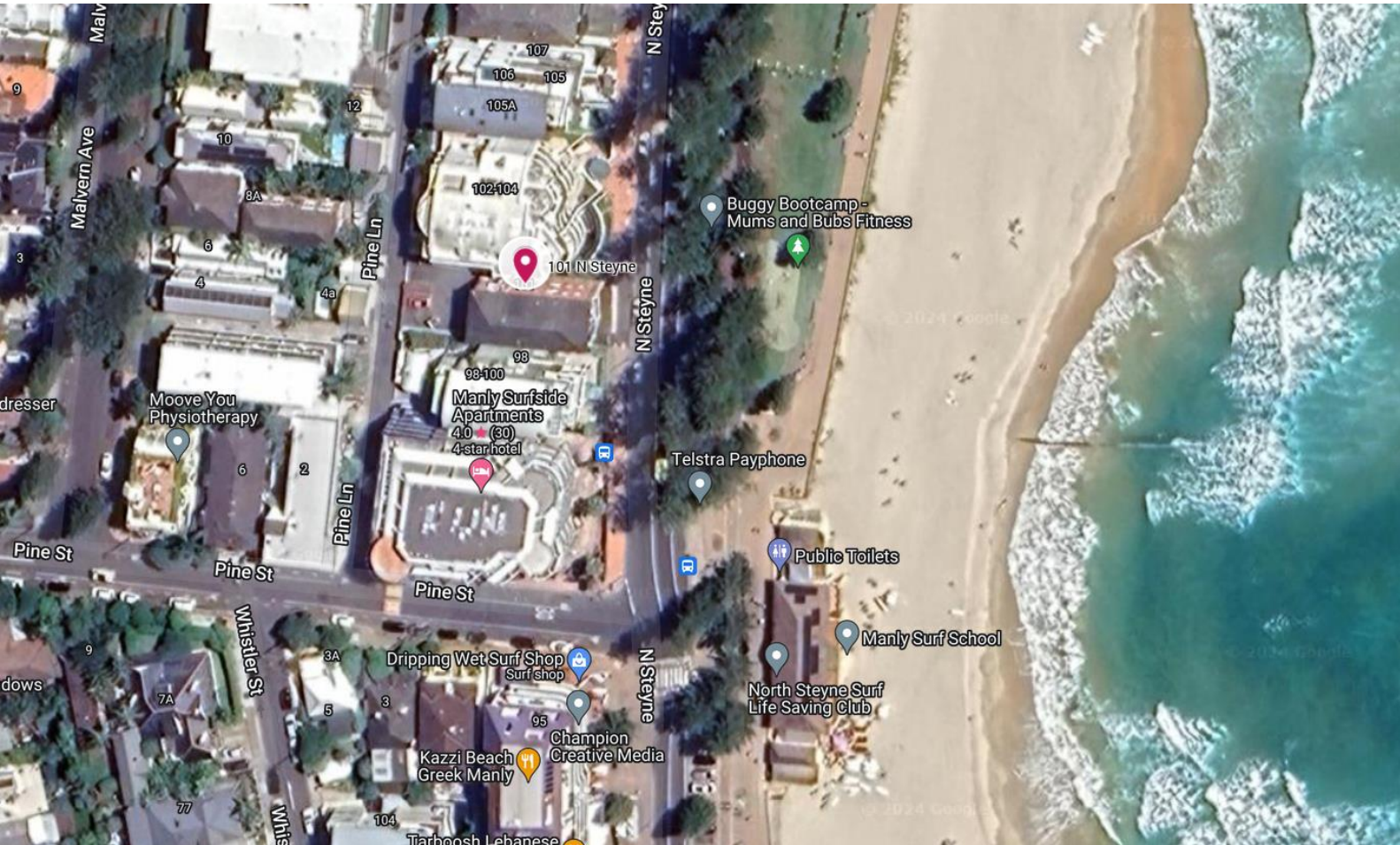
The strategies and initiatives presented in this report demonstrate the project's commitment to sustainable development.

## **APPENDIX A – BASIX REPORT**





**IGS** INTEGRATED  
GROUP  
SERVICES



**101 North Steyne, Manly NSW**

# **BASIX Assessment Report**

18<sup>th</sup> December 2024





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## Document Control

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|----------|------------------|------------|----|
| 1.0      | 18 December 2024 | B. Shojaei | BS |

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## 1. EXECUTIVE SUMMARY

IGS has been commissioned to assess the interaction of the residential area of the proposed development at 101 North Steyne, Manly NSW, with the local environment in terms of BASIX compliance.

A BASIX Certificate is a regulatory requirement and demonstrates compliance with the NSW Government's sustainability targets. BASIX assessment and certification has been completed for this project (Certificate No 1778522M).

Dwellings within the development have been assessed in terms of their passive energy design using the BASIX Thermal Comfort protocol. They have also been assessed in terms of their ability to conserve water and also to minimise energy consumption via appliances and hot water etc.

With the recommendations provided in the BASIX certificate, the development meets and exceeds the minimum requirements for all the following areas.

- Water Efficiency
- Energy Efficiency
- Thermal Comfort

This development achieves the following targets:

- Water Efficiency: 40% reduction (minimum requirements under BASIX: 40%).
- Energy Efficiency: 61% reduction (minimum requirements under BASIX: 61%).
- Thermal Comfort: Will pass the thermal performance requirements under BASIX.

## 2. INTRODUCTION

BASIX is an NSW State Planning Policy Tool which assesses the environmental performance of new residential premises against a range water, energy and greenhouse gas emissions targets. The assessment has three core components, BASIX Thermal Comfort, BASIX Water and BASIX Energy.

The thermal comfort assessment requires that the thermal performance of dwellings is evaluated and measures put in place to ensure annual heating and cooling loads do not exceed pre-defined limits without compromising the occupant's thermal comfort. This assessment uses computer simulation to evaluate the estimated building fabric thermal performance and passive solar design features such as orientation and solar shading.

The energy section evaluates gas and electrical energy used for heating, cooling lighting, ventilation and appliances. The BASIX Energy target requires the development to use 61% less energy than the NSW average.

The water assessment takes account of landscaping, stormwater management as well as water efficiency performance of fixtures and fitting such as taps and showers. The BASIX target for water requires that potable water consumption is at least 40% lower than the NSW average.

**Note:** this report is only a guide to the BASIX certificate, for full details of BASIX requirements please refer to the BASIX certificate.

### 3. BUILDING DESCRIPTION

The proposed development will be located at 101 North Steyne, Manly NSW.

#### 3.1 Information Used in Review

Our review is based on the following architectural drawings by Smart design Architects (Table 1).

*Table 1. Architectural drawings list.*

| Drawing title | Drawing number |
|---------------|----------------|
| B1 Plan       | DA099          |
| L00 Plan      | DA100          |
| L01 Plan      | DA101          |
| L02 Plan      | DA102          |
| L03 Plan      | DA103          |
| L04 Plan      | DA104          |
| Roof Plan     | DA105          |
| Elev - N S    | DA400          |
| Elev - E W    | DA401          |
| Sect - A B    | DA450          |

## 4. BASIX WATER SECTION

The water efficiency performance of the development has been assessed using the online BASIX Tool. The assessment has considered the common area and central system features including the landscape design, plant species, water catchment areas, rain water tank size and efficiency of preferred fixtures and fittings in the dwellings.

The proposed development will meet the mandatory BASIX water target of 40% as long as the water commitments detailed in Table 2 are installed. For details of the requirements necessary to achieve this target, please refer to the BASIX Certificate No. 1778522M.

*Table 2. Water Commitments.*

| <b>Common Areas and Central Systems</b> |   |
|---|---|
| Common areas                            | <ul style="list-style-type: none"> <li>• 4-star (&gt; 4.5 but &lt;= 6 L/min) showerhead.</li> <li>• No common toilet facility.</li> <li>• 4-star (water-rated) taps.</li> <li>• No common clothes washer facility.</li> </ul>   |
| <b>Private Dwellings</b>                |   |
| Fixtures                                | <ul style="list-style-type: none"> <li>• 4-star (Water Rating) showerheads with a flow rate &gt; 4.5 but &lt;= 6 L/min.</li> <li>• 4-star (Water Rating) toilets.</li> <li>• 6-star (Water Rating) kitchen taps.</li> <li>• 6-star (Water Rating) bathroom taps.</li> <li>• 4-star (Water Rating) dishwashers.</li> <li>• On demand hot water recirculation.</li> </ul> |
| Individual spa                          | <ul style="list-style-type: none"> <li>• Unit no. 1: spa capacity: 5kL, with cover and not shaded.</li> </ul>   |

## 5. BASIX THERMAL COMFORT SECTION

The preliminary thermal performance of the development has been evaluated using FirstRate5 software; this computer simulation of residential developments is used to assess the potential of a residential development to have low heating and cooling energy requirements once operational.

### 5.1 Modelling Assumptions

FirstRate5 software calculates the transient hourly heat gains and losses for each space inside a building taking into account the building's thermal storage, typical residential occupancy and operational profiles plus hourly weather data for the site.

Building geometry and orientation were modelled according to supplied drawings.

The "base-case" building fabric and estimated glazing and thermal performance requirements are described in Table 3 below. Please note the estimated requirements below are based on the nominated construction materials by the architect.

Table 3. Building Fabric Requirements.

| Element                        | Insulation/glazing   |                              |                   |
|--------------------------------|--|------------------------------|-------------------|
| External walls                 | Minimum added R2.8 thermal insulation.   |                              |                   |
| Internal walls                 | Party walls between units and to corridors, lifts, etc.: <ul style="list-style-type: none"><li>Minimum added R1.5 thermal insulation.</li></ul> Any other Walls: <ul style="list-style-type: none"><li>Stud, plasterboard with no added insulation.</li></ul>              |                              |                   |
| Floors                         | Where unconditioned area below: <ul style="list-style-type: none"><li>Suspended Concrete Slab Floor with minimum added R3.0 thermal insulation.</li></ul> All other area: <ul style="list-style-type: none"><li>Concrete, Plasterboard with no added insulation.</li></ul> |                              |                   |
| Ceilings                       | Where unconditioned area above: <ul style="list-style-type: none"><li>Concrete slab with minimum added R4.5 thermal insulation.</li></ul>  |                              |                   |
| Roof                           | <ul style="list-style-type: none"><li>Concrete with no added insulation (ceiling insulation).</li><li>Lightweight Metal Deck roof with added R1.0 insulation.</li></ul>  |                              |                   |
| Ceiling Penetration            | <ul style="list-style-type: none"><li>Sealed LED downlights and exhaust fans.</li><li>1200 diameter ceiling fan for living area and Bedrooms.</li></ul>  |                              |                   |
| Estimated Glazing Requirements |  |                              |                   |
| Units                          | Window Type  | Total System U-Value (W/m2K) | Total System SHGC |
| L01.02, L02.02, L03.01.        | Fixed Sliding  | Maximum U-value $\leq 3.2$   | 0.49 $\pm$ 5%     |
|                                | Awning Casement  | Maximum U-value $\leq 3.2$   | 0.46 $\pm$ 5%     |
| L00.01, L01.01, L02.01.        | Fixed  | Maximum U-value $\leq 2.18$  | 0.30 $\pm$ 5%     |
|                                | Sliding  | Maximum U-value $\leq 2.2$   | 0.27 $\pm$ 5%     |
|                                | Awning   | Maximum U-value $\leq 2.2$   | 0.28 $\pm$ 5%     |
|                                | Casement   | Maximum U-value $\leq 2.2$   | 0.30 $\pm$ 5%     |
| L03.02.                        | Fixed  | Maximum U-value $\leq 2.02$  | 0.30 $\pm$ 5%     |
|                                | Sliding  | Maximum U-value $\leq 2.03$  | 0.29 $\pm$ 5%     |
|                                | Awning   | Maximum U-value $\leq 2.08$  | 0.27 $\pm$ 5%     |
|                                | Casement   | Maximum U-value $\leq 2.02$  | 0.27 $\pm$ 5%     |
| Skylight                       |  | Maximum U-value $\leq 2.53$  | 0.21 $\pm$ 5%     |

**Note:**

The preliminary thermal insulation and glazing performance requirements outlined in this report nominate the estimated minimum BASIX requirements only. The specified performance values therefore do not consider requirements for any other disciplines such as Acoustics, Fire or Safety compliance. Where required, the development shall comply with any additional requirements related to the local council or other design disciplines in addition to the compliance requirements detailed in this report.

Compliance with the minimum BASIX requirements does not warrant thermal comfort. All services consultants and contractors shall design and construct the development to comply with the minimum requirements of the NCC Vol 1 & 2 and NSW Section J requirements.



## 6. BASIX ENERGY SECTION

The Energy performance of the development has been assessed using the online BASIX Tool. The assessment has considered Common Area and Central System features including the lifts, ventilation and lighting for common areas (corridors, lobbies, car park etc.), centralised domestic hot water and the efficiency of preferred lighting and appliances in the dwellings. The proposed development will meet the mandatory BASIX Energy target of 61% as long as the energy commitments detailed in Table 4 are installed.

Table 4. Energy Commitments.

| Component                         |                       | Commitment  |
|-----------------------------------|-----------------------|---|
| Common Areas of residential areas | Lift bank             | <ul style="list-style-type: none"> <li>Lift bank No.1:<br/>Gearless traction with VVVF motor.<br/>Number of levels with apartments served by a lift: 6<br/>Number of levels from the bottom of the lift shaft to the top of the lift shaft: 6<br/>Number of lifts: 1<br/>Lift load capacity: <math>\geq 1001</math> kg but <math>\leq 1500</math>kg</li> </ul>  |
|                                   | Swimming pool / Sauna | <ul style="list-style-type: none"> <li>N/A</li> </ul>   |
|                                   | Ventilation           | <ul style="list-style-type: none"> <li>Carpark: ventilation (supply &amp; exhaust). Controlled with carbon monoxide monitor and VSD fan.</li> <li>Switch room: ventilation (supply only), Thermostatically controlled.</li> <li>Garbage room: ventilation exhaust only.</li> <li>Plant or service rooms: ventilation (exhaust only), Thermostatically controlled.</li> <li>Ground floor lobby type: ventilation (supply only), Time clock or BMS controlled.</li> <li>Hallways/Lobby areas: ventilation (supply only), Time clock or BMS controlled.</li> </ul> |
|                                   | Lighting              | <ul style="list-style-type: none"> <li>Carpark: LED lighting with motion sensors.</li> <li>Lift bank: LED lighting, connected to the lift call button.</li> <li>Switch room: LED lighting with manual on / manual off.</li> <li>Garbage room: LED lighting with motion sensors.</li> <li>Plant or service rooms: LED lighting with manual on / manual off.</li> <li>Ground floor lobby type: LED lighting with time clock and motion sensors.</li> <li>Hallways/Lobby areas: LED lighting with time clock and motion sensors.</li> </ul>                        |
|                                   | Central Hot Water     | <ul style="list-style-type: none"> <li>Electric heat pump – air sourced.<br/>R0.6 insulation to the pipes.<br/>Unit Efficiency: <math>3.0 &lt; \text{COP} \leq 3.5</math></li> </ul>  |
| Private Dwellings                 | Ventilation           | <ul style="list-style-type: none"> <li>Bathroom: Individual fan, ducted to façade or roof, interlocked to light with timer off.</li> <li>Kitchen Exhaust: Individual fan, ducted to façade or roof, manual on/off switch.</li> <li>Laundry Exhaust: Individual fan, ducted to façade or roof, interlocked to light.</li> </ul>  |

| Component |  | Commitment   |
|-----------|--|--|
|           | Heating & Cooling<br>to living and bedroom areas | <ul style="list-style-type: none"> <li>• Heating: 3-phase air-conditioning / EER 3.0 – 3.5</li> <li>• Cooling: 3-phase air-conditioning / EER 3.0 – 3.5</li> </ul>                         |
|           | Spa Heating                                      | <ul style="list-style-type: none"> <li>• Electric heat pump, to be controlled by timer.</li> </ul>   |
|           | Lighting   | <ul style="list-style-type: none"> <li>• Fluorescent or LED lights with dedicated fittings.</li> </ul>   |
|           | Appliances                                       | <ul style="list-style-type: none"> <li>• Electric cooktops and electric ovens.</li> <li>• 4-star (energy rating) dishwashers.</li> <li>• 4-star (energy rating) clothes dryers.</li> </ul> |

## 7. DISCLAIMER

This report is prepared using the information described above and inputs from other consultants. Whilst IGS has endeavoured to ensure the information used is accurate, no responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact IGS for detailed advice which will take into account that party's particular requirements.

Computer performance assessment provides an estimate of building performance. This estimate is based on a necessarily simplified and idealised version of the building that does not and cannot fully represent all the intricacies of the building once built. As a result, simulation results only represent an interpretation of the potential performance of the building. Although great care has been taken to prepare this report, IGS does not make any representations or give any warranties or assurances as to the accuracy or completeness of the information contained in the report or that the report is free from errors or omissions. IGS and its employees and agents shall not be liable for any loss arising because of, any person using or relying on the report and whether caused by reason or error, negligent act or omission in the report. This draft BASIX assessment and certification has been prepared based on the preliminary architectural and building services design with the view to conducting a detailed assessment once the design is further developed.

Performance of the completed building may be significantly affected by the quality of construction; commissioning, ongoing management of the building, and the way the building is operated, monitored and maintained. Building fabric inputs require verifiable manufacturer data to confirm thermal properties.

This report is intended as a guide to assist with the application of BASIX. It should be read in conjunction with the BASIX and the NCC applicable to the development; specific applications may vary during the design development of the project.

## **8. SUMMARY & CONCLUSION**

The proposed development has been assessed in terms of its ability to conserve water and minimise energy consumption. Furthermore, the thermal performance (passive and fabric design) of the development will comply with the BASIX thermal comfort requirements.

Subject to the provisions of this report the proposed development will be able to achieve the BASIX requirements. For further details, please refer to the BASIX Certificate 1778522M provided.

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## APPENDIX A – BASIX CERTIFICATE

# BASIX<sup>®</sup>Certificate

Building Sustainability Index [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

## Multi Dwelling

Certificate number: 1778522M

This certificate confirms that the proposed development will meet the NSW government's requirements for sustainability, if it is built in accordance with the commitments set out below. Terms used in this certificate, or in the commitments, have the meaning given by the document entitled "BASIX Definitions" dated 10/09/2020 published by the Department. This document is available at [www.basix.nsw.gov.au](http://www.basix.nsw.gov.au)

Secretary

Date of issue: Wednesday, 18 December 2024

To be valid, this certificate must be submitted with a development application or lodged with a complying development certificate application within 3 months of the date of issue.



### Project summary

|  |                                 |
|--|---------------------------------|
| Project name                                 | 101 North Steyne Manly NSW 2095 |
| Street address                               | 101 NORTH STEYNE MANLY 2095     |
| Local Government Area                        | NORTHERN BEACHES                |
| Plan type and plan number                    | Strata Plan SP4518              |
| Lot no.                                      | CP                              |
| Section no.                                  | -                               |
| No. of residential flat buildings            | 1                               |
| Residential flat buildings: no. of dwellings | 7                               |
| Multi-dwelling housing: no. of dwellings     | 0                               |
| No. of single dwelling houses                | 0                               |

### Project score

|                     |        |             |
|---------------------|--------|-------------|
| Water               | ✓ 40   | Target 40   |
| Thermal Performance | ✓ Pass | Target Pass |
| Energy              | ✓ 61   | Target 61   |
| Materials           | ✓ -100 | Target n/a  |

If any changes to this BASIX certificate are required, please contact IGS with following details:

- Project reference: 101 North Steyne, Manly NSW 2095
- Contact number: 0430 108 801

### Certificate Prepared by

Name / Company Name: IGS

ABN (if applicable): 68163019029

# Description of project

## Project address

|                           |                                 |
|---------------------------|---------------------------------|
| Project name              | 101 North Steyne Manly NSW 2095 |
| Street address            | 101 NORTH STEYNE MANLY 2095     |
| Local Government Area     | NORTHERN BEACHES                |
| Plan type and plan number | Strata Plan SP4518              |
| Lot no.                   | CP                              |
| Section no.               | -                               |

## Project type

|  |   |
|--|---|
| No. of residential flat buildings            | 1 |
| Residential flat buildings: no. of dwellings | 7 |
| Multi-dwelling housing: no. of dwellings     | 0 |
| No. of single dwelling houses                | 0 |

## Site details

|                                 |     |
|---------------------------------|-----|
| Site area (m²)                  | 636 |
| Roof area (m²)                  | 250 |
| Non-residential floor area (m²) | -   |
| Residential car spaces          | 16  |
| Non-residential car spaces      | -   |

## Common area landscape

|  |    |
|--|----|
| Common area lawn (m²)                            | 0  |
| Common area garden (m²)                          | 45 |
| Area of indigenous or low water use species (m²) | 23 |

## Assessor details and thermal loads

|                    |             |
|--------------------|-------------|
| Assessor number    | DMN/12/1407 |
| Certificate number | 91SFXWVXJA  |
| Climate zone       | 56          |

## Project score

|                     |        |             |
|---------------------|--------|-------------|
| Water               | ✓ 40   | Target 40   |
| Thermal Performance | ✓ Pass | Target Pass |
| Energy              | ✓ 61   | Target 61   |
| Materials           | ✓ -100 | Target n/a  |

# Description of project

The tables below describe the dwellings and common areas within the project

## Residential flat buildings - Building1, 7 dwellings, 5 storeys above ground

| Dwelling no. | No. of bedrooms | Conditioned floor area (m²) | Unconditioned floor area (m²) | Area of garden & lawn (m²) | Indigenous species (min area m²) |
|--------------|-----------------|-----------------------------|-------------------------------|----------------------------|----------------------------------|
| 1            | 4+              | 203                         | 0                             | 44                         | 0                                |
| 5            | 3               | 134                         | 0                             | 3.2                        | 0                                |

| Dwelling no. | No. of bedrooms | Conditioned floor area (m²) | Unconditioned floor area (m²) | Area of garden & lawn (m²) | Indigenous species (min area m²) |
|--------------|-----------------|-----------------------------|-------------------------------|----------------------------|----------------------------------|
| 2            | 2               | 127                         | 0                             | 0                          | 0                                |
| 6            | 3               | 168                         | 0                             | 0                          | 0                                |

| Dwelling no. | No. of bedrooms | Conditioned floor area (m²) | Unconditioned floor area (m²) | Area of garden & lawn (m²) | Indigenous species (min area m²) |
|--------------|-----------------|-----------------------------|-------------------------------|----------------------------|----------------------------------|
| 3            | 3               | 134                         | 0                             | 3.2                        | 0                                |
| 7            | 3               | 307.3                       | 0                             | 42                         | 0                                |

| Dwelling no. | No. of bedrooms | Conditioned floor area (m²) | Unconditioned floor area (m²) | Area of garden & lawn (m²) | Indigenous species (min area m²) |
|--------------|-----------------|-----------------------------|-------------------------------|----------------------------|----------------------------------|
| 4            | 2               | 127                         | 0                             | 0                          | 0                                |

# Description of project

The tables below describe the dwellings and common areas within the project

## Common areas of unit building - Building1

| Common area        | Floor area (m²) |
|--------------------|-----------------|
| Lift bank (No. 1)  | -               |
| Garbage room       | 6.87            |
| Hallway/lobby type | 31.8            |

| Common area              | Floor area (m²) |
|--------------------------|-----------------|
| Undercover car park area | 460             |
| Plant or service room    | 53              |

| Common area             | Floor area (m²) |
|-------------------------|-----------------|
| Switch room             | 15.5            |
| Ground floor lobby type | 28              |



# Schedule of BASIX commitments

## 1. Commitments for Residential flat buildings - Building1

### (a) Buildings

#### (i) Materials

### (b) Dwellings

#### (i) Water

#### (ii) Energy

#### (iii) Thermal Performance

### (c) Common areas and central systems/facilities

#### (i) Water

#### (ii) Energy

## 2. Commitments for common areas and central systems/facilities for the development (non-building specific)

### (b) Common areas and central systems/facilities

#### (i) Water

#### (ii) Energy

## Schedule of BASIX commitments

The commitments set out below regulate how the proposed development is to be carried out. It is a condition of any development consent granted, or complying development certificate issued, for the proposed development, that BASIX commitments be complied with.

### 1. Commitments for Residential flat buildings - Building1

#### (a) Buildings

| (i) Materials   | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|---|------------------|------------------------------|-----------------|
| (a) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Floor types", "External wall types", "Internal wall types", "Ceiling and roof types", "Frames" and "Glazing" tables below.               |                  |                              | ✓               |
| (b) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all specifications included in the tables below.  |                  | ✓                            |                 |
| (c) The applicant must construct the floors, walls, roof, ceiling and roof, windows, glazed doors and skylights of the development in accordance with the specifications listed in the tables below. In the case of glazing, a 5% variance from the area values listed in the "Frames" and "Glazing" tables is permitted. | ✓                | ✓                            | ✓               |
| (d) The applicant must show through receipts that the materials purchased for construction are consistent with the specifications listed in the below tables.   |                  |                              | ✓               |

#### Floor types

| Floor type  | Area (m2) | Insulation | Low emissions option |
|---|-----------|------------|----------------------|
| concrete slab on ground, frame:   | 280       | -          | none                 |
| suspended floor above enclosed subfloor, frame: suspended concrete slab | 292       | -          | -                    |
| floors above habitable rooms, frame: suspended concrete slab            | 1146      | -          | -                    |

#### External wall types

| External wall type   | Construction type   | Area (m2) | Low emissions option | Insulation |
|----------------------|---|-----------|----------------------|------------|
| External wall type 1 | framed (metal clad), frame: light steel frame                   | 520       | -                    | -          |
| External wall type 2 | framed (fibre cement sheet or boards), frame: light steel frame | 450       | -                    | -          |

| Internal wall types  |  |           |            |
|----------------------|--|-----------|------------|
| Internal wall type   | Construction type                            | Area (m2) | Insulation |
| Internal wall type 1 | plasterboard, frame:light steel frame        | 890       | -          |
| Internal wall type 2 | single skin masonry, frame:light steel frame | 780       | -          |

| Reinforcement concrete frames/columns           |             |                      |
|---|-------------|----------------------|
| Building has reinforced concrete frame/columns? | Volume (m³) | Low emissions option |
| -   | -           | -                    |

| Ceiling and roof types                                     |           |                 |                    |
|--|-----------|-----------------|--------------------|
| Ceiling and roof type                                      | Area (m²) | Roof Insulation | Ceiling Insulation |
| concrete - plasterboard internal, frame: light steel frame | 250       | -               | -                  |

| Glazing types       |                     |                     | Frame types           |                    |                  |                   |                       |
|---------------------|---------------------|---------------------|-----------------------|--------------------|------------------|-------------------|-----------------------|
| Single glazing (m²) | Double glazing (m²) | Triple glazing (m²) | Aluminium frames (m²) | Timber frames (m²) | uPVC frames (m²) | Steel frames (m²) | Composite frames (m²) |
| -                   | 560                 | -                   | 560                   | -                  | -                | -                 | -                     |

**(b) Dwellings**








| (i) Water   | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|---|------------------|------------------------------|-----------------|
| (a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.  |                  |                              |                 |
| (b) The applicant must plant indigenous or low water use species of vegetation throughout the area of land specified for the dwelling in the "Indigenous species" column of the table below, as private landscaping for that dwelling. (This area of indigenous vegetation is to be contained within the "Area of garden and lawn" for the dwelling specified in the "Description of Project" table).   | ✓                | ✓                            |                 |
| (c) If a rating is specified in the table below for a fixture or appliance to be installed in the dwelling, the applicant must ensure that each such fixture and appliance meets the rating specified for it.   |                  | ✓                            | ✓               |
| (d) The applicant must install an on demand hot water recirculation system which regulates all hot water use throughout the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below.  |                  | ✓                            | ✓               |
| (e) The applicant must install:<br><br>(aa) a hot water diversion system to all showers, kitchen sinks and all basins in the dwelling, where indicated for a dwelling in the "HW recirculation or diversion" column of the table below; and<br><br>(bb) a separate diversion tank (or tanks) connected to the hot water diversion systems of at least 100 litres. The applicant must connect the hot water diversion tank to all toilets in the dwelling. |                  | ✓<br>✓                       | ✓<br>✓          |
| (e) The applicant must not install a private swimming pool or spa for the dwelling, with a volume exceeding that specified for it in the table below.   | ✓                | ✓                            |                 |
| (f) If specified in the table, that pool or spa (or both) must have a pool cover or shading (or both).  |                  | ✓                            |                 |
| (g) The pool or spa must be located as specified in the table.  | ✓                | ✓                            |                 |
| (h) The applicant must install, for the dwelling, each alternative water supply system, with the specified size, listed for that dwelling in the table below. Each system must be configured to collect run-off from the areas specified (excluding any area which supplies any other alternative water supply system), and to divert overflow as specified. Each system must be connected as specified.  | ✓                | ✓                            | ✓               |

|              | Fixtures                      |                             |                  |                   |                               | Appliances          |                  | Individual pool     |            |               |             | Individual spa      |           |            |
|--------------|-------------------------------|-----------------------------|------------------|-------------------|-------------------------------|---------------------|------------------|---------------------|------------|---------------|-------------|---------------------|-----------|------------|
| Dwelling no. | All shower-heads              | All toilet flushing systems | All kitchen taps | All bathroom taps | HW recirculation or diversion | All clothes washers | All dish-washers | Volume (max volume) | Pool cover | Pool location | Pool shaded | Volume (max volume) | Spa cover | Spa shaded |
| 1            | 4 star (> 4.5 but <= 6 L/min) | 4 star                      | 6 star           | 6 star            | On demand HW recirculation    | not specified       | 4 star           | -                   | -          | -             | -           | 5                   | yes       | no         |

|                     | Fixtures                     |                             |                  |                   |                               | Appliances          |                  | Individual pool     |            |               |             | Individual spa      |           |            |
|---------------------|------------------------------|-----------------------------|------------------|-------------------|-------------------------------|---------------------|------------------|---------------------|------------|---------------|-------------|---------------------|-----------|------------|
| Dwelling no.        | All shower-heads             | All toilet flushing systems | All kitchen taps | All bathroom taps | HW recirculation or diversion | All clothes washers | All dish-washers | Volume (max volume) | Pool cover | Pool location | Pool shaded | Volume (max volume) | Spa cover | Spa shaded |
| All other dwellings | 4 star (> 4.5 but ≤ 6 L/min) | 4 star                      | 6 star           | 6 star            | On demand HW recirculation    | not specified       | 4 star           | -                   | -          | -             | -           | -                   | -         | -          |

|               | Alternative water source         |      |               |                      |                       |                    |             |            |
|---------------|----------------------------------|------|---------------|----------------------|-----------------------|--------------------|-------------|------------|
| Dwelling no.  | Alternative water supply systems | Size | Configuration | Landscape connection | Toilet connection (s) | Laundry connection | Pool top-up | Spa top-up |
| All dwellings | No alternative water supply      | -    | -             | -                    | -                     | -                  | -           | -          |

| (ii) Energy  | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|--|------------------|------------------------------|-----------------|
| (a) The applicant must comply with the commitments listed below in carrying out the development of a dwelling listed in a table below.   |                  |                              |                 |
| (b) The applicant must install each hot water system specified for the dwelling in the table below, so that the dwelling's hot water is supplied by that system. If the table specifies a central hot water system for the dwelling, then the applicant must connect that central system to the dwelling, so that the dwelling's hot water is supplied by that central system.   | ✓                | ✓                            | ✓               |
| (c) The applicant must install, in each bathroom, kitchen and laundry of the dwelling, the ventilation system specified for that room in the table below. Each such ventilation system must have the operation control specified for it in the table.  |                  | ✓                            | ✓               |
| (d) The applicant must install the cooling and heating system/s specified for the dwelling under the "Living areas" and "Bedroom areas" headings of the "Cooling" and "Heating" columns in the table below, in/for at least 1 living/bedroom area of the dwelling. If no cooling or heating system is specified in the table for "Living areas" or "Bedroom areas", then no systems may be installed in any such areas. If the term "zoned" is specified beside an air conditioning system, then the system must provide for day/night zoning between living areas and bedrooms.                                     |                  | ✓                            | ✓               |
| (e) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Artificial lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that the "primary type of artificial lighting" for each such room in the dwelling is fluorescent lighting or light emitting diode (LED) lighting. If the term "dedicated" is specified for a particular room or area, then the light fittings in that room or area must only be capable of being used for fluorescent lighting or light emitting diode (LED) lighting. |                  | ✓                            | ✓               |
| (f) This commitment applies to each room or area of the dwelling which is referred to in a heading to the "Natural lighting" column of the table below (but only to the extent specified for that room or area). The applicant must ensure that each such room or area is fitted with a window and/or skylight.  | ✓                | ✓                            | ✓               |

| (ii) Energy  | Show on DA plans | Show on CC/CDC plans & specs  | Certifier check   |
|--|------------------|---|---|
| <p>(g) This commitment applies if the applicant installs a water heating system for the dwelling's pool or spa. The applicant must:</p> <p>(aa) install the system specified for the pool in the "Individual Pool" column of the table below (or alternatively must not install any system for the pool). If specified, the applicant must install a timer, to control the pool's pump; and</p> <p>(bb) install the system specified for the spa in the "Individual Spa" column of the table below (or alternatively must not install any system for the spa). If specified, the applicant must install a timer to control the spa's pump.</p> |                  | <br>  |   |
| <p>(h) The applicant must install in the dwelling:</p> <p>(aa) the kitchen cook-top and oven specified for that dwelling in the "Appliances &amp; other efficiency measures" column of the table below;</p> <p>(bb) each appliance for which a rating is specified for that dwelling in the "Appliances &amp; other efficiency measures" column of the table, and ensure that the appliance has that minimum rating; and</p> <p>(cc) any clothes drying line specified for the dwelling in the "Appliances &amp; other efficiency measures" column of the table.</p>   |                  | <br><br> |  |
| (i) If specified in the table, the applicant must carry out the development so that each refrigerator space in the dwelling is "well ventilated".  |                  |    |   |

|               | Hot water                        | Bathroom ventilation system              |                                     | Kitchen ventilation system               |                      | Laundry ventilation system               |                      |
|---------------|----------------------------------|--|-------------------------------------|--|----------------------|--|----------------------|
| Dwelling no.  | Hot water system                 | Each bathroom                            | Operation control                   | Each kitchen                             | Operation control    | Each laundry                             | Operation control    |
| All dwellings | Central hot water system (No. 1) | individual fan, ducted to façade or roof | interlocked to light with timer off | individual fan, ducted to façade or roof | manual switch on/off | individual fan, ducted to façade or roof | interlocked to light |

|               | Cooling                                 |   | Heating                                 |   | Natural lighting            |              |
|---------------|---|---|---|---|-----------------------------|--------------|
| Dwelling no.  | living areas                            | bedroom areas                           | living areas                            | bedroom areas                           | No. of bathrooms or toilets | Main kitchen |
| All dwellings | 3-phase airconditioning / EER 3.0 - 3.5 | 3-phase airconditioning / EER 3.0 - 3.5 | 3-phase airconditioning / EER 3.0 - 3.5 | 3-phase airconditioning / EER 3.0 - 3.5 | 0                           | -            |

|                     | Individual pool     |           |       | Individual spa     |       | Appliances other efficiency measures |            |               |   |  |
|---------------------|---------------------|-----------|-------|--------------------|-------|--------------------------------------|------------|---------------|---|--|
| Dwelling no.        | Pool heating system | Pool Pump | Timer | Spa heating system | Timer | Kitchen cooktop/oven                 | Dishwasher | Clothes dryer | Indoor or sheltered clothes drying line | Private outdoor or unsheltered clothes drying line |
| 1                   | -                   | -         | -     | electric heat pump | yes   | electric cooktop & electric oven     | 4 star     | 4 star        | -                                       | -  |
| All other dwellings | -                   | -         | -     | -                  | -     | electric cooktop & electric oven     | 4 star     | 4 star        | -                                       | -  |

| (iii) Thermal Performance  | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|--|------------------|------------------------------|-----------------|
| (a) The applicant must attach the certificate referred to under "Assessor details" on the front page of this BASIX certificate (the "Assessor Certificate") to the development application and construction certificate application for the proposed development (or, if the applicant is applying for a complying development certificate for the proposed development, to that application). The applicant must also attach the Assessor Certificate to the application for a final occupation certificate for the proposed development. |                  |                              |                 |
| (b) The Assessor Certificate must have been issued by an Accredited Assessor in accordance with the Thermal Comfort Protocol.  |                  |                              |                 |
| (c) The details of the proposed development on the Assessor Certificate must be consistent with the details shown in this BASIX Certificate, including the details shown in the "Thermal Loads" table below.   |                  |                              |                 |
| (d) The applicant must show on the plans accompanying the development application for the proposed development, all matters which the Thermal Comfort Protocol requires to be shown on those plans. Those plans must bear a stamp of endorsement from the Accredited Assessor, to certify that this is the case.   | ✓                |                              |                 |
| (e) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), all thermal performance specifications set out in the Assessor Certificate, and all aspects of the proposed development which were used to calculate those specifications.   |                  | ✓                            |                 |
| (f) The applicant must construct the development in accordance with all thermal performance specifications set out in the Assessor Certificate, and in accordance with those aspects of the development application or application for a complying development certificate which were used to calculate those specifications.  |                  | ✓                            | ✓               |
| (g) Where there is an in-slab heating or cooling system, the applicant must:<br><br>(aa) Install insulation with an R-value of not less than 1.0 around the vertical edges of the perimeter of the slab; or<br>(bb) On a suspended floor, install insulation with an R-value of not less than 1.0 underneath the slab and around the vertical edges of the perimeter of the slab.  | ✓                | ✓                            | ✓               |
| (h) The applicant must construct the floors and walls of the development in accordance with the specifications listed in the table below.  | ✓                | ✓                            | ✓               |



| (iii) Thermal Performance  | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|--|------------------|------------------------------|-----------------|
| (i) The applicant must show on The plans accompanying The development application for The proposed development, The locations of ceiling fans set out in The Assessor Certificate.   | ✓                |                              |                 |
| (j) The applicant must show on the plans accompanying the application for a construction certificate (or complying development certificate, if applicable), the locations of ceiling fans set out in the Assessor Certificate. |                  | ✓                            |                 |

|               | Thermal loads                            |  |  |
|---------------|--|--|--|
| Dwelling no.  | Area adjusted heating load (in MJ/m²/yr) | Area adjusted cooling load (in MJ/m²/yr) | Area adjusted total load (in MJ/m²/yr) |
| All dwellings | 28                                       | 20                                       | 48.000                                 |

**(c) Common areas and central systems/facilities**

| <b>(i) Water</b>  | <b>Show on DA plans</b> | <b>Show on CC/CDC plans &amp; specs</b> | <b>Certifier check</b> |
|---|-------------------------|---|------------------------|
| (a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.   |                         | ✓                                       | ✓                      |
| (b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table. | ✓                       | ✓                                       | ✓                      |
| (c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.  | ✓                       | ✓                                       |                        |
| (d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.   |                         | ✓                                       |                        |
| (e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.   |                         | ✓                                       | ✓                      |
| (f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.  |                         | ✓                                       | ✓                      |

| <b>Common area</b> | <b>Showerheads rating</b>     | <b>Toilets rating</b> | <b>Taps rating</b> | <b>Clothes washers rating</b> |
|--------------------|-------------------------------|-----------------------|--------------------|-------------------------------|
| All common areas   | 4 star (> 4.5 but <= 6 L/min) | no common facility    | 4 star             | no common laundry facility    |

| <b>(ii) Energy</b>  | <b>Show on DA plans</b> | <b>Show on CC/CDC plans &amp; specs</b> | <b>Certifier check</b> |
|---|-------------------------|---|------------------------|
| (a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.  |                         | ✓                                       | ✓                      |
| (b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified. |                         | ✓                                       | ✓                      |
| (c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.  | ✓                       | ✓                                       | ✓                      |

|                          | Common area ventilation system |                                   | Common area lighting                |                               |                              |
|--------------------------|--------------------------------|-----------------------------------|-------------------------------------|-------------------------------|------------------------------|
| Common area              | Ventilation system type        | Ventilation efficiency measure    | Primary type of artificial lighting | Lighting efficiency measure   | Lighting control system/ BMS |
| Lift bank (No. 1)        | -                              | -                                 | light-emitting diode                | connected to lift call button | -                            |
| Undercover car park area | ventilation (supply + exhaust) | carbon monoxide monitor + VSD fan | light-emitting diode                | motion sensors                | -                            |
| Switch room              | ventilation supply only        | thermostatically controlled       | light-emitting diode                | manual on / manual off        | -                            |
| Garbage room             | ventilation exhaust only       | -                                 | light-emitting diode                | motion sensors                | -                            |
| Plant or service room    | ventilation exhaust only       | thermostatically controlled       | light-emitting diode                | manual on / manual off        | -                            |
| Ground floor lobby type  | ventilation supply only        | time clock or BMS controlled      | light-emitting diode                | time clock and motion sensors | -                            |
| Hallway/lobby type       | ventilation supply only        | time clock or BMS controlled      | light-emitting diode                | time clock and motion sensors | -                            |

| Central energy systems           | Type                                 | Specification   |
|----------------------------------|--------------------------------------|---|
| Lift bank (No. 1)                | gearless traction with V V V F motor | Number of levels (including basement): 6<br>number of levels from the bottom of the lift shaft to the top of the lift shaft: 6<br>number of lifts: 1<br>lift load capacity: $\geq 1001$ kg but $\leq 1500$ kg |
| Central hot water system (No. 1) | electric heat pump – air sourced     | Piping insulation (ringmain & supply risers):<br>(a) Piping external to building: R0.6 (~25 mm);<br>(b) Piping internal to building: R0.6 (~25 mm)<br>(c) Unit Efficiency: $3.0 < \text{COP} \leq 3.5$        |

## 2. Commitments for common areas and central systems/facilities for the development (non-building specific)

### (b) Common areas and central systems/facilities

| (i) Water   | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|---|------------------|------------------------------|-----------------|
| (a) If, in carrying out the development, the applicant installs a showerhead, toilet, tap or clothes washer into a common area, then that item must meet the specifications listed for it in the table.   |                  | ✓                            | ✓               |
| (b) The applicant must install (or ensure that the development is serviced by) the alternative water supply system(s) specified in the "Central systems" column of the table below. In each case, the system must be sized, be configured, and be connected, as specified in the table. | ✓                | ✓                            | ✓               |
| (c) A swimming pool or spa listed in the table must not have a volume (in kLs) greater than that specified for the pool or spa in the table.  | ✓                | ✓                            |                 |
| (d) A pool or spa listed in the table must have a cover or shading if specified for the pool or spa in the table.   |                  | ✓                            |                 |
| (e) The applicant must install each fire sprinkler system listed in the table so that the system is configured as specified in the table.   |                  | ✓                            | ✓               |
| (f) The applicant must ensure that the central cooling system for a cooling tower is configured as specified in the table.  |                  | ✓                            | ✓               |

| Common area      | Showerheads rating           | Toilets rating     | Taps rating | Clothes washers rating     |
|------------------|------------------------------|--------------------|-------------|----------------------------|
| All common areas | 4 star (> 4.5 but ≤ 6 L/min) | no common facility | 4 star      | no common laundry facility |

| (ii) Energy   | Show on DA plans | Show on CC/CDC plans & specs | Certifier check |
|---|------------------|------------------------------|-----------------|
| (a) If, in carrying out the development, the applicant installs a ventilation system to service a common area specified in the table below, then that ventilation system must be of the type specified for that common area, and must meet the efficiency measure specified.  |                  | ✓                            | ✓               |
| (b) In carrying out the development, the applicant must install, as the "primary type of artificial lighting" for each common area specified in the table below, the lighting specified for that common area. This lighting must meet the efficiency measure specified. The applicant must also install a centralised lighting control system or Building Management System (BMS) for the common area, where specified. |                  | ✓                            | ✓               |
| (c) The applicant must install the systems and fixtures specified in the "Central energy systems" column of the table below. In each case, the system or fixture must be of the type, and meet the specifications, listed for it in the table.  | ✓                | ✓                            | ✓               |

| Central energy systems | Type | Specification |
|------------------------|------|---------------|
| Other                  | -    | -             |

## Notes

1. In these commitments, "applicant" means the person carrying out the development.
2. The applicant must identify each dwelling, building and common area listed in this certificate, on the plans accompanying any development application, and on the plans and specifications accompanying the application for a construction certificate / complying development certificate, for the proposed development, using the same identifying letter or reference as is given to that dwelling, building or common area in this certificate.
3. This note applies if the proposed development involves the erection of a building for both residential and non-residential purposes (or the change of use of a building for both residential and non-residential purposes). Commitments in this certificate which are specified to apply to a "common area" of a building or the development, apply only to that part of the building or development to be used for residential purposes.
4. If this certificate lists a central system as a commitment for a dwelling or building, and that system will also service any other dwelling or building within the development, then that system need only be installed once (even if it is separately listed as a commitment for that other dwelling or building).
5. If a star or other rating is specified in a commitment, this is a minimum rating.
6. All alternative water systems to be installed under these commitments (if any), must be installed in accordance with the requirements of all applicable regulatory authorities. NOTE: NSW Health does not recommend that stormwater, recycled water or private dam water be used to irrigate edible plants which are consumed raw, or that rainwater be used for human consumption in areas with potable water supply.

## Legend

1. Commitments identified with a "✔" in the "Show on DA plans" column must be shown on the plans accompanying the development application for the proposed development (if a development application is to be lodged for the proposed development).
2. Commitments identified with a "✔" in the "Show on CC/CDC plans and specs" column must be shown in the plans and specifications accompanying the application for a construction certificate / complying development certificate for the proposed development.
3. Commitments identified with a "✔" in the "Certifier check" column must be certified by a certifying authority as having been fulfilled. (Note: a certifying authority must not issue an occupation certificate (either interim or final) for a building listed in this certificate, or for any part of such a building, unless it is satisfied that each of the commitments whose fulfilment it is required to monitor in relation to the building or part, has been fulfilled).

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## APPENDIX B – REFERENCED ARCHITECTURAL DRAWINGS



| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

| NOTES |   |
|-------|---|
| 01    | All dimensions to be verified on site.                                      |
| 02    | Report any discrepancies or omissions to SDS prior to construction.         |
| 03    | All drawings to be read in conjunction with specification.                  |
| 04    | All drawings to be read in conjunction with consultants' drawings.          |
| 05    | All structure to structural engineer's details.                             |
| 06    | Refer to architect for ambiguous details or when clarification is required. |

PRELIMINARY  
NOT FOR CONSTRUCTION

| issue | reason   | date     |
|-------|----------|----------|
| A     | DRAFT DA | 13.12.24 |

| DRAWING SCHEDULE |                                |
|------------------|--------------------------------|
| 000 -            | LEGEND, SITE, DEMOLITION       |
| DA000            | LEGEND, DRAWING LIST, SITE MAP |
| DA001            | SITE LOCATION PLAN             |
| DA002            | SITE & RF PLAN                 |
| DA003            | SITE DEMOLITION PLAN           |

|       |           |
|-------|-----------|
| 100 - | PLANS     |
| DA099 | B1 PLAN   |
| DA100 | L00 PLAN  |
| DA101 | L01 PLAN  |
| DA102 | L02 PLAN  |
| DA103 | L03 PLAN  |
| DA104 | L04 PLAN  |
| DA105 | ROOF PLAN |

|       |            |
|-------|------------|
| 400 - | ELEVATIONS |
| DA400 | ELEV - N S |
| DA401 | ELEV - E W |

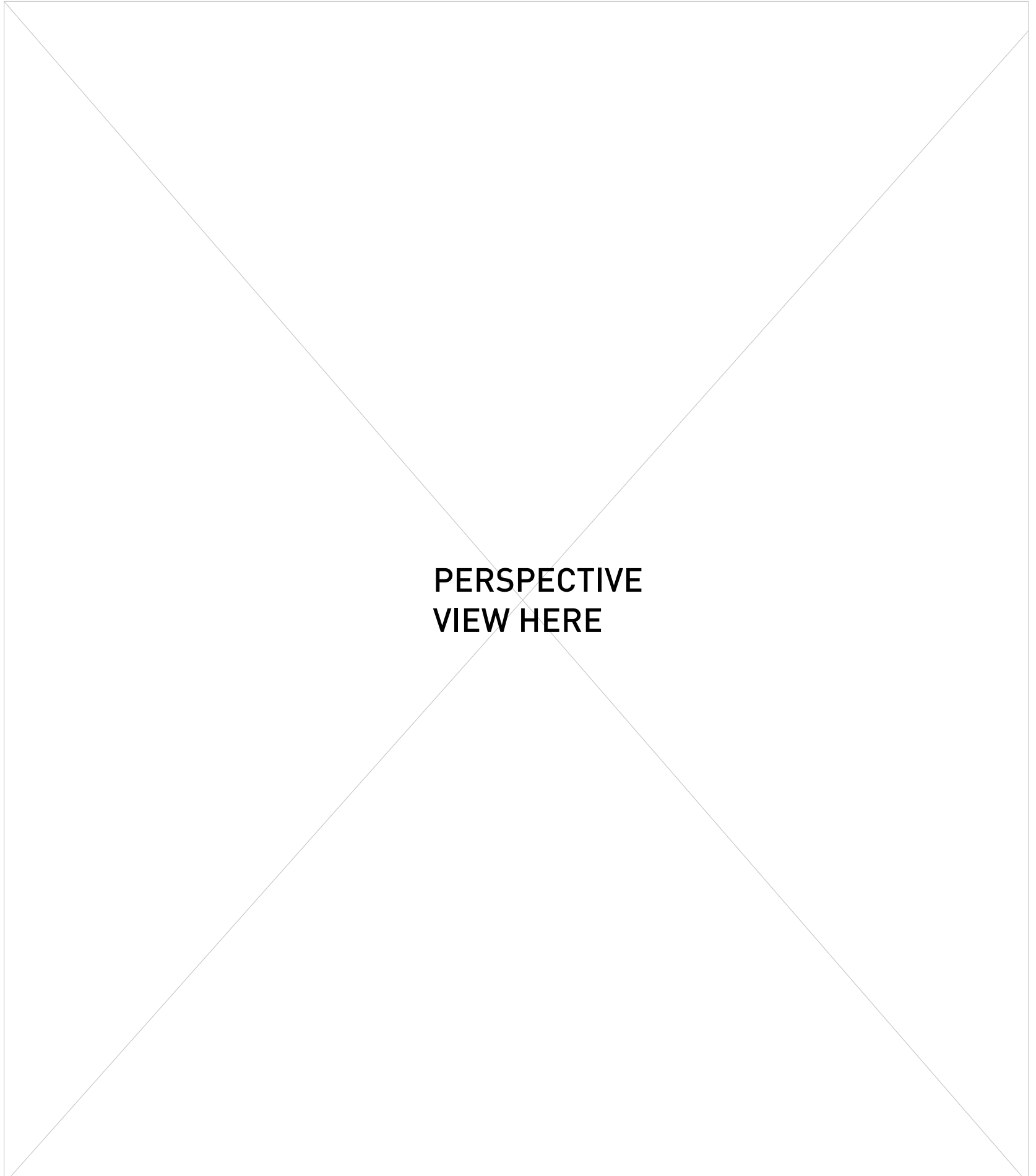
|       |            |
|-------|------------|
| 450 - | SECTIONS   |
| DA450 | SECT - A B |

|       |                              |
|-------|------------------------------|
| 800 - | DIAGRAM                      |
| DA800 | SUN EYE VIEWS                |
| DA801 | SHADOW PLAN                  |
| DA802 | SHADOW ELEVATIONS 98-100     |
| DA803 | SHADOW ELEVATIONS 98-100     |
| DA804 | DEEP SOIL ZONES              |
| DA810 | GFA PLAN                     |
| DA820 | LIVEABLE AND ADAPTABLE UNITS |

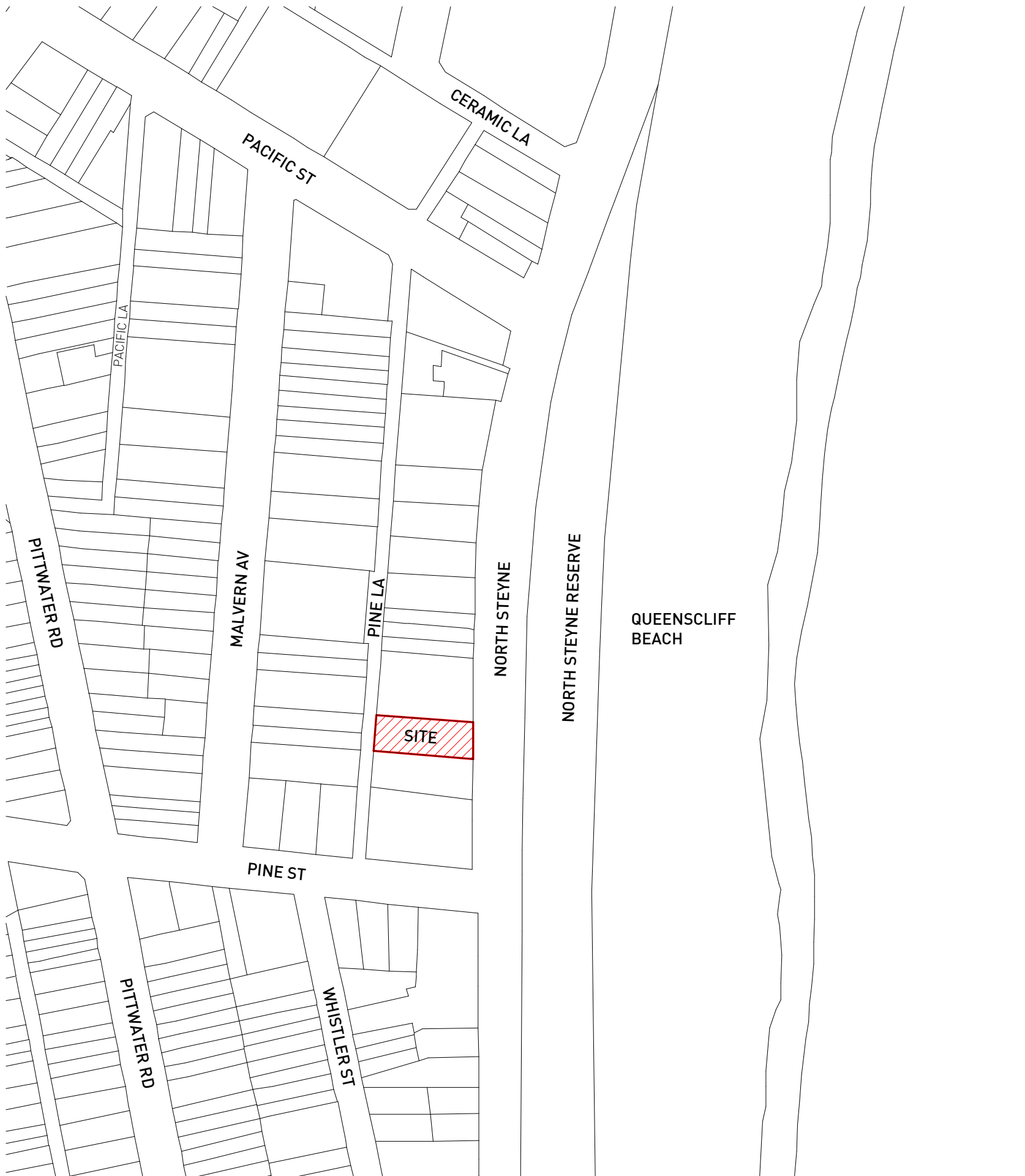
ABBREVIATIONS

|          |                                |        |                                   |        |                                  |
|----------|--------------------------------|--------|-----------------------------------|--------|----------------------------------|
| AC       | Air Conditioning               | FIP    | Fire Indicator Panel              | RHS    | Rectangular Hollow Section       |
| ACC SHR  | Accessible SHR                 | FIP-M  | Fire Mimic Panel                  | RL     | Relative Level                   |
| ACU      | Air Condensor Unit             | FM     | Flexible Mastic                   | ROBE   | Robe/Wardrobe                    |
| AFFL     | Above Finished Floor Level     | FOY    | Foyer                             | RS     | Roller Shutter                   |
| ALC      | Aluminium Composite System     | FW     | Floor Waste                       | RVC    | Roof Vent Cowl                   |
| ALCP     | Solid Aluminium Cladding Panel | G      | Glass / Glazing                   | RWO    | Rain Water Outlet                |
| APT      | Apartment, Apartments          | G-BAL  | Glass Balustrade                  | SB30   | 30 wide Setting Bead             |
| AS       | Australian Standard            | G-CB   | Glass - Colour Backed             | SCR    | Screen                           |
| BAL      | Balustrade                     | G-F    | Glazing - Fixed                   | SHR    | Shower                           |
| BALC     | Balcony                        | GALV   | Galvanised - hot dipped           | SHS    | Square Hollow Section            |
| BCA      | Building Code of Australia     | GAR    | Garage                            | SIM    | Similar                          |
| BDY      | Boundary                       | GND    | Ground                            | SL     | Skylight                         |
| BED      | Bedroom                        | GRL#   | Grab Rail (number)                | SNK    | Sink                             |
| BG       | Box Gutter                     | HALL   | Hallway/Corridor                  | SRO    | Shower Rose                      |
| BIT      | Bitumen                        | HRL    | Handrail                          | SRV    | Services                         |
| BK       | Brick                          | HWS    | Hot Water Service                 | SS     | Stainless Steel                  |
| BL       | Building Line                  | HYD    | Hydraulic                         | ST     | Stone                            |
| BLDG     | Building                       | INS    | Insulation - Thermal / Acoustic   | STL    | Steel                            |
| BLS      | Ballast                        | J      | Joinery Item                      | STN    | Stair Nosing                     |
| BN       | Bin                            | KIT    | Kitchen                           | STO    | Storage                          |
| BOL      | Bollard                        | KRB    | Kerb                              | STR    | Fire Stair                       |
| BRAC     | Bicycle Rack                   | LC     | Laundry Chute                     | FIRE   |                                  |
| BTH      | Bath                           | LDY    | Laundry                           | STR#   | Stair (number)                   |
| CB       | Concrete Block                 | LIV    | Living Room                       | STRUCT | Structural                       |
| CBD      | Cupboard                       | LOB    | Lobby                             | SUBST  | Substation                       |
| CFC      | Compressed Fibre Cement        | LV     | Louvre                            | SV     | Soil Vent                        |
| CJ       | Construction Joint             | LY-AL  | Louvre - Aluminium                | SWP    | Stormwater Pit                   |
| CLN      | Cleaner                        | MC     | Metal Cladding                    | TBA    | To Be Advised                    |
| COBB     | Cobblestone                    | MDB    | Main Distribution Board           | TBC    | To Be Confirmed                  |
| COL      | Column                         | ME     | Metal                             | TEL    | Telephone                        |
| COMMS    | Communications                 | MECH   | Mechanical                        | TERR   | Terrace                          |
| COND     | Concrete                       | MEET   | Meeting Room                      | TGSI   | Tactile Ground Surface Indicator |
| CONC-S   | Concrete Sand Blasted          | MFE    | Metal Fence                       | TMF    | Timber Floor                     |
| B        |                                | MO     | Microwave Oven                    | TMFE   | Timber Fence                     |
| COS      | Confirm On Site                | MR     | Metal Roof                        | TOB    | Top of Balustrade                |
| CPL      | Contiguous Piling              | MS     | Mild Steel                        | TOC    | Top of Column                    |
| CPT      | Carpet                         | MSB    | Main Switch Board                 | TOF    | Top of Fence                     |
| CR       | Cement Render                  | MW     | Matwell (with mail)               | TOK    | Top of Kerb                      |
| CT       | Ceramic Tile                   | MZ     | Mezzanine                         | TOP    | Top of Parapet                   |
| D        | Door                           | N      | New Item                          | TOW    | Top of Wall                      |
| DD       | Dish Drain                     | N/A    | Not Applicable                    | TPZ    | Tree Protection Zone             |
| DIA      | Diameter                       | NBN    | National Broadband Network        | TYP    | Typical                          |
| DP       | Downpipe                       | NTS    | Not To Scale                      | TZ     | Terrazzo                         |
| DRC      | Drencher                       | O/H    | Overhead                          | U/G    | Underground                      |
| DW       | Dishwasher                     | O/R    | Overrun                           | U/S    | Underside                        |
| DWG      | Drawing                        | OF     | Overflow Spitter                  | UA     | Unequal Angle                    |
| EA       | Equal Angle                    | OPT    | Option                            | UB     | Universal Beam                   |
| EDB      | Electrical Distribution Board  | OV     | Oven                              | UC     | Universal Column                 |
| EGL      | Existing Ground Level          | P      | Pantry                            | UNO    | Unless Noted Otherwise           |
| ELEC     | Electrical                     | PB     | Plasterboard                      | UOS    | Unless Otherwise Specified       |
| ENG      | Engineer                       | PB-FR  | Plasterboard - Fire Resistant     | VP     | Vent Pipe                        |
| ENS      | Ensuite                        | PB-MR  | Plasterboard - Moisture Resistant | W      | Window                           |
| ENTRY    | Entry                          | PCO    | Powdercoat                        | WC     | Water Closet                     |
| EQ       | Equal                          | PF     | Paint Finish                      | WC-ACC | Accessible WC                    |
| EX/EXIST | Existing Structure or Finish   | PFC    | Parallel Flange Channel           | WC-AMB | Ambulant WC                      |
| EXH      | Exhaust                        | PLT    | Plant Room                        | WIR    | Walk In Robe                     |
| EXT      | External                       | POL    | Polyurethane Finish               | WK     | Workstation                      |
| F        | Fixed                          | PU     | Paving Unit                       | WM     | Washing Machine                  |
| FAM      | Family                         | PV     | Photovoltaic Cell                 | WP     | Waste Pipe                       |
| FC       | Fibre Cement                   | R      | Refrigerator                      | WS     | Wheelstop                        |
| FCL      | Finished Ceiling Level         | R-COMM | Comms Riser                       | WSC    | Waste Chute                      |
| FCU      | Fan Coil Unit                  | R-ELEC | Electrical Riser                  | WST    | Waste / Waste Storage            |
| FE       | Fire Extinguisher              | R-HYD  | Hydraulic Riser                   | WT     | Water Tank                       |
| FFL      | Finished Floor Level           | R-MECH | Mechanical Riser                  |        |                                  |
| FG       | Floor Grate                    | RAH    | Roof Access Hatch                 |        |                                  |
| FGL      | Finished Ground Level          | REF    | Reference                         |        |                                  |
| FH       | Fire Hydrant                   | REQ    | Required                          |        |                                  |
| FHR      | Fire Hose Reel                 | RF     | Roofing                           |        |                                  |

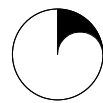
BASIX NOTES



1 PERSPECTIVE



2 LOCATION PLAN





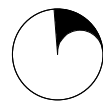
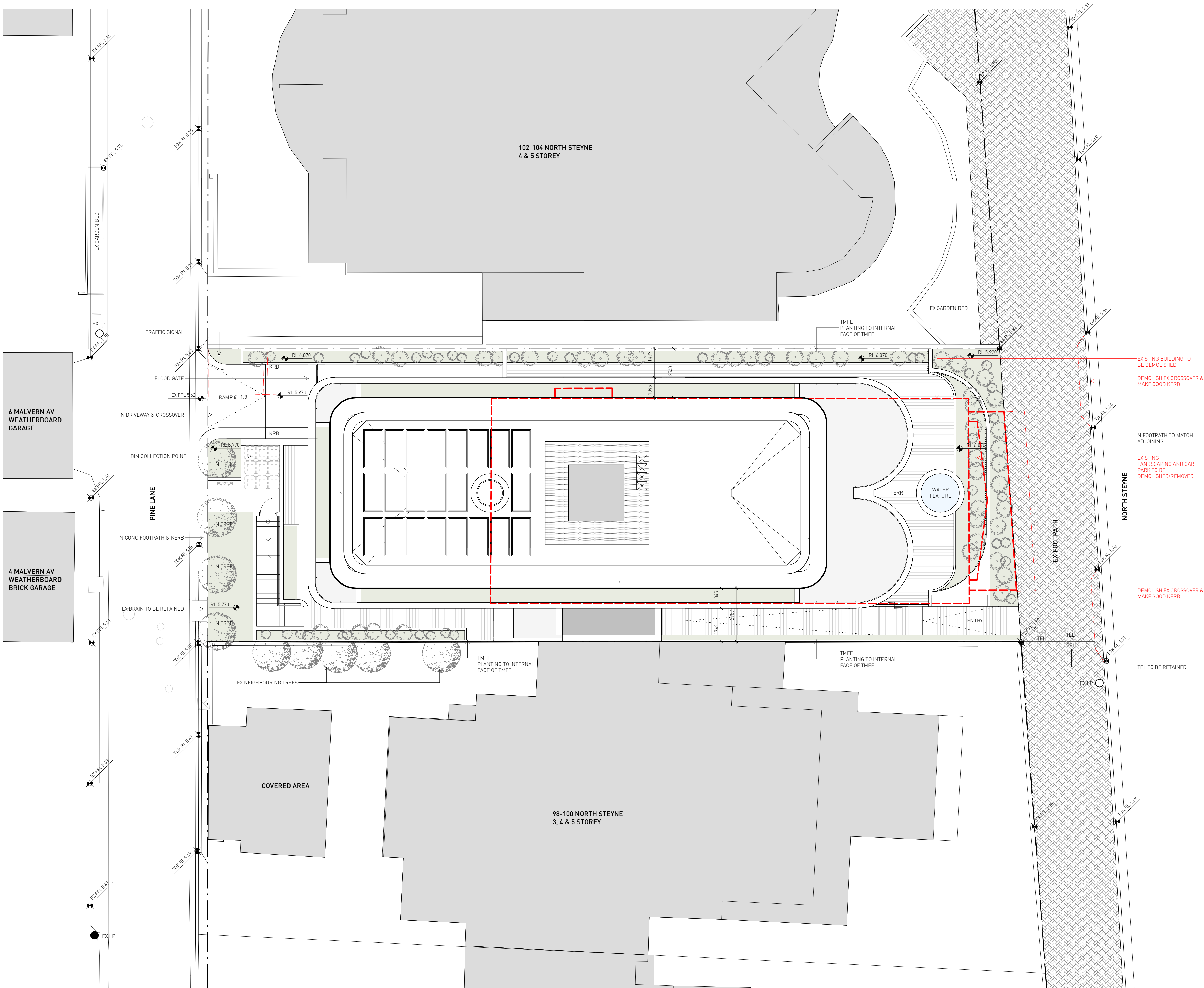
| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

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PRELIMINARY  
NOT FOR CONSTRUCTION

| issue | reason          | date     |
|-------|-----------------|----------|
| A     | FOR INFORMATION | 12.07.24 |
| B     | FOR INFORMATION | 01.08.24 |
| C     | FOR INFORMATION | 28.08.24 |
| D     | FOR INFORMATION | 10.09.24 |
| E     | FOR INFORMATION | 30.10.24 |
| F     | DRAFT DA        | 13.12.24 |





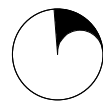
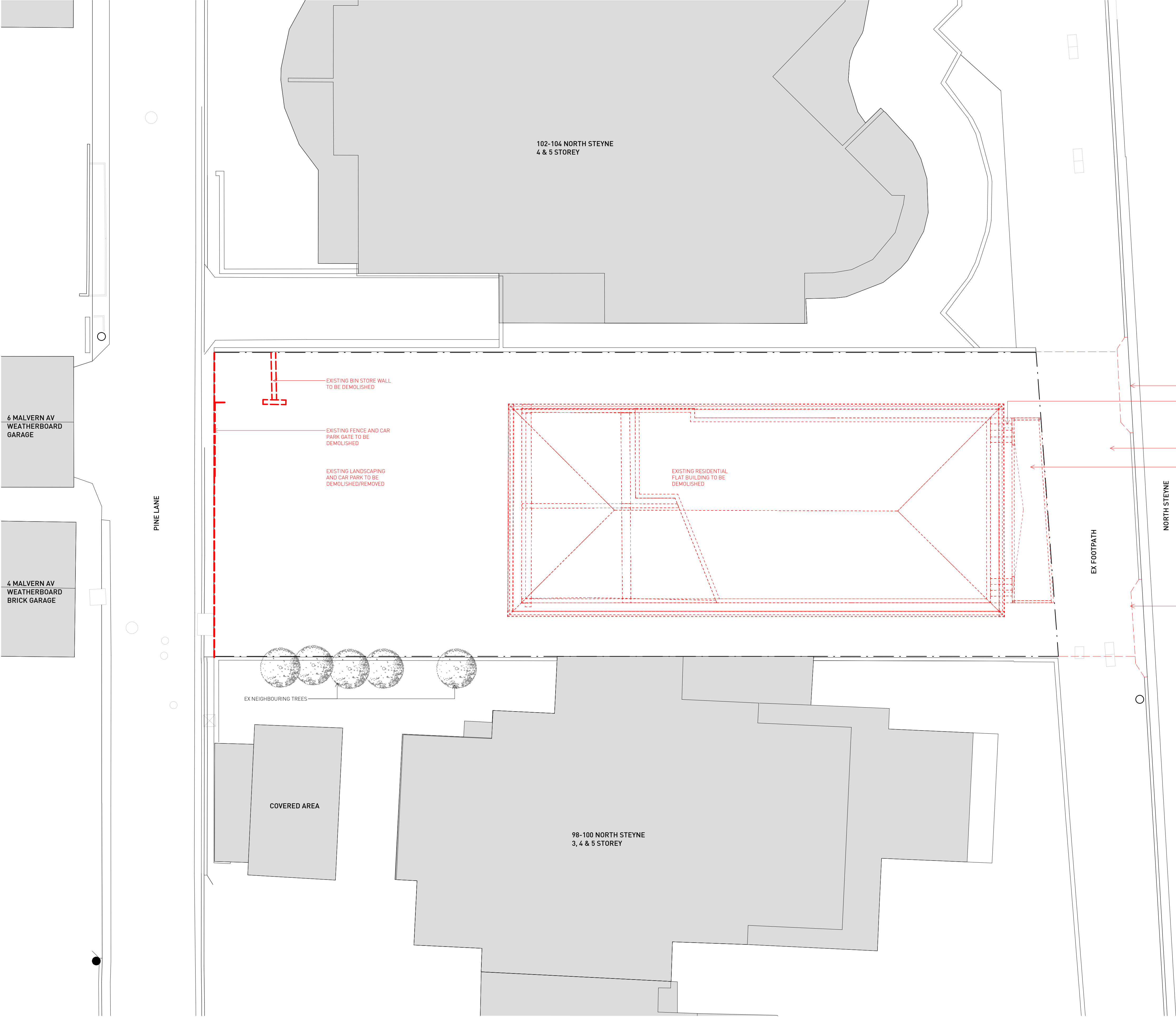
| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

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| E     | DRAFT DA        | 13.12.24 |



LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

- NOTES
- 01

All dimensions to be verified on site.
- 02

Report any discrepancies or omissions to SDS prior to construction.
- 03

All drawings to be read in conjunction with specification.
- 04

All drawings to be read in conjunction with consultants' drawings.
- 05

All structure to structural engineer's details.
- 06

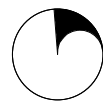
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| D     | FOR INFORMATION | 10.09.24 |
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| F     | FOR INFORMATION | 26.09.24 |
| G     | FOR INFORMATION | 02.10.24 |
| H     | FOR INFORMATION | 08.10.24 |
| I     | FOR INFORMATION | 24.10.24 |
| J     | FOR INFORMATION | 30.10.24 |
| K     | FOR INFORMATION | 12.11.24 |
| L     | FOR INFORMATION | 26.11.24 |
| M     | FOR INFORMATION | 29.11.24 |
| N     | FOR INFORMATION | 09.12.24 |
| O     | FOR INFORMATION | 06.12.24 |
| P     | DRAFT DA        | 13.12.24 |

TOTAL CAR SPACES = 16

TOTAL BIKE SPACES = 13



**LEGEND**

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

COMPLIANCE SYMBOL LEGEND

CROSS VENTILATION

LIVABLE

ACCESSIBLE

SOLAR ACCESS >2HRS +

SOLAR ACCESS <2HRS

SOLAR ACCESS NONE

LANDSCAPE LEGEND

NEW TREE

EXISTING TREE RETAINED

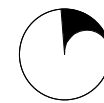
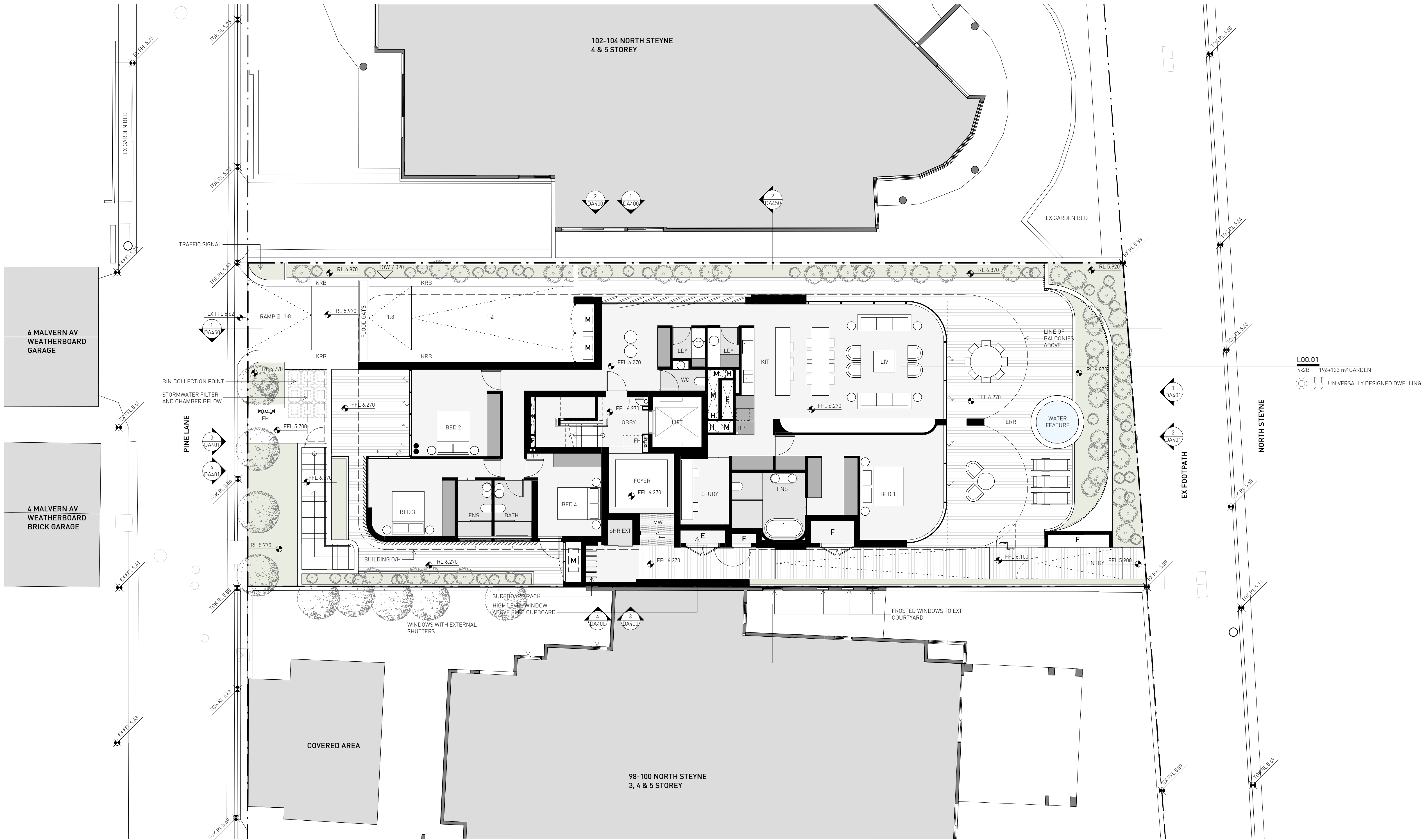
EXISTING TREE REMOVED

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| H     | FOR INFORMATION | 08.10.24 |
| I     | FOR INFORMATION | 30.10.24 |
| J     | FOR INFORMATION | 12.11.24 |
| K     | FOR INFORMATION | 26.11.24 |
| L     | FOR INFORMATION | 29.11.24 |
| M     | FOR INFORMATION | 09.12.24 |
| N     | FOR INFORMATION | 06.12.24 |
| O     | DRAFT DA        | 13.12.24 |





| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

COMPLIANCE SYMBOL LEGEND

|             |                      |
|-------------|----------------------|
| <div></div> | CROSS VENTILATION    |
| <div></div> | LIVABLE              |
| <div></div> | ACCESSIBLE           |
| <div></div> | SOLAR ACCESS ≥2HRS + |
| <div></div> | SOLAR ACCESS <2HRS   |
| <div></div> | SOLAR ACCESS NONE    |

LANDSCAPE LEGEND

|             |                        |
|-------------|------------------------|
| <div></div> | NEW TREE               |
| <div></div> | EXISTING TREE RETAINED |
| <div></div> | EXISTING TREE REMOVED  |

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| L     | FOR INFORMATION | 06.12.24 |
| M     | DRAFT DA        | 13.12.24 |

L01.01 / L02.01

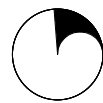
2x3B 94 +23 m² BALC

UNIVERSALLY DESIGNED DWELLING

L01.02 / L02.02

3x3B 165 +23 m² BALC

UNIVERSALLY DESIGNED DWELLING



| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

COMPLIANCE SYMBOL LEGEND

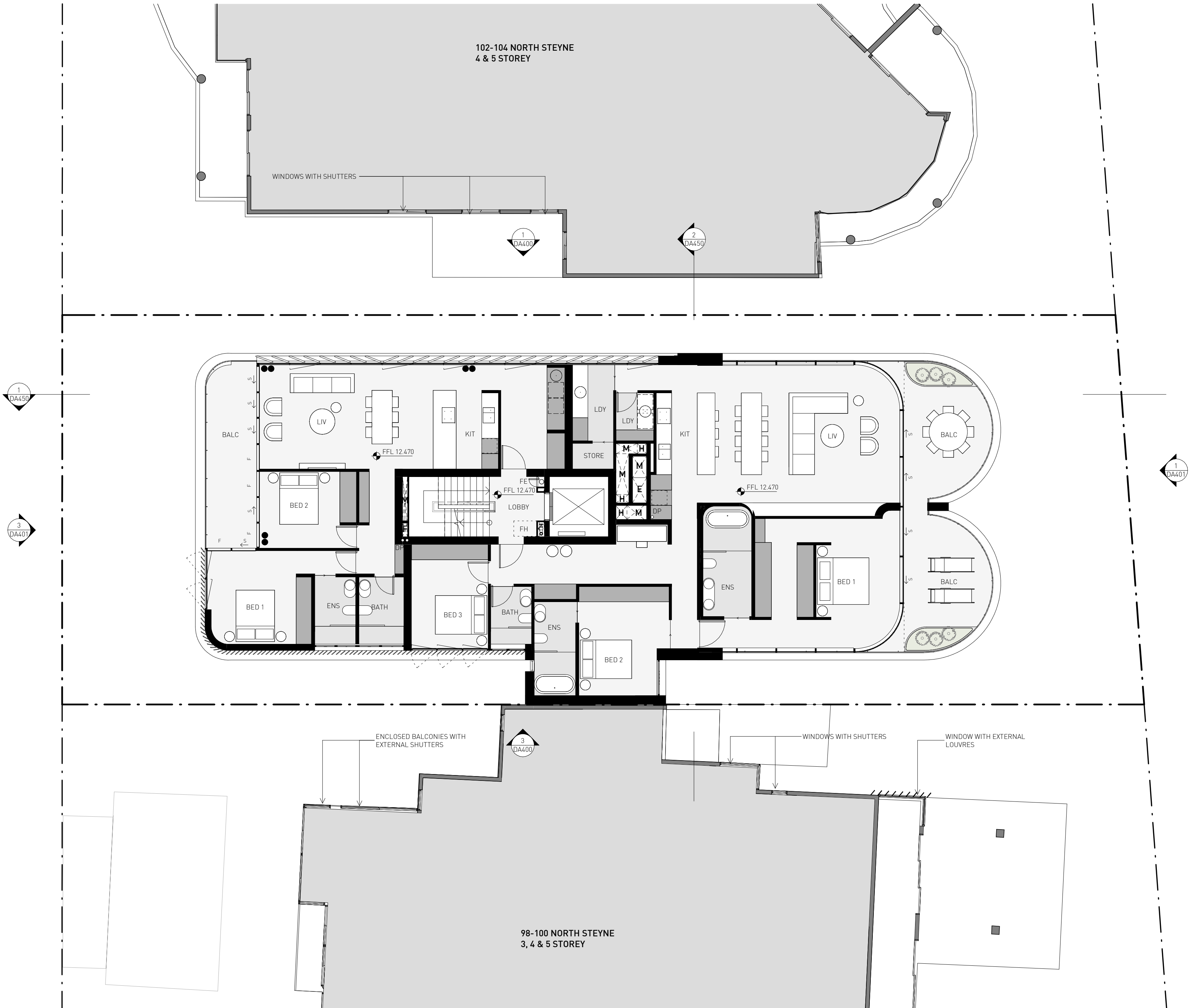
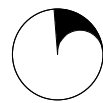
|             |                      |
|-------------|----------------------|
| <div></div> | CROSS VENTILATION    |
| <div></div> | LIVABLE              |
| <div></div> | ACCESSIBLE           |
| <div></div> | SOLAR ACCESS ≥2HRS + |
| <div></div> | SOLAR ACCESS <2HRS   |
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| LEGEND                     |             |
|----------------------------|-------------|
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| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

COMPLIANCE SYMBOL LEGEND

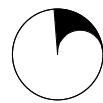
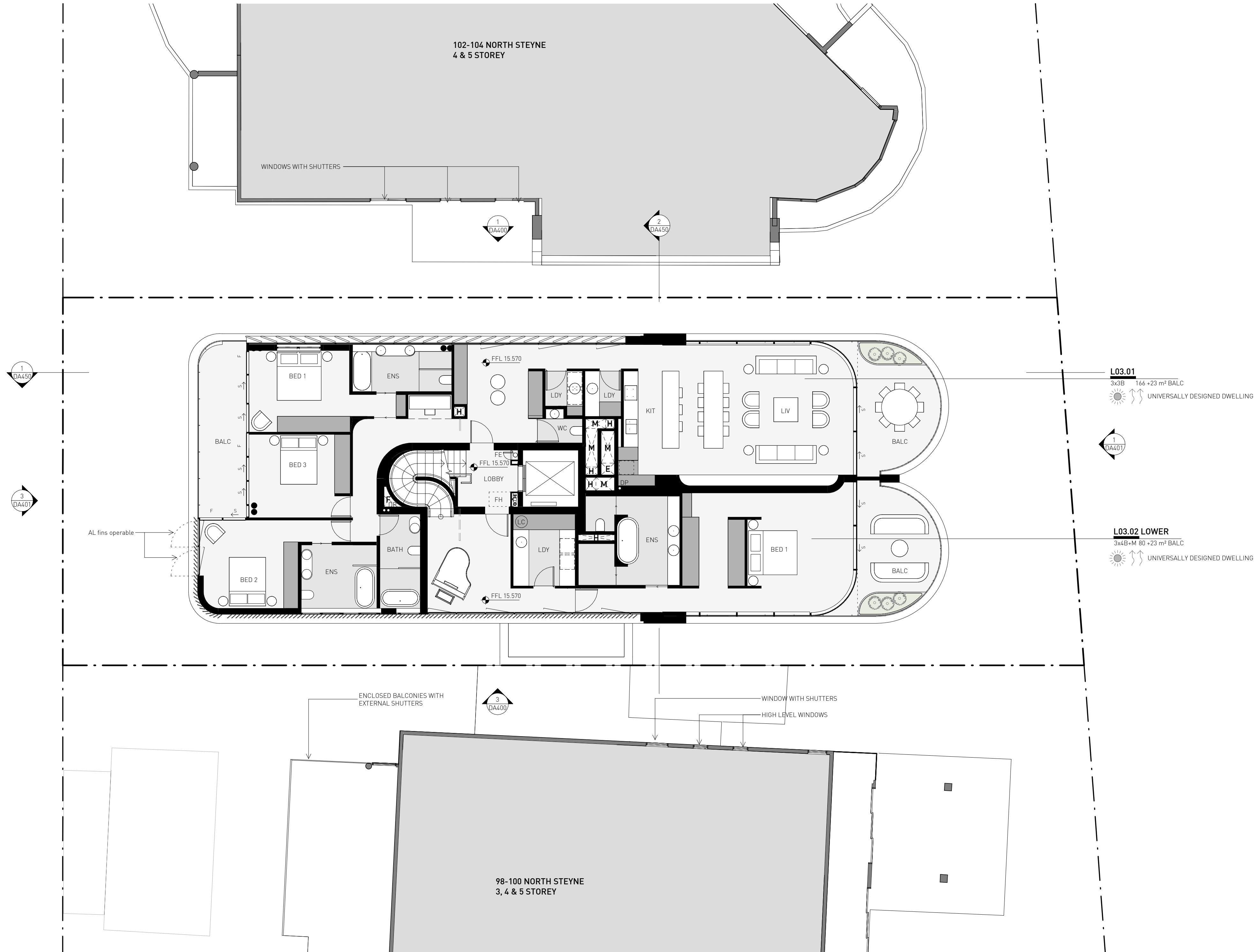
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|-------------|----------------------|
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| LEGEND                     |             |
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COMPLIANCE SYMBOL LEGEND

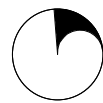
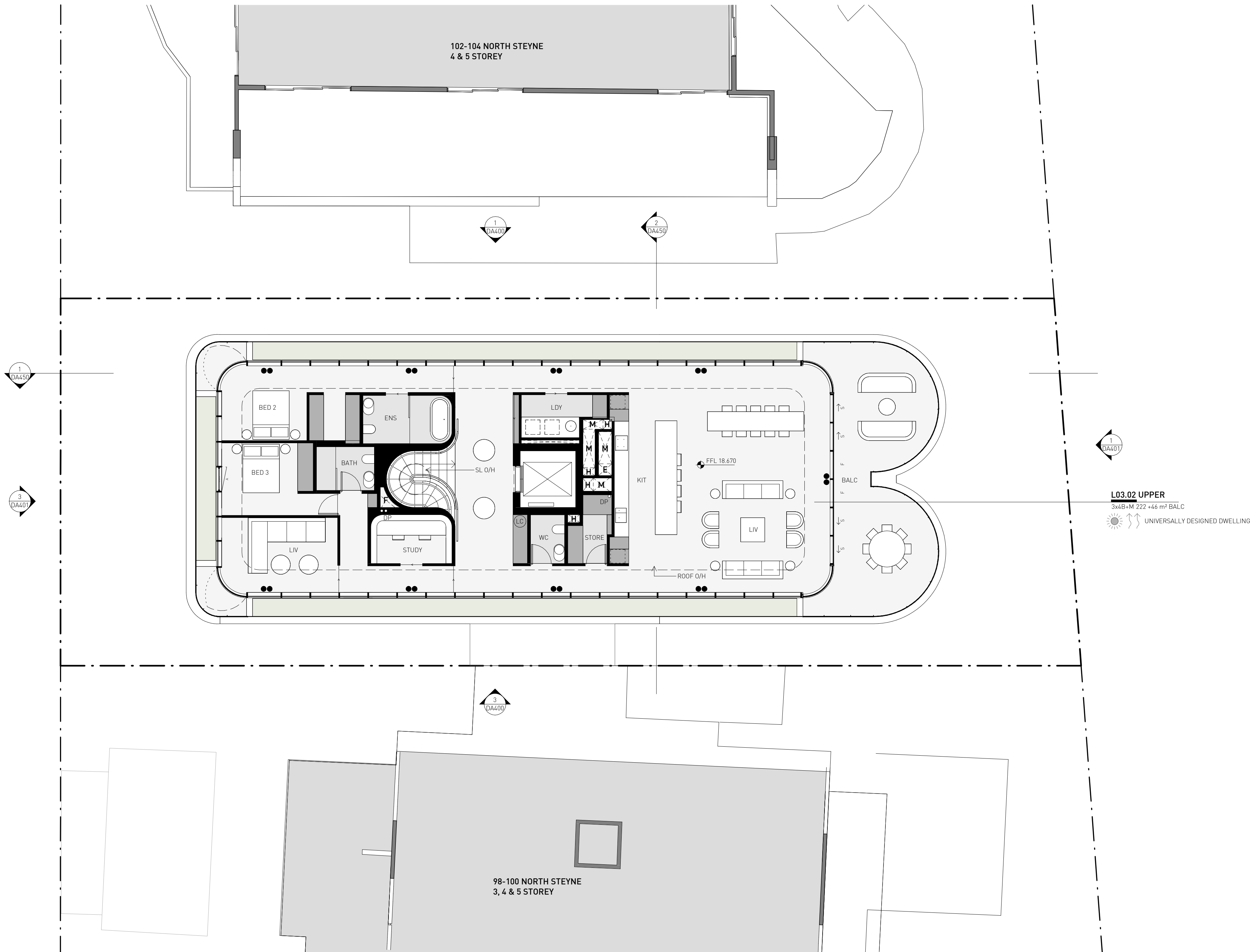
|             |                      |
|-------------|----------------------|
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PRELIMINARY  
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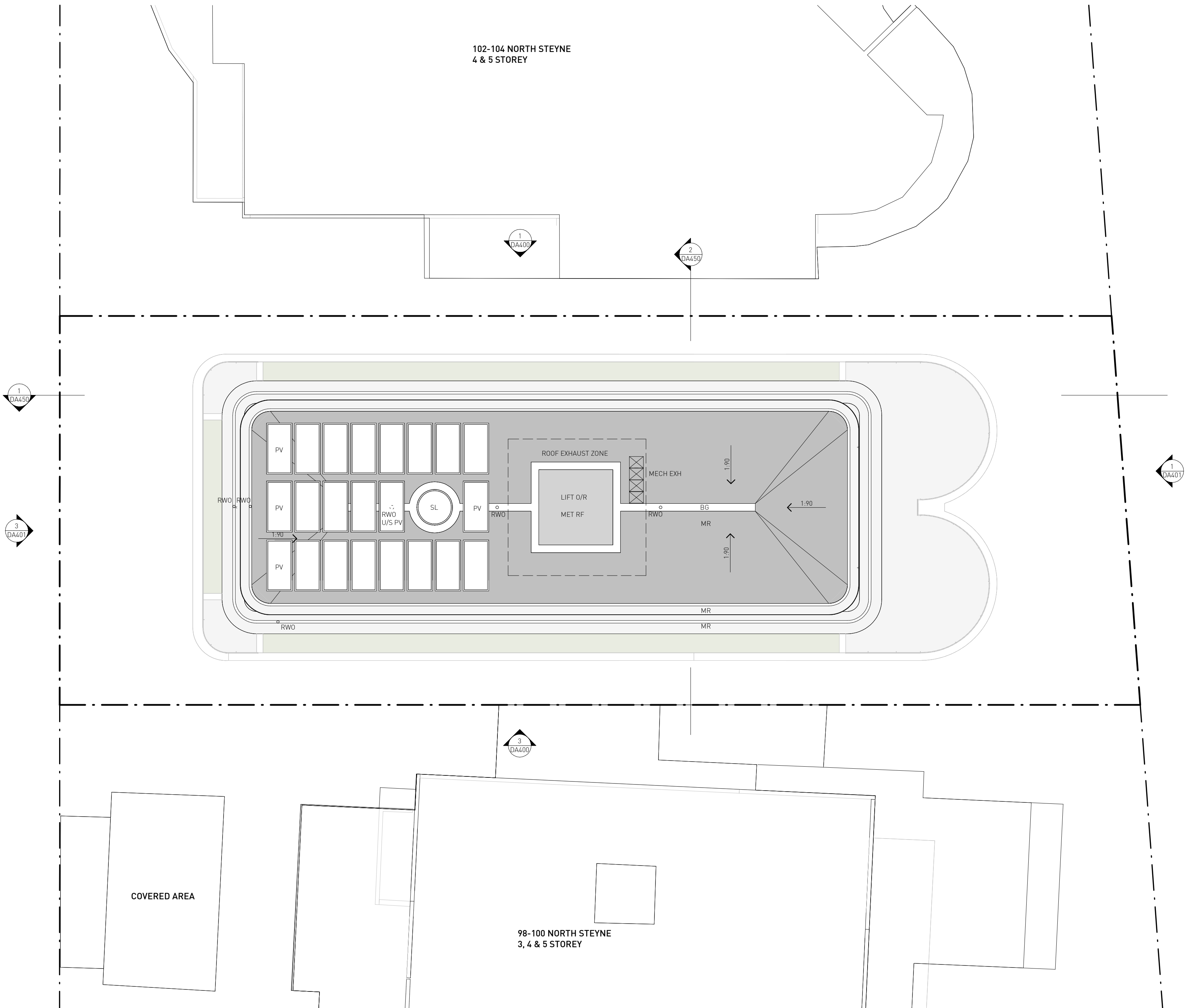
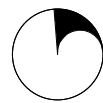
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| K     | FOR INFORMATION | 09.12.24 |
| L     | FOR INFORMATION | 06.12.24 |
| M     | DRAFT DA        | 13.12.24 |



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|----------------------------|-------------|
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| PRELIMINARY<br>NOT FOR CONSTRUCTION |                 |          |
|-------------------------------------|-----------------|----------|
| issue                               | reason          | date     |
| A                                   | FOR INFORMATION | 26.09.24 |
| B                                   | FOR INFORMATION | 08.10.24 |
| C                                   | FOR INFORMATION | 30.10.24 |
| D                                   | FOR INFORMATION | 29.11.24 |
| E                                   | FOR INFORMATION | 09.12.24 |
| F                                   | FOR INFORMATION | 06.12.24 |
| G                                   | DRAFT DA        | 13.12.24 |





LEGEND

New Wall

Existing/Neighbouring Wall

To be Demolished

Site Boundary

- NOTES
- 01

All dimensions to be verified on site.
- 02

Report any discrepancies or omissions to SDS prior to construction.
- 03

All drawings to be read in conjunction with specification.
- 04

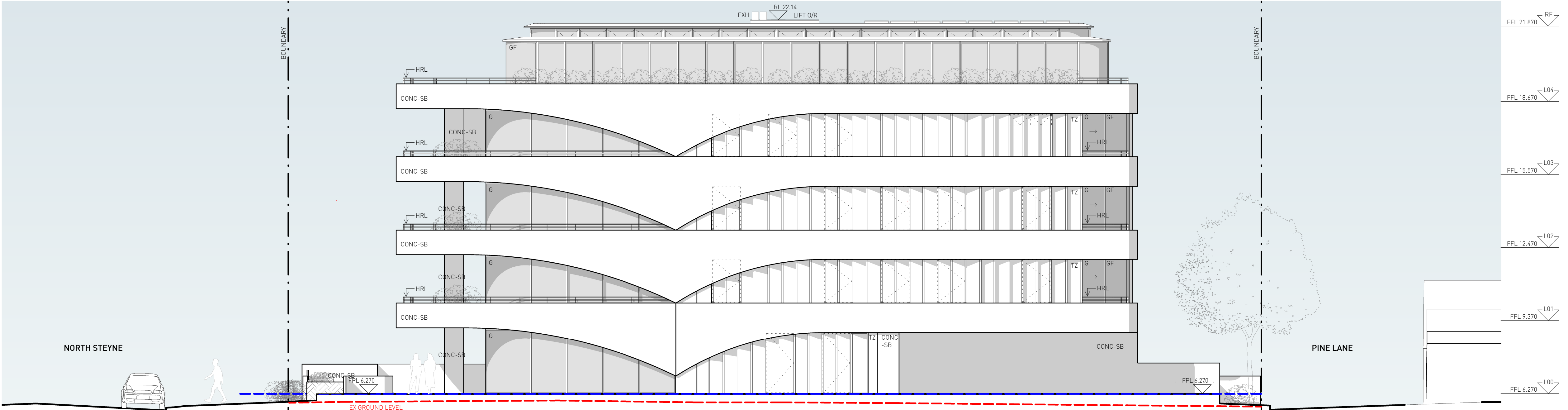
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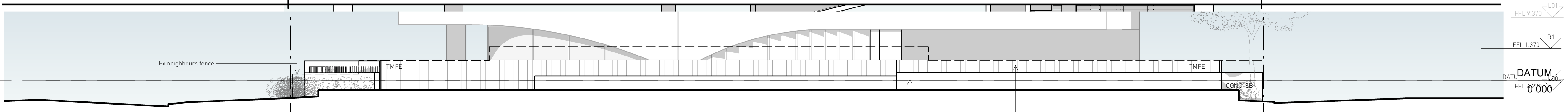
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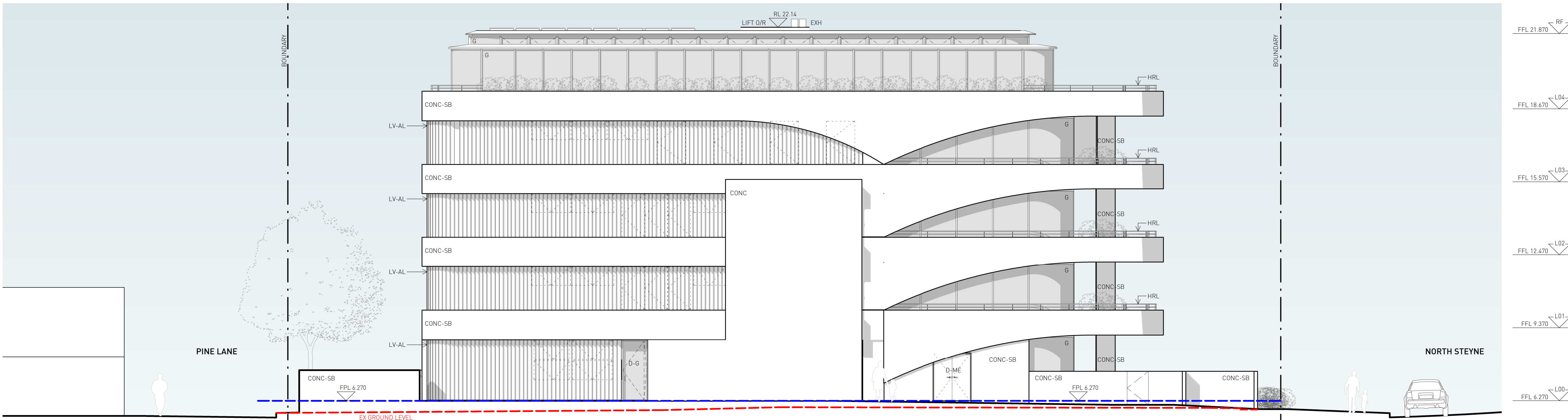
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|-------|-----------------|----------|
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| J     | FOR INFORMATION | 09.12.24 |
| K     | FOR INFORMATION | 06.12.24 |
| L     | DRAFT DA        | 13.12.24 |



1 NORTH ELEVATION



2 NORTH ELEVATION BOUNDARY



3 SOUTH ELEVATION



4 SOUTH ELEVATION BOUNDARY

| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

- NOTES
- 01

All dimensions to be verified on site.
- 02

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- 03

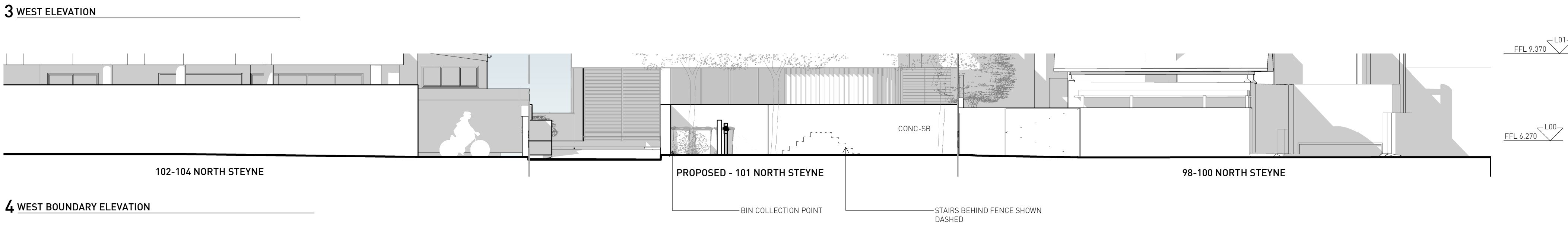
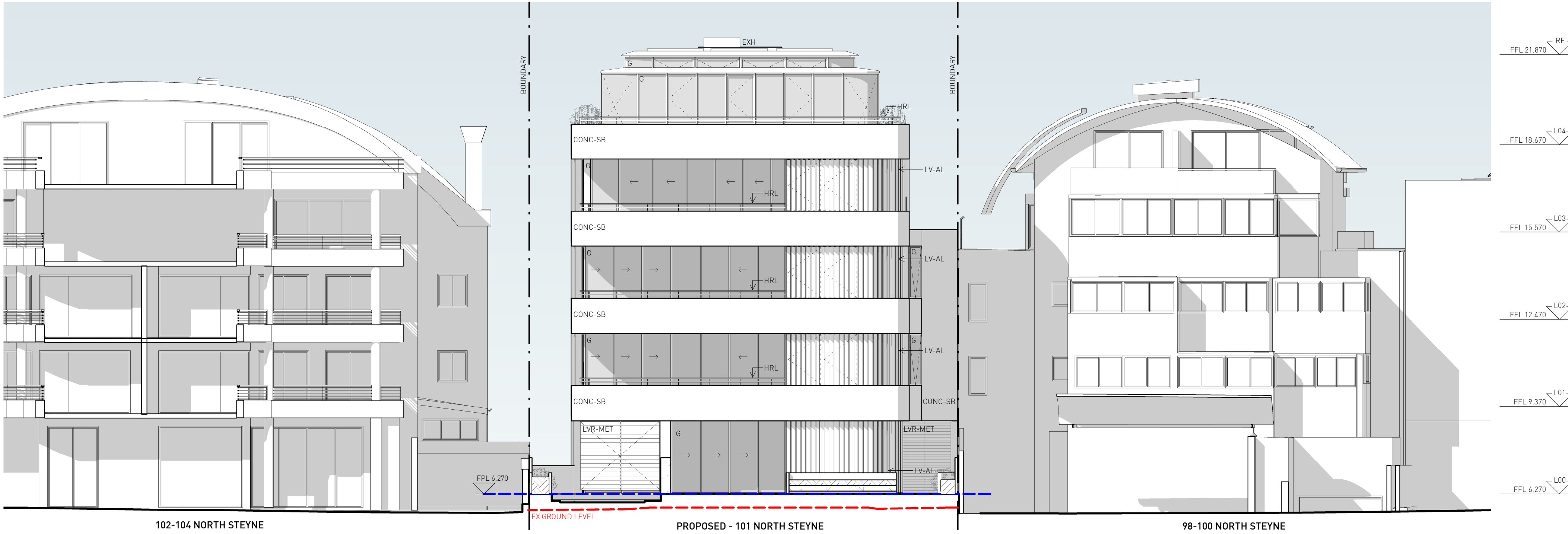
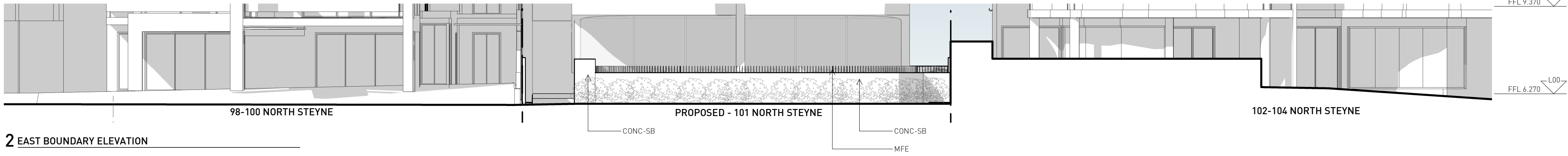
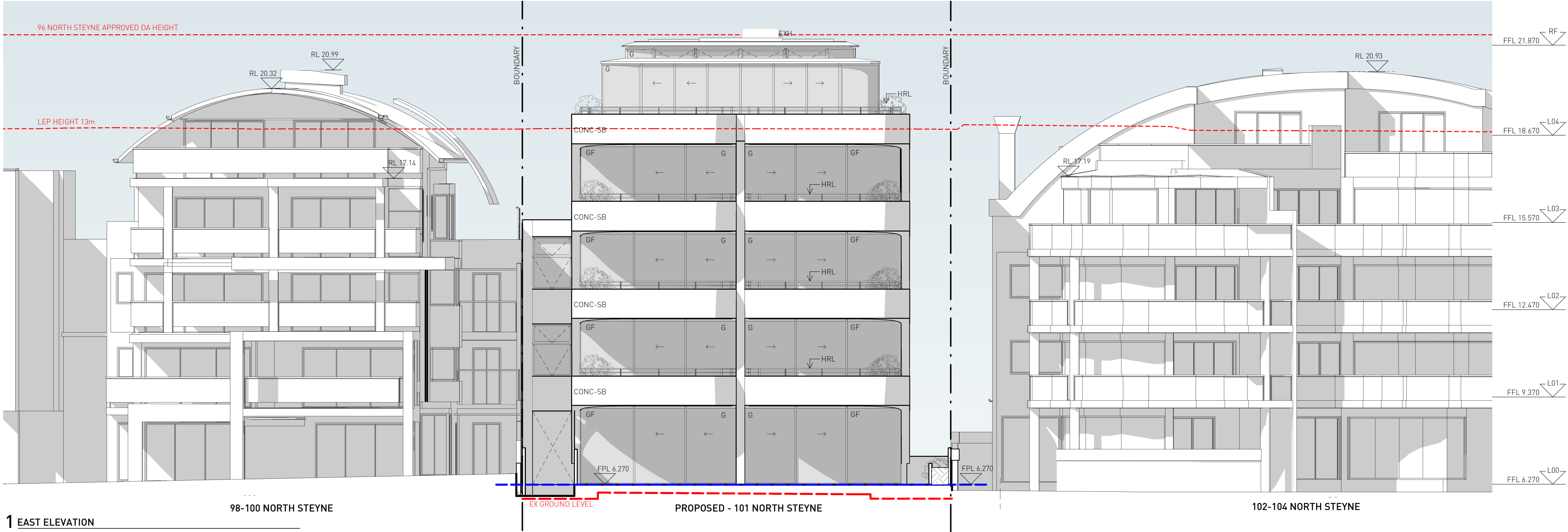
All drawings to be read in conjunction with specification.
- 04

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|-------------------------------------|-----------------|----------|
| issue                               | reason          | date     |
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| C                                   | PRE DA          | 22.08.24 |
| D                                   | FOR INFORMATION | 28.08.24 |
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| L                                   | FOR INFORMATION | 06.12.24 |
| M                                   | DRAFT DA        | 13.12.24 |

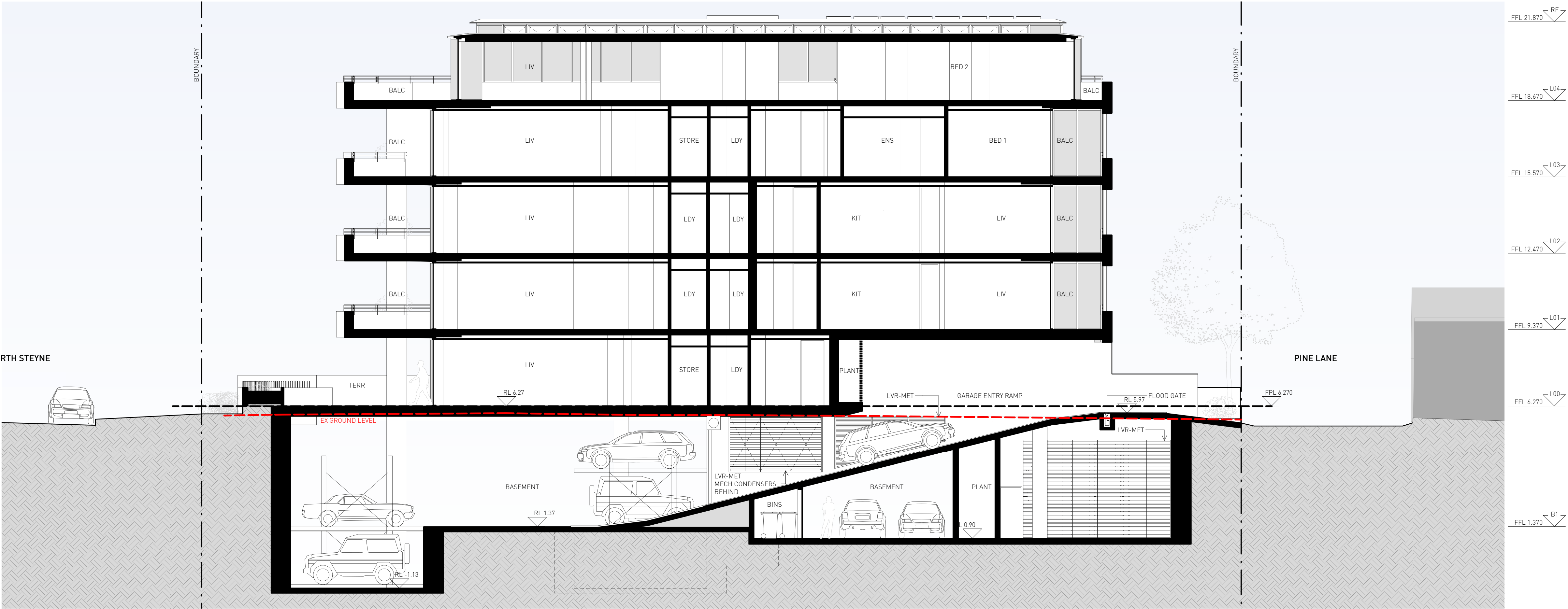




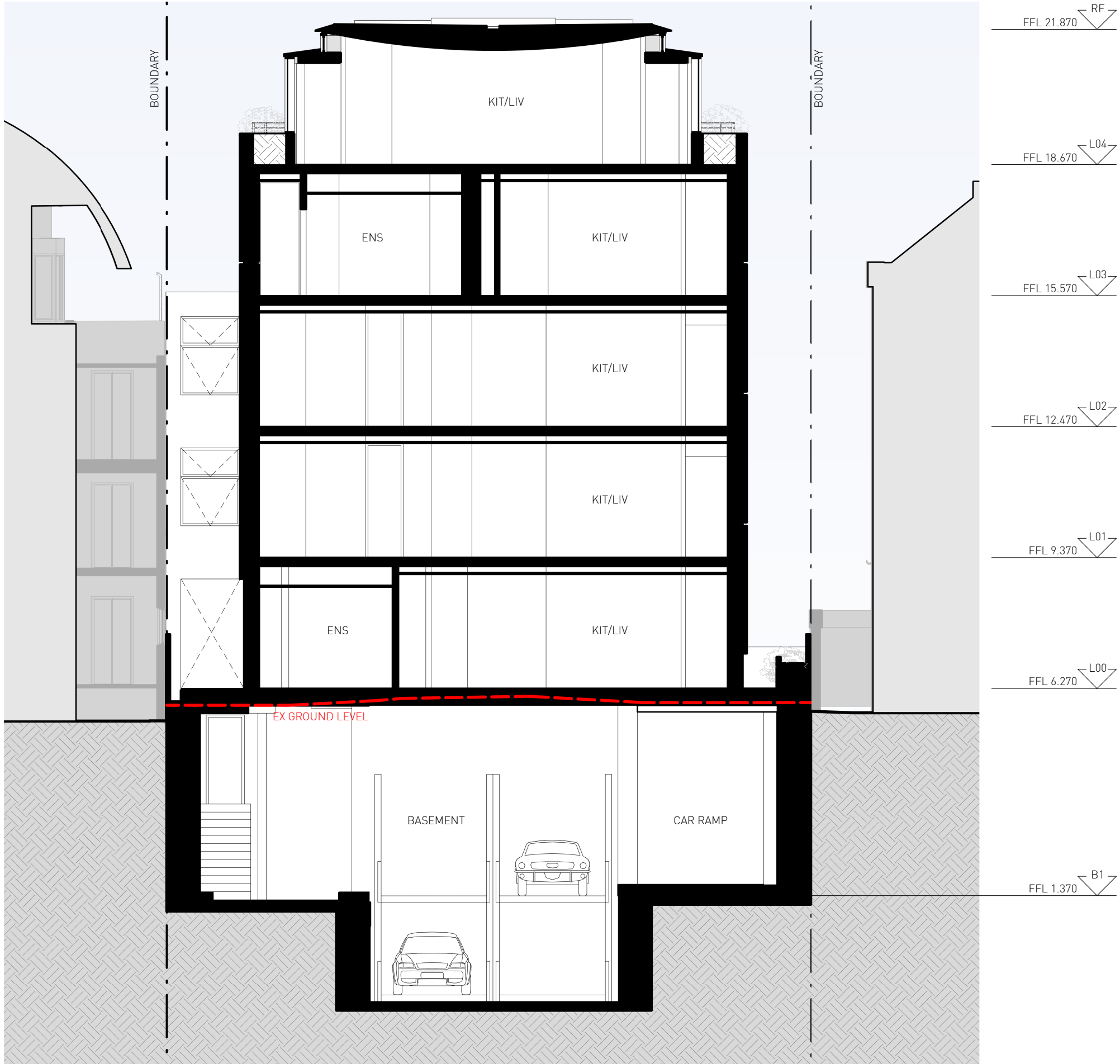
| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

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| K                                   | FOR INFORMATION | 09.12.24 |
| L                                   | FOR INFORMATION | 06.12.24 |
| M                                   | DRAFT DA        | 13.12.24 |



1 SECTION A



2 SECTION B

| LEGEND                     |             |
|----------------------------|-------------|
| New Wall                   | <div></div> |
| Existing/Neighbouring Wall | <div></div> |
| To be Demolished           | <div></div> |
| Site Boundary              | <div></div> |

COMPLIANCE SYMBOL LEGEND

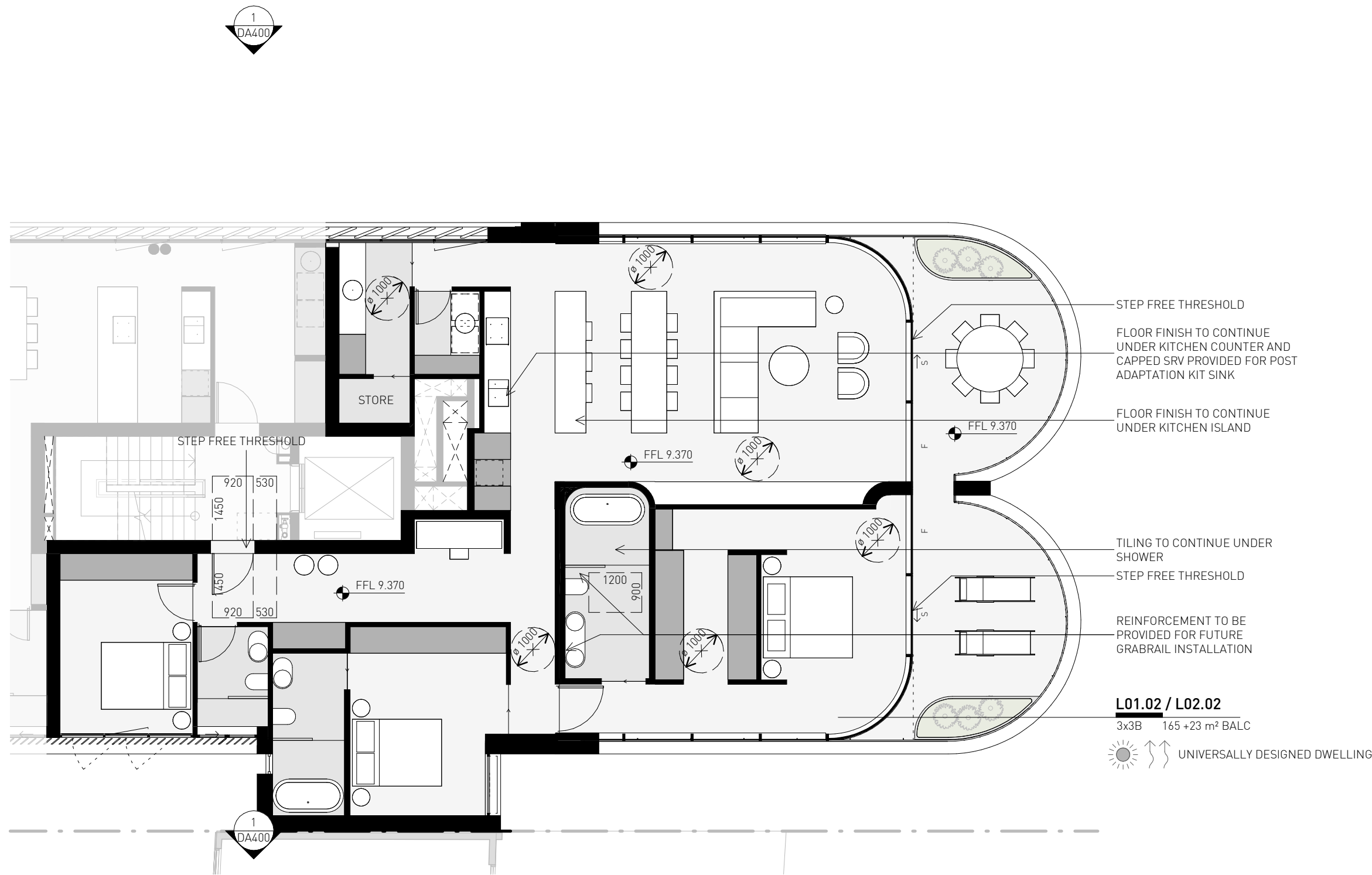
|             |                     |
|-------------|---------------------|
| <div></div> | CROSS VENTILATION   |
| <div></div> | LIVABLE             |
| <div></div> | ACCESSIBLE          |
| <div></div> | SOLAR ACCESS 2HRS + |
| <div></div> | SOLAR ACCESS <2HRS  |
| <div></div> | SOLAR ACCESS NONE   |

NOTES

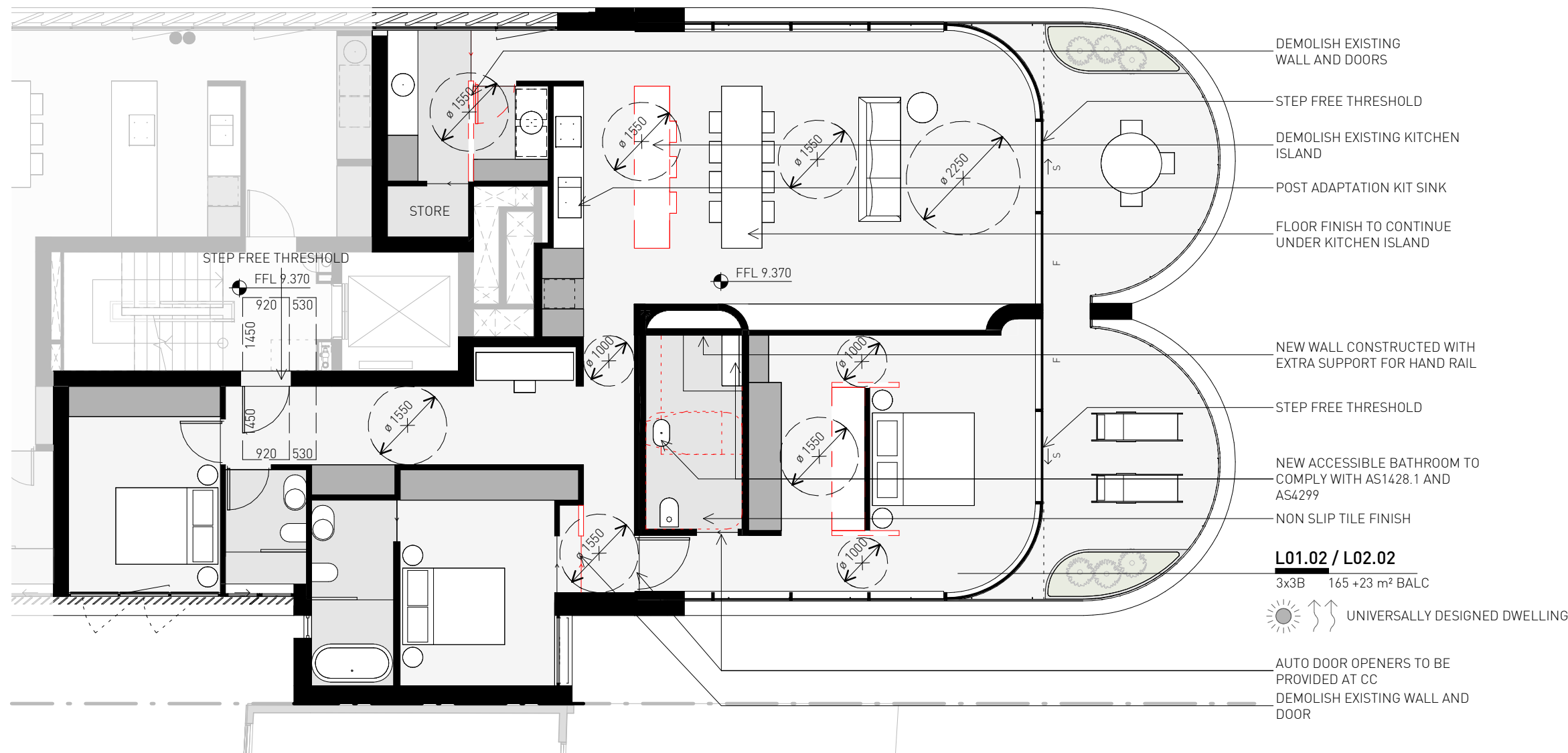
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PRELIMINARY  
NOT FOR CONSTRUCTION

| issue | reason   | date     |
|-------|----------|----------|
| A     | DRAFT DA | 13.12.24 |



1 L01.02 AND L02.02 LIVEABLE (TYPICAL)



2 L01.02 AND L02.02 ADAPTABLE

