ECHIDNA

ARCHITECTURAL DESIGN REPORT - AUG 2022

GENTON

REV A
DATE 18/08/2022

CONTENTS

Revision	Description	Date	Approved by
A	SSDA SUBMISSION	18/08/2022	ST

PROJECT SUMMARY

1. PROJECT SUMMARY

“Echidna” is the project name for a new Data Centre to be located in Eastern Creek on the north-eastern corner of the intersection of Old Wallgrove Road and Eastern Creek Drive. Echidna sits on a shared site with another data centre currently under construction and will ultimately become part of a complete communal campus once both projects are completed. They are supported by a new approved substation that also sits on the site.

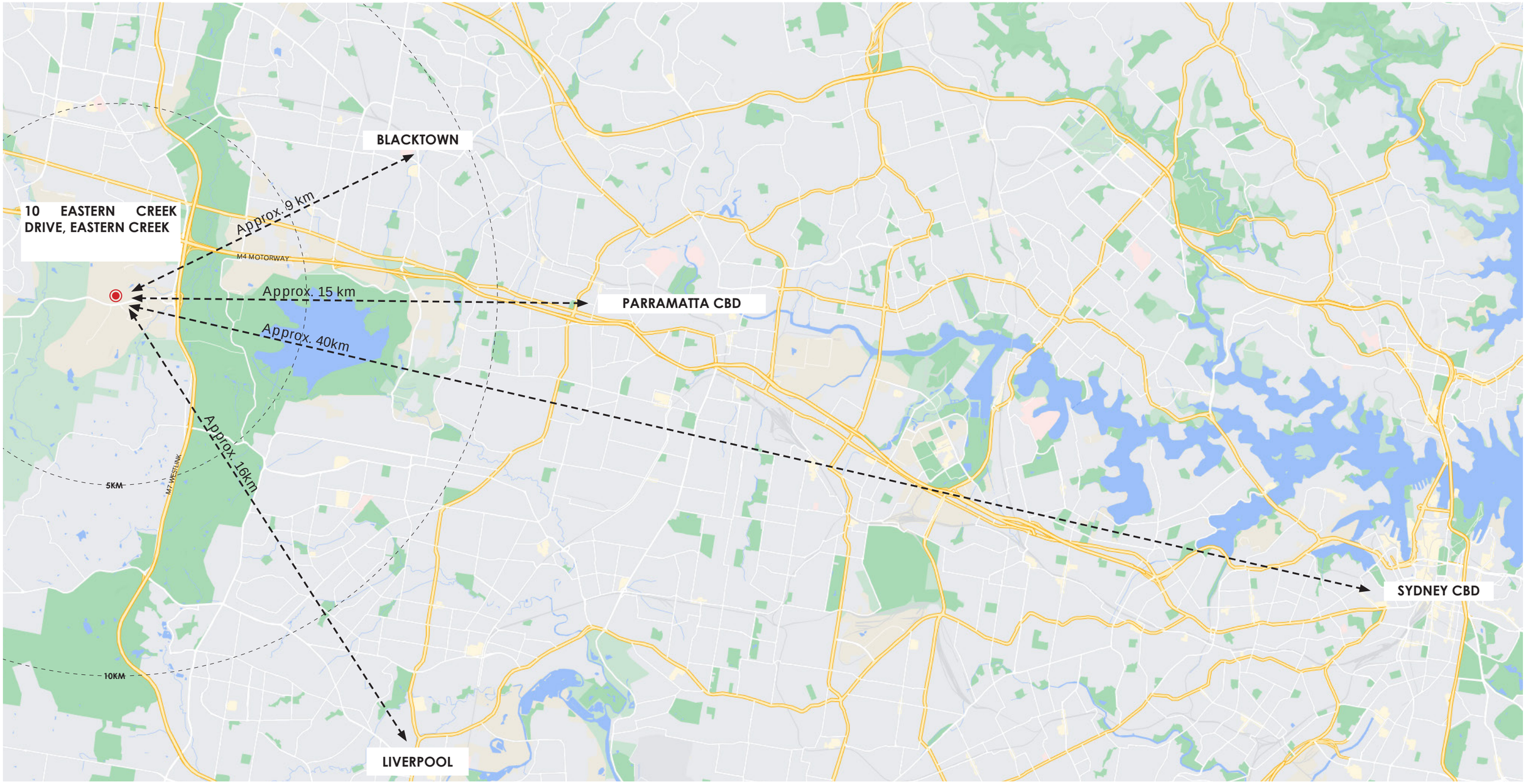
The project described in this Design Report explains the design approach that the team has undertaken in consideration of the requirements of the facility, the aspirations of the masterplan and how the development can support the objectives envisioned for the broader context while fundamentally providing a critical piece of technology infrastructure that supports the growth of the region.

Echidna incorporates a two storey building that includes ground level security offices and level 1 offices and two levels of data hall processing space. These are all connected via internal lifts and stairs. The roof has limited roof plant and equipment behind parapet screen walls. The technical space is powered by internal electrical plant rooms that have stand-by generators in external generator yard on the south eastern (internal) side of the site. Water tanks support ESD harvesting initiatives are positioned internal elevation of the site. The loading docks have been placed on the internal elevation away from the street and connected by a comprehensive internal street network for safe vehicle movement that also support plant replacement and maintenance requirements.

Due to its location, at the corner of the intersection of Old Wallgrove Road and Eastern Creek Drive, the proposed development will more clearly define the street and provide new elevations and landscape impression to the area. These street facing elevations provide an opportunity to design a streetscape that contributes to Eastern Creek’s evolving character and setting.

SITE & CONTEXT

2. LOCALITY PLAN



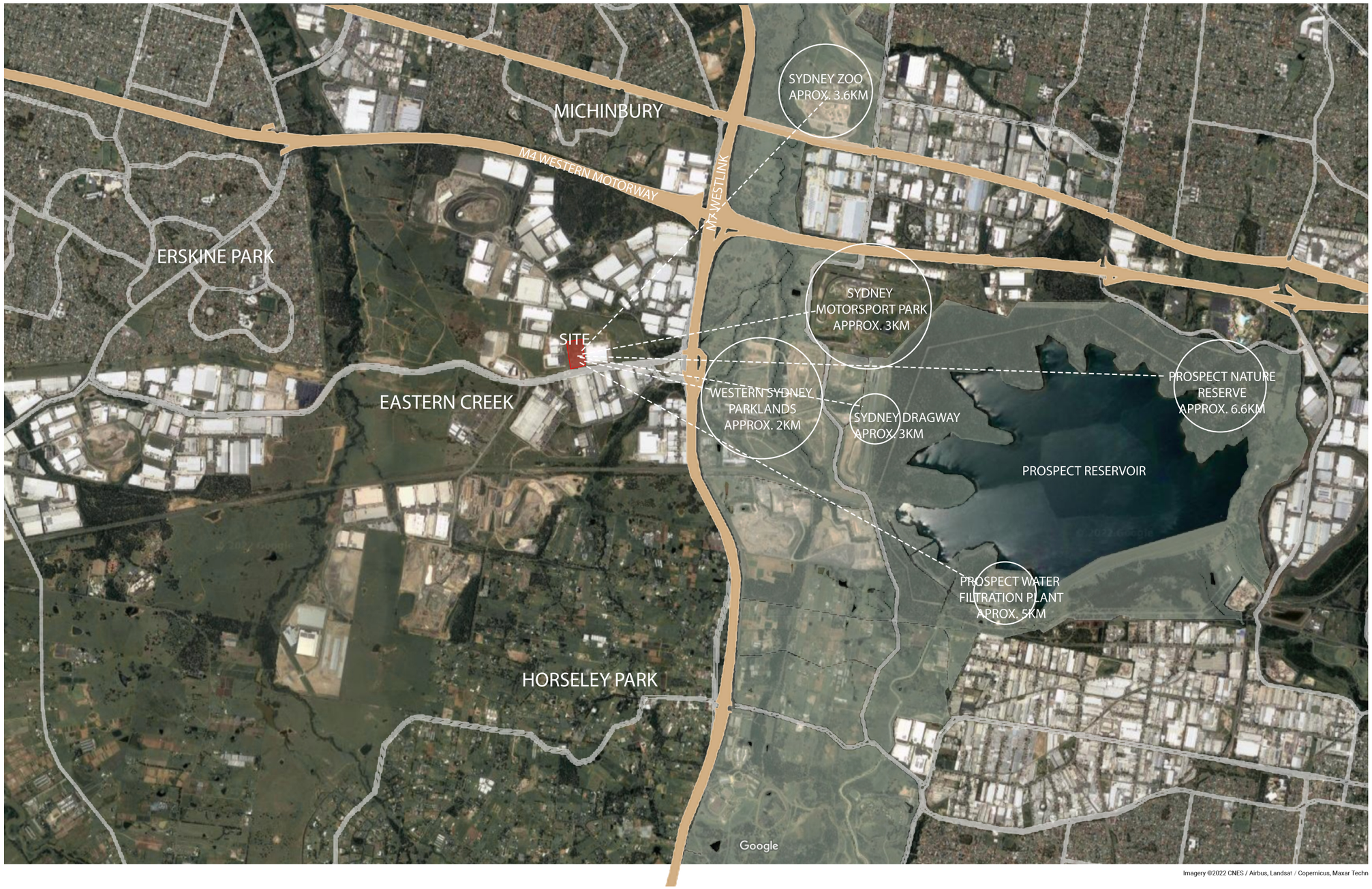
The adjacent image indicates the plot proximity to key locations in Sydney.

The site address is:
10 EASTERN CREEK DRIVE, EASTERN CREEK

The plot areas are outlined below:
14.04 acres; 56,850 m2

Note: All areas approximate. Areas obtained from Six Maps.
Image Source: Google Maps

3. SURROUNDING SITE CONTEXT



THE SURROUNDING SITE

The proposed development sits within an industrial area that is predominantly defined by the immediate industrial zoned land that has large format warehouse typologies and infrastructure. It is conveniently located near the "Lighthorse Interchange" intersection of the M4 Western Motorway and the M7 Westlink. These major pieces of road infrastructure also act as a threshold between otherwise adjacent areas. To the east across the M7 are the Western Sydney Parklands that connect to Motorsports Park and Prospect Reservoir. Further to the west of the overall industrial lands is the Riparian corridor created by Eastern Creek. Therefore, whilst sitting relatively close to the Parklands and Reserves, the more immediate characteristic of the site context is the large format industrial facilities and importantly their emerging landscaped streetscapes and front landscaped setbacks.

4. SITE

Image Source: SIX MAP

SITE CONTEXT

Located on 10 Eastern Creek Drive, Eastern Creek - the site sits at the north-eastern corner of the intersection of Eastern Creek Drive and Old Wallgrove Road, Eastern Creek.

The site offers convenient access towards major road and transport interchanges, with the M7 westlink being approximately 1km East of the site and the M4 Western Motorway being approximately 1.8km North of the Site.

Moreover, the site sits in close proximity to the Transgrid power station along with various other industrial used buildings, supplier warehouses, distribution centres and frieght transport facilities.

To the north of the site, there is currently substantial undeveloped parcels of land.

LEGEND:

- PROPOSED DEVELOPMENT
- EXISTING DEVELOPMENT (UNDER CONSTRUCTION)
- LOT BOUNDARY
- HIGHWAY
- ARTERIAL ROAD
- LOCAL ROAD

Lot/Section/Plan no:
4001/-/DP1243178

5. PLANNING CONTEXT

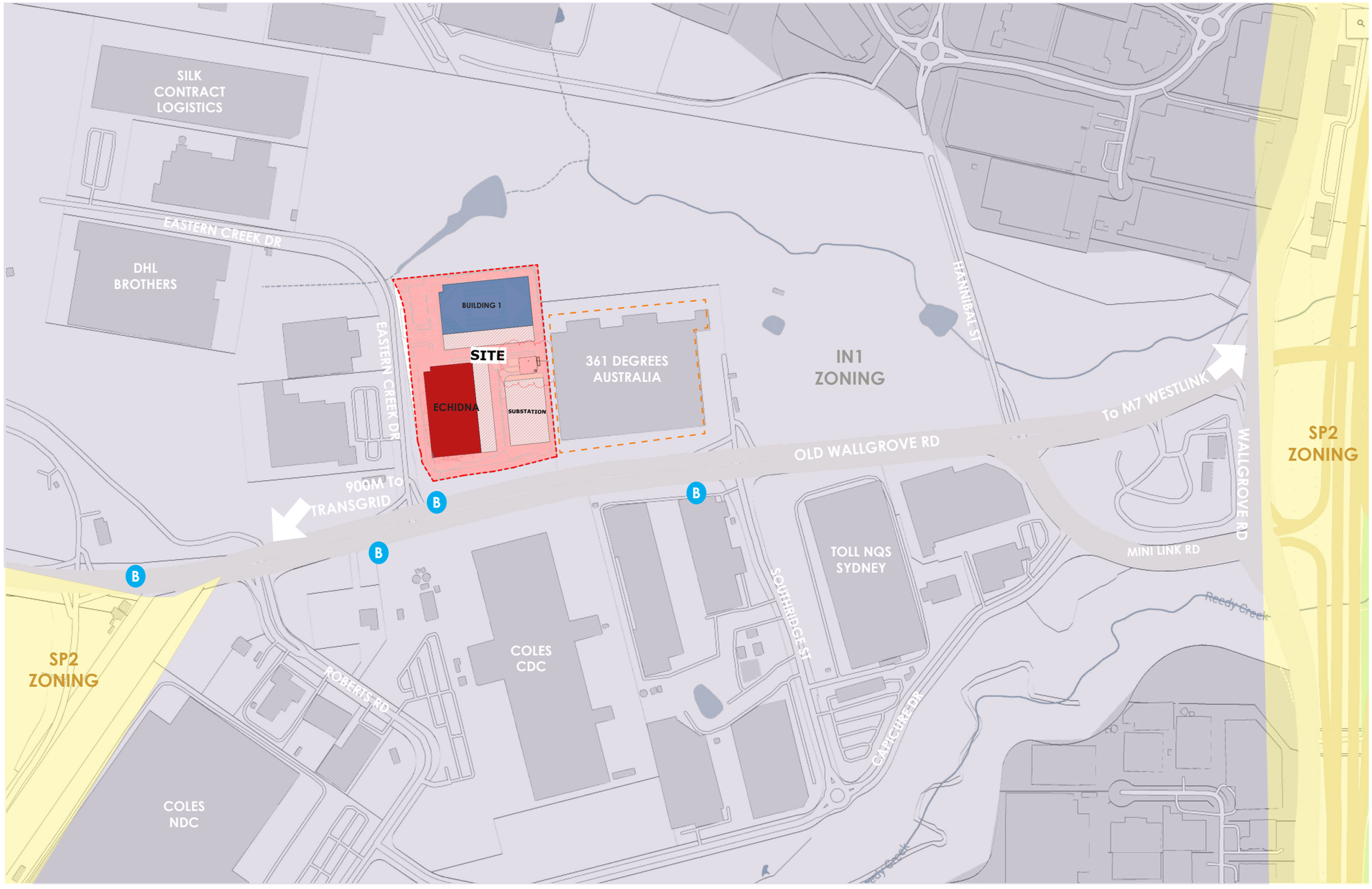


Image Source: SIX MAP

The site is zoned within the IN1 General Industrial Zone under Sate Environmental Planning Policy (SEPP). The SEPP does not specify any restriction on building height or floor space ratio (FSR) on the subject site.

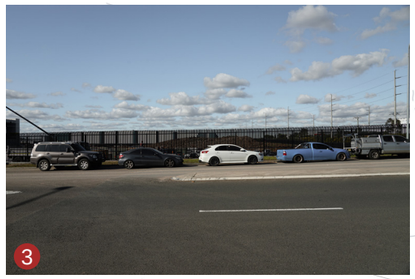
LEGEND:

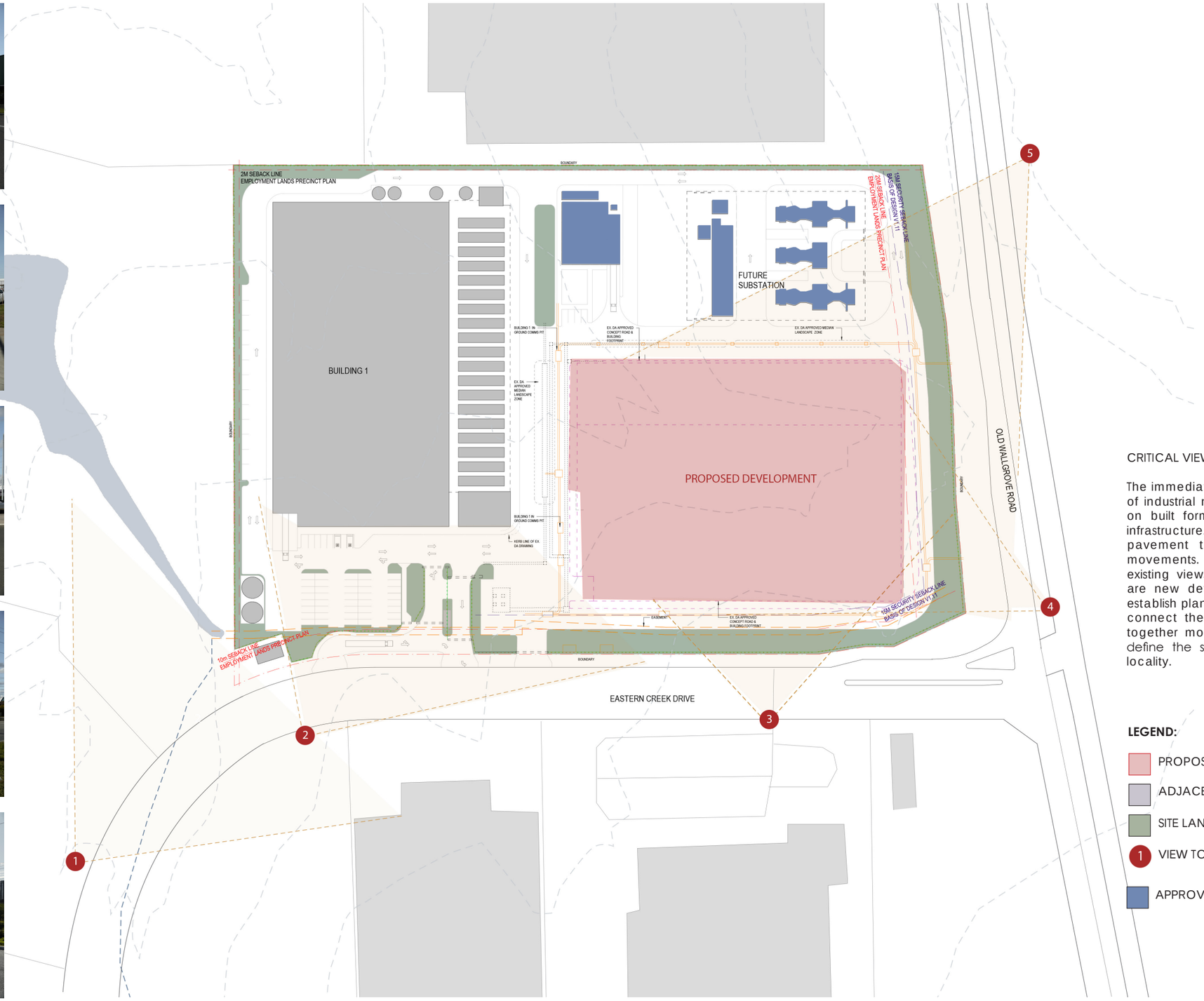
- BUS STOP
- LOT BOUNDARY
- ADJACENT DEVELOPMENT
- PROPOSED DEVELOPMENT
- EXISTING DEVELOPMENT (UNDER CONSTRUCTION)
- EXISTING SURROUNDING BUILDINGS
- SP2: INFRASTRUCTURE
- IN1: GENERAL INDUSTRIAL ZONE

NOTE: LAND ZONE MAP IN ACCORDANCE WITH

IN1 - GENERAL INDUSTRIAL (SEPP PUB.2-12-2021)
SP2 - INFRASTRUCTURE (LEP PUB.26-5-2015)

6. EXISTING SITE CONTEXT





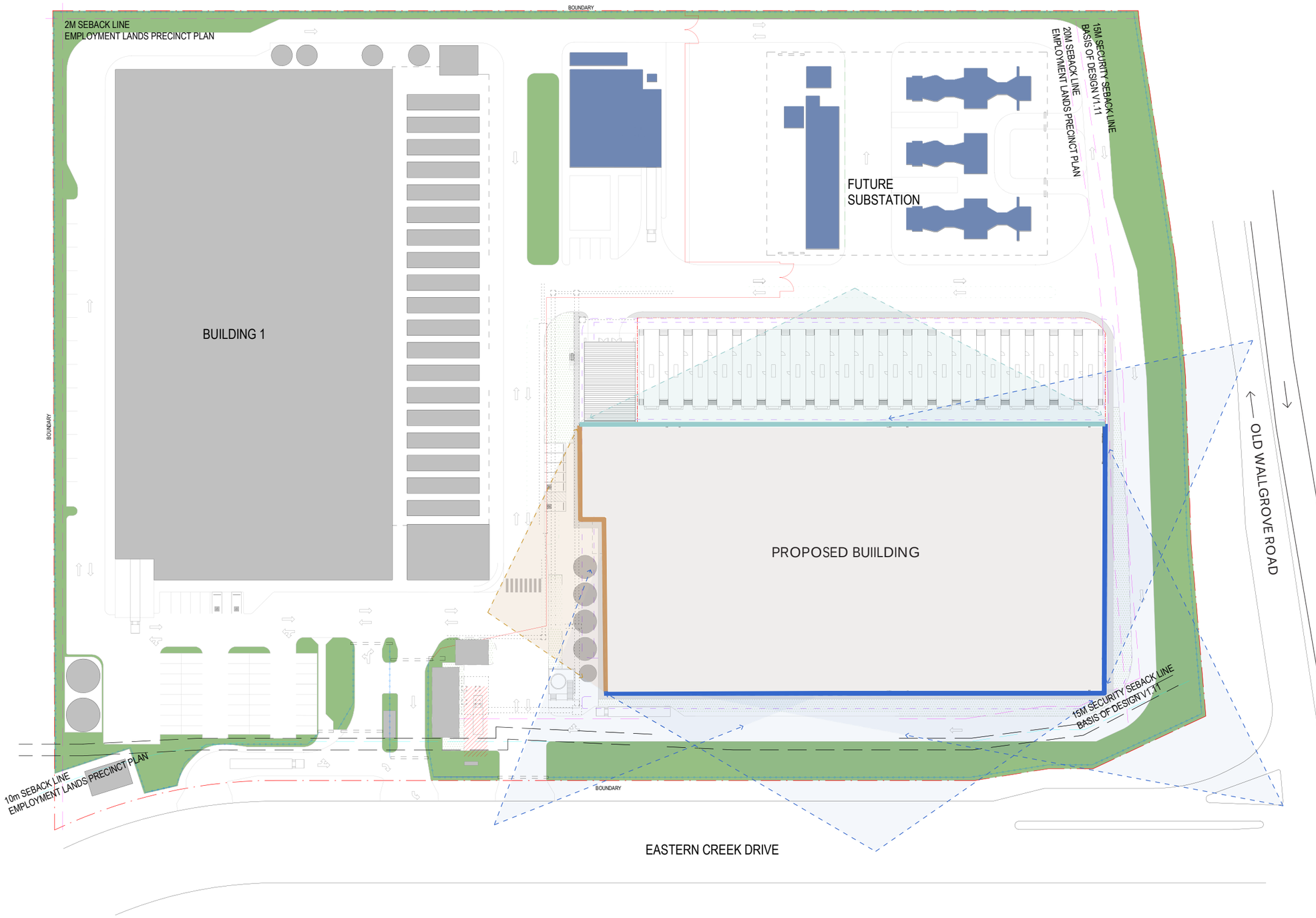
CRITICAL VIEWS: EXISTING

The immediate existing surrounding context is of industrial nature including long elevations on built form, and large overhead power infrastructure. There are vast areas of road pavement to accommodate the vehicle movements. We expect that over time these existing views will evolve however as there are new developments underway that will establish planting in their setbacks that should connect the existing landscape treatments together more continuously and coherently define the streetscapes and enhance the locality.

LEGEND:

- PROPOSED DEVELOPMENT
- ADJACENT BUILDINGS
- SITE LANDSCAPING
- 1 VIEW TOWARDS SITE
- APPROVED BUILDINGS

7. PROMINENT ELEVATIONS



Being located at the corner of the intersection of Old Wallgrove Road and Eastern Creek Drive, the proposed development would deliver two public featured elevations.

The two most prominent elevations would be from the two public prominent inward views from the major Old Wallgrove Road and Eastern Creek Drive, where public movement such as vehicles and pedestrian largely circulates.

The placement of the proposed building has been carefully considered from an urban design perspective. The facility requires external plant and equipment that have a relationship to the internal building arrangement. We have proposed to position the building in a way that conceals the external plant and equipment from the public domain as much as possible especially from Eastern Creek Drive. The external plant has been positioned to face an approved substation on the site situated to the east. The entire site perimeter includes a detailed landscape proposal that creates a green buffer to the public domain that will be the first impression of the site and also the entry to Eastern Creek Drive. The layout also allows the semi-public internal view to have the office orientated towards Building 1 that enhances the campus nature of the overall site.

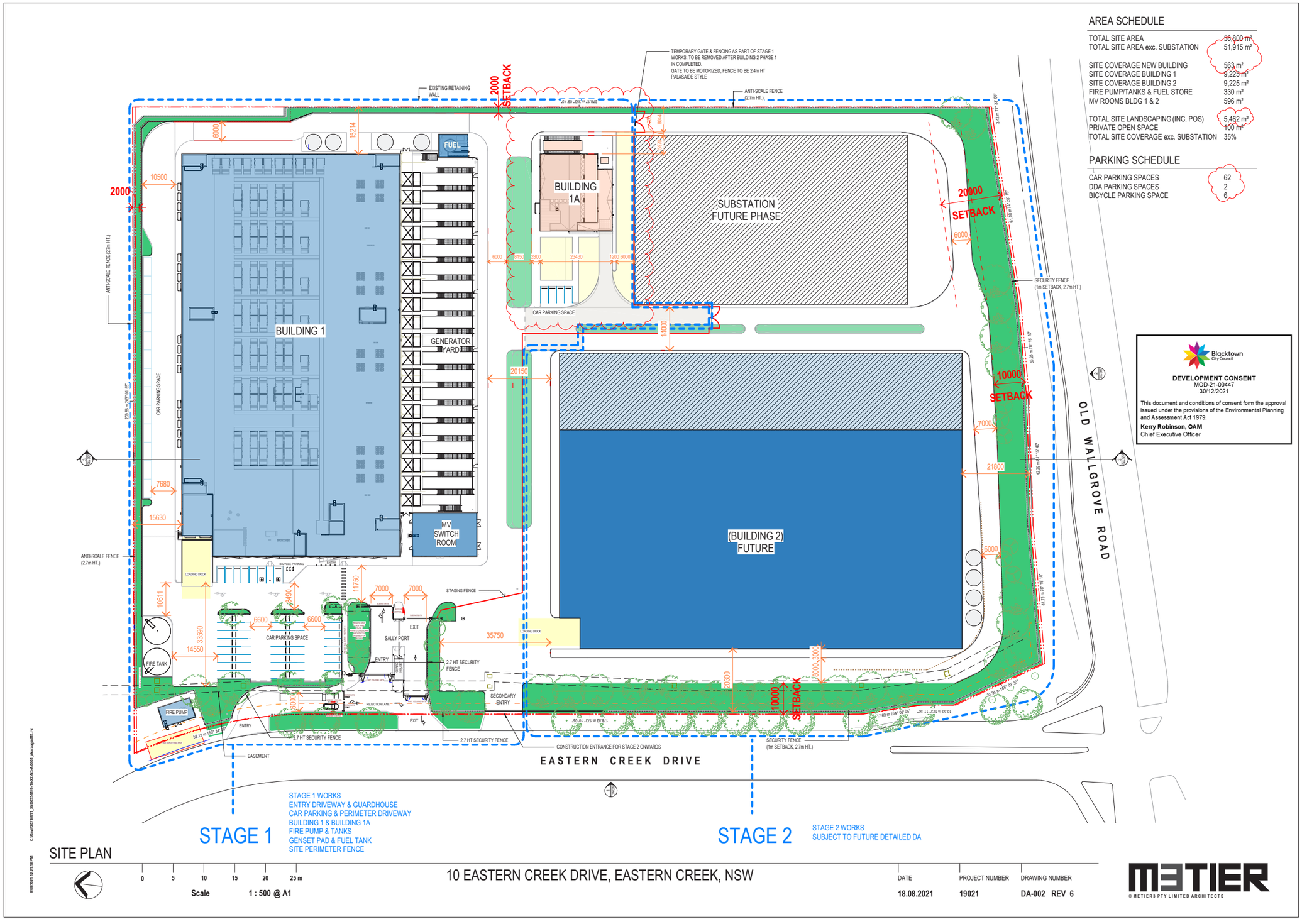
LEGEND:

- LONG END FEATURE ELEVATION
- SHORT END FEATURE ELEVATION
- INNER LONG ELEVATION
- PUBLIC PROMINENT INWARD VIEW
- SEMI-PUBLIC PROMINENT INWARD VIEW
- PRIVATE PROMINENT INWARD VIEW
- EXISTING BUILDING (UNDER CONSTRUCTION)
- PROPOSED BUILDING
- APPROVED BUILDINGS

EXISTING DEVELOPMENT APPROVAL

8. APPROVED DA

APPROVED STAMPED PLAN MOD-21-004473



PROPOSED DEVELOPMENT

9. DESIGN STATEMENT

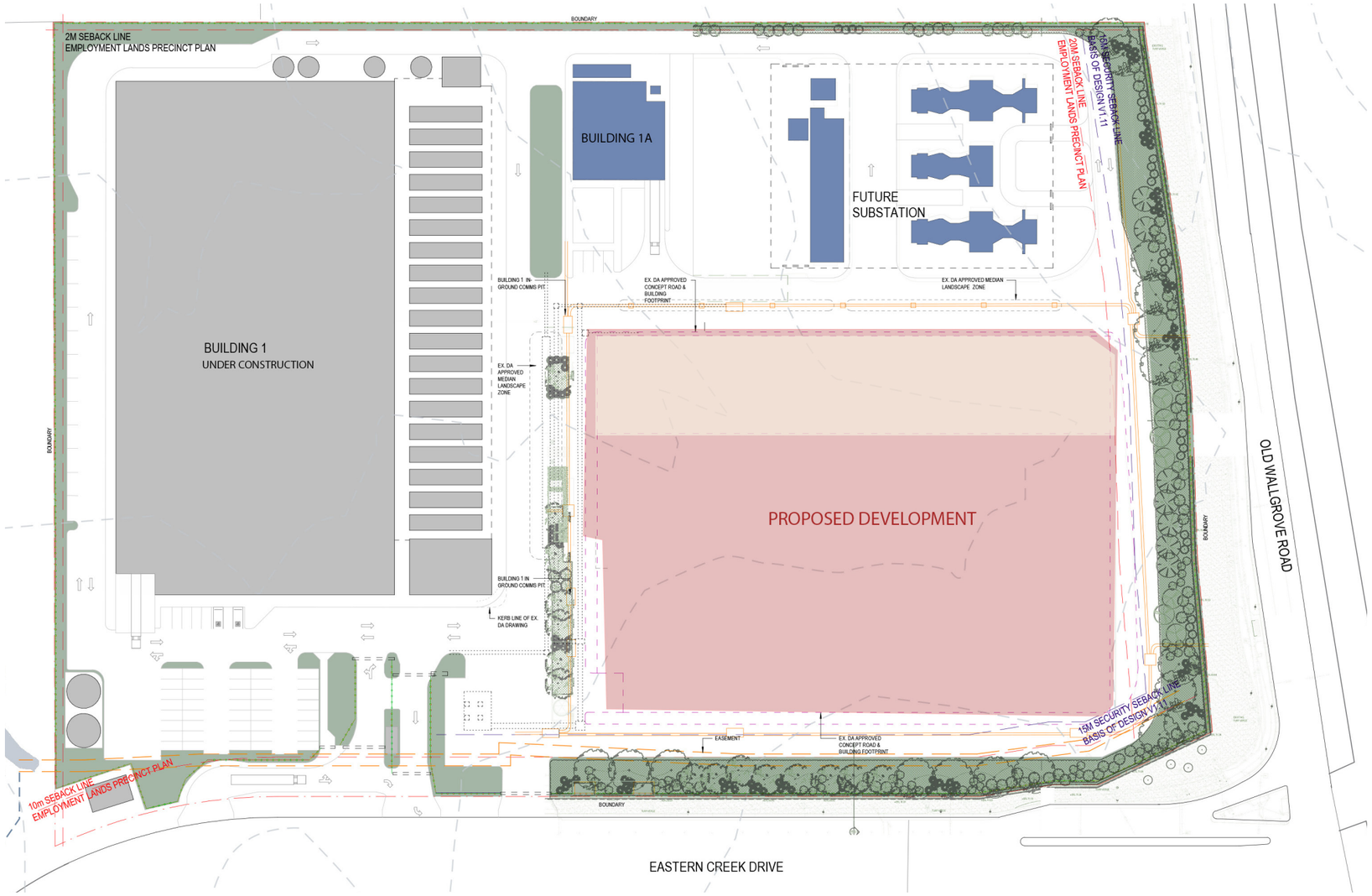
The proposal has been prepared with careful design consideration for the context, the site and the building and it's associated plant and equipment.

At a context scale we have analysed the existing history of the area and its central location on the Cumberland Plain in Greater Sydney. The Eastern Creek industrial area sits between the Riparian corridor of Eastern Creek and the large areas of vegetation of the Western Sydney Parklands and Prospect Reservoir. It therefore has a role to play to establish tree canopy and green connections along the streetscapes linking these more significant vegetation areas together from east to west as it links into adjacent development. Endemic and native species have been proposed to reinforce this approach. The corner position of the site in the context presents an opportunity to extend the green verge from Wallgrove Road around to Eastern Creek Drive and improves both the impression of the arrival to Eastern Creek Drive as well as for commuters travelling along Old Wallgrove Road.

Given the corner prominence of the site it was important to consider how to screen plant and equipment and potential negative visual impacts on the streetscape. The building has been sited to effectively screen not only the proposed equipment associated with this proposal "Echidna" but also to screen the approved substation from Eastern Creek Drive and to screen much of the external plant associated with Building 1. The position also means that the additional office space faces building 1 and allows employees and visitors to connect across the campus more readily and safely.

The architectural treatment of the building facades that face public areas that has been managed with the use of materials that complement those present in the area and still meet the technical requirements of the facility. An interpretation of corrugated treatments typical of the areas has been re-interpreted on these elevations. Importantly the proposal seeks to achieve this by using existing elements and emphasising the structural rationality of the building and it's materiality. By limiting additional additive elements we can achieve the interest without increasing the embodied carbon more than required to achieve the visual depth and interest on the façade. Resilient prefinished metals and precast have been used consistently across all elevations for consistency.

10. URBAN DESIGN



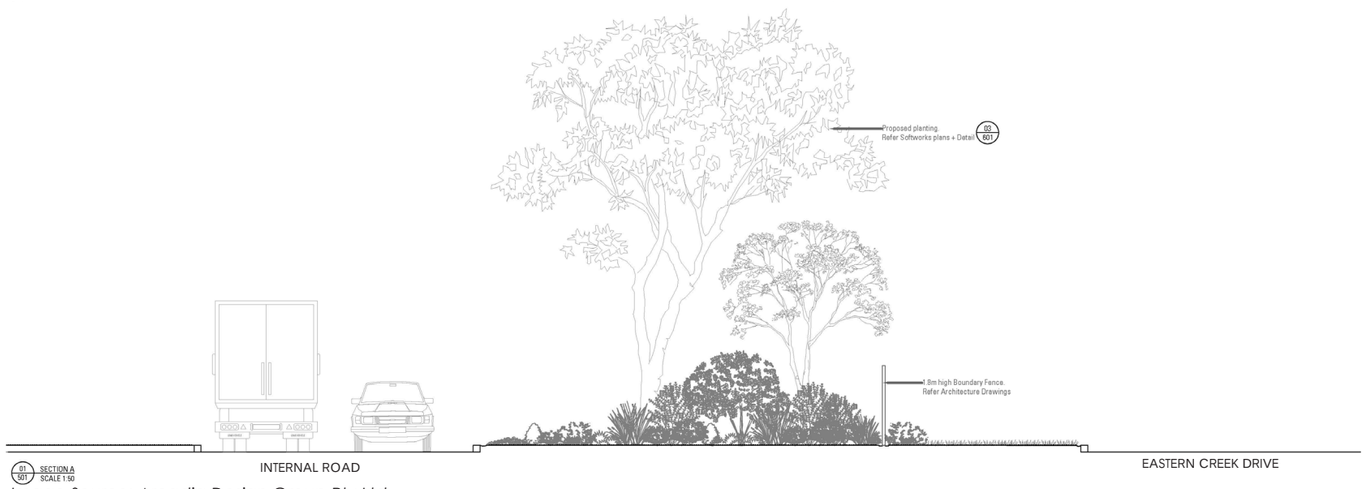


Image Source: Arcadia Design Group Pty Ltd

URBAN DESIGN & MASTERPLANNING

The proposal is part of an overall campus masterplan for the site with existing consents in place and construction underway on Building 1. Additional ancillary buildings and a substation will also be built on the site adjacent to this proposal. The masterplanning design process balanced the connections for people and operations across the campus as well as the urban design implications for the siting of the building and its associated plant and equipment. The building has been sited to effectively screen much of the mechanical and electrical plant deeper in the site and away from Eastern Creek Drive. The internal road network allows large vehicles to love around the site and access these areas. Given this we have also placed the loading dock internally so as not to present directly to the street.

The overall outcome of this sensitive masterplan approach is to create a continuous landscape verge in the setback to the corner of the site. It creates a safe campus by provided clear and close connections for buildings for staff and keeps the driveway cross overs in their existing positions with no new crossovers proposed near the intersection of Eastern Creek Drive and Old Wallgrove Road.

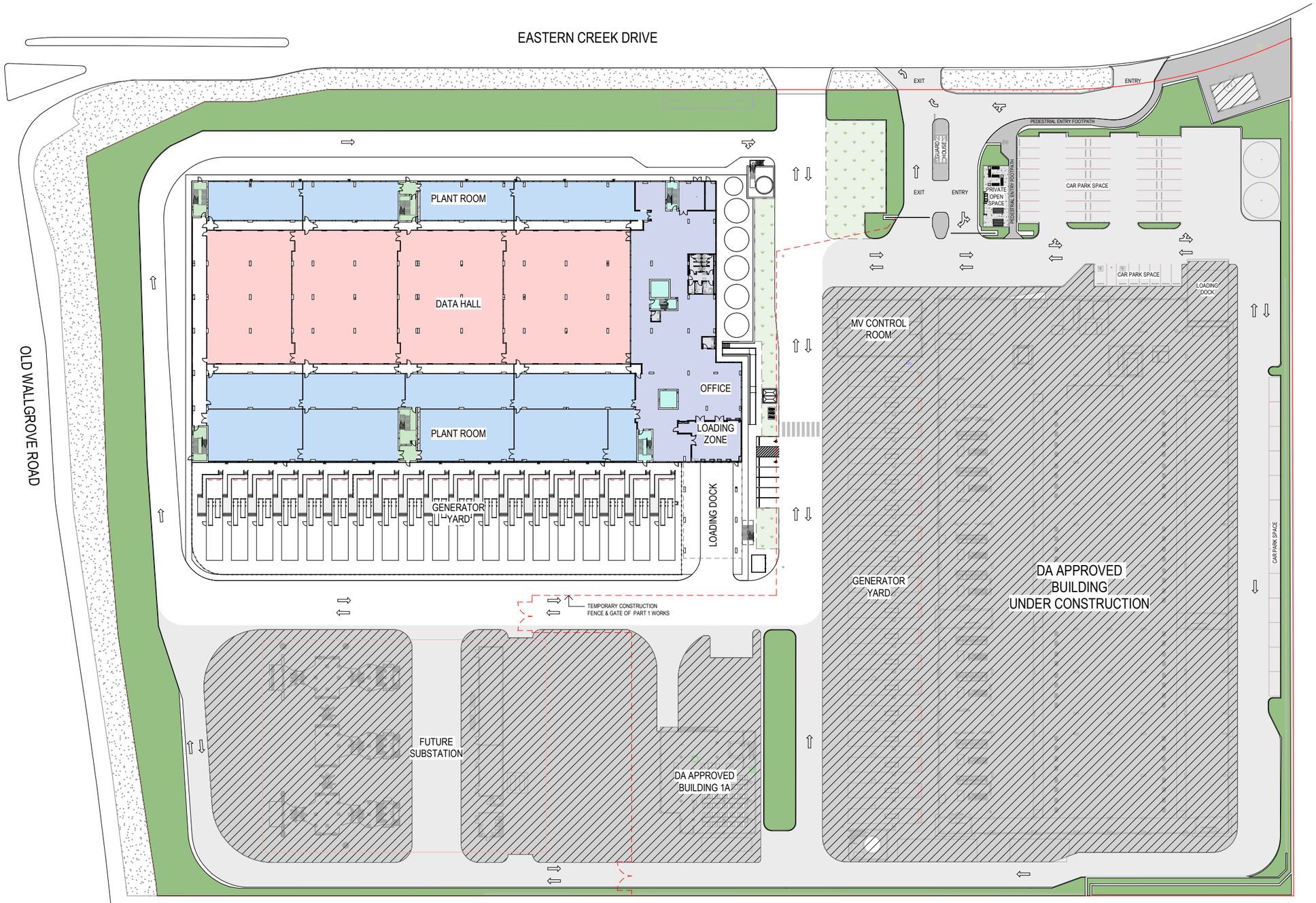
The built form proposed is also consistent with the scale of neighbouring development and consistent with the typology within the estate. The long elevation faces Eastern Creek Drive has been addressed through refined articulation with the shorter elevation facing Old Wallgrove Road. The external plant and equipment adjacent is placed next to previously approved electrical substation infrastructure. For vehicles travelling north on Old Wallgrove Road this plant and equipment as well as the substation is screened by the siting of the Proposed building due to the direction and speed of travel and the proposed landscape and existing landscape in the bifurcated verge will assist in screening the plant and equipment for those travelling in the opposite direction.

LEGEND:

- PROPOSED DEVELOPMENT
- EXISTING BUILDING (UNDER CONSTRUCTION)
- SITE LANDSCAPING
- APPROVED BUILDINGS
- GENERATOR YARD

Refer to landscape drawings for details

11. MASTERPLAN



MASTERPLAN

The office block to the front of the site to allow easy access for pedestrians. The exterior generator set hidden from Eastern Creek Drive by buikding mass. The plan demosntrates a good separation between generator sets and the existing approved Building 1.

Existing security port measures applied directly to this proposed design.

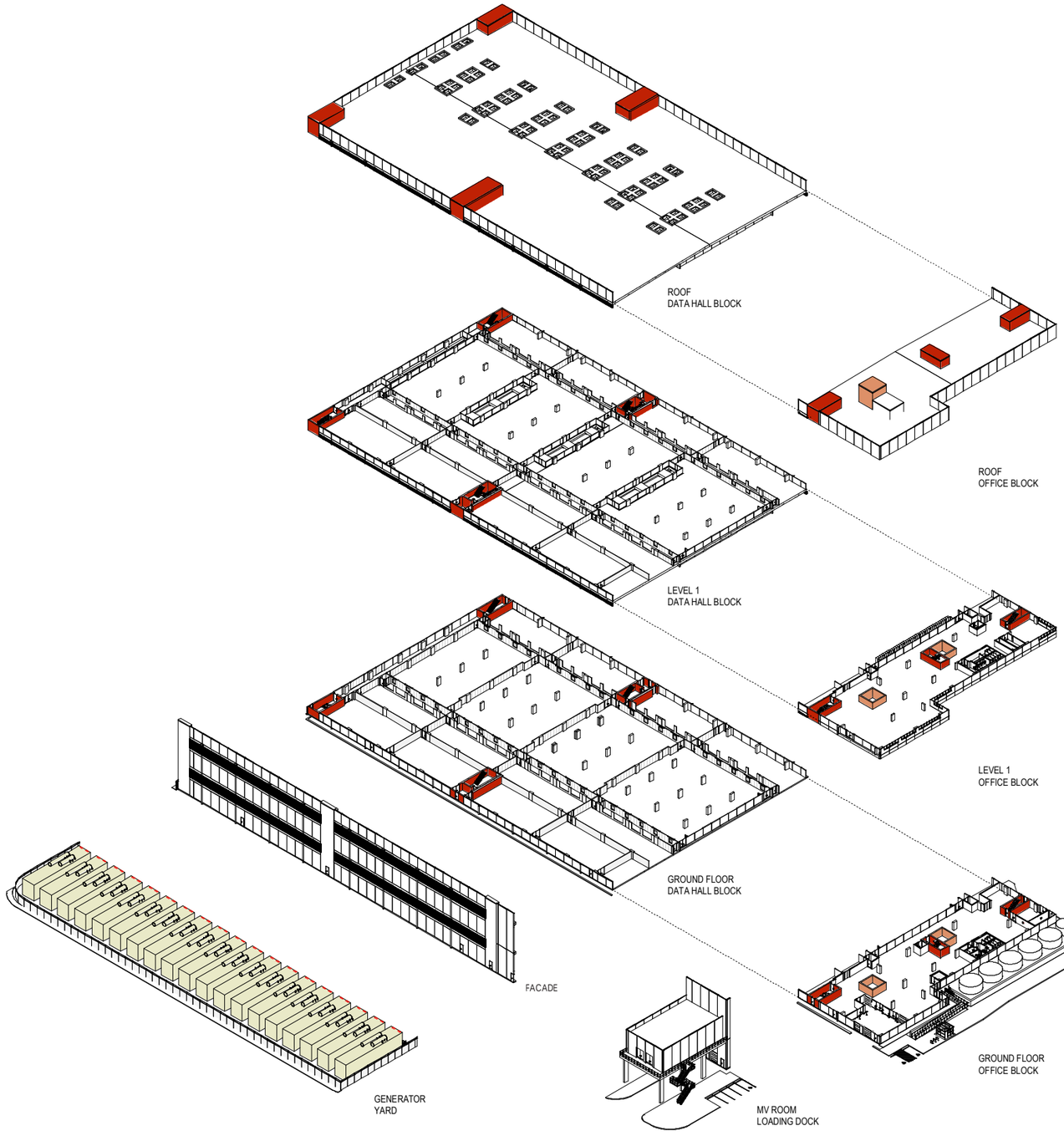
Truck/material movement entry separate to pedestrian vehicle and/or emergency vehicle entry.

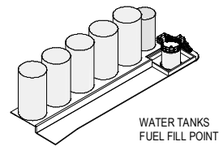
Building sits on site without any clash to setbacks.

LEGEND:

- DATA HALL AREA
- OFFICE AND ADMINISTRATION AREAS
- PLANT AND SERVICES AREAS
- VERTICAL CIRCULATION AREA - OFFICE
- VERTICAL CIRCULATION AREA - DATA HALL

12. BUILDING ELEMENTS





LEGEND:

- VERTICAL CIRCULATION - STAIRS
- VERTICAL CIRCULATION - LIFT SHAFTS

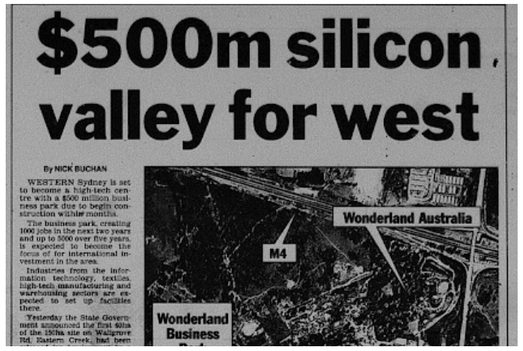
13. ARCHITECTURAL EXPRESSION

SURROUNDING CONTEXT CHARACTERISTICS

PROSPECT RESERVOIR

EASTERN CREEK DRIVE: CORRUGATED STEEL WAREHOUSE

1999: THE BIRTH OF EASTERN CREEK BUSINESS PARK



$500m silicon valley for west

By NICK BUCHAN

WESTERN Sydney is set to become a high-tech centre with a $500 million business park due to begin construction within months.

The business park, creating 1000 jobs in the next two years and up to 5000 over five years, is expected to become the focus of for international investment in the area.

Industries from the information technology, textiles, high-tech manufacturing and warehousing sectors are expected to set up facilities there.

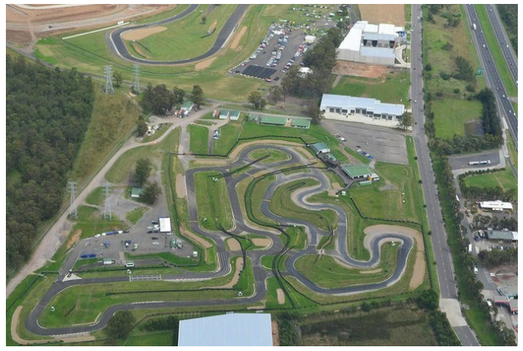
Yesterday the State Government announced the first 40ha of the 150ha site on Wallgrove Rd, Eastern Creek, had been

Wonderland Australia

M4

Wonderland Business

EASTERN CREEK MOTORSPORTS HUB& KARTING PARK



EASTERN CREEK BUSINESS HUB

WESTERN SYDNEY PARKLANDS

SURROUNDING BUILDING TYPOLOGIES

WAREHOUSE

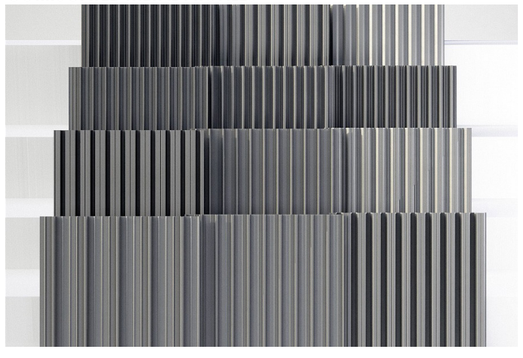
DATA CENTRES

DISTRIBUTION CENTRES

EASTERN CREEK QUARTER

TYPOLOGY STUDY

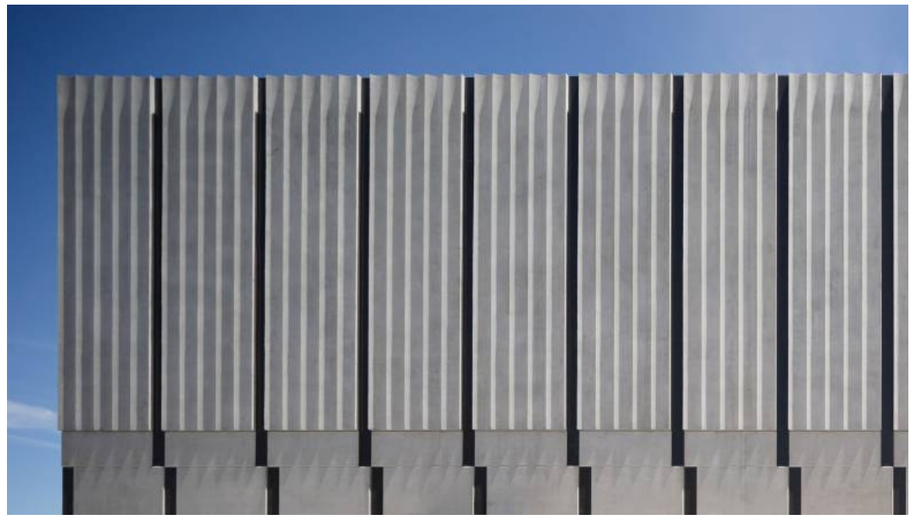
CORRUGATED METAL PROFILES

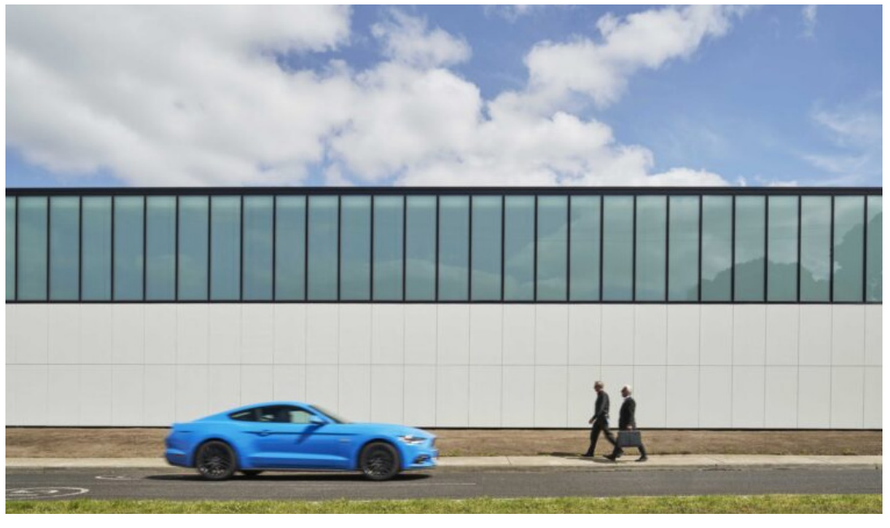


TYPOLOGY APPLICATION

PRECAST PANELS + FINS

VERTICAL EXPRESSION





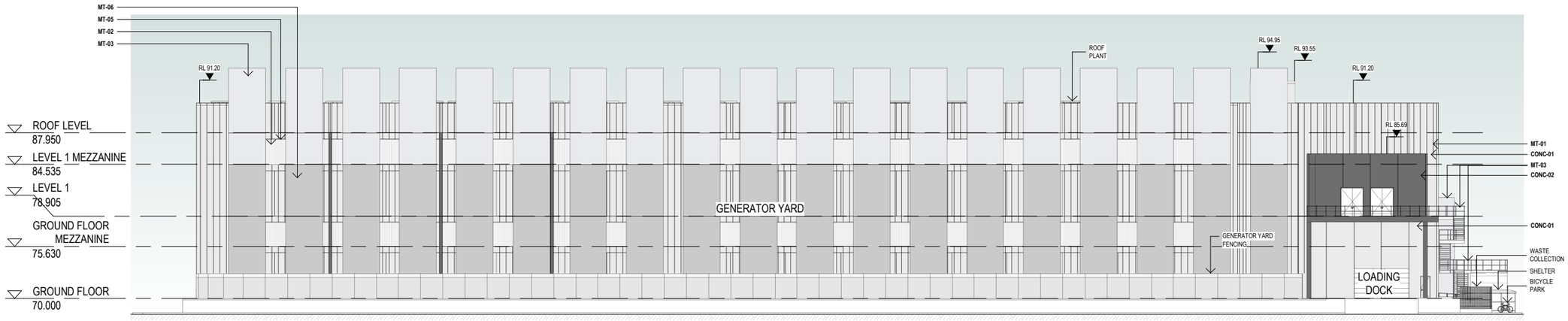
STRUCTURAL EXPRESSION

PRECAST WITH DARK EXPRESSED JOINT

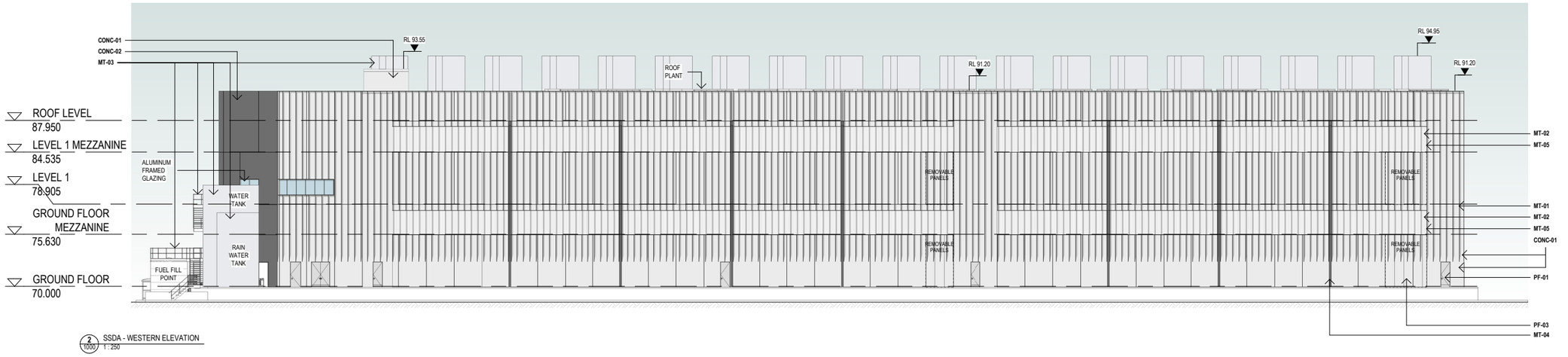
CONSISTENT VERTICAL EXPRESSION

The Architectural designs seeks to descale the length of the long horizontal façade by establishing a clear language of primary, secondary and tertiary elements in the façade with an emphasis on their vertical expression. Importantly this is achieved by maximising existing elements in the built form including precast panel break ups, down pipes, structural supports to screens and attenuation louvres. These are complemented with the addition of prefinished metal fins fixed vertically to the precast facades to create a unified and simplified form. They are extended beyond the roof line to create a higher parapet that unifies the stair overruns and screens roof plant. The use of fins maximises the creation of façade depth with minimal additional material as opposed to other methods of applying layers of material on top of each other that would consume more materials and generate more embodied carbon. The proposal also seeks to “up-spec” the base materials technically required. By embracing these base elements such as precast and enriching through joint expression to create visual interest and tinting the concrete with applied finishes the overall impression is of a higher quality construction.

14. KEY DESIGN FEATURES - LONG ELEVATIONS



1/1000 SSDA - EASTERN ELEVATION
1 : 250



2/1000 SSDA - WESTERN ELEVATION
1 : 250

FINISH LEGEND

METALS

MT-01
LIGHT GREY
FINS
SHROUD AROUND WINDOWS AND DOORS

MT-02
GREY
POWDER COATED LOUVRES

MT-03
STEEL GREY
PRE-FINISHED METAL TANKS AND SERVICES DUCTS AND EXHAUST PIPES

MT-04
DARK GREY
POWDER COATED DOWNPIPES

MT-05
COOL GREY
PERFORATED PARAPET SCREEN

MT-06
PEWTER GREY
PRE-FINISHED METAL DUCTS AND EXHAUST PIPES

APPLIED TINT / PAINTED PRECAST CONCRETE PANELS

CONC-01
COOL GREY
FACADE FINISH

CONC-02
DARK GREY
FACADE FINISH

PAINT COLOURS

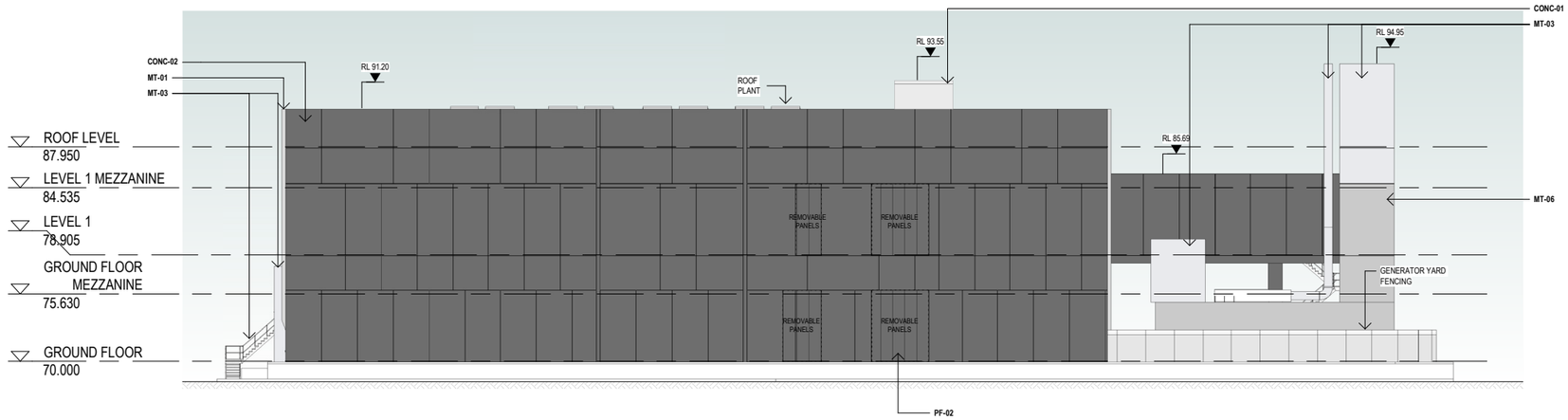
PF-01
LIGHT GREY
DOORS

PF-02
DARK GREY
TEMPORARY PANELS

PF-03
COOL GREY
TEMPORARY PANELS

14. KEY DESIGN FEATURES - SHORT ELEVATIONS

1 / 1000 SSDA - NORTHERN ELEVATION
1 : 250



2 / 1000 SSDA - SOUTHERN ELEVATION
1 : 250

FINISH LEGEND

METALS

MT-01
LIGHT GREY
FINS
SHROUD AROUND WINDOWS AND DOORS

MT-02
GREY
POWDER COATED LOUVRES

MT-03
STEEL GREY
PRE-FINISHED METAL TANKS AND SERVICES DUCTS AND EXHAUST PIPES

MT-04
DARK GREY
POWDER COATED DOWNPIPES

MT-05
COOL GREY
PERFORATED PARAPET SCREEN

MT-06
PEWTER GREY
PRE-FINISHED METAL DUCTS AND EXHAUST PIPES

APPLIED TINT / PAINTED PRECAST CONCRETE PANELS

CONC-01
COOL GREY
FACADE FINISH

CONC-02
DARK GREY
FACADE FINISH

PAINT COLOURS

PF-01
LIGHT GREY
DOORS

PF-02
DARK GREY
TEMPORARY PANELS

PF-03
COOL GREY
TEMPORARY PANELS

15. ARCHITECTURAL CONCEPT PROPOSAL
CONCEPT RENDER - PHOTO MONTAGE

The proposed development responds to the surrounding context in terms of scale/height, materiality and colour. The proposed landscape design creates continuity of the landscape presentation of the street scape afforded by the setbacks. These landscaped setbacks work to reduce the visual dominance and enhance the presentation of the site and the overall street.

15. ARCHITECTURAL CONCEPT PROPOSAL
CONCEPT RENDER - PHOTO MONTAGE

The verticality of the overall architectural expression creates a coherent language for the overall building form. Importantly this elevation is part of the careful consideration to place the proposed building in a position that screens the substation and external plant that has been positioned to face the approved substation.
Successfully using this vertical expression to descale the building while maintaining a consistent and clear overall form was an important consideration in the architectural approach. The perforated metal screens at the parapets soften the top of the building while linking the stair overruns to create consistent that parapet that also screens roof top plant from this view. The precast concrete is used continuously on this façade to create consistency with the short elevations. This view also demonstrates the importance of the landscape approach that obscures the built form and defines the greenery to the street.

15. ARCHITECTURAL CONCEPT PROPOSAL
CONCEPT RENDER - PHOTO MONTAGE

The proposal will announce and redefine the corner of Old Walgrove Road and Eastern Creek Drive. The new built form screens the existing Building 1 Plant and equipment from this prominent corner view as well as the approved substation. The corner has substantial planting extending along both street frontages to create continuity and link to adjacent streets and developments. The precast panels on this elevation have been broken up and include additional expression to create an overall visually interesting texture to the façade that also represents a substantial and well constructed project that contributes to the impression of the industrial estate.

16. DESIGN SUMMARY

The overall proposal will complement and enhance the site and the impression of the estate of Eastern Creek Drive by defining the main entry arrival with new built form and continuous verge planting in the setback that links the corner aspect of the site. This approach supports the objectives of the 2.6.1 Design Objective for NSW in contributing to the character of the context and locality while also meeting the rigorous technical and security requirements these types of facilities require to operate.

The resultant urban, architecture and landscape design proposal delivers minimal impact on the surrounding environment through its consideration to the character, materiality, colour within its context. The design responses we have proposed are based on our research of the context and believe that the proposed development and
surrounding domain will be integrated and resilient throughout the lifecycle of the development and it's operation. Our experience with these facilities has allowed the design to be developed to place external plant and equipment in less sensitive positions that also work with the technical requirements of operating the facility, maintenance and replacement strategies and delivery requirements. It also prioritise people to enjoy the campus by placing the workspaces as close together as possible and clearly linked with internal pathways separated from internal traffic movements.

The proposal will make a positive contribution to the immediate area and serve as a further part of the link between the Western Sydney Parklands and Eastern Creek and also deliver a world class piece of critical technology infrastructure that will support the growth of the region.

ARCHITECTURAL DESIGN MEMO OF BETTER PLACED OBJECTIVES

1.0 BETTER PLACED - AN INTEGRATED DESIGN POLICY FOR THE BUILT ENVIRONMENT OF NSW 2017

OBJECTIVE 1: BETTER FIT

The design of the new data centre has been informed by its site location and local context through the following elements:

- Location of the building sits within an industrial area defined by the immediate industrial land that has large format warehouses and typologies, allowing the building typology to compliment its surrounding context;
- Siting and orientating the building in a way that connects the existing buildings in a campus-style manner while maintaining the key landscape qualities of the approved masterplan;
- Siting the building in a way that conceals the external plant and equipment from the public domain, allowing prominent building elevations and perimeter landscaping to flourish;
- Place-based material selection and architectural language overall. Corrugated treatments around the area are reconceptualised in order to provide an exciting approach to a consistent language local character of buildings in the surrounding area;
- The project is part of the growing nature of Eastern Creek and provides newly essential services in a building. The quality of the building complements the local character and setting, meeting the technical requirements of the facility and adding to the expansive nature of Eastern Creek.

OBJECTIVE 2: BETTER PERFORMANCE

Sustainability is considered a fundamental aspect of functional and whole of life design. The project will achieve an environmentally sustainable response by implementing a series of objectives:

- Environmentally sensitive site response to minimise impacts through considered site layout;
- Durable and adaptable design, and building components are engineered for the entire life of the facility;
- Flexibility and resilience as the building can withstand reconfigurations while retaining the same purpose;
- Minimal use of resources both during and post construction;
- Minimise waste through construction and after building occupation;
- Adoption of advanced engineering practices to minimise emissions and pollution by creating energy efficient design;
- Limitation of additive layered design elements achieving public interest without increasing embodied carbon;
- Use of prefinished and off-site constructed elements for embodied carbon reduction;
- Enhance the site's green areas with additional landscaping and linking them to adjacent landscape to increase the ecological value of the site.

OBJECTIVE 3: BETTER FOR COMMUNITY

The building typology of the data centre adds to an already diverse amalgamation of building uses in Eastern Creek. The proposed building and surrounding public domain will be integrated as part of its context, and adds to the landscape link to achieve landscaping linkages east-west between Western Sydney Parklands, Prospect Reservoir and Eastern Creek. The species selected are endemic and therefore resilient through the life cycle of the development for its community.

The building provides essential infrastructure and services, while ensuring the best possible urban design outcomes are achieved.

Construction and operation of the building will provide employment opportunities for the local community, supporting the notion of a connected community.

The building will also provide an inclusive, equitable environment for both staff and visitors in all aspects, including access to and around the building. The verge landscaping additionally improves visual appearance for all people in the area and provides benefits of passive shading and heat island effects, as well as porous land area for the benefit of all people of the community.

1.0 BETTER PLACED - AN INTEGRATED DESIGN POLICY FOR THE BUILT ENVIRONMENT OF NSW 2017

OBJECTIVE 4: BETTER FOR PEOPLE

The building and its surroundings are designed for people with a focus on safety, comfort, and to enhance linkages and collaboration across the campus.

For staff, the buildings have been sited with clear pedestrian linkages and as close as possible proximity of front doors to enhance social connection across the facilities that constitute the site. Car parking spaces are conveniently located and wayfinding is intuitive due to the considered siting of the buildings. Clear circulation is also provided for truck movements to allow them to access more discreetly located loading docks that are therefore safely out of the way of other visitors to site.

All aspects of the design, from the external approaches to internal spaces have been considered in terms of staff and visitor safety, comfort and support.

OBJECTIVE 5: BETTER WORKING

The campus-style masterplan allows both buildings to work together using the same services infrastructure onsite, allowing for greater facility efficiency and space utilisation.

The new building will comprise of spaces and services infrastructure that will provide a flexible, efficient facility which will accommodate future growth, consolidating the need for the building typology and enabling the building to stay resilient, remaining valuable and well-utilised into the future.

Safety in Design is a high priority in these facilities and has been considered in the way that spaces are designed and accessed through operational use of the building. This is also considered through plant replacement strategies to manage maintenance and replacement study.

OBJECTIVE 6: BETTER VALUE

The building will provide value for the community by providing a piece of infrastructure that is resilient and valuable long-term. The facility supports the 21st century digital economy to enhance the capacity of local businesses. This type of infrastructure investment elevates the standards of Eastern Creek, and in the future will support ongoing return on investment for industry and the community, all while providing a greater quality of life for users of the building.

OBJECTIVE 7: BETTER LOOK AND FEEL

The siting of the new building aims to allow a perimeter landscape opportunity to areas adjacent to roadways, while allowing the corner prominence of the building to express itself in a sensitive, engaging way to the public.

The building consolidates the site entry, allowing a clear demarcation of access through landscaped areas, allowing the campus-style nature of the site to come forth.

The visual qualities of the proposed building will contribute to its surroundings and promote positive engagement with the site. The proposal seeks to achieve this by using existing elements and emphasising the structural rationality of the building and its materiality. By limiting additive layered elements we can achieve visual intensity and interest to the building through depth, light and shadow.

The new building is orientated to the north to capitalise on the natural light into the office areas, with internal offices, meeting rooms and eating areas taking advantage of this setting.

The building provides engaging architectural facades and landscapes as encouraged in the Better Fit and Better for People Design Objectives.