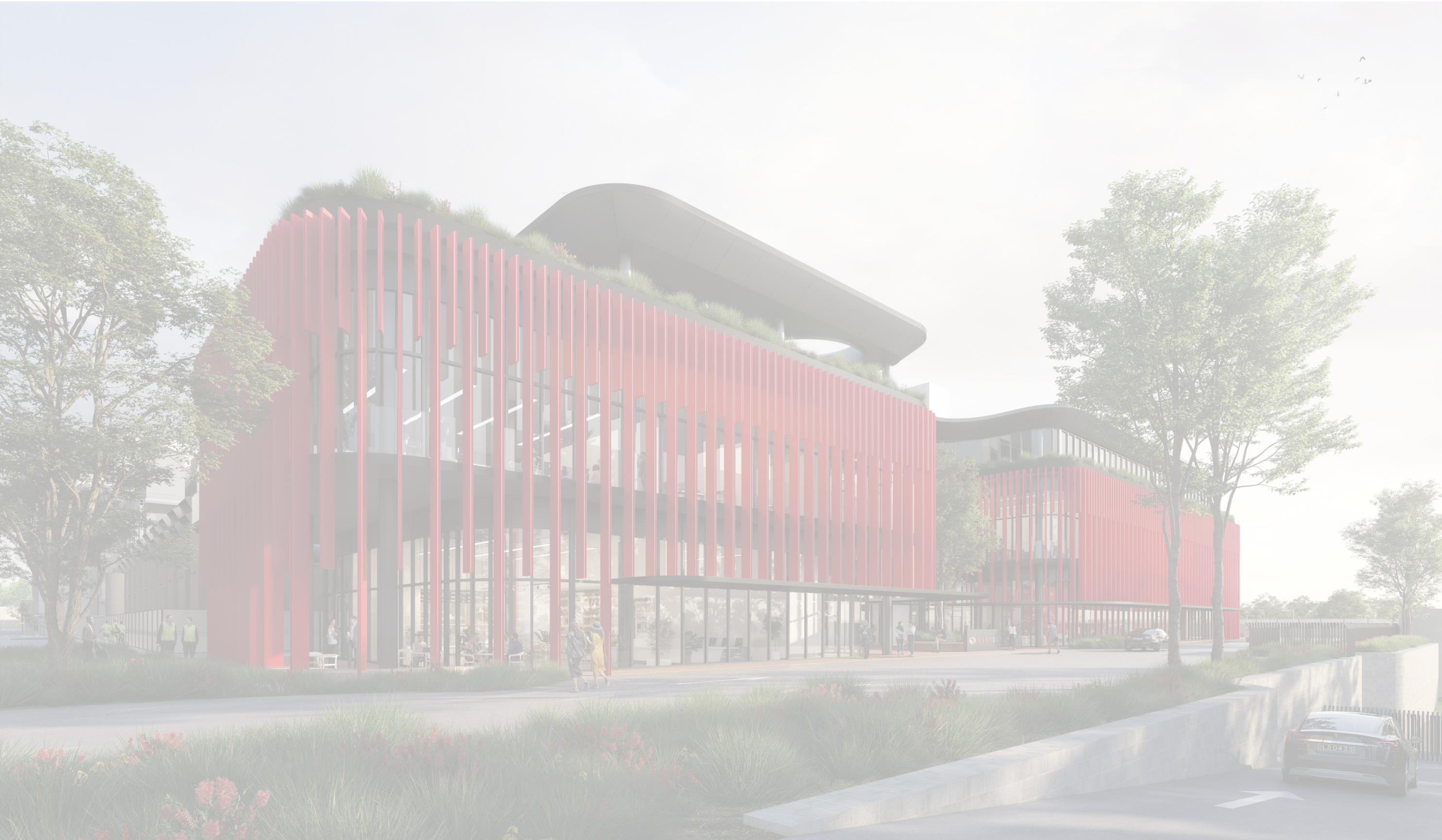
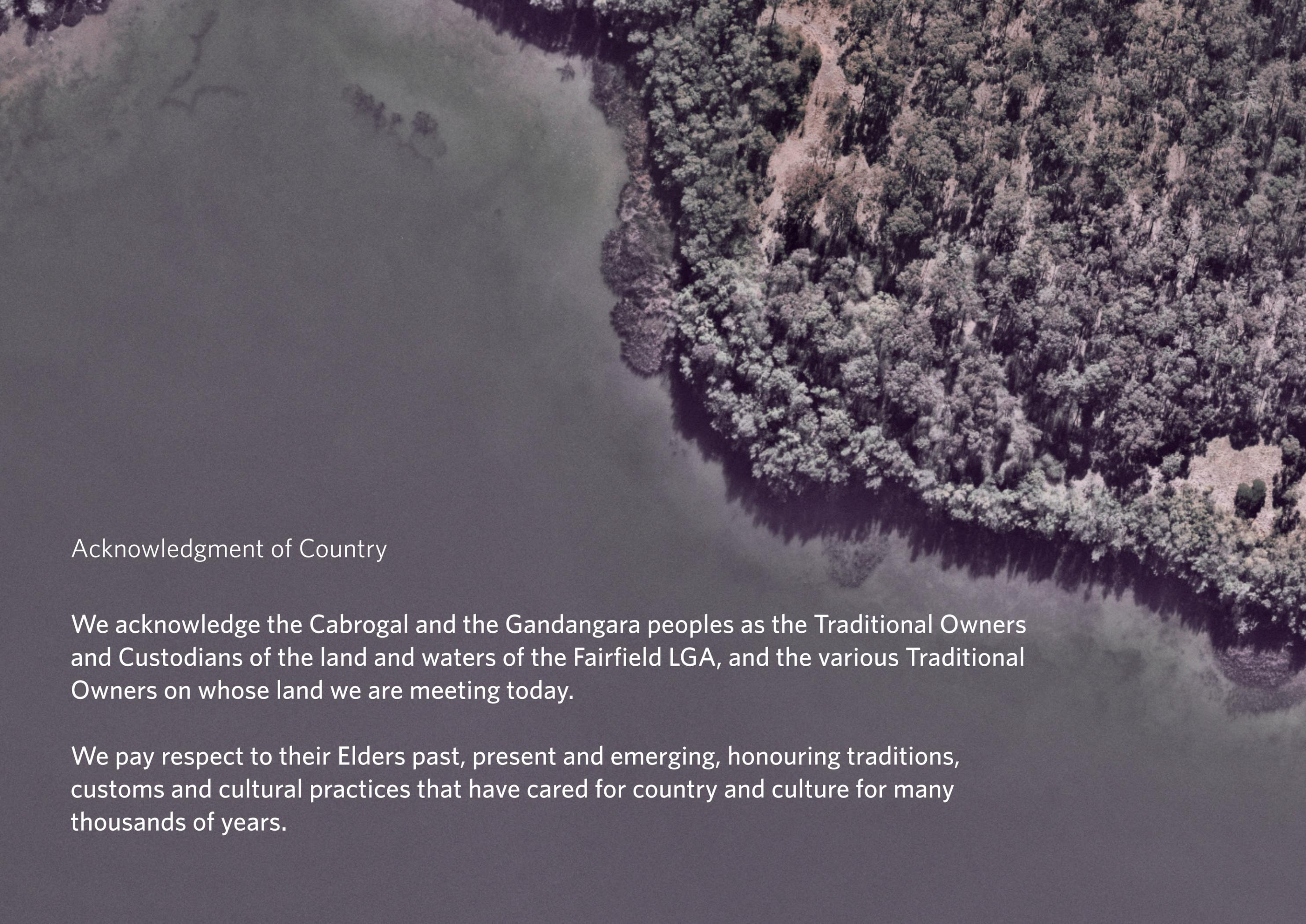


# NEXTDC DATA CENTRE SHIRAZ 4 | SSSA Architectural Design Report

Jun 2024  
Revision: CP04 - SSSA ISSUE



An aerial photograph showing a wide river flowing through a dense, green forest. The river is on the left side of the frame, and the forest covers the right side. The water is a dark, muted green, and the trees are a vibrant green. The overall scene is a natural, undisturbed landscape.

## Acknowledgment of Country

We acknowledge the Cabrogal and the Gandangara peoples as the Traditional Owners and Custodians of the land and waters of the Fairfield LGA, and the various Traditional Owners on whose land we are meeting today.

We pay respect to their Elders past, present and emerging, honouring traditions, customs and cultural practices that have cared for country and culture for many thousands of years.

## Executive Summary

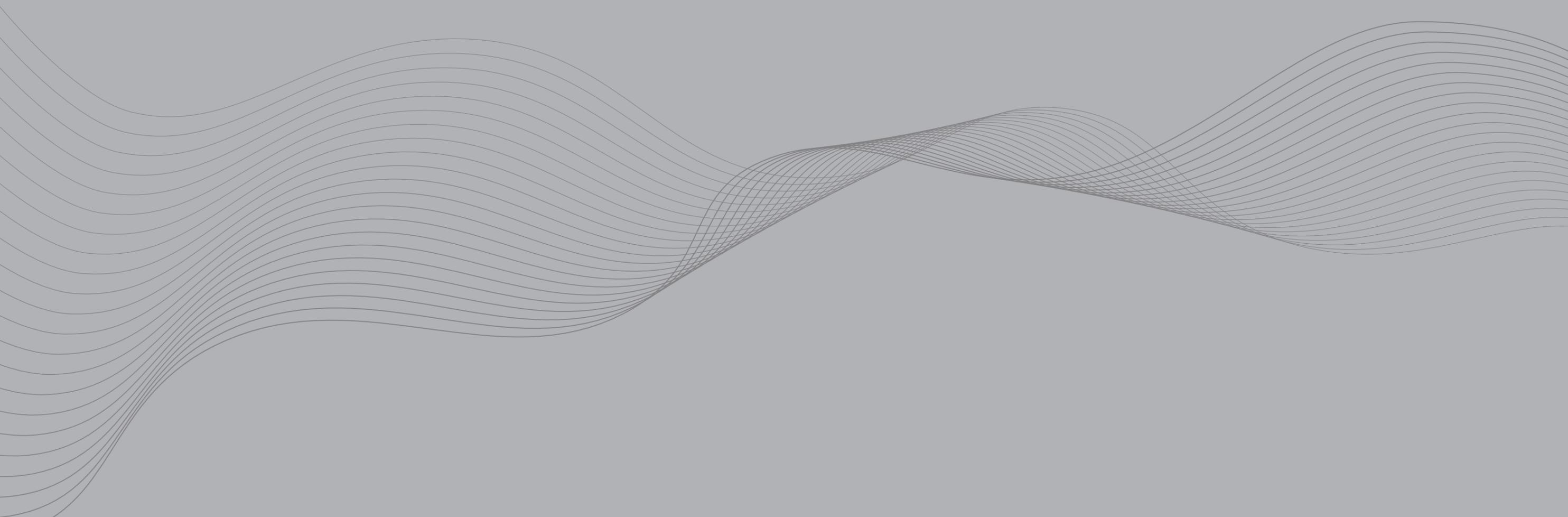
This NEXTDC Data Centre Shiraz 4 Architectural Design Report has been prepared by HDR on behalf of NEXTDC Limited to accompany a detailed State Significant Development Application (SSDA) for the S4 data centre development at 16 Johnston Crescent, Horsley Park. The site is legally described as Lot 305 in Deposited Plan 1275011.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-63741210). This report concludes that the proposed data centre development is suitable and warrants approval subject to the implementation of the any mitigation measures.

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# 01\_ Project Overview



# 01\_ Overview

## 1.1. Project Introduction

The key features of the Proposal are summarised as follows:

- Site preparation works including bulk earthworks.
- Staged construction and operation of five data centre buildings comprising a total gross floor area (GFA) of 63,654m<sup>2</sup> including 52,916m<sup>2</sup> of technical data hall floor space and 10,738m<sup>2</sup> of ancillary office and innovation floor space, including 'front of house' meeting and function spaces, and a café.
- Associated and ancillary on-site facilities on-site parking for 200 cars, business identification signage (pylon and elevation signage), civil and stormwater works and 9,900m<sup>2</sup> of deep soil landscaping.
- Delivery of 232 megawatts of power, including a 330kV substation and a 33kV switching station, plus above ground diesel storage tanks and above ground water tanks for industrial water and fire water.

The Project will be delivered in three construction stages as follows:

- Stage 1 = Buildings A, B, C, and substation
- Stage 2 = Building D
- Stage 3 = Building E

Descriptor	Project Details
Project Area	The site has a total area of 8.206 hectares. The entire site will be disturbed by the Project.
Use and Activities	Data centre with ancillary office and innovation floor space and café.
Project Summary	<ul style="list-style-type: none"> <li>• Site preparation works including bulk earthworks.</li> <li>• Staged construction and operation of five data centre buildings comprising a total gross floor area (GFA) of 63,654m<sup>2</sup> including 52,916m<sup>2</sup> of technical data hall floor space and 10,738m<sup>2</sup> of ancillary office and innovation floor space, including 'front of house' meeting and function spaces, and a café.</li> <li>• Ancillary development including on-site parking for 200 cars, business identification signage (pylon and elevation signage), civil and stormwater works.</li> <li>• Delivery of 232 megawatts of power, including a 330kV substation and a 33kV switching station, plus above ground diesel storage tanks and above ground water tanks for industrial water and fire water.</li> </ul>
Gross Floor Area (GFA)	<ul style="list-style-type: none"> <li>• Total GFA of 63,654m<sup>2</sup>, broken down as follows:</li> <li>• Data halls/technical: 52,916m<sup>2</sup></li> <li>• Mission critical (MCX) office, innovation and admin floor space: 10,738m<sup>2</sup></li> <li>• Total number of data halls: 34 data halls</li> </ul>
Maximum Height	Building A - 32 metres over three storeys Buildings B, C, D and E - 39 metres over four storeys
Floor Space Ratio	0.78:1
Deep Soil Area	9,900m <sup>2</sup> (12.1% of site area)
Car Parking	200 car spaces including 6 DDA spaces and 10 EV spaces



# 01\_ Overview

## 1.1. Project Introduction

Descriptor	Project Details
Motorbike Parking	5 spaces
Bicycle Parking	24 spaces
Utilities	<p>Provision of required utilities:</p> <p>Building A Utilities including:</p> <ul style="list-style-type: none"> <li>Above ground diesel storage tanks (10 x 25kL each)</li> <li>Above ground water tanks for industrial water (4 x 170kL each)</li> </ul> <p>Building B Utilities including:</p> <ul style="list-style-type: none"> <li>Above ground diesel storage tanks (10 x 65kL each)</li> <li>Above ground water tanks for industrial water (4 x 580kL each)</li> </ul> <p>Building C Utilities including:</p> <ul style="list-style-type: none"> <li>Above ground diesel storage tanks (10 x 65kL each)</li> <li>Above ground water tanks for industrial water (4 x 580kL each)</li> </ul> <p>Building D Utilities including:</p> <ul style="list-style-type: none"> <li>Above ground diesel storage tanks (10 x 65kL each)</li> <li>Above ground water tanks for industrial water (4 x 580kL each)</li> </ul> <p>Building E Utilities including:</p> <ul style="list-style-type: none"> <li>Above ground diesel storage tanks (14 x 65kL each)</li> <li>Above ground water tanks for industrial water (6 x 580kL each)</li> </ul> <p>Fire Water Storage Tanks:</p> <ul style="list-style-type: none"> <li>Above ground water tanks for fire water (6 x 340kL each)</li> </ul> <p>Substation:</p> <ul style="list-style-type: none"> <li>On site 330kV substation plus 33kV switching station</li> </ul>
Power Consumption	232 megawatts
Operations and Management	The facility would be constructed and operated by NEXTDC. The site would be operated on a 24-hour, 7 days a week basis.
Existing Services and Infrastructure	Existing services and infrastructures will be extended, adapted and augmented to meet the demands of the Project.
Staging/Phasing	<p>The Project will be constructed in three stages:</p> <ul style="list-style-type: none"> <li>Stage 1 = Buildings A, B, C, and substation</li> <li>Stage 2 = Building D</li> <li>Stage 3 = Building E</li> </ul>



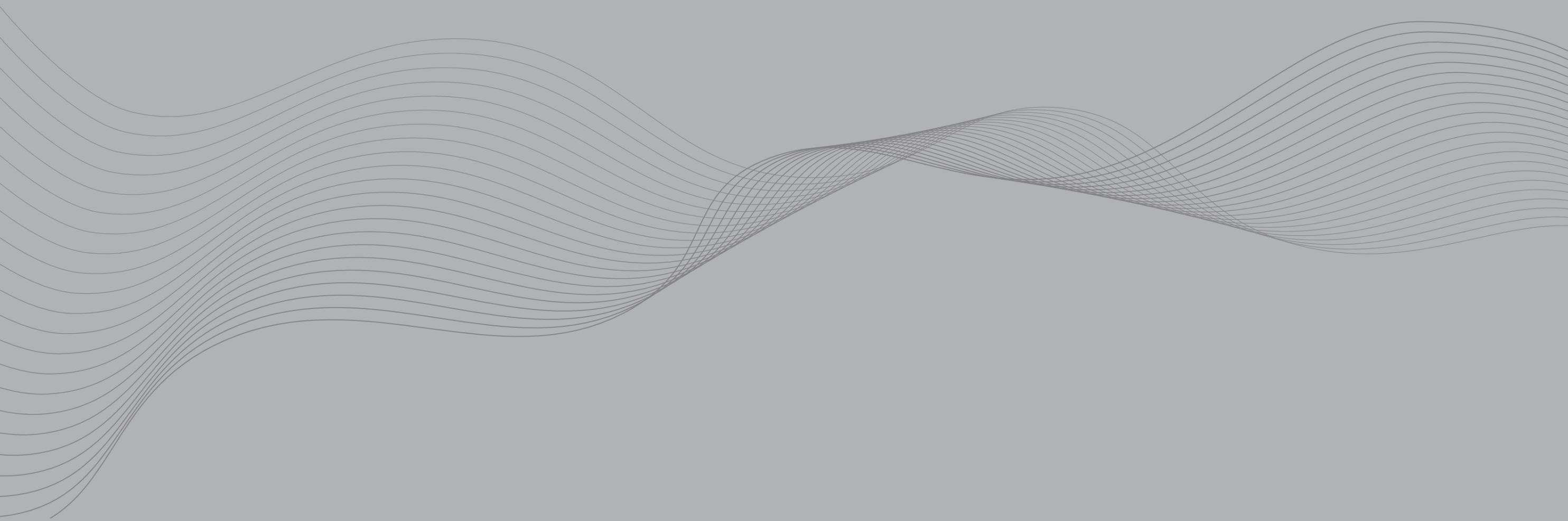
# 01\_ Overview

## 1.2. SEARs Response

This report has been prepared in response to the requirements contained within the Secretary’s Environmental Assessment Requirements (SEARs) dated 27 October 2023 issued for the SSDA (SSD-63741210). Specifically, this report has been prepared to respond to the SEARS requirement issued below.

Item	Description of Requirement	Section Reference
<b>4. Built Form and Urban Design</b>	<ul style="list-style-type: none"> <li>▪ Explain and illustrate the proposed built form, including a detailed site and context analysis to justify the proposed site planning and design approach.</li> <li>▪ Demonstrate how the proposed built form (layout, height, bulk, scale, separation, setbacks, interface and articulation) addresses and responds to the context, site characteristics, streetscape and existing and future character of the locality.</li> <li>▪ Demonstrate how the building design will deliver a high-quality development, including consideration of façade design, articulation, materials, finishes, colours, any signage and integration of services.</li> <li>▪ Assess how the development complies with the relevant accessibility requirements.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sections 02, 03, 04, and 05 of this report.</li> <li>▪ Refer to Appendices for Architectural drawings, BCA Report, and Accessibility Report.</li> </ul>
<b>7. Trees and Landscaping</b>	<p>Provide a detailed site-wide landscape plan, that:</p> <ul style="list-style-type: none"> <li>◦ identifies the number and location of trees to be removed and retained, and how opportunities to retain significant trees have been explored and/or informs the plan.</li> <li>◦ details the proposed site planting, including location, number and species of plantings, heights of trees at maturity and proposed canopy coverage (as a percentage of the site area).</li> <li>◦ demonstrates how the proposed development would:               <ul style="list-style-type: none"> <li>▪ contribute to long term landscape setting in respect of the site and streetscape.</li> <li>▪ mitigate the urban heat island effect and ensure appropriate comfort levels on-site.</li> <li>▪ contribute to the objective of increased urban tree canopy cover.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Section 4.4 of this report.</li> <li>▪ Refer to Appendix for Landscape drawings.</li> </ul>

## 02\_ Site Context & analysis



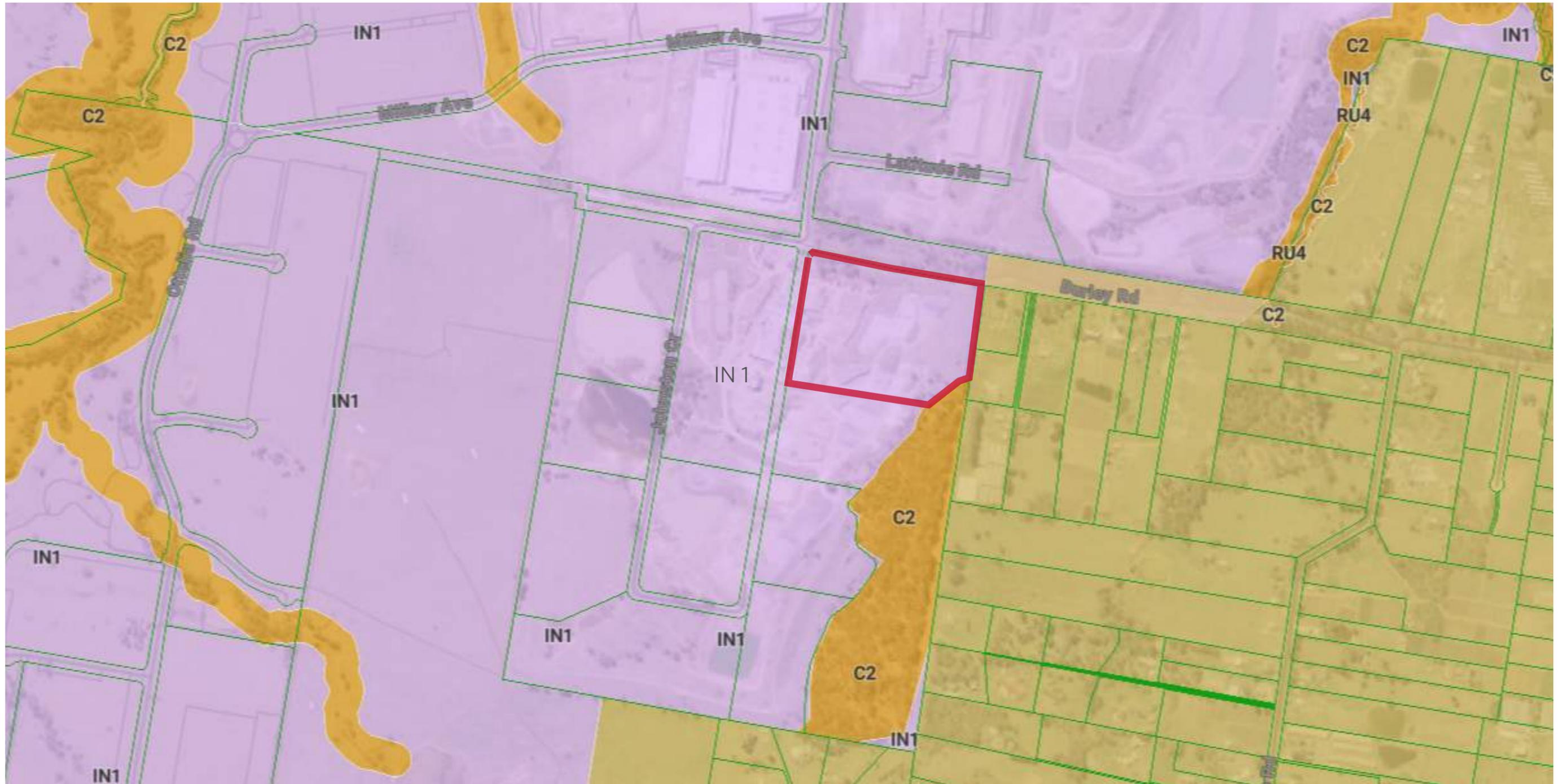
# 02\_ Site Context & Analysis

## 2.1. Site Location



# 02\_ Site Context & Analysis

## 2.2. Planning Framework



**Legend**

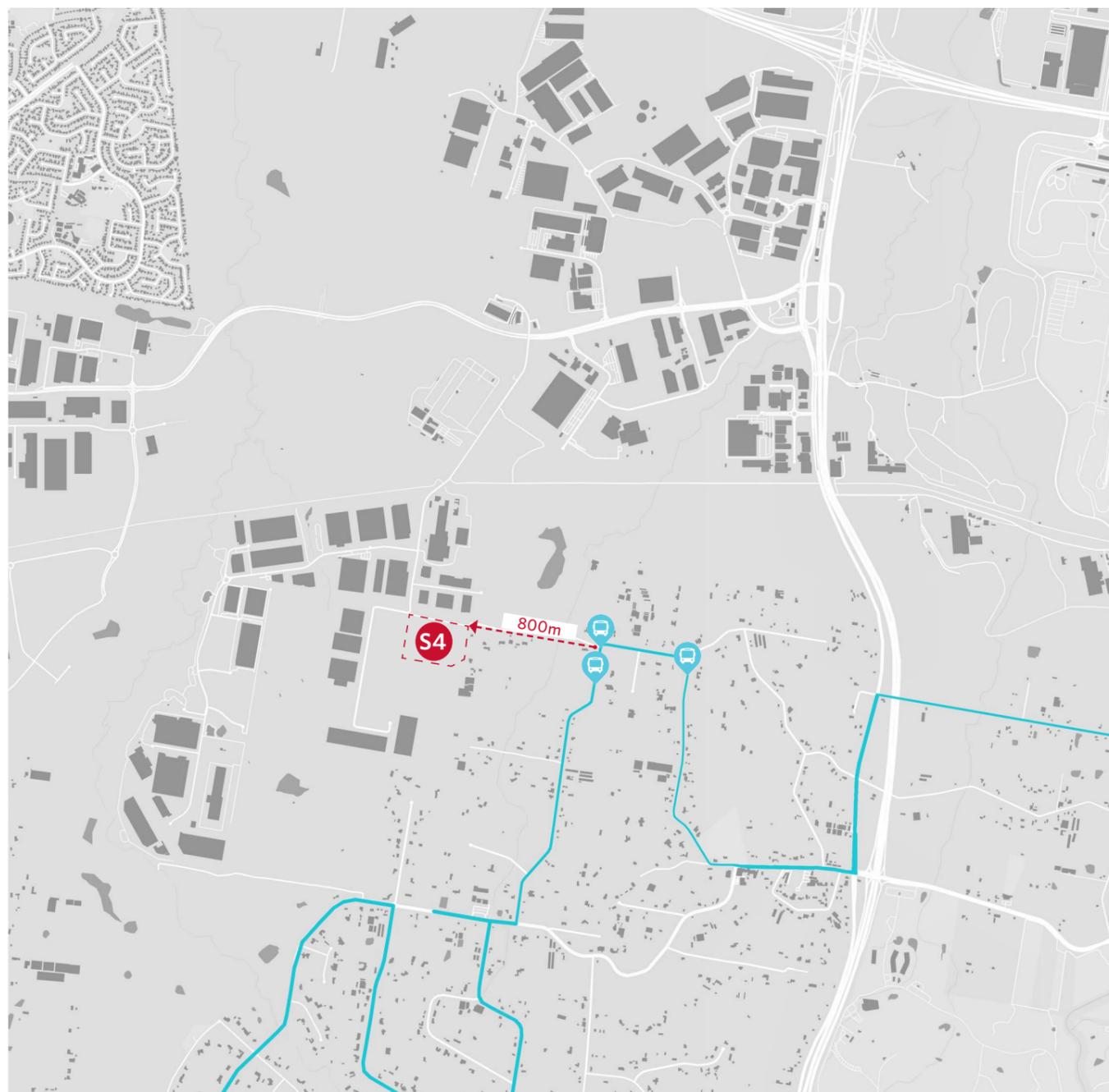
- Site
- C2 - Environmental Conservation
- IN1 - General Industrial
- RU4 - Primary Production Small Lots zone



# 02\_ Site Context & Analysis

## 2.3. Site Access

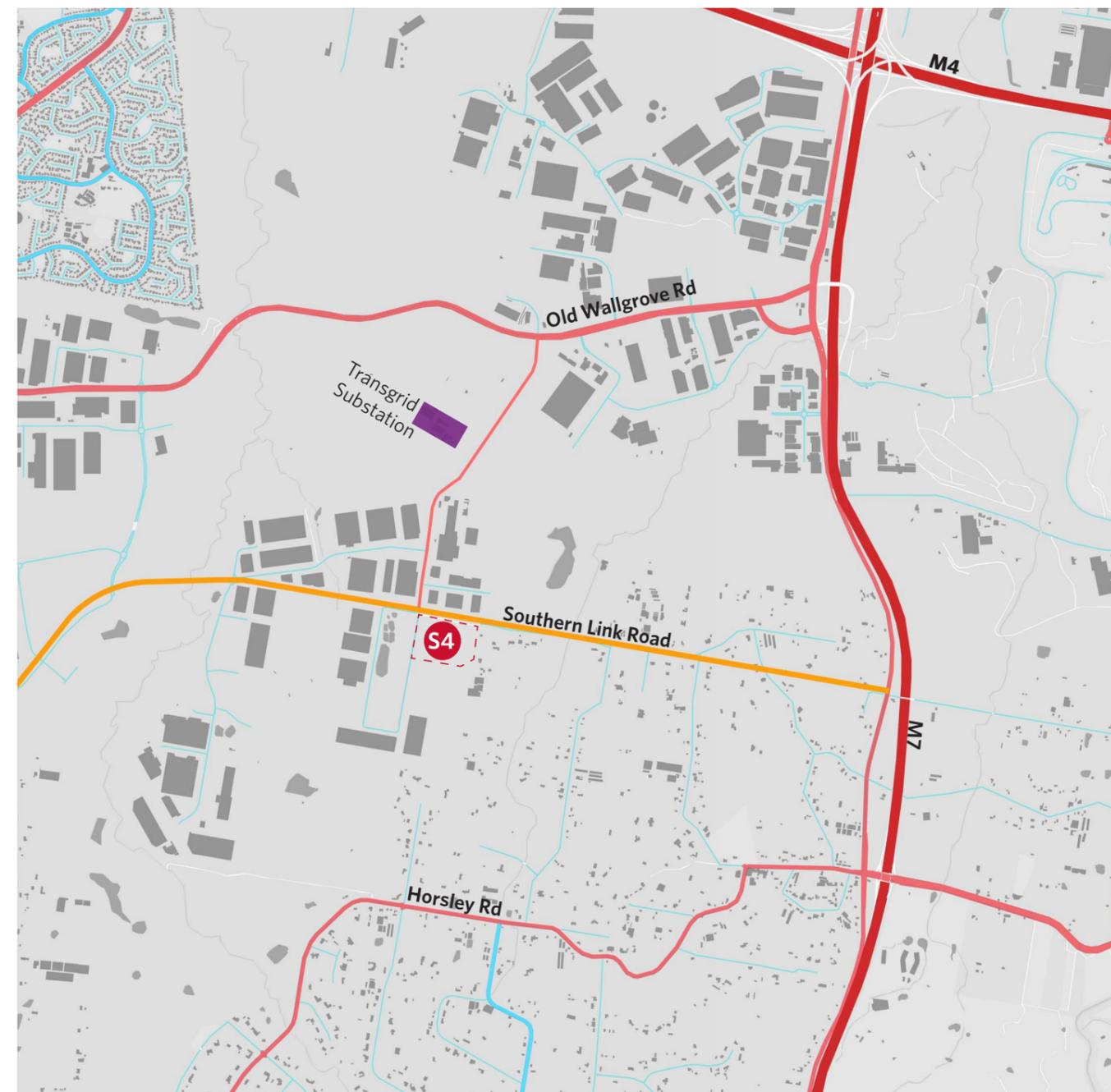
### PUBLIC TRANSPORT



### Legend

- Bus Stop
- Bus Route 813

### ROAD HIERARCHY (Future road network to be considered)



- Major Motorway
- Primary Roads
- Secondary Roads
- Streets
- Future Roads

# 02\_ Site Context & Analysis

## 2.4. Site Environment

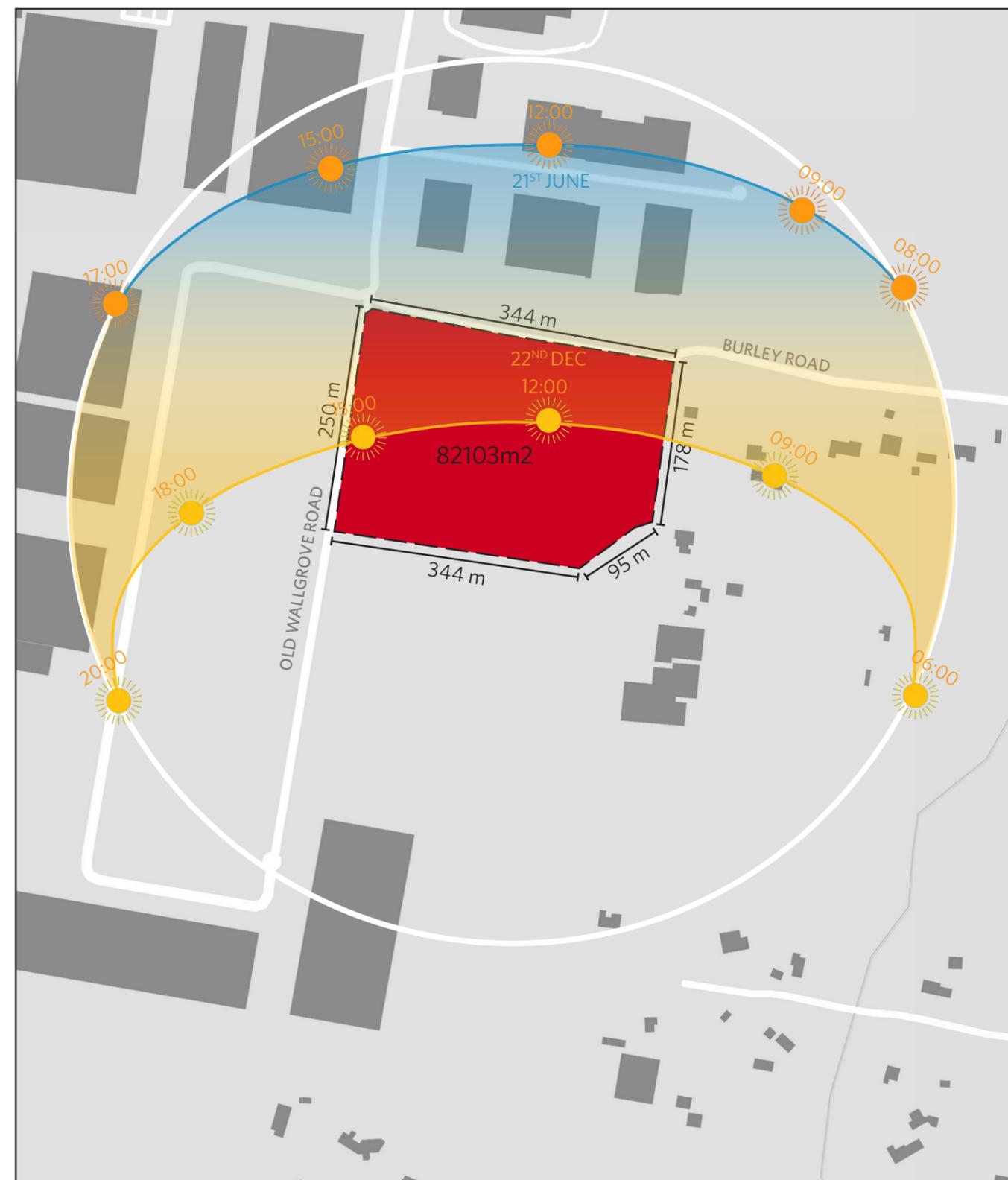
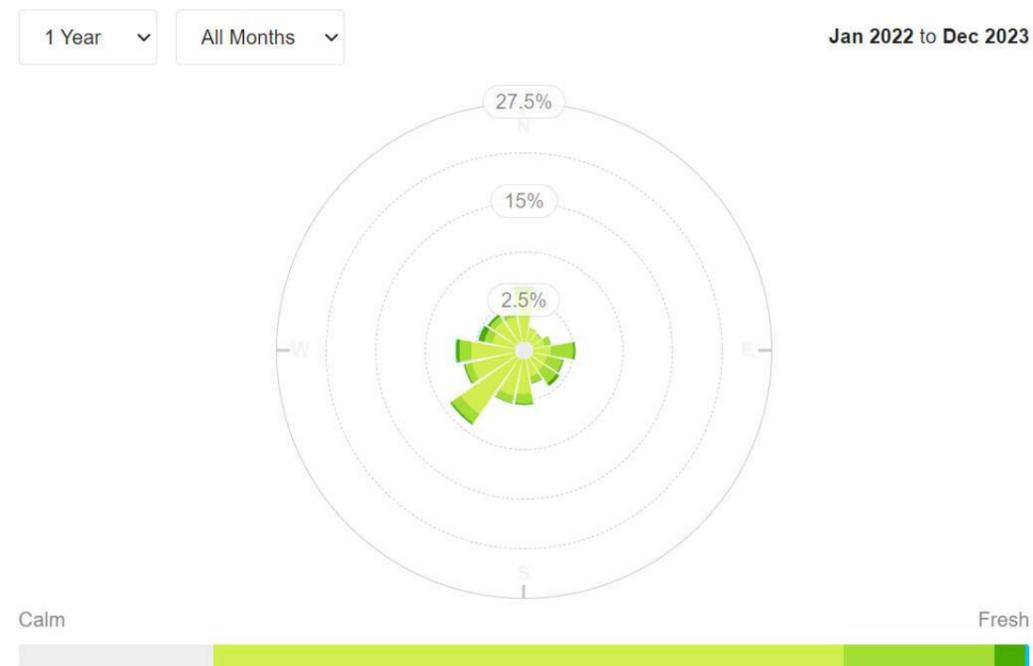
### Climate

Horsley Park has a humid subtropical climate (Cfa) with warm to hot summers and cool to mild winters. The highest recorded temperature was 47.0 °C, registered on 4 January 2020. -2.3 °C was the lowest temperature recorded on 17 July 2007

Climate data for Horsley Park (Sydney International Equestrian Centre) [hide]													
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Record high °C (°F)	47.0 (116.6)	46.4 (115.5)	40.5 (104.9)	35.9 (96.6)	28.1 (82.6)	24.7 (76.5)	27.3 (81.1)	28.4 (83.1)	36.0 (96.8)	37.5 (99.5)	42.0 (107.6)	44.4 (111.9)	47.0 (116.6)
Average high °C (°F)	30.0 (86.0)	28.6 (83.5)	26.7 (80.1)	23.8 (74.8)	20.5 (68.9)	17.6 (63.7)	17.4 (63.3)	19.1 (66.4)	22.3 (72.1)	24.7 (76.5)	26.4 (79.5)	28.3 (82.9)	23.8 (74.8)
Average low °C (°F)	17.9 (64.2)	17.8 (64.0)	16.2 (61.2)	12.9 (55.2)	9.0 (48.2)	7.1 (44.8)	5.9 (42.6)	6.4 (43.5)	9.3 (48.7)	11.9 (53.4)	14.3 (57.7)	16.2 (61.2)	12.1 (53.8)
Record low °C (°F)	10.4 (50.7)	10.4 (50.7)	7.2 (45.0)	1.9 (35.4)	0.8 (33.4)	-1.8 (28.8)	-2.3 (27.9)	-0.5 (31.1)	0.7 (33.3)	3.6 (38.5)	5.6 (42.1)	8.9 (48.0)	-2.3 (27.9)
Average precipitation mm (inches)	75.2 (2.96)	123.2 (4.85)	92.6 (3.65)	69.0 (2.72)	43.6 (1.72)	66.5 (2.62)	51.3 (2.02)	38.0 (1.50)	38.3 (1.51)	64.3 (2.53)	77.4 (3.05)	64.2 (2.53)	804.9 (31.69)
Average precipitation days (≥ 1 mm)	7.8	7.6	8.8	6.7	5.2	6.4	5.0	4.0	4.7	5.9	7.2	7.2	76.5
Average relative humidity (%)	49	53	54	53	52	55	50	42	42	45	50	48	49

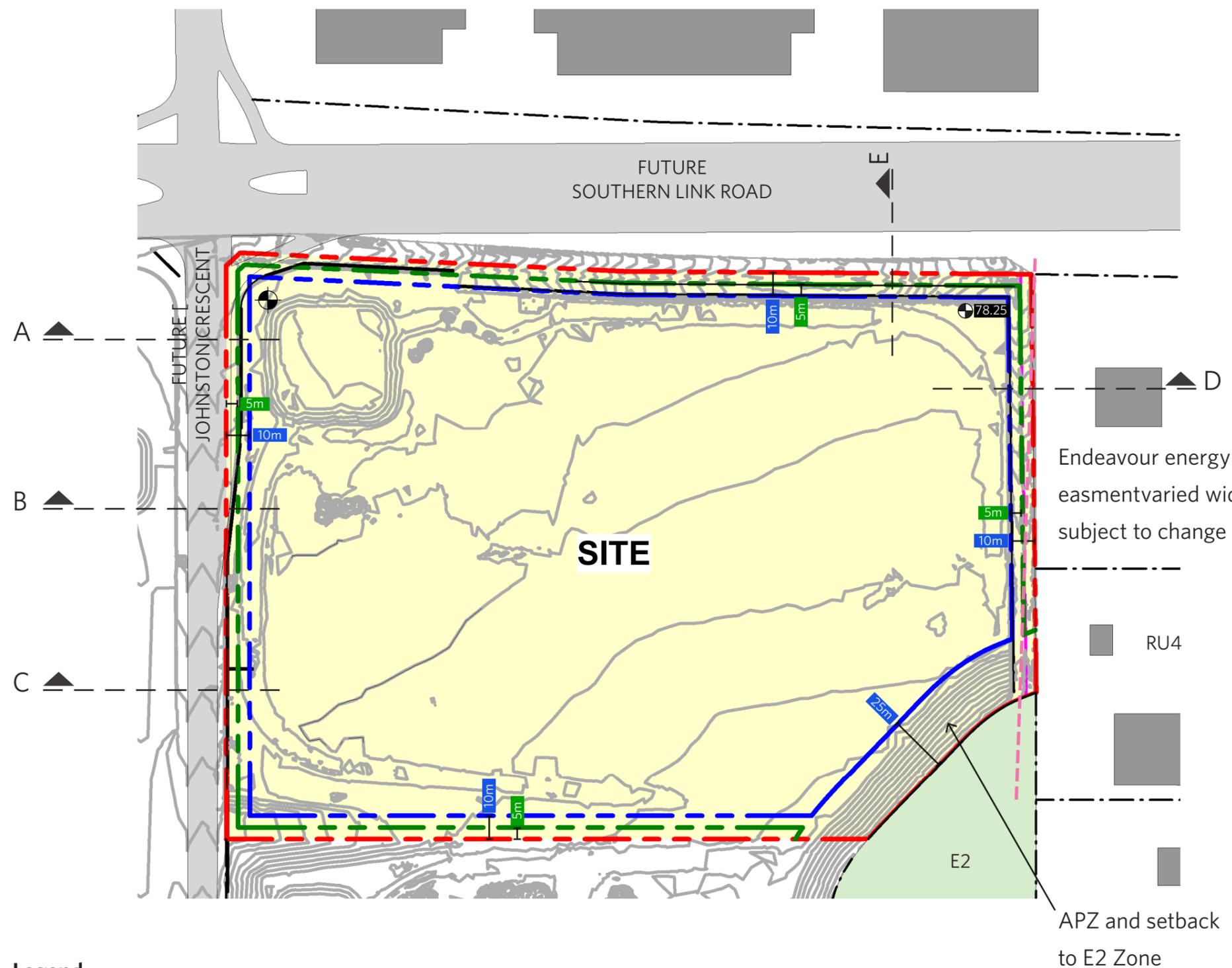
Source: [8]

### Wind Rose



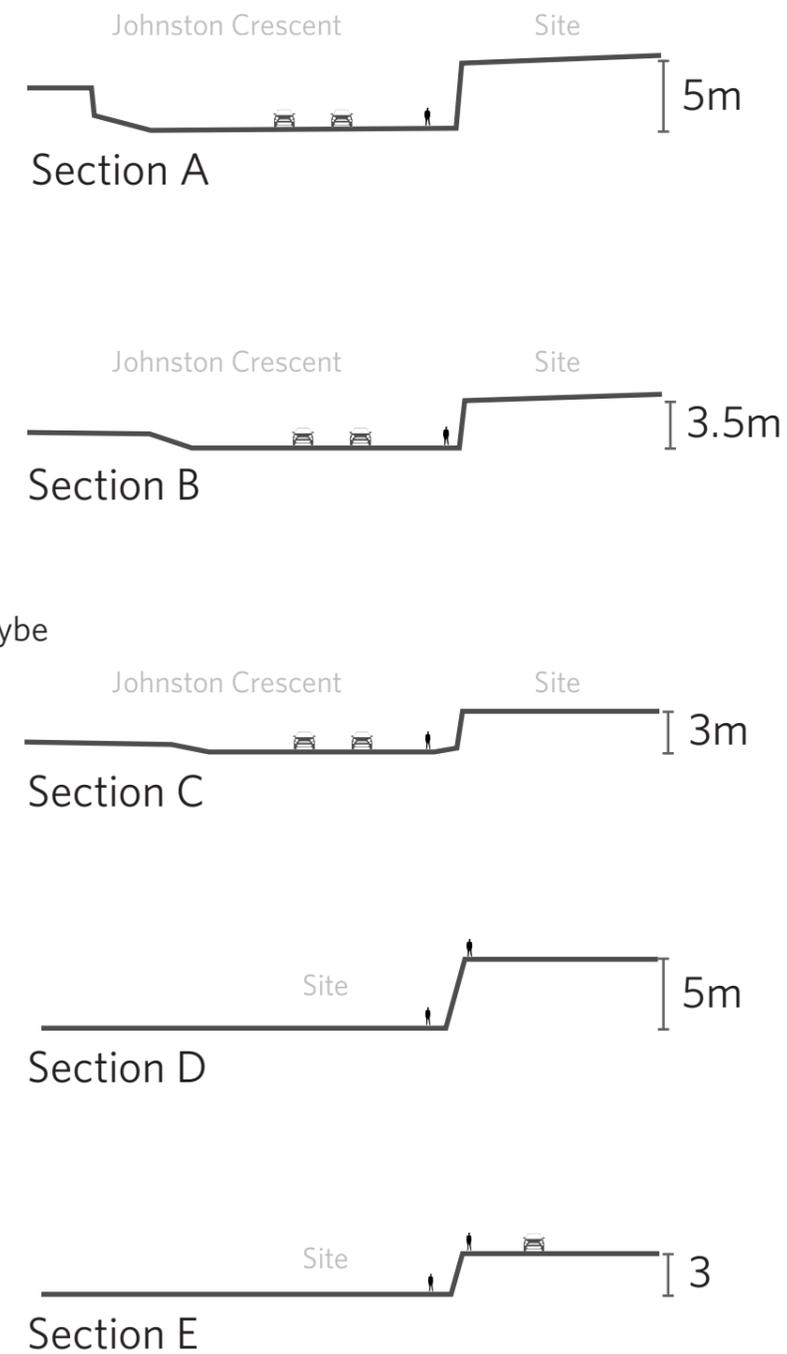
# 02\_ Site Context & Analysis

## 2.5. Site Topography and Site Constraints



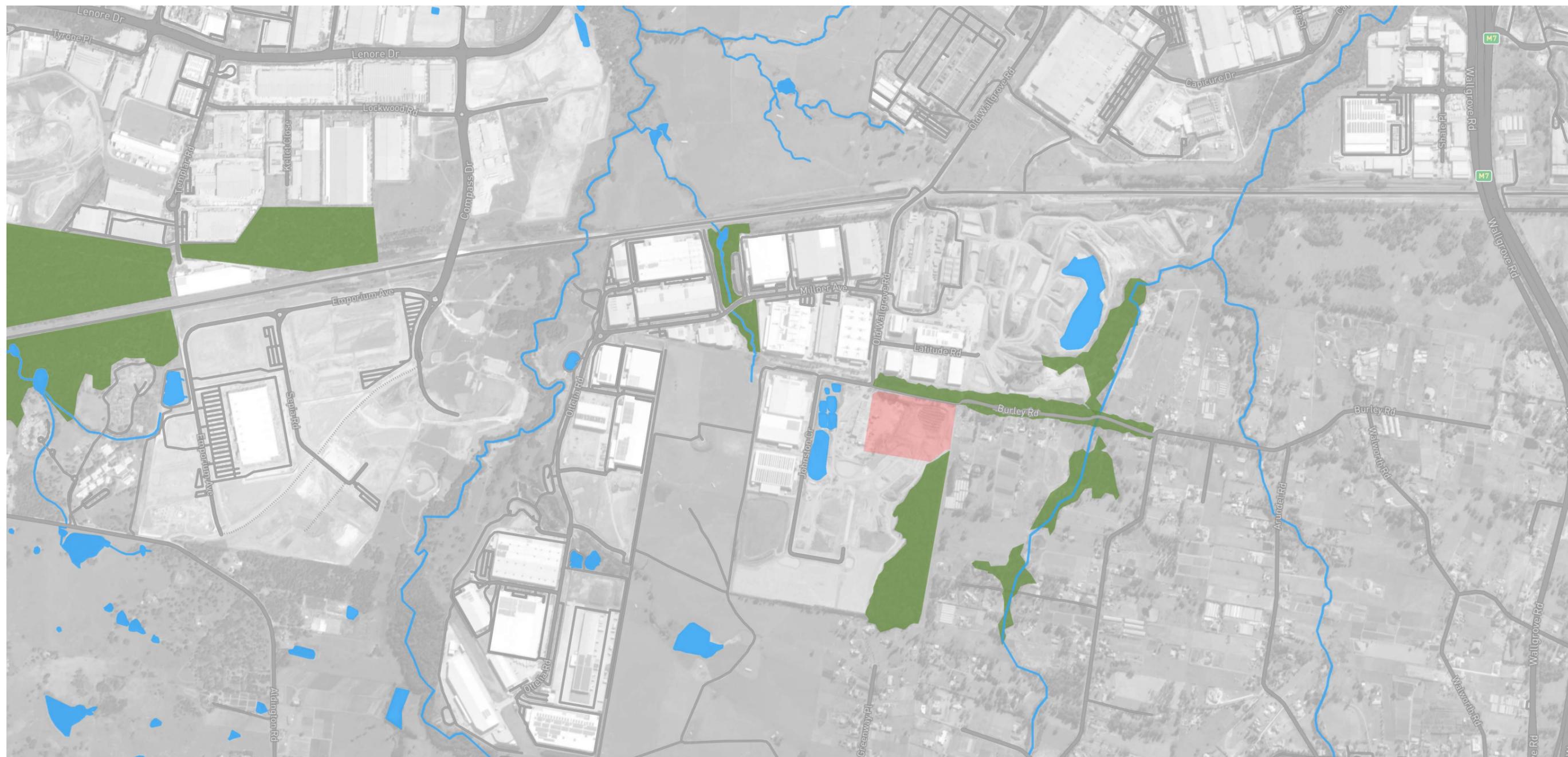
### Legend

- Site Boundary
- DCP Setback
- Landscape Setback



# 02\_ Site Context & Analysis

## 2.6. Site Character - Surrounding Natural Environment

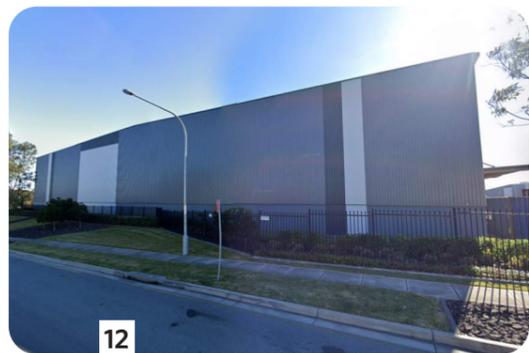
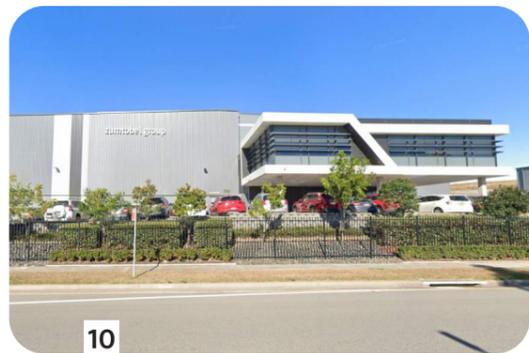
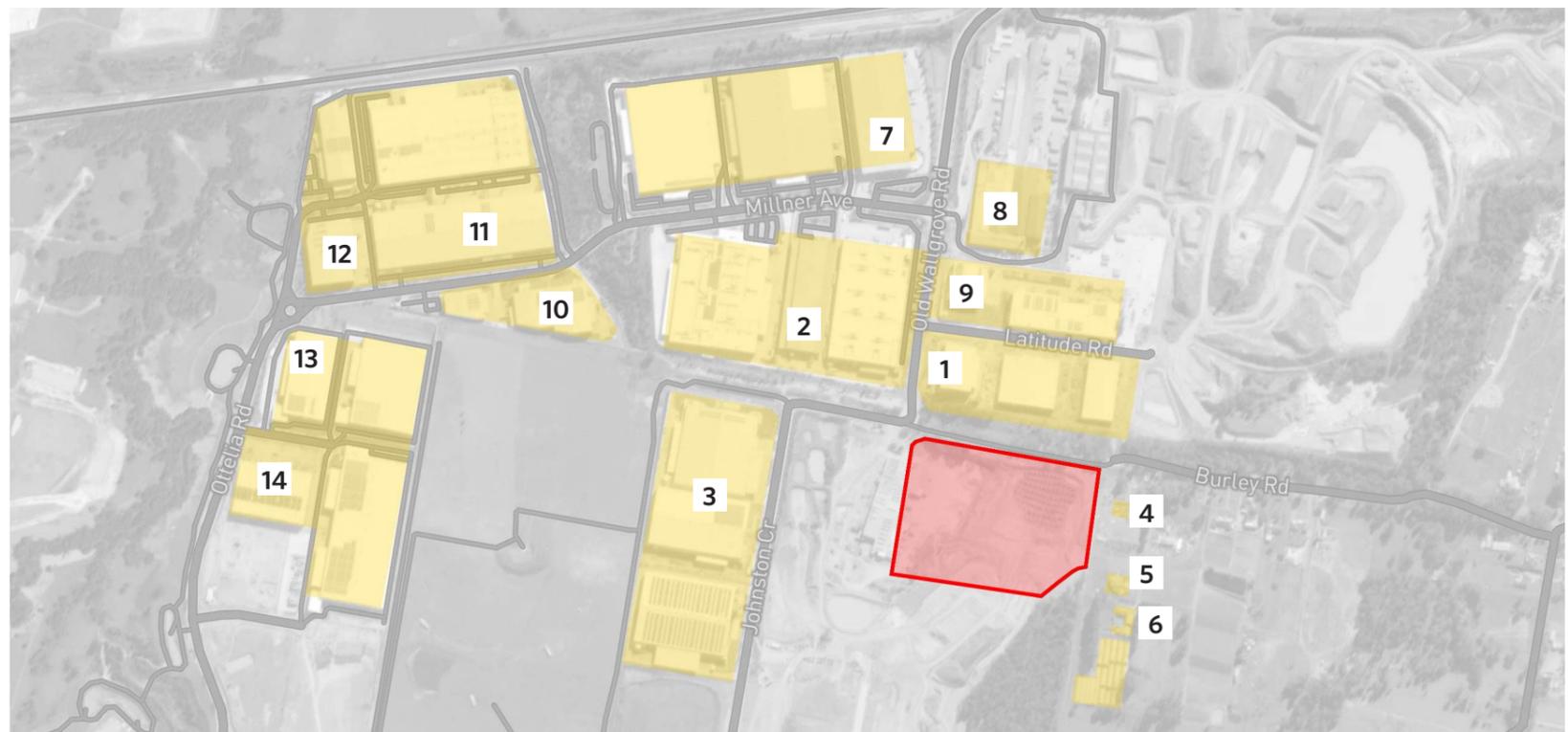


**Legend**

- S4 Site
- Landscape
- Lake and river

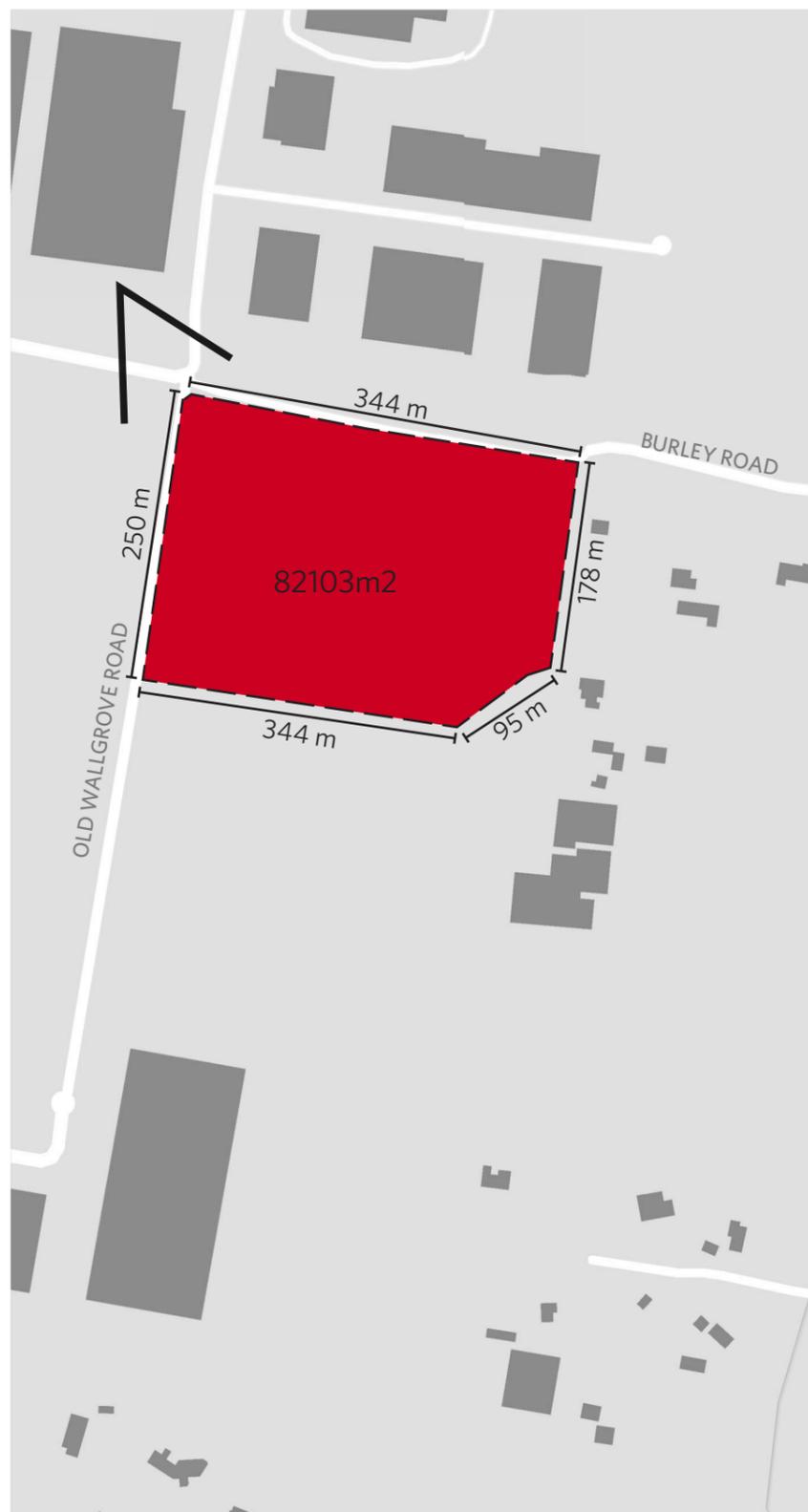
# 02\_ Site Context & Analysis

## 2.7. Site Character - Built Environment

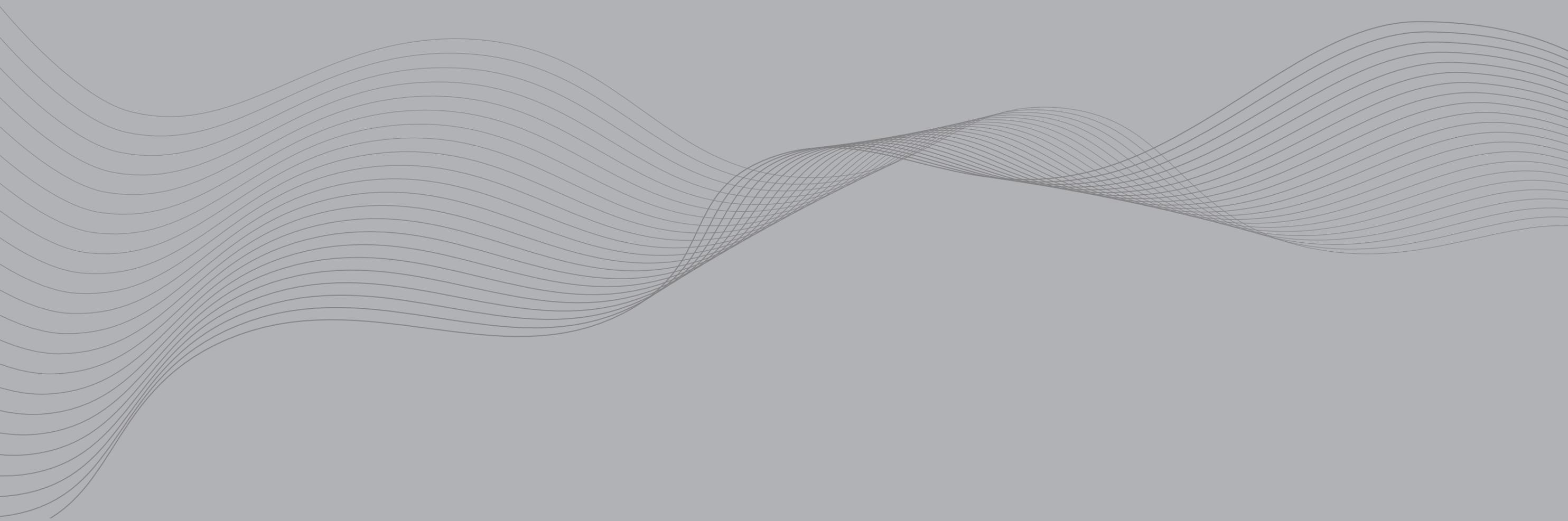


# 02\_ Site Context & Analysis

## 2.8. Site Character - Site Aerial View



# 03\_ Site Design Response



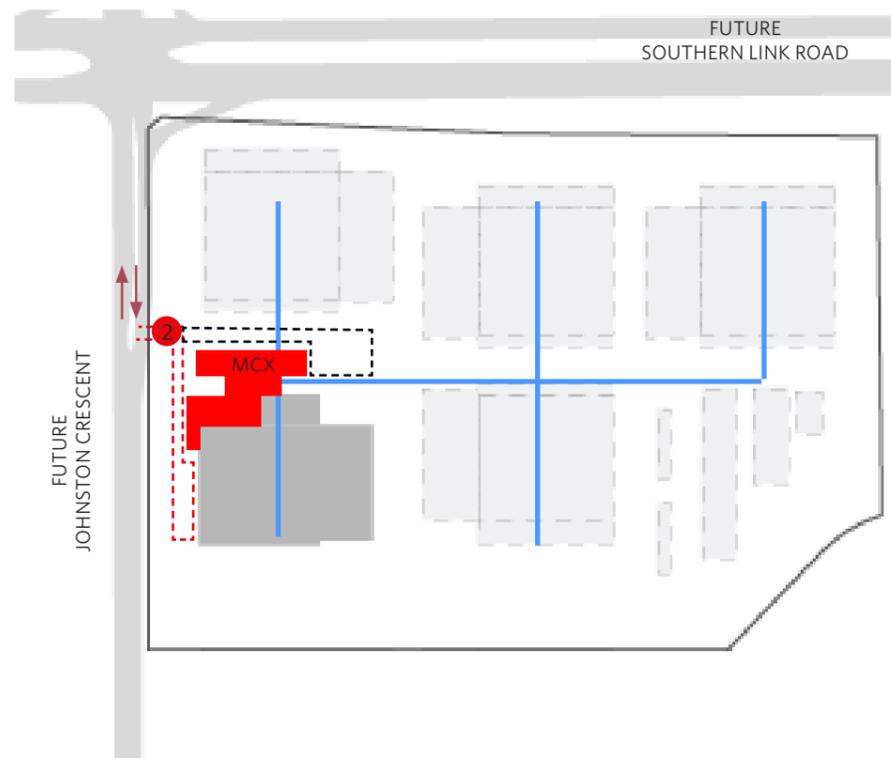
# 03\_ Site Design Response

## 3.1. Site Options

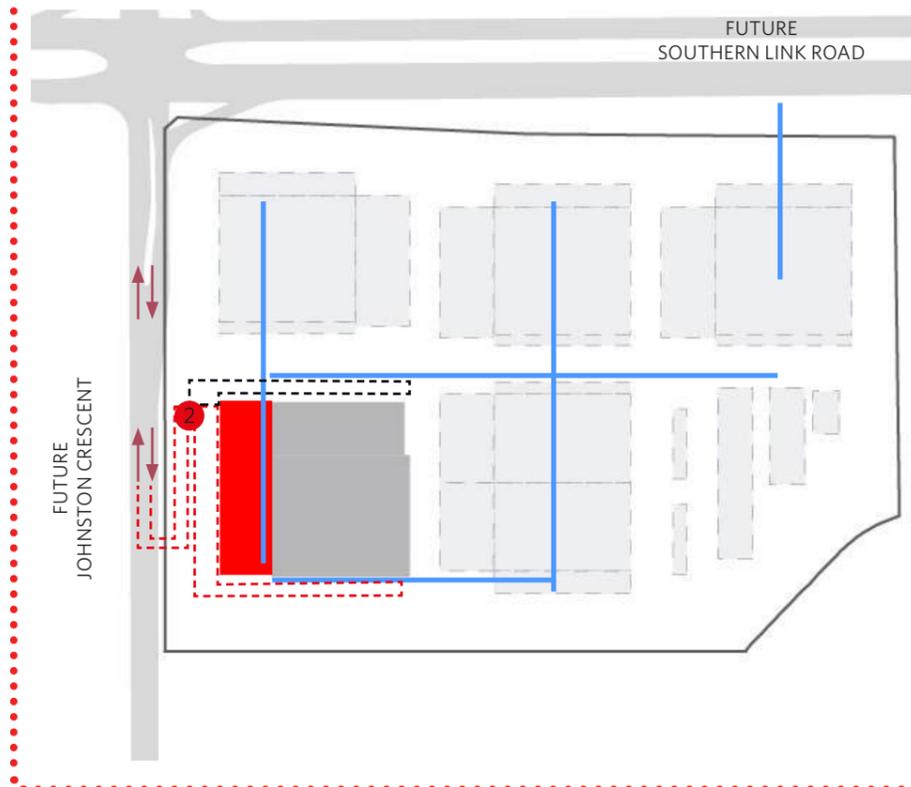
### OPTION 1



### OPTION 2.1



### PREFERRED OPTION



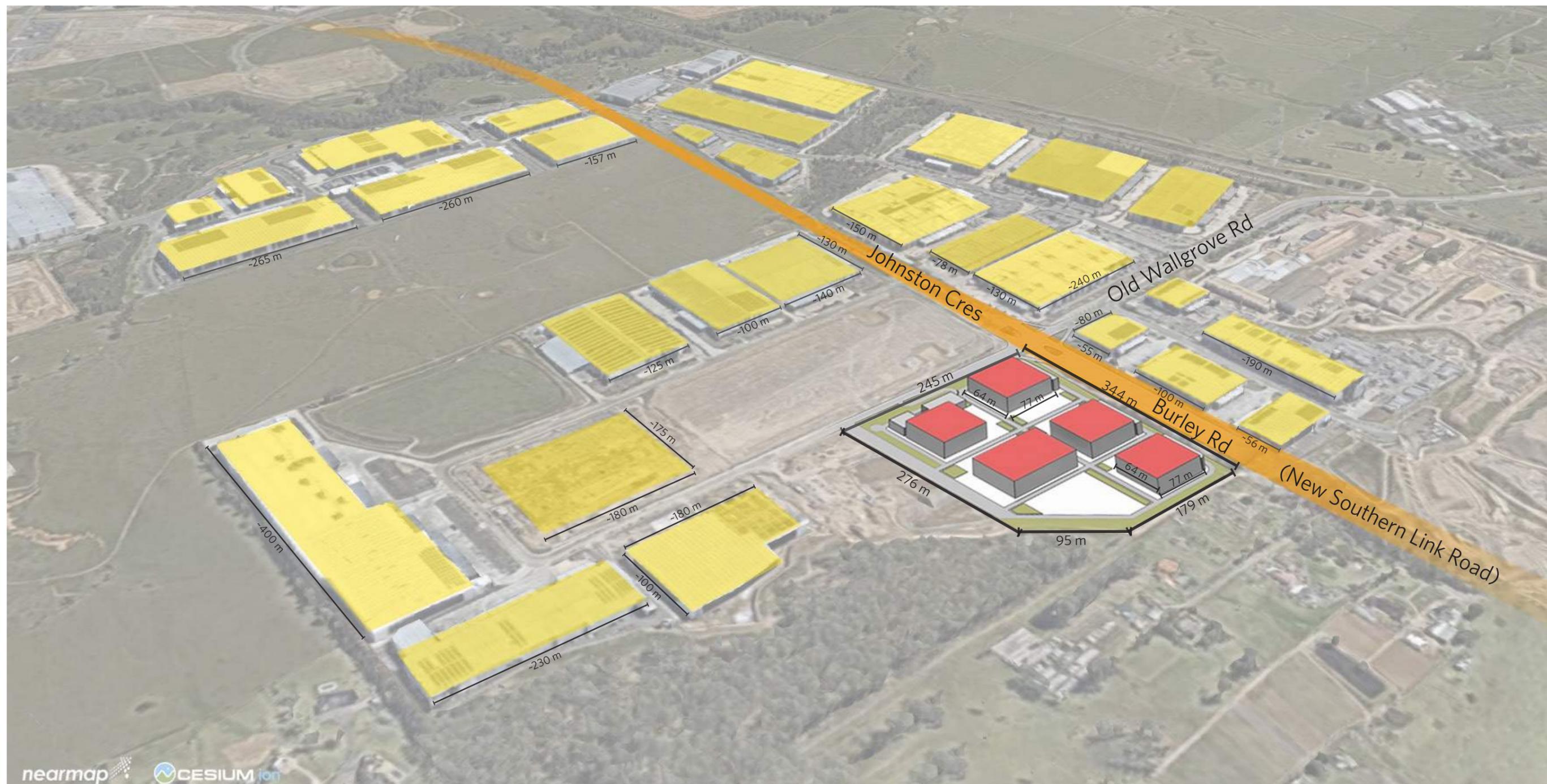
- + PRESENTATION TO SOUTHERN LINK ROAD - HEIGHT CONCERNS
- = BULK TO SOUTHERN LINK ROAD
- + ARRIVAL EXPERIENCE
- FOH LOCATION RELATIVE TO COMPLETE DEVELOPMENT
- = STAGE 1 REQUIRED WORKS

- = PRESENTATION TO SOUTHERN LINK ROAD - HEIGHT CONCERNS
- BULK TO SOUTHERN LINK ROAD
- = ARRIVAL EXPERIENCE
- = FOH LOCATION RELATIVE TO COMPLETE DEVELOPMENT
- + STAGE 1 REQUIRED WORKS

- = PRESENTATION TO SOUTHERN LINK ROAD - HEIGHT CONCERNS
- BULK TO SOUTHERN LINK ROAD
- + ARRIVAL EXPERIENCE
- + FOH LOCATION RELATIVE TO COMPLETE DEVELOPMENT
- + STAGE 1 REQUIRED WORKS

# 03\_ Site Design Response

## 3.2. Urban grain scale consideration



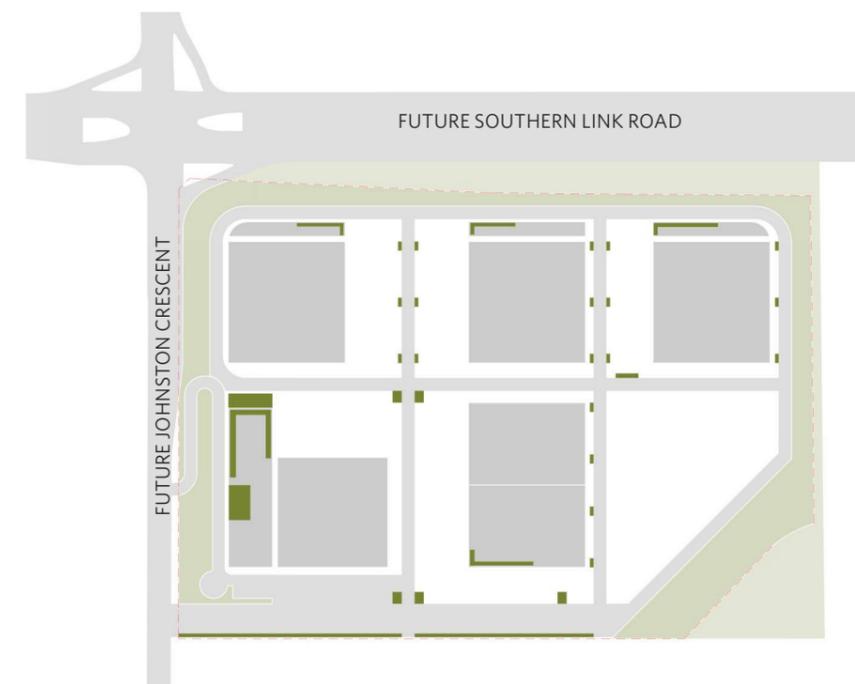
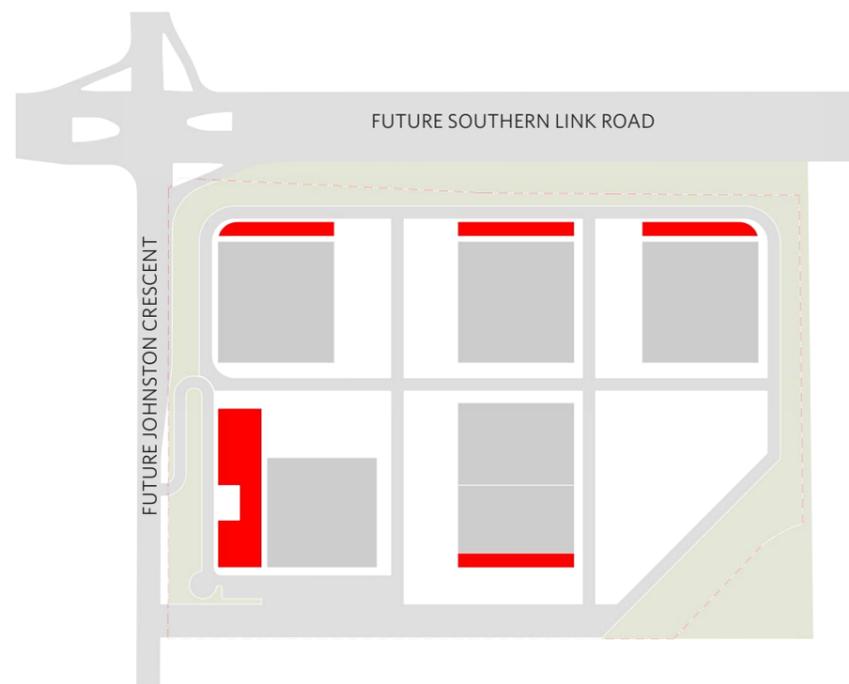
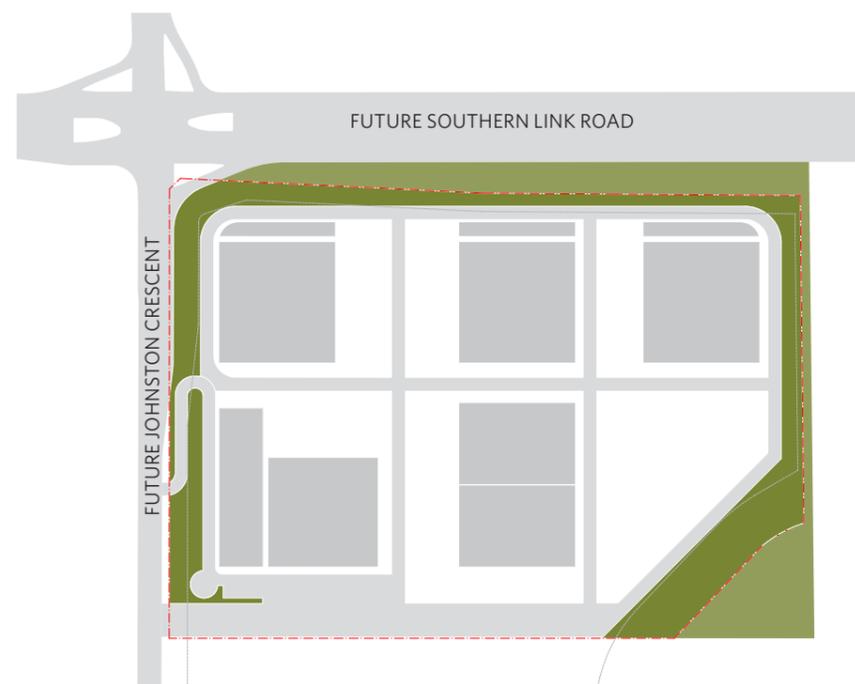
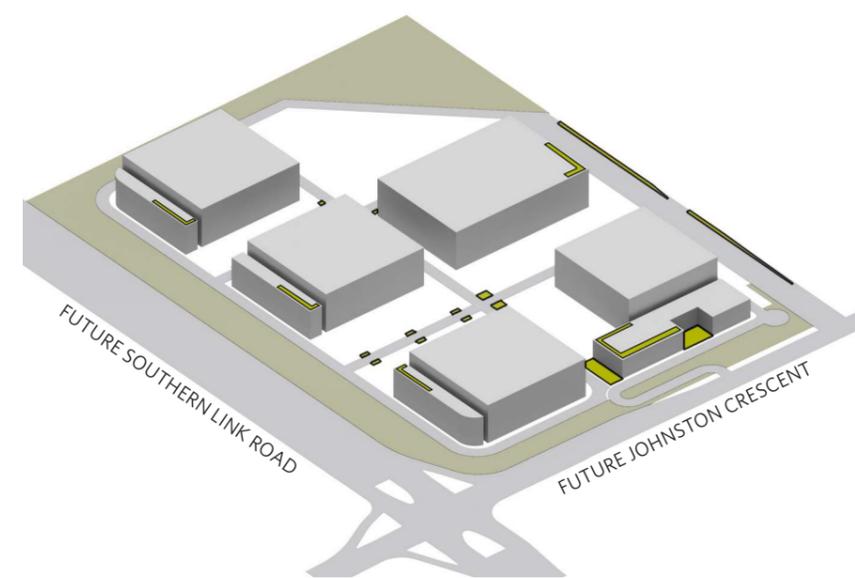
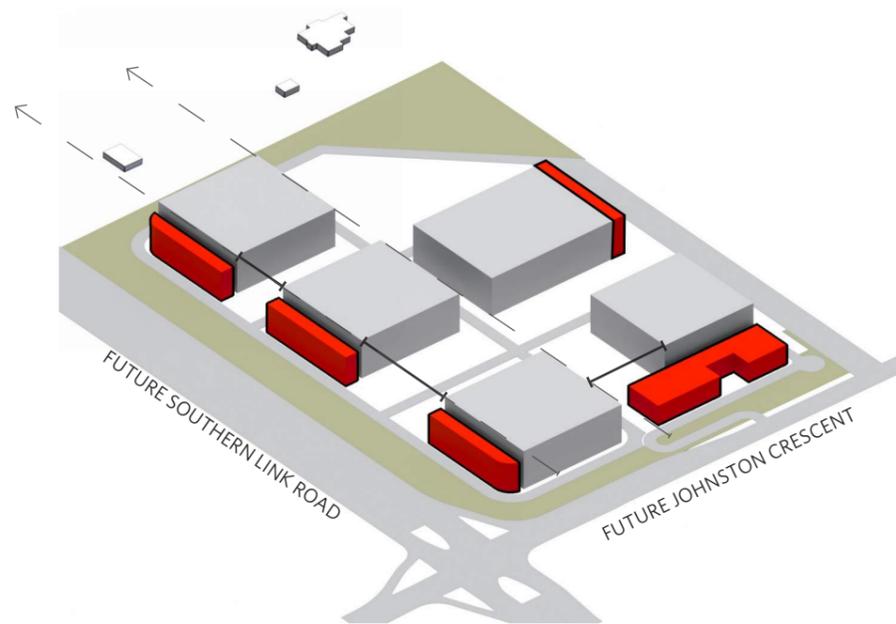
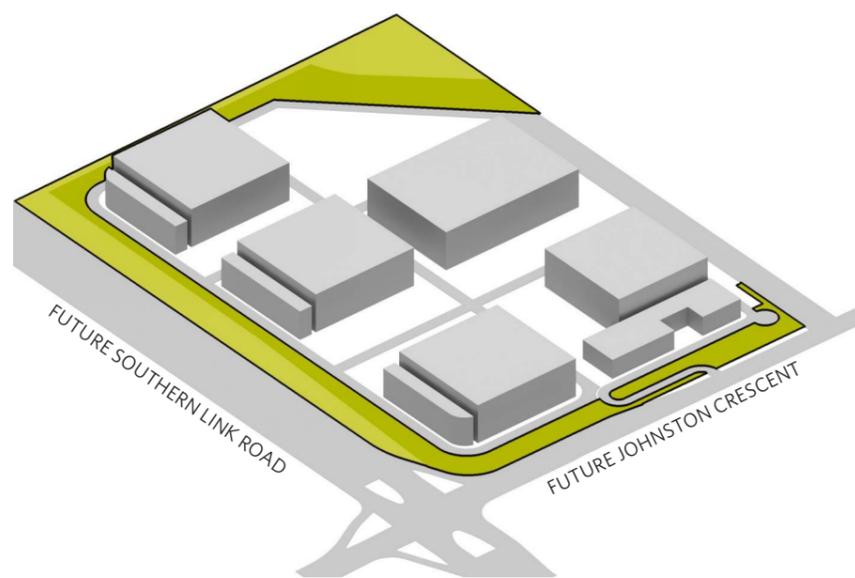
# 03\_ Site Design Response

## 3.3. Key Design Principles

- Generous green curtilage

- Activating adjoining street scape
  - Articulated buildings
- Campus street grid reflective of neighbouring rural residential grid

- Green amenities pockets at ground level and roof level

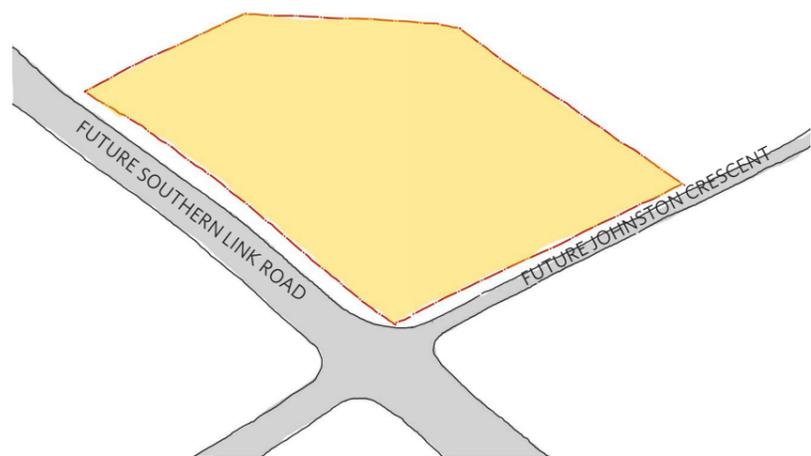


# 03\_ Site Design Response

## 3.4. Evolution of Massing

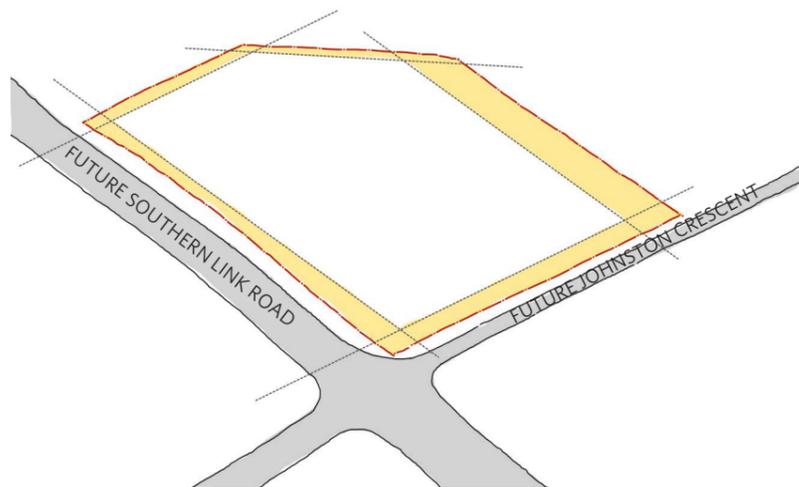
### 1. Site Boundaries

The site boundaries serve as critical anchors in shaping architectural massing, influencing initial form and integrating with external site context.



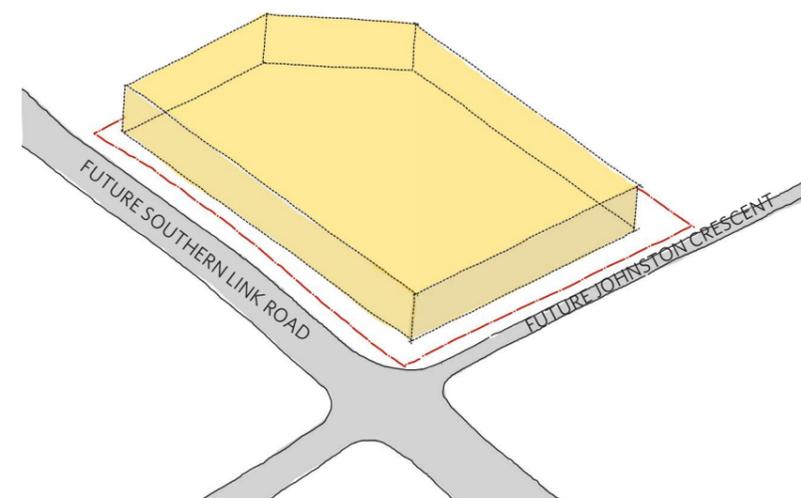
### 2. Setbacks and Internal perimeter roads

Various setbacks of 10m (building), 5m (landscape) and 25m (APZ) around the boundary determine the overall footprint for building placement. Internal perimeter roads guide circulation within the site, also influencing building adjacencies, orientation, and visual hierarchy.



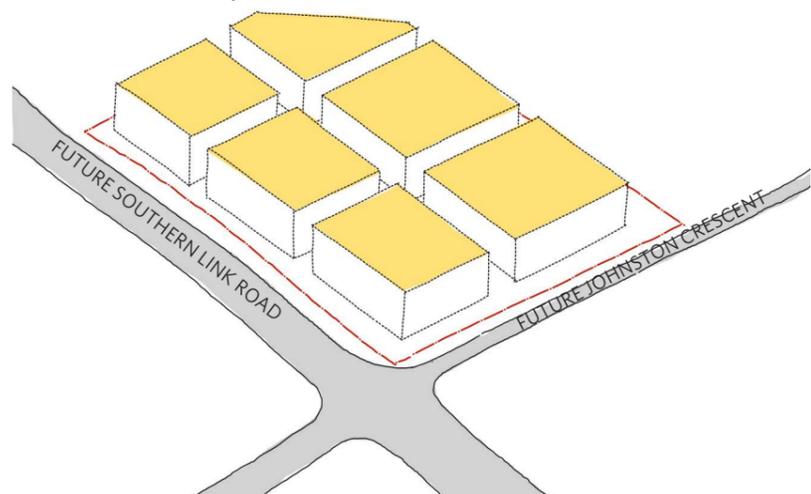
### 3. Remaining Massing Envelope

By considering setbacks, height restrictions, and spatial relationships, the massing envelope allows for flexibility, accommodating building adjustments and guiding the placement and scale of buildings.



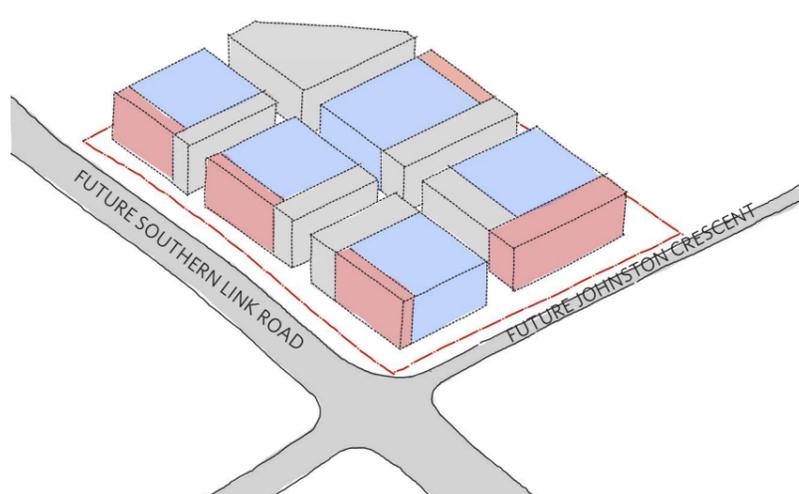
### 4. Building Blocks and Internal roads

Buildings and internal roads define the overall massing. Strategically dividing the site into smaller portions create distinct zones for different functions contributing to a functional campus.



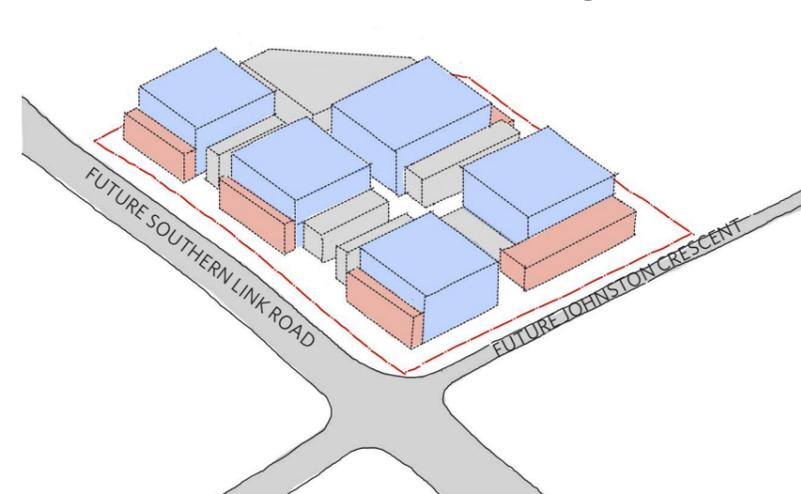
### 5. Office, Data Hall and Plant area allocation

The allocation of the functional areas optimizes functionality and also reduces the perceived bulk and scale.



### 6. Building Mass Height and Footprint adjustment

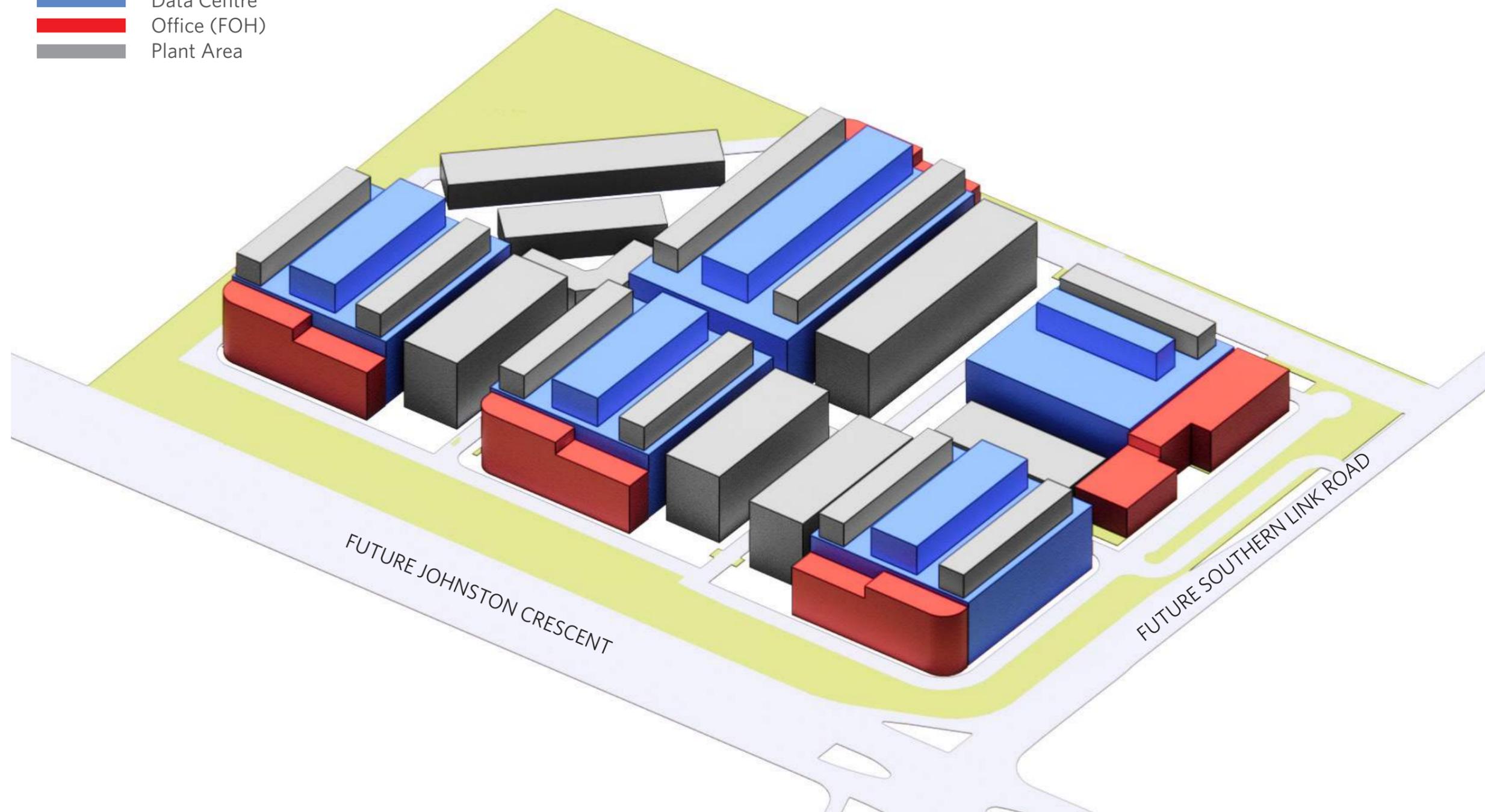
Reducing the heights of the Office blocks with more distinctive facade treatment further reduce the perceived bulk and scale, softening the visual impact and ensuring a harmonious blend with the surroundings.



# 03\_ Site Development

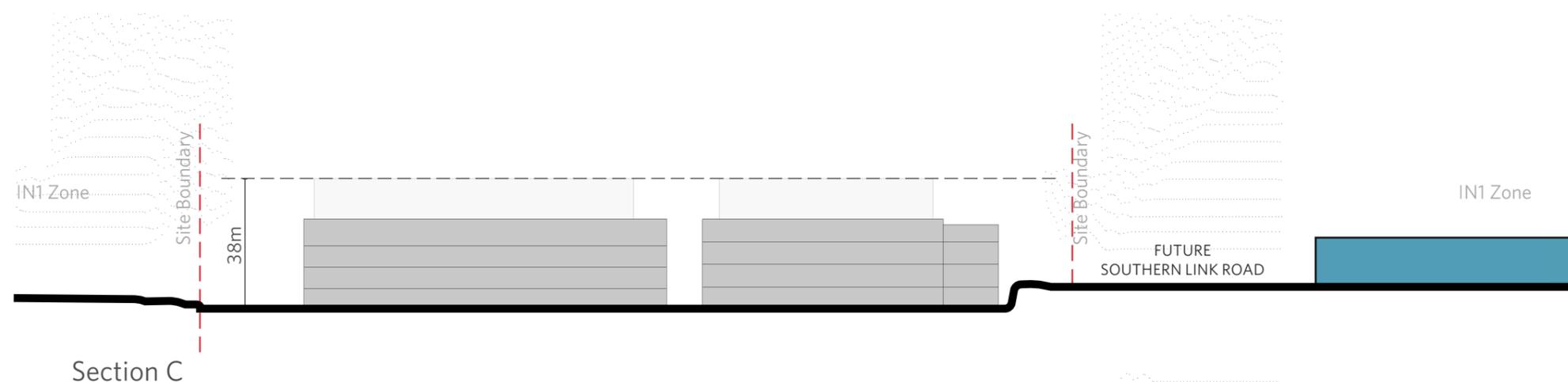
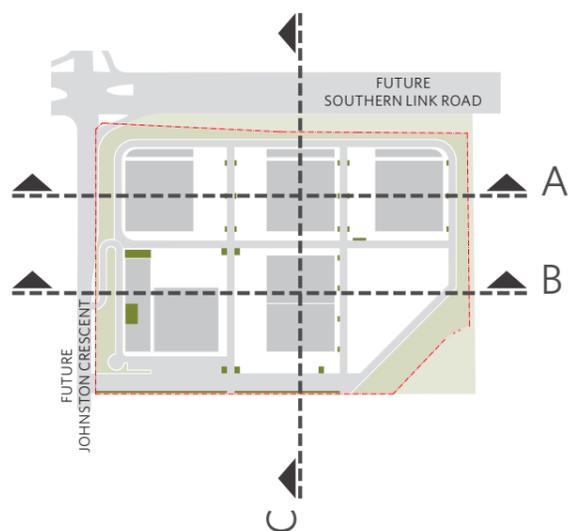
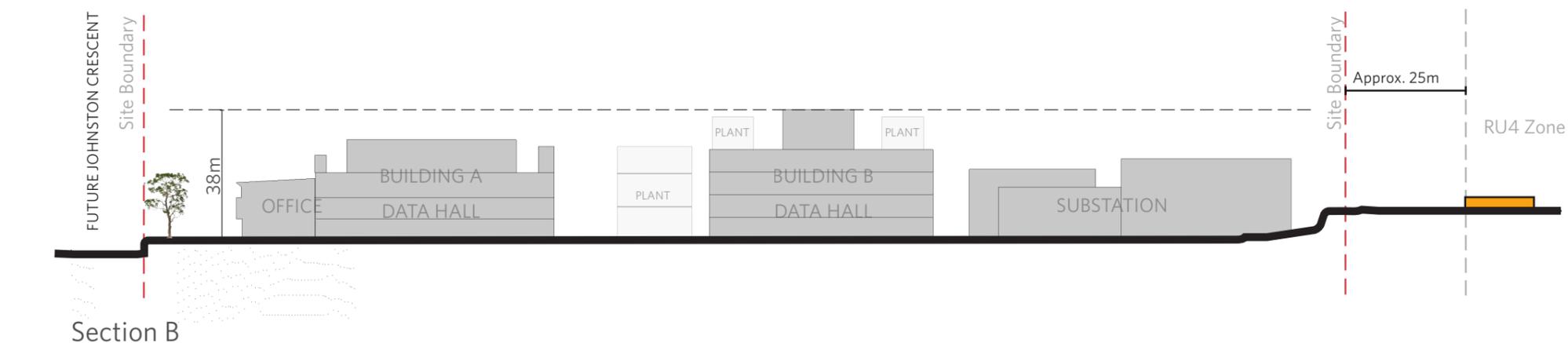
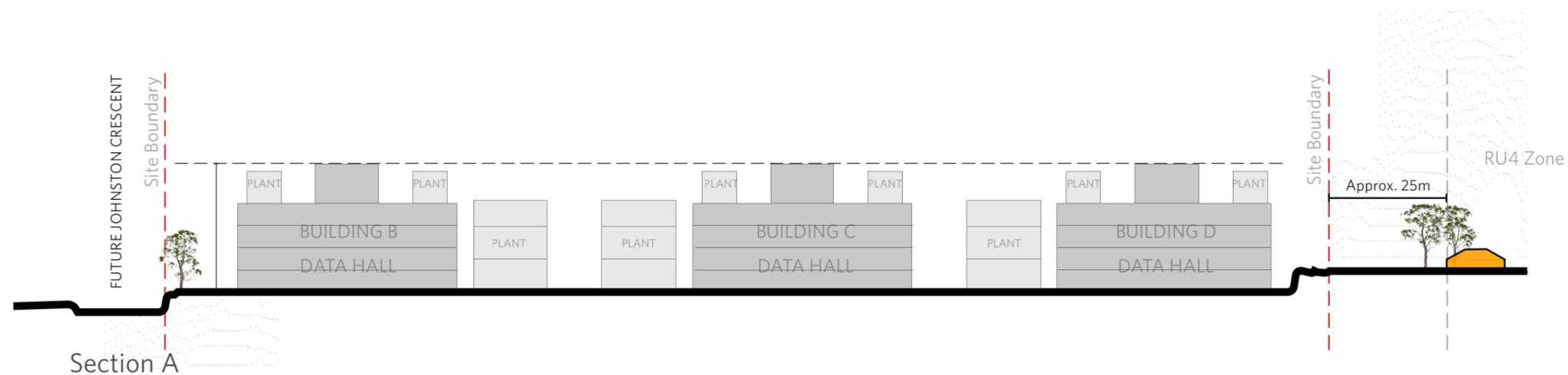
## 3.5. Functional Mass Diagram

- Data Centre
- Office (FOH)
- Plant Area



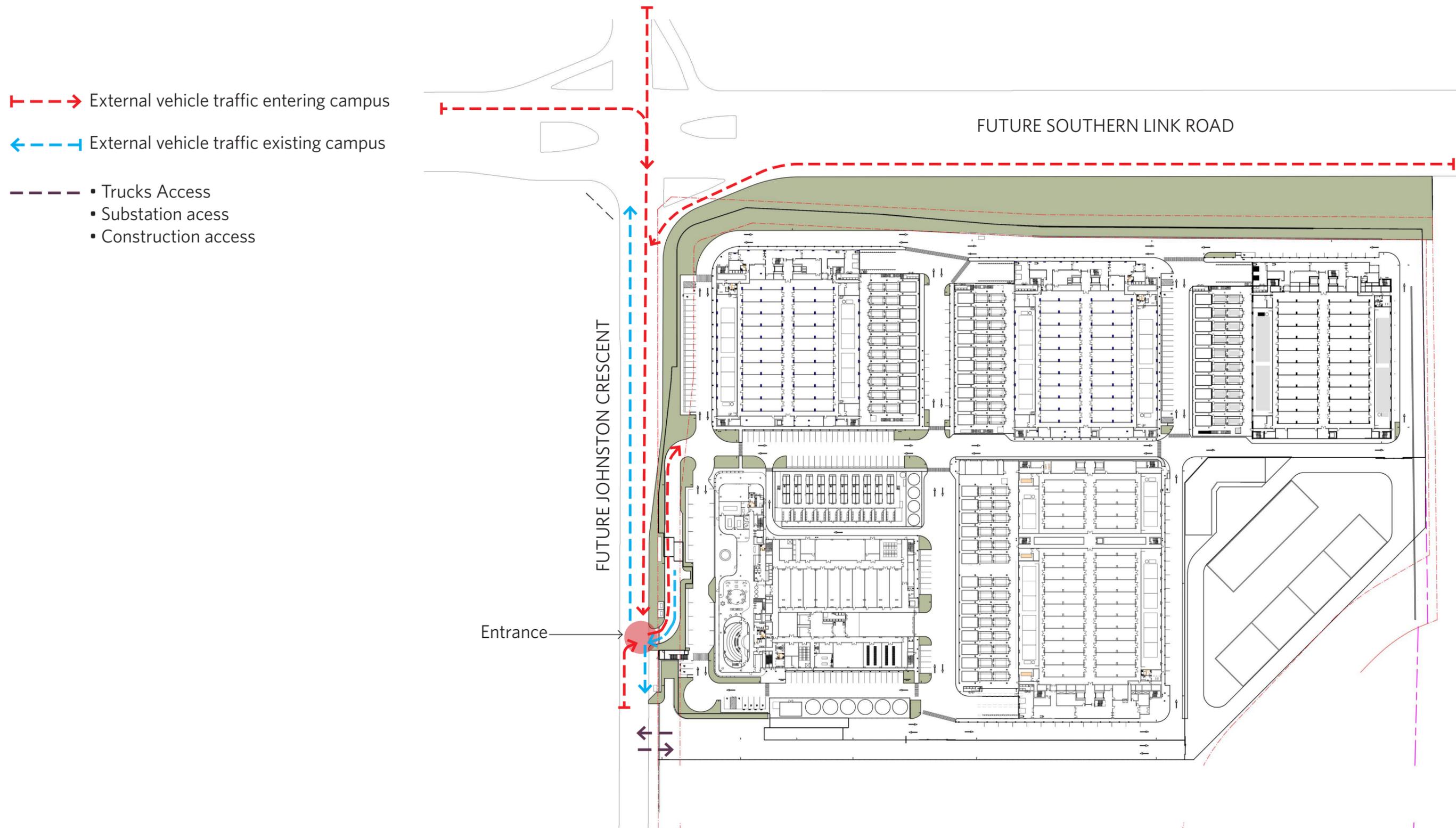
# 03\_ Site Development

## 3.6. Sitting within site - Height relationship diagrams



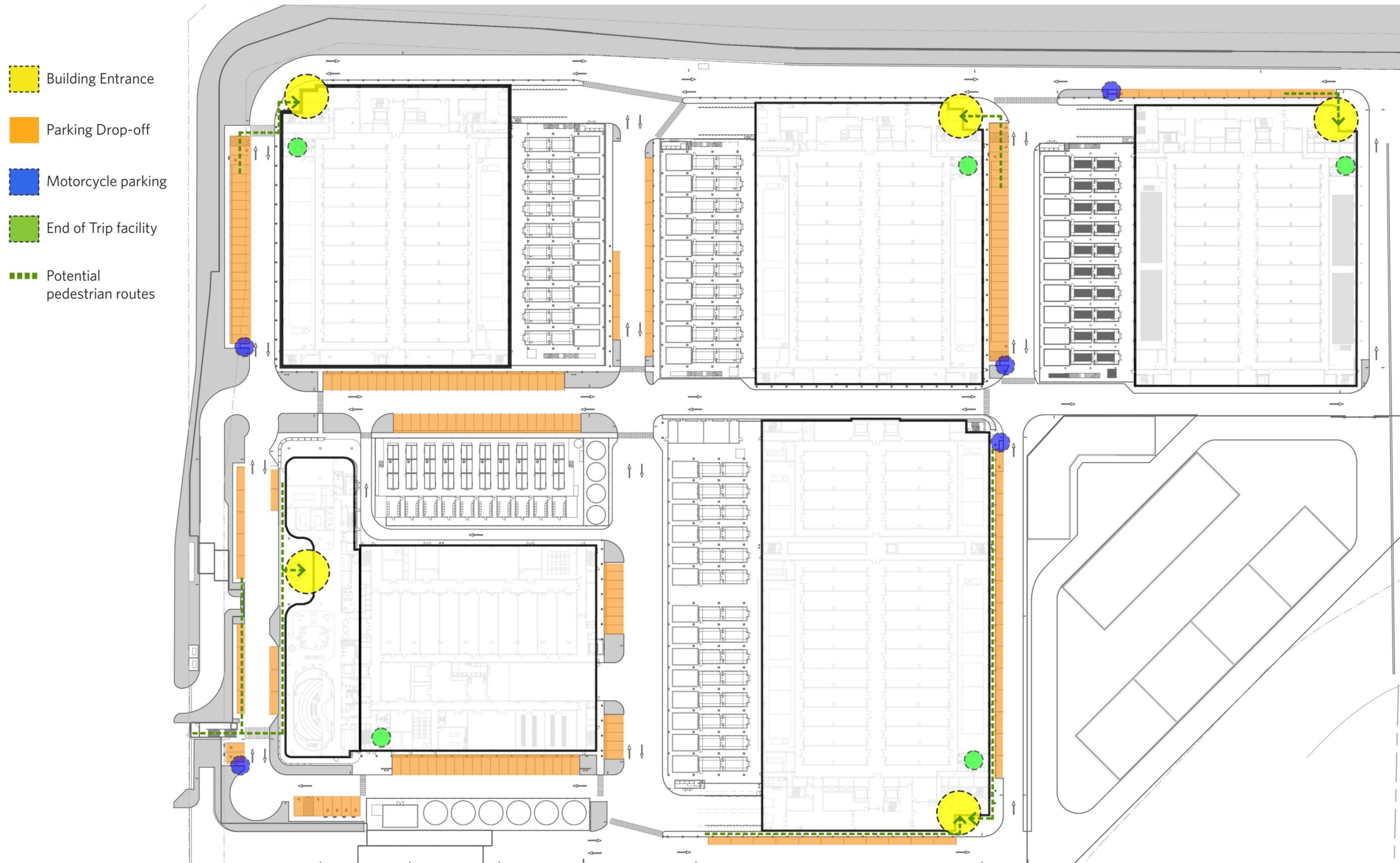
# 03\_ Site Development

## 3.7. External Traffic Flow



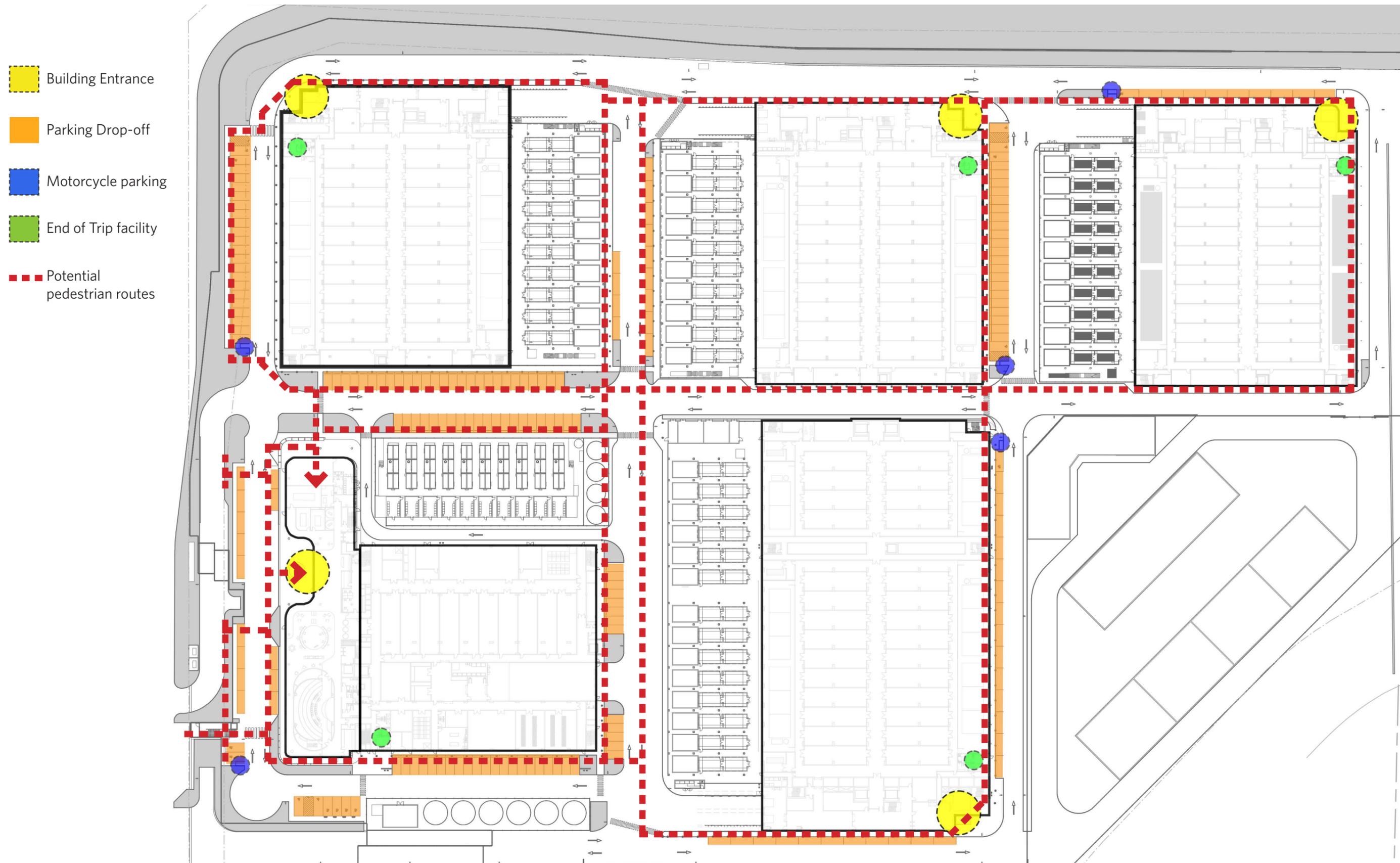
# 03\_ Site Development

## 3.8. Internal Pedestrian Flow - Visitors



# 03\_ Site Development

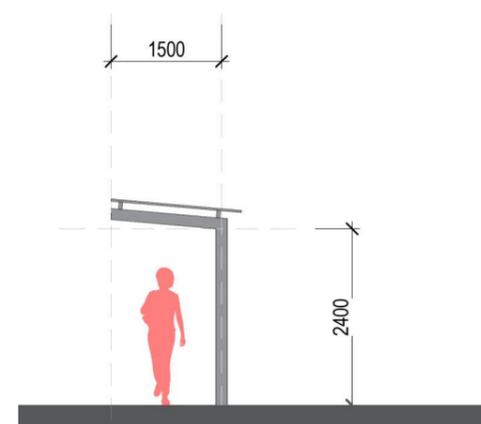
## 3.9. Internal Pedestrian Flow - Staff



# 03\_ Site Development

## 3.10. Covered Walkways Allocation

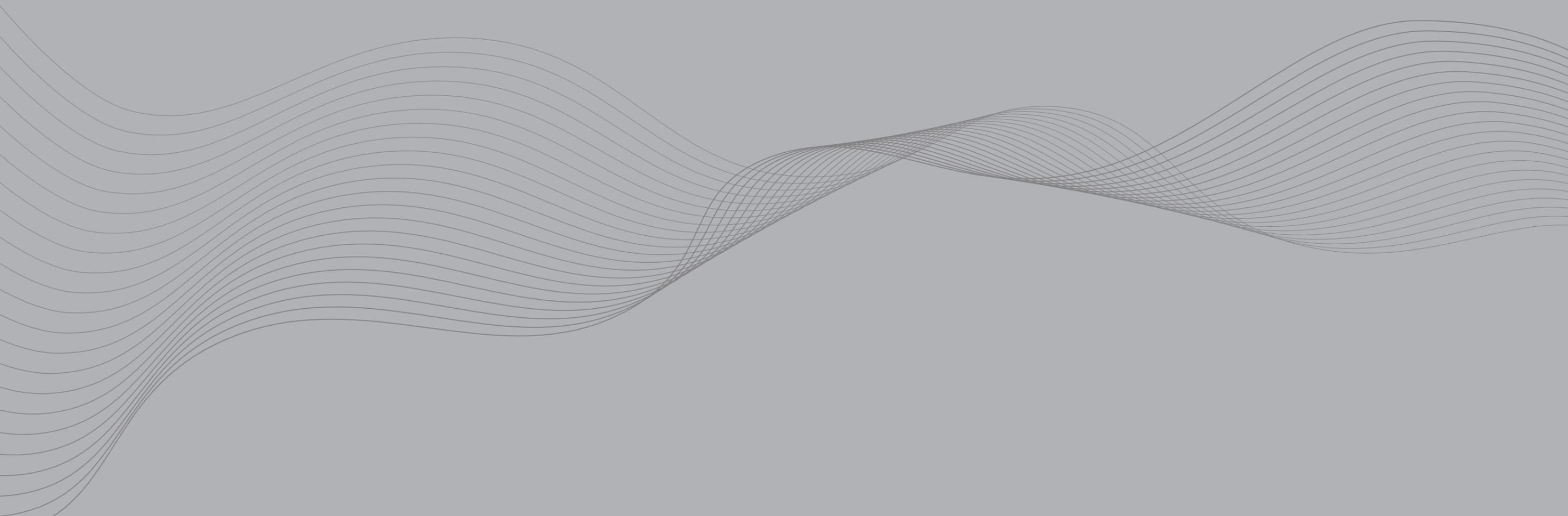
- Covered walkway
- Building undercroft walkway
- Covered drop-off
- Pedestrian crossing



Typical section - Covered walkway



## 04\_ Built Form and Design Strategies



# 04\_ Built Form and Design Strategies

## 4.1. Site History and Transformation

A history of transformation - Woodland to pastoral land, manual labour to old industry to new technology and regeneration



Cumberland Woodland - A history of Country

*Cumberland Plain Woodland is widespread in Fairfield. Larger areas can be found in the Western Sydney Parklands, with small patches in Bossley Bush Reserve, Lalich Reserve, Cobham Road Reserve, Sartor Crescent Reserve, Wetherill Park Reserve and Powers Road Reserve.*



Convict Bricks - Local History

*The convict bricks have interpretive significance as evidence of building skills and economic growth that occurred on the outskirts of Sydney through the homestead estates, and no doubt enhanced by the use of free convict labour.*

*The convict gang used in 1831 at Horsley Park, were one of the last consigned to private developers prior to the cessation of convict servitude and the hand moulding of bricks was replaced with brick making machines.*



PGH / CSR - Australian Industrial History

*PGH Bricks first came into existence in 1958 when the building companies established by Maxwell Porter and David Galbraith (incorporated in 1899 and 1949 respectively) merged with Hanson Consolidated industries.*

*PGH Bricks & Pavers was then acquired by CSR in 1989, marking CSR's first foray into the brick industry. In May 2015, CSR and Boral formed a joint venture, Boral CSR Bricks Pty Ltd, which combined their brick operations along the east coast of Australia*



NEXTDC - A high tech Australian Story

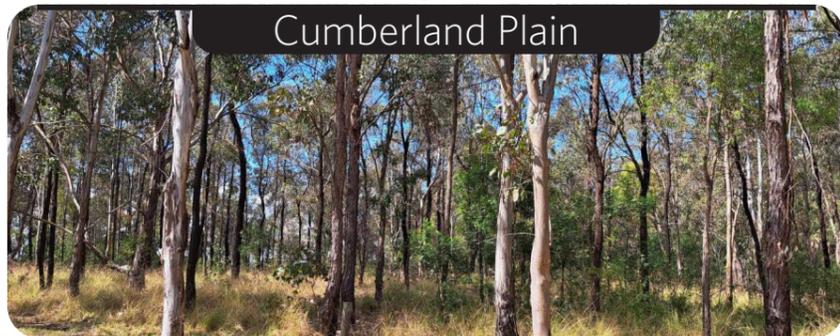
*Data Centres are critical digital infrastructure which support not only the factories of the future but multitude aspects of industry, commerce, government, defence, education and research, community and culture.*

*NEXTDC and Shiraz 4 are at the forefront of Australia's future.*

# 04\_ Built Form and Design Strategies

## 4.1. Site History and Transformation

Far History



Cumberland Plain

Recent History



Australian Brick Factory

Present and Future



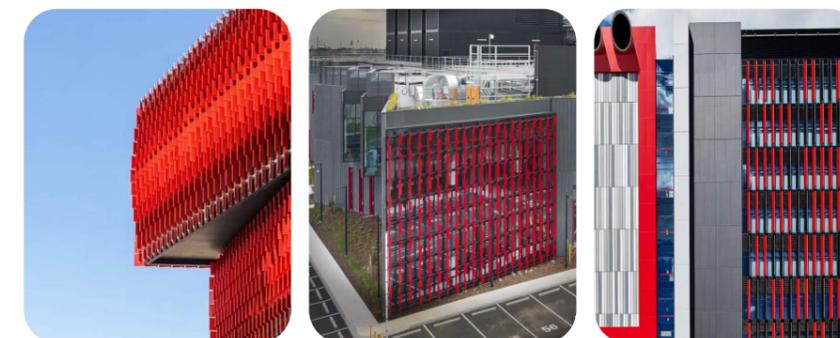
NEXTDC



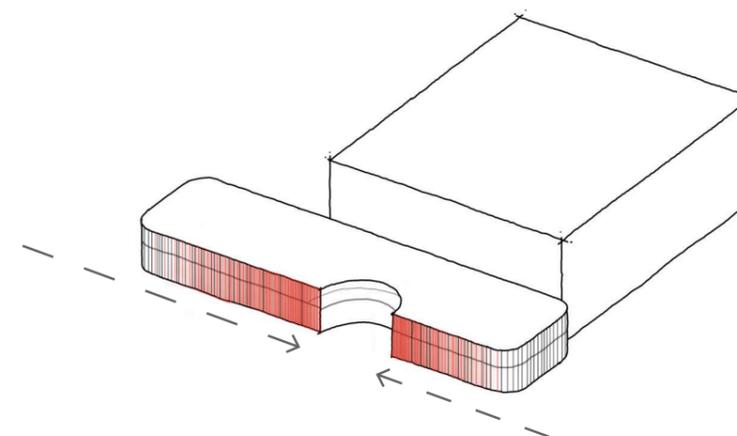
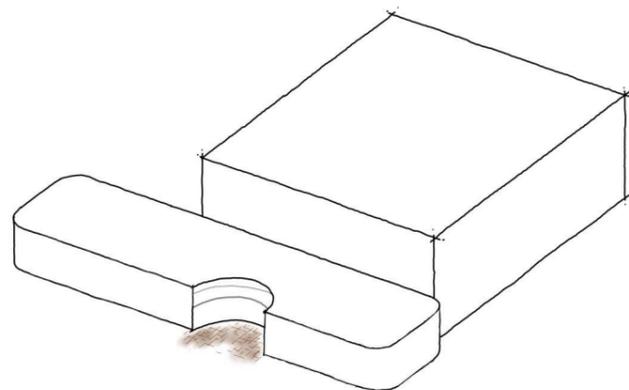
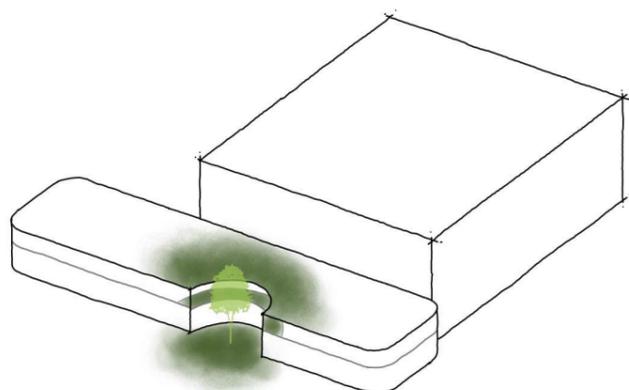
The design proposes a generous green curtilage, pockets of planting and green roof terraces to restore flora and biodiversity to the currently bare site



Memory of place is imbedded into the proposed facade and ground plane through the use of reds and ochers



The proposal pushes beyond being simply a 'data centre'. It is a people centric technology campus featuring high quality spaces for work, learning, amenity and respite



## 04\_ Built Form and Design Strategies

### 4.2. Design Statement

The proposed design for the Shiraz 4 data centre takes the denuded terrain of a brick makers quarry and restores it to new life with a lush contemporary technology campus.

The facility integrates diverse elements not often seen together within a data centre. These include a cafe, concierge, auditorium, kitchens, leisure and respite spaces, meeting and training rooms, high quality mission critical office spaces, roof terraces and end of trip in addition to the data halls and infrastructure.

It is this people centric environment which is pushing the paradigm of what a data centre is, re positioning it as a mixed use technology facility, the design endeavors to transcend conventional notions, embracing innovation, adaptability and identity.

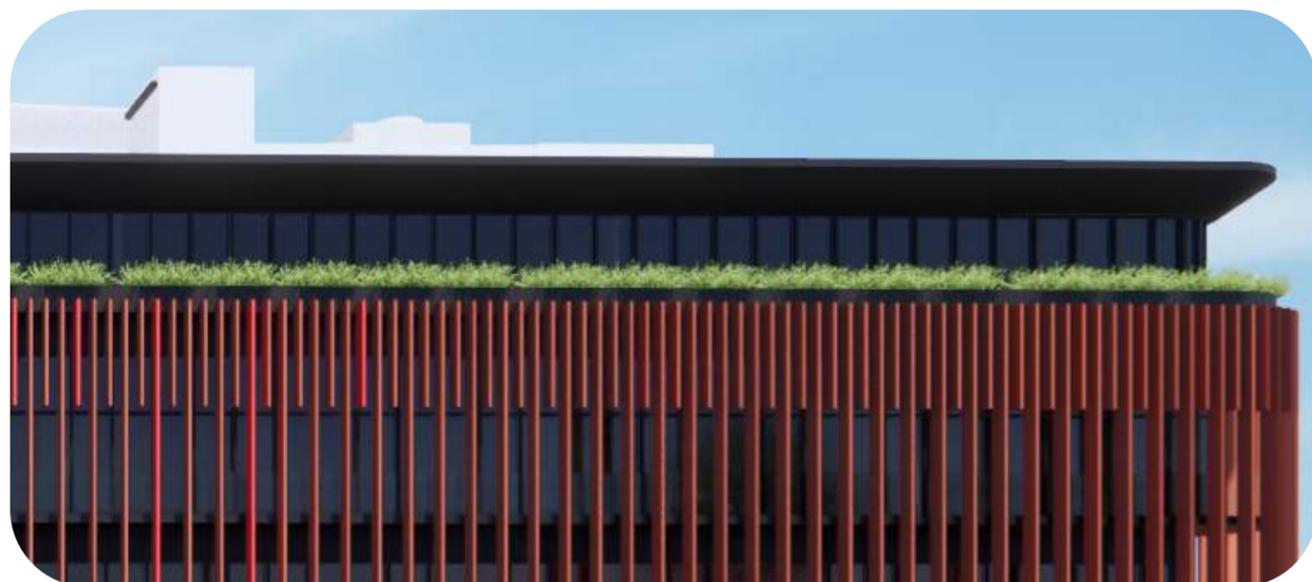
Central to the proposed development is a modular and sustainable synthesis of architecture and engineering, which permeates every facet of the project from conception to operation and throughout the entire life cycle. This approach underscores a conscientious effort to drive down consumption and maximize efficiency.

In summary, the Shiraz 4 centre project embodies a holistic synthesis of people centric, sustainable and restorative design, functionality, efficiency and adaptability to provide critical digital infrastructure necessary for the growth and security of Australian industry, business, government, education and community technology use. All of this wrapped in a rich architectural fabric which speaks to the clay of the old quarry on which it sits.



# 04\_ Built Form and Design Strategies

## 4.2. Design Statement



### Facade Design

The facade design strategy integrates red and black hues with pockets of greenery for the admin office blocks, contrasting against a precast concrete facade for the data hall blocks. This juxtaposition enhances visual interest while promoting biodiversity

Light-colored elements at the roof alleviate the building’s bulk and reduce heat load, contributing to a visually balanced and harmonious composition that aligns with the project’s overarching principles of sustainability.

### Admin Offices

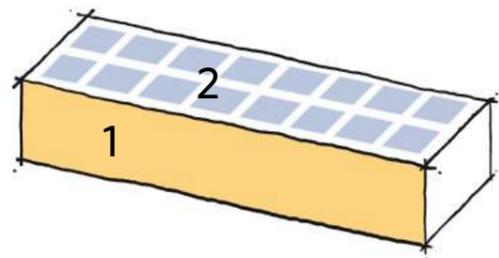
The admin office blocks feature a distinct patterning treatment and color tone selection, creating a welcoming atmosphere for visitors. The facade’s design emphasizes separation from the main data centre, ensuring a dedicated and inviting front-of-house experience.

This approach fosters a sense of arrival and hospitality, reflecting a commitment to providing exceptional service and accessibility.

# 04\_ Built Form and Design Strategies

## 4.3. Design Principles - Office Building

### Energy Efficiency



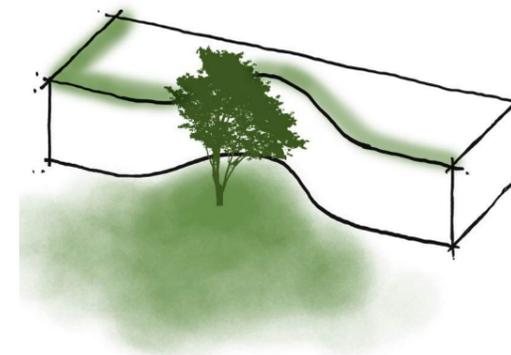
The office building employs strategic design to enhance energy efficiency and sustainability. Its facade is engineered to shield the interior from the western sun, reducing the need for cooling and minimizing energy consumption. Additionally, solar panels adorn the roof, harnessing renewable energy to offset its power needs, embodying a commitment to environmental responsibility while ensuring a comfortable and eco-friendly workspace.

### Brand



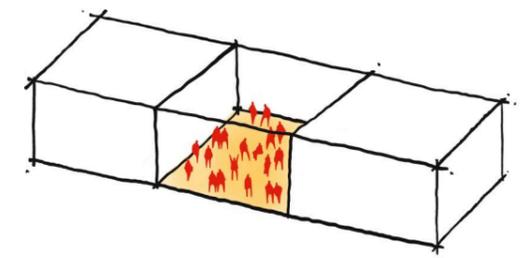
The office building embodies NEXTDC's branding ethos through its built form and design strategies. Clean lines and a rich yet controlled approach to the facade and interior reflect the company's commitment to pairing the rigour and efficiency of the data halls with quality of staff and customer experience. Bold accents of the brand's signature colors infuse energy into the facade, while strategic placement of logos and signage reinforces the company's identity. The result is a seamlessly integrated space that merges form with function.

### Connection With Landscape



The office building's design harmoniously integrates green spaces within and around its structure, fostering a seamless connection to the surrounding landscape. Strategically positioned gardens and green buffers not only enhance the human experience but also promote bio diversity. This deliberate incorporation of nature blurs the lines between indoor and outdoor spaces, creating a refreshing environment that inspires productivity and well-being.

### Respite & Oasis

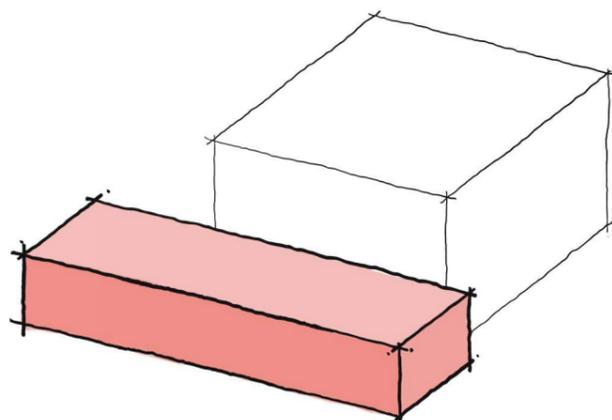


The office building is a testament to human-centric design, offering inviting front-of-house spaces where people can socialize and connect. Its layout prioritizes user experience, fostering a sense of community and collaboration. With amenities carefully integrated throughout, it becomes a hub where work seamlessly blends with social interaction, creating a vibrant and engaging environment for all users.

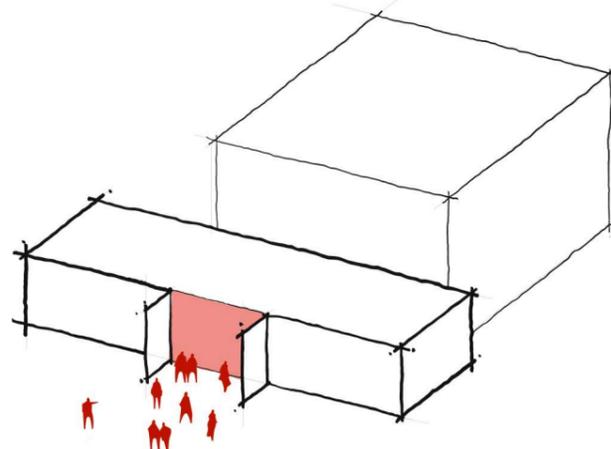
## 04\_ Built Form and Design Strategies

### 4.3. Design Principles - Office Building

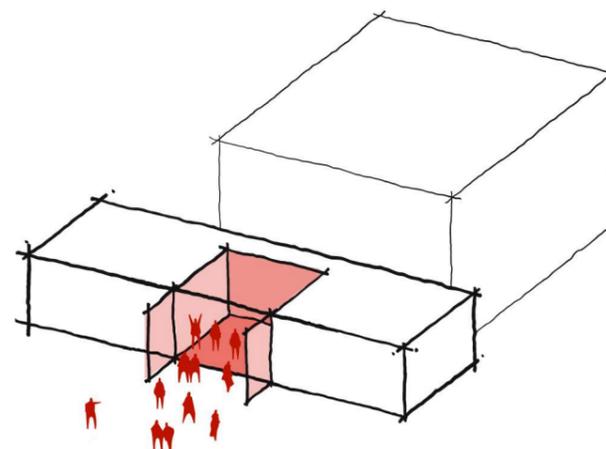
Building Mass



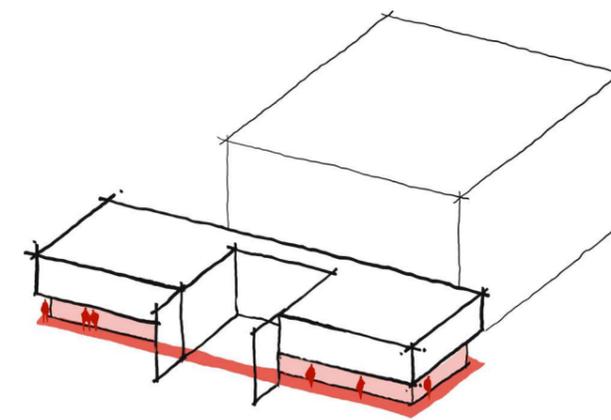
Way-finding



Central Heart



External Circulation



The office building's design effectively separates the front-of-house from the data hall building. With distinct forms, each section serves its purpose efficiently. The front-of-house boasts inviting, sleek architecture, fostering a welcoming atmosphere for clients and employees. Meanwhile, the data hall, detached yet connected, prioritizes security and technical requirements, ensuring seamless operations without compromising the building's overall design integrity.

The office buildings well-defined entrance, enhanced by thoughtful wayfinding elements ensure seamless navigation. The building sets the stage for productive interactions and fosters a sense of belonging from the moment one steps inside.

The office building's design revolves around a central heart, seamlessly integrated with the main entry. This architectural focal point serves as more than just a gathering space; it's a hub of connectivity and collaboration, fostering a sense of community among occupants. With fluid lines and strategic placement, the design maximizes functionality while promoting interaction and well-being within the workplace environment.

External circulation is strategically incorporated through a covered walkway around buildings, enhancing connectivity while providing protection from weather conditions.

# 04\_ Built Form and Design Strategies

## 4.4. Landscape

- The landscape architecture seamlessly blends nature and practicality, utilizing natural features to boost energy efficiency and minimize environmental footprint.
- Rooftop gardens and indigenous flora serve as natural insulators, reducing heat absorption and lowering cooling needs.
- Thoughtful placement of trees and plants acts as visual screens, enhancing aesthetics while also purifying the air and fostering biodiversity.
- Native planting not only beautifies the surroundings but also contributes to a healthier ecosystem, supporting local wildlife and enhancing overall environmental sustainability.
- By integrating greenery into the design, the landscape serves as both a functional element and a testament to the project's commitment to sustainable practices.

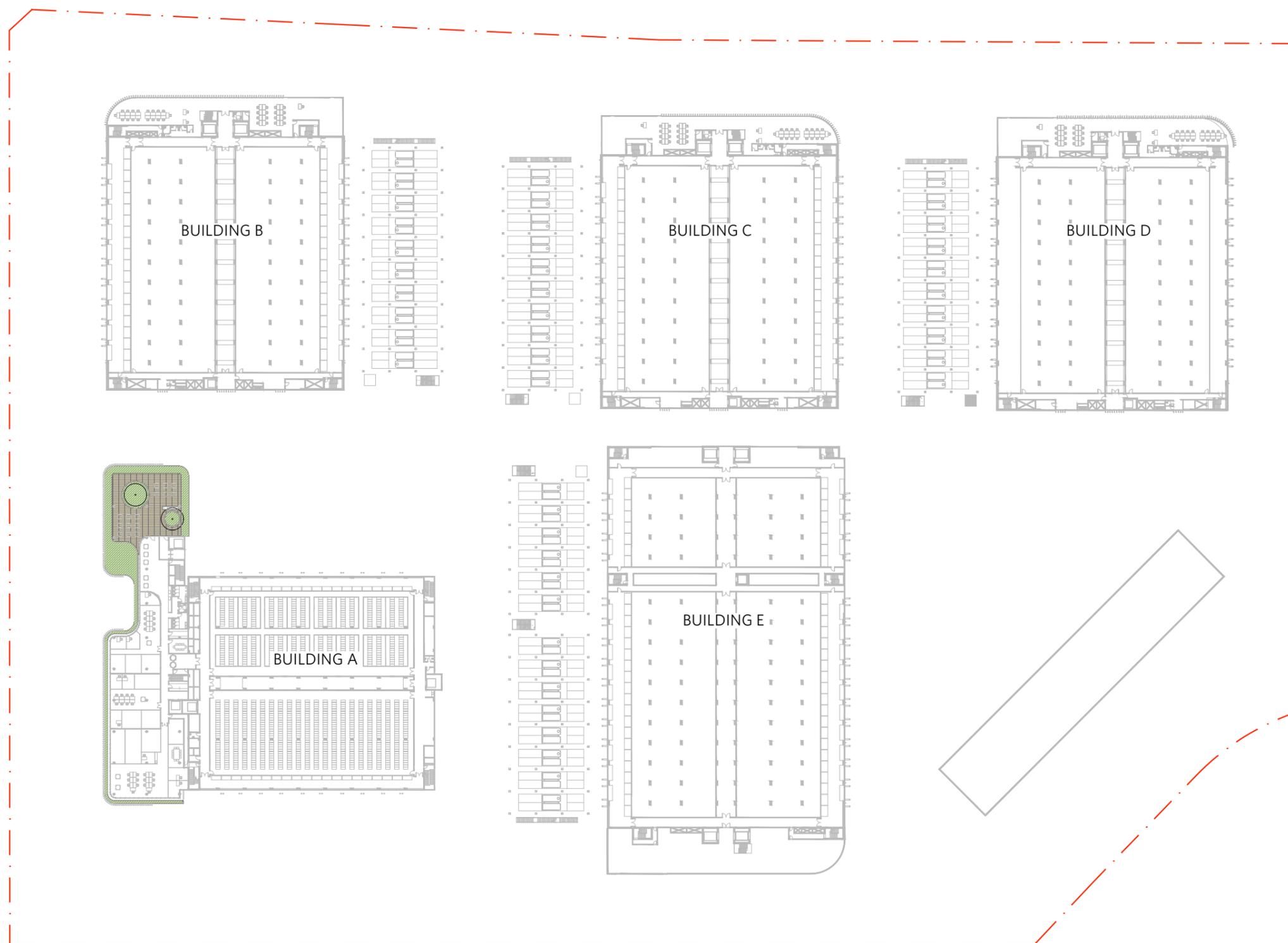


Ground Level

# 04\_ Built Form and Design Strategies

## 4.4. Landscape

- Building A's amenity area provides a versatile space ideal for gatherings, meetings, and relaxation, catering to various needs throughout the day.
- Enhancing the perimeter with lush planting will establish a verdant border, accentuating the building's surroundings.
- Incorporating prominent trees adds visual appeal while potentially diversifying with seasonal changes.
- This greenery not only beautifies the space but also contributes to a healthier environment, promoting well-being and connection with nature.
- Whether seeking a quiet retreat or a vibrant meeting spot, the amenity area in Building A offers a welcoming sanctuary for all occupants.



Level 2

# 04\_ Built Form and Design Strategies

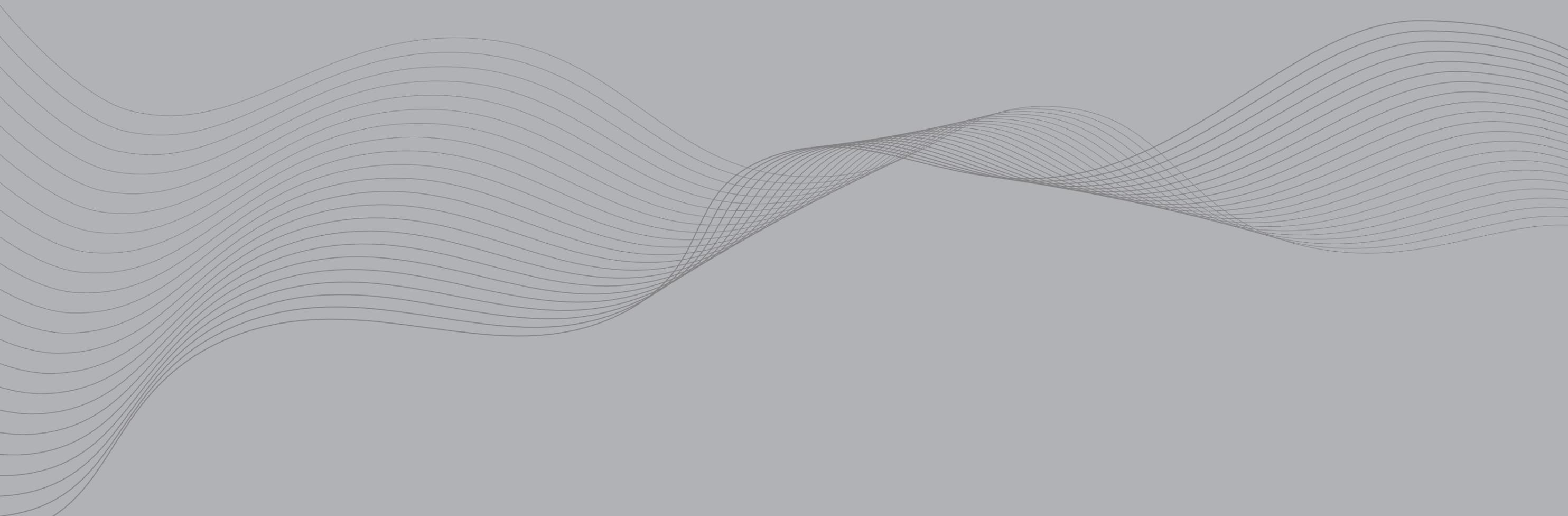
## 4.4. Landscape

- Buildings B to E introduce distinct amenity zones, providing secluded spaces away from adjacent offices.
- These zones will feature diverse seating options, catering to dining, casual meetings, and social gatherings.
- Surrounding greenery will be strategically planted along the perimeter, offering lush views and natural shade for enhanced comfort and relaxation.



Level 3

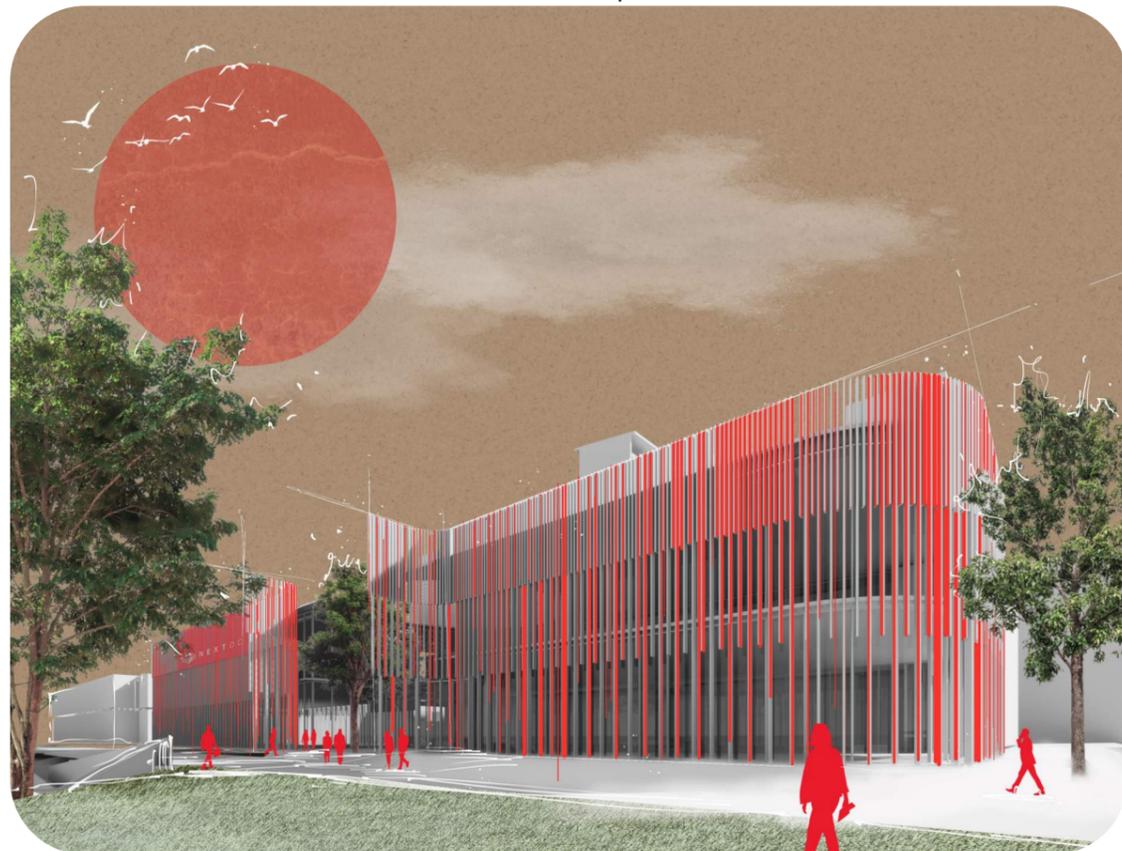
## 05\_ Materiality and Facade



# 05\_ Materiality and Facade

## 5.1. Office Building Facade Options

Preferred Option



Option 01



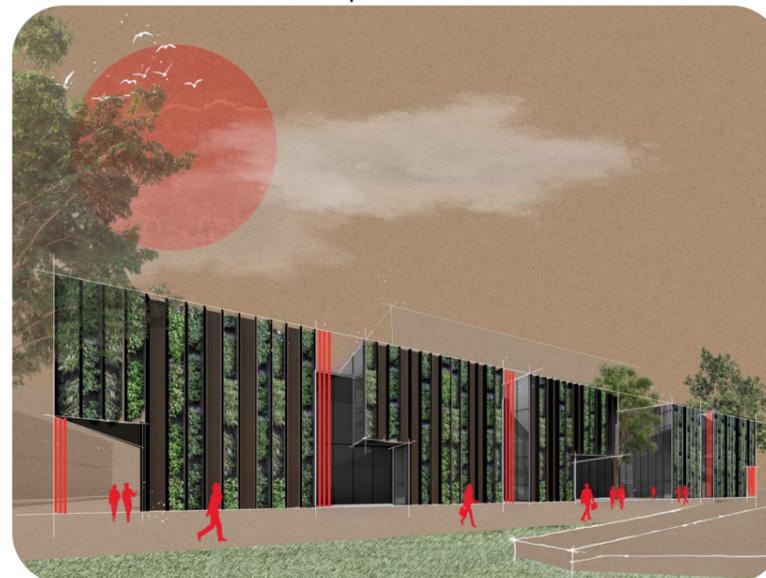
Option 02



Option 03



Option 04



Option 05



- The office building employs soft corners at both its main entrance and building corners, fostering a welcoming and organic atmosphere for its users. This design strategy enhances comfort and flow, prioritizing user comfort and enhancing the overall architectural harmony.
- The office building boasts a contemporary design, with vertical fins strategically positioned to provide optimal solar control. This not only reduces energy consumption but also ensures occupants enjoy unobstructed views of the surrounding environment, enhancing both comfort and sustainability.
- This preferred option also focuses on functionality and aesthetics, featuring a central courtyard as the main entrance. Here, a striking feature tree takes centre stage, providing not only a visual focal point but also a sense of tranquility and connection to nature. This deliberate layout creates a welcoming arrival point, offers clear orientation, and enhances the overall green ambiance, fostering a conducive work environment.

# 05\_ Materiality and Facade - Commercial Buildings (FOH)

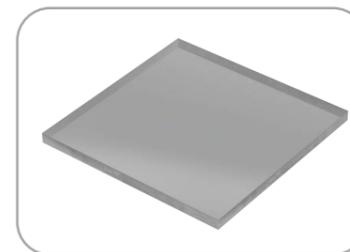
## 5.2. Main Office Building - Elevations



Vertical fin blades  
 Powder coated aluminium finish  
 Color: NEXTDC Red



Soffit and Wall Cladding  
 Aluminium panel  
 Color: Dark Grey



Glazing

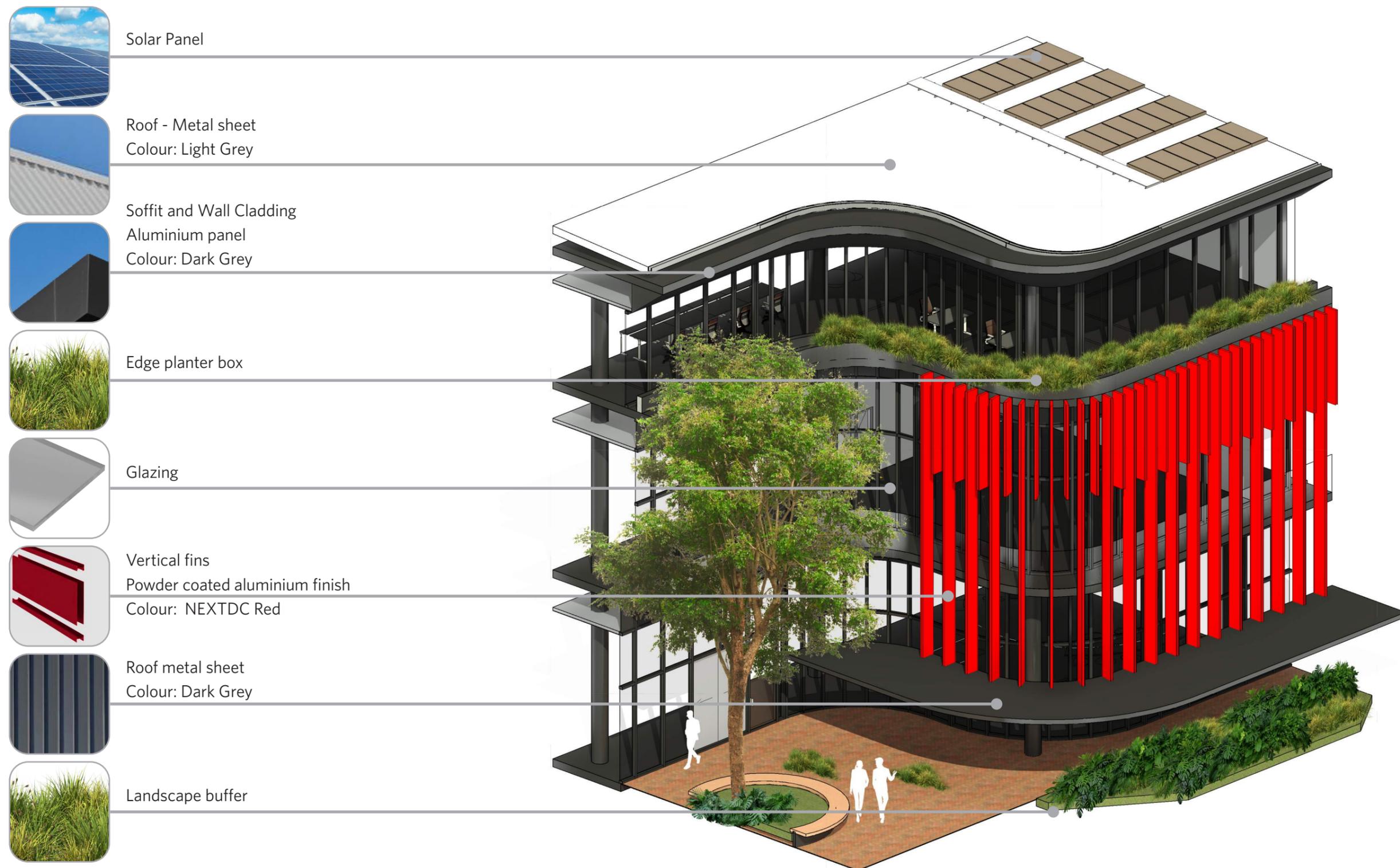


Roof - Metal sheet  
 Color: Light Grey



# 05\_ Materiality and Facade - Office Building

## 5.3. Colour Study - Light and Shade



# 05\_ Materiality and Facade

## 5.4. Typical Data Hall and Office Building Facades

**01** Vertical fin blades  
Powder coated aluminium finish  
Colour: NEXTDC Red

**02** Metal Cladding  
Colour: Monument

**03** Glazing  
Colour: Grey tinted glass

**04** Painted Wall  
Colour: Light grey

**05** Powder coated Wall Finish  
Colour: Surfmist (Light grey)

**06** Powder coated generators  
Colour: Mid grey

**07** Metal Screen  
Colour: Mid grey

**08** Roof - Metal sheet  
Colour: Light grey

**09** Louvers  
Colour: Mid grey

**10** Pipes and Cooling Towers  
Stainless Steel

HYPERSCALE - ROOF SFL 109.600

HYPERSCALE - L-03 SFL 103.200

HYPERSCALE - L-02 SFL 96.800

HYPERSCALE - L-01 SFL 90.400

HYPERSCALE - L-00 SFL 84.000

HYPERSCALE - ROOF SFL 109.600

HYPERSCALE - L-03 SFL 103.200

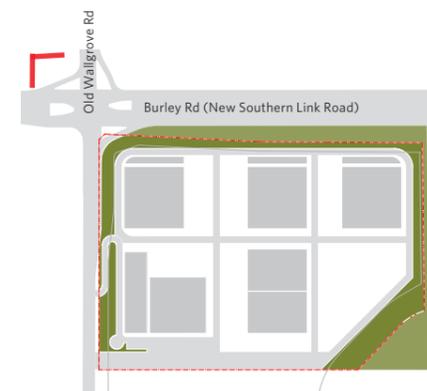
HYPERSCALE - L-02 SFL 96.800

HYPERSCALE - L-01 SFL 90.400

HYPERSCALE - L-00 SFL 84.000

# 05\_ Materiality and Facade

## 5.5. Isometric View



Electrical Substation

Building D -Data hall

Building D -Office

Building C -Data hall

Building C -Office

Building B -Data hall

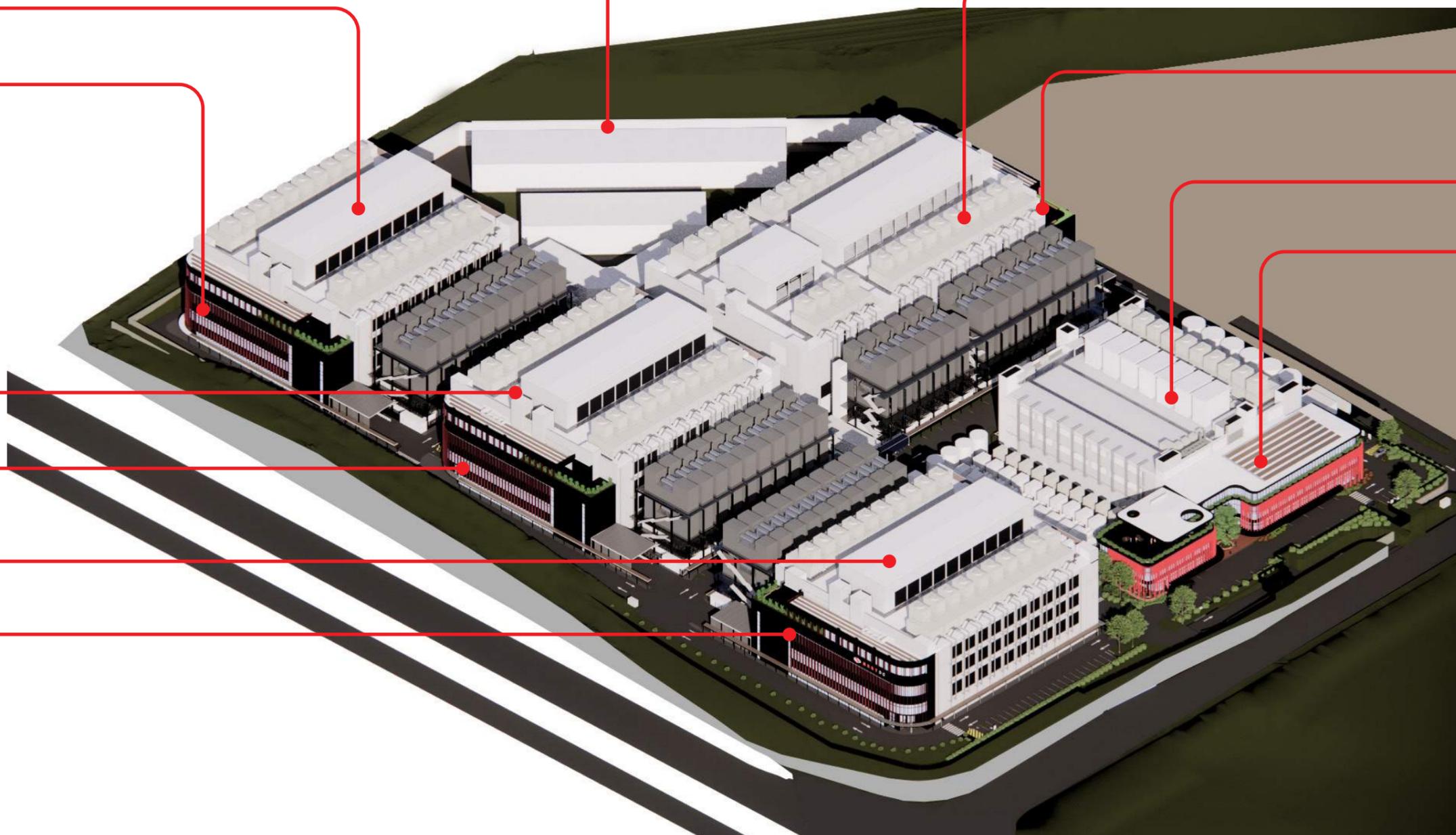
Building B -Office

Building E -Data hall

Building E -Office

Building A -Data hall

Building A -Office



## 05\_ Materiality and Facade

### 5.6. Aerial View from North West



## 05\_ Materiality and Facade

### 5.7. Street View from North West



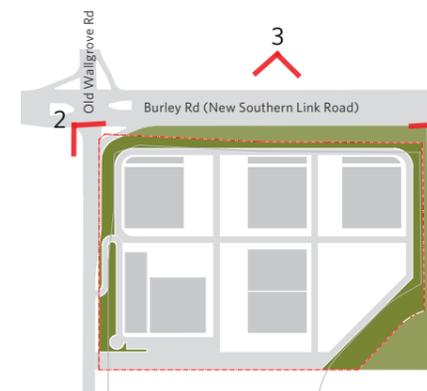
## 05\_ Materiality and Facade

### 5.8. Entry Experience View from West



# 05\_ Materiality and Facade

## 5.7. Street Level Views



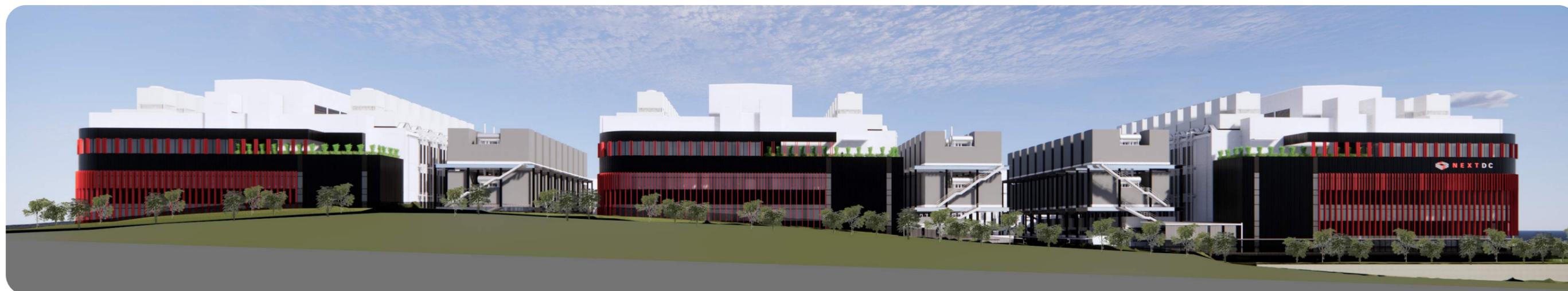
3D View 01



3D View 02



3D View 03



# 05\_ Materiality and Facade - Commercial Buildings (FOH)

## 5.8. Street Level Views

3d View 01



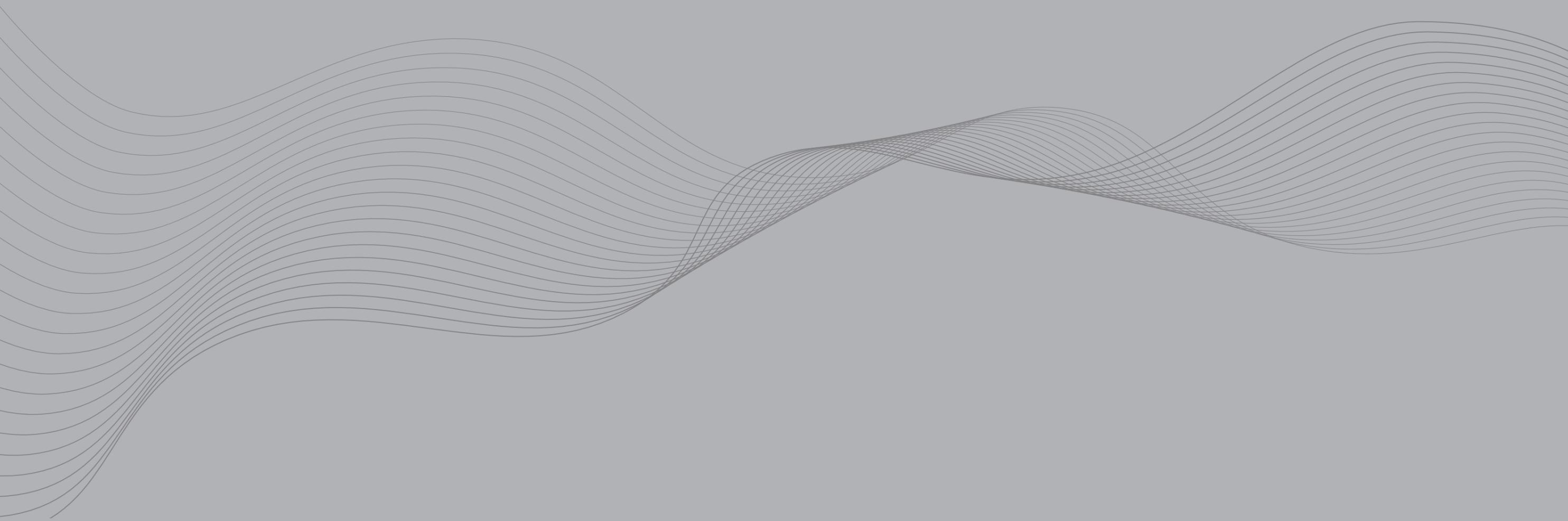
3d View 02



3d View 03



# 06\_ Environmental Responses



# 06\_ Environmental Responses

## 6.1 Initiatives and sustainability

### Greenhouse Gas Emissions and Energy

With up to 40% of global Greenhouse Gas Emissions attributed to buildings, increasing building energy performance is a critical step in addressing the growing issues of sustainability and climate change. It is also an important step in future-proofing a development for the energy grid that is increasingly relying on renewable energy.

The NSW State government has a target Net zero emissions by 2050 with a 50% reduction in emissions by 2030.

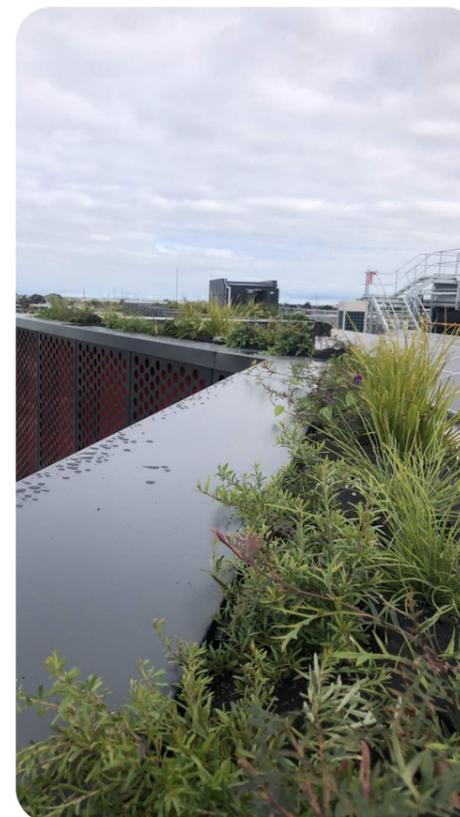
For Shiraz 4, we are aiming for operational energy use reduction through the following:

- Aiming for NABERS 5.5 Star Energy from the site's operation, excluding the office area
- Passive design - limiting glazing extent, vertical shading elements, well-insulated and sealed
- Renewable energy through several dedicated areas including rooftop solar photovoltaic (PV)
- Efficient building systems including LED lighting with smart controls
- Selection of energy efficient equipment, focusing on low-GWP refrigerant
- Selection of low embodied carbon materials.
- Reduce energy consumption by allowing automatic dimming or brightening of lights based on the amount of natural light in a room, and triggered by people entering an area.

### Water Consumption

Potable water use reduction through the following:

- Efficient fixtures and fittings for toilets and sanitary appliances
- Green roof area to the rooftop perimeter reduce peak stormwater flow and filter pollutants
- Rainwater harvesting and reuse for irrigation and toilet flushing.



## 06\_ Environmental Responses

### 6.1 Initiatives and sustainability

#### Landscape

The project utilises the following design responses:

- Vegetated managed ecological zone to the south east corner
- Relocation of existing street trees
- Massed planting to the north west corner and west frontage
- Raingardens and Water-Sensitive Urban Design (WSUD) to remove pollutants from the rainwater and reduce irrigation requirements
- Utilising native, drought-tolerant plants
- Retain existing retaining walls and prioritise use of locally sourced materials and materials that connect to the site's history.

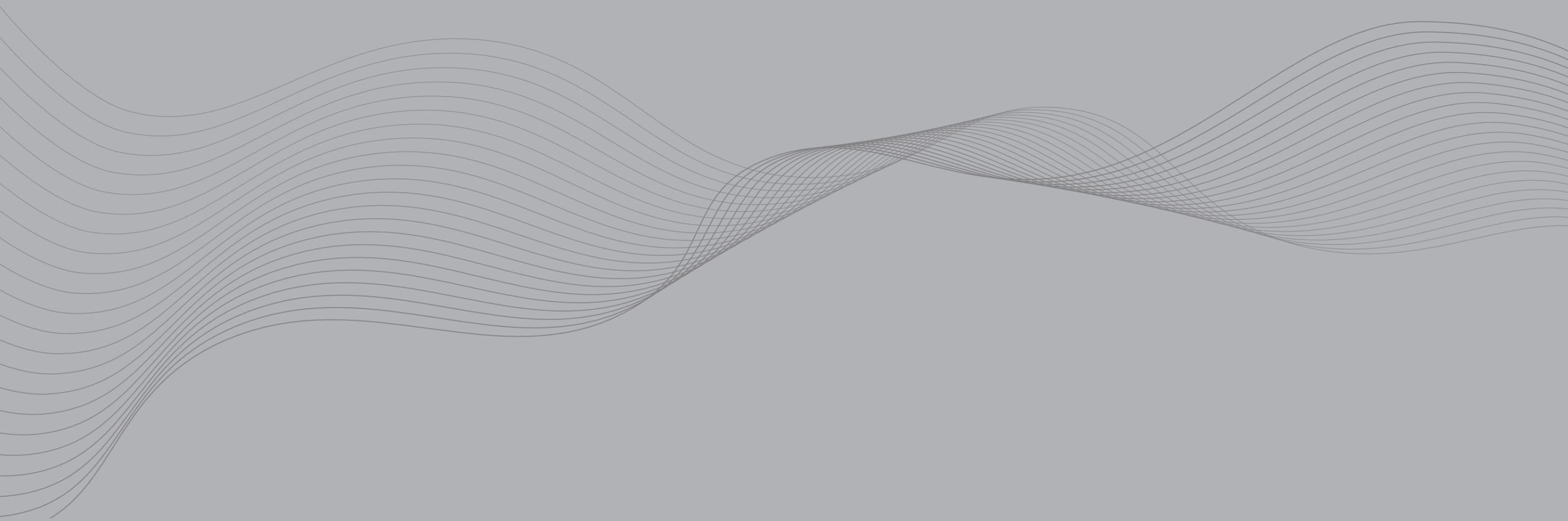
#### Supporting health and well-being

The following helps the site's users to maintain physical and mental well-being:

- Low or ultra-low VOC/formaldehyde finishes
- Windows that give access to daylight and views of landscaped areas
- Rooftop facilities including a BBQ and seating area to allow social connection
- End of Trip facilities including bicycle parking to facilitate fossil-fuel free transport to and from the site.



# 07\_ Design Response to GANSW



# 07\_ Design Repsonse to GANSW

## 7.1. Better Placed



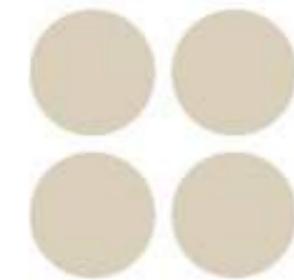
### **Better Fit: Contextual, local and of its place**

- The immediate context is largely defined by; industry and warehouses, rural residential remnants, bushland fragments and the sites history as a quarry and brick factory.
- The Shiraz 4 technology campus, contains extensive high technology, industrial equipment and critical communications infrastructure. Its existence supports local industry such as electrical, mechanical and telecommunications equipment manufacturing, installation and maintenance.
- More broadly, the facility provides the computational power and secure data storage necessary for a wide variety of users across western Sydney including universities, advanced manufacturing, finance, government and defence.
- In form, the building grid of the masterplan, references the scale of the rural residential lots.
- Unlike many of the very long unbroken warehouses to the west and north, the blocks of the technology campus are more akin to town centre blocks in plan scale and grid. They provide a transition between the industrial and rural residential.
- The design references its place and history. The red and ochre tones of the façade remember that the site was once a brick quarry, this is further reflected in brickwork considered for strategic areas of the paving and landscape.
- The green landscape curtilage restores trees, shrubs and biodiversity to land once completely cleared for the sake of industrial manufacturing and quarrying.



### **Better Performance: Sustainable, adaptable and durable**

- Fundamental to NEXTDC's approach to engineering design is to maximize the use of unconditioned outside air to minimize energy consumption by the mechanical cooling systems in the facility. This is not the easy solution, but it is the right solution.
- The technology campus features extensive solar arrays on roofs and awnings.
- The existing site is completely bare of all life. The proposed facility, restores biodiversity, in the planted perimeter and planted roof terraces.
- Adaptability in the context of this campus means designing infrastructure capable of accommodating evolving technological needs, shifting tenant and operational requirements over time. This is key to the planning of the buildings in this facility and extensive, demonstrable effort has been made to design a facility that is fit for a wide variety of tenants and emerging technology.
- Durability and resilience is everything to a data center. From the robustness of its materials and finishes, to its structure and the redundant systems imbedded in the design, it is made to resist failure so much so that it can serve as a disaster recovery center when infrastructure fails elsewhere.



### **Better for community: inclusive, connected and diverse**

- This campus features a variety of environments for the community of employees, tenants and visitors. At the heart of the facility is an auditorium which will bring people together for technology seminars, industry events and other gatherings.
- Bookable training rooms, mixed use office space and a café are supported by quiet rooms, places for nursing, meditation, prayer, breakout spaces for diverse working habits, communal rooftop spaces with access to views and greenery. There are even fun and frivolous spaces, nooks with pinball machines and massage chairs, vending machines for night owls and communal kitchenettes scattered through the plan.

The Better Placed policy establishes guidelines to achieve good design within the built environment in New South Wales.

Good Design creates buildings that are efficient, user friendly, enjoyable and provide additional value to the community and local context.

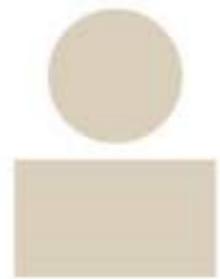
The Government Architect New South Whales (GANSW) defines a well designed built environment as being: healthy, responsive, integrated, equitable and resilient.

The Better Placed policy defines seven objectives for good design:

1. Better Fit: Contextual, local and of its place
2. Better Performance: Sustainable, adaptable and durable
3. Better for Community: inclusive, connected and diverse
4. Better for people: safe, comfortable and livable
5. Better working: Functional, efficient and fit for purpose
6. Better Value: creating and adding value
7. Better look and feel: engaging, inviting and attractive

# 07\_ Design Response to GANSW

## 7.1. Better Placed



### **Better for People: Safe, comfortable and livable**

- Prioritizing “Better for People” within the Better Placed policy involves ensuring the data centre is not only technologically advanced but also conducive to the well-being of the users.
- Soil remediation, native plant restoration and sustainable practices enhance the environment. Users benefit from a rejuvenated landscape that fosters connection with nature. The materiality of the landscape extends into the lobby spaces with a well-designed interior using timber extensively throughout, and up into the planted accessible roof terraces.
- Within the data centre offices, ergonomic layouts, ample natural light, and efficient circulation pathways ensure safety and comfort. Noise reduction measures create a serene work environment, promoting productivity and mental well-being.
- A well-located vehicle dropoff bay, pathways, accessible lift and end of trip facilities encourage walking and cycling, promoting physical activity. Shaded areas and covered walkways throughout the development shield pedestrians from weather enhancing comfort and safety.



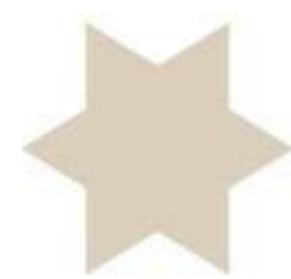
### **Better Working: Functional, efficient and fit for purpose**

- The data centre by its very nature is defined by functionality and efficiency. Rationality, linearity repetition, modularity are evident in the plan and engineering.
- But this is more than a data centre.
- As a mixed tenant technology campus, high quality work spaces and amenity are key to commercial success.
- “Human Experience” is one of the fundamental principles of the project brief. It drives everything from the arrival, the drop off, end of trip facilities, the approach to the front door, consideration of safety, cover and weather protection, the journey across the campus. The high quality of the front of house design, materials and finishes, the use of timber internally for warmth, extensive glazing for light.
- The internal plan is clear with primary and secondary axis off which hang; technical spaces, work spaces or amenity.
- Major and minor plant and equipment installation and replacement and testing is a significant aspect of the work which occurs in the technical parts of the buildings. Extensive study and design effort has been made to maximise the safety and efficiency of this work. This includes mapping equipment installation paths, crainage and lifting strategies, alignment of services and equipment between structural bays.



### **Better Value: Creating and adding value**

- Achieving “Better Value” through good design involves not only maximizing the efficiency of the centre’s operations but also ensuring it adds substantial value to the community and local context.
- The well-designed data centre optimizes resource utilization, minimize energy consumption, and incorporates sustainable practices to reduce its environmental footprint.
- Compared to the surrounding warehouses. The Shiraz 4 campus is a significant piece of considered architectural design, landscape design and technology.
- It creates jobs, both directly and indirectly, through a long construction and fitout life as well as through its operational life.
- Repurposing the existing site of the former quarry site contributes to its ecological and social rehabilitation. Not only through regenerating areas of landscape but increasing the onsite population who will contribute to the surrounding communities.



### **Better Look and Feel: Engaging, inviting and attractive**

- The architecture of Shiraz 4 is undeniably engaging. The striking contrast of tones and textures, the soft curves meeting hard edges and the intriguing arcana of its machinery make for something memorable.
- The fundamental architectural moves of the arrival building are all about invitation. The way the façade curves, creating a legible entry which literally pulls one in, the feature tree which sits at the center of that curve and the location of the concierge, waiting to greet those who are drawn across the threshold.
- There is an attractive elegance in the horizontal proportions, a warmth to the timber clad interiors, a dynamism and punch in the façades red blades and an intriguing pull to ascend to the roof terraces to discover the view.



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