



# URBAN DESIGN AND LANDSCAPE PLAN







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
Cover image:

Artist's impression | Campbell Road ventilation facility – southern side illustrating the 'Gateway to Sydney' view



# URBAN DESIGN AND LANDSCAPE PLAN

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# Abbreviations

AHD Australian Height Datum	ISCA Infrastructure Sustainability Council of Australia	Project WestConnex M4-M5 Link Mainline Tunnels
AS Australian Standards	ITS Intelligent Transport Systems	REMMs Revised Environmental Management Measures
BCA Building Code of Australia	JAJV Jacobs, Aurecon Joint Venture	RL Reduced Level
CASA Civil Aviation Safety Authority	LED Light Emitting Diode	RRB Radio Rebroadcasting
CEMP Construction Environmental Management Plan	LSBJV Lendlease, Samsung and Bouygues Joint Venture	SB Southbound
CFC Compressed Fibre Cement	MCoA Minister's Conditions of Approval	SiD Safety in Design
CSSI Critical State Significant Infrastructure	M&E Mechanical and Electrical	SPI St Peters Interchange
CBD Central Business District	M4 M4 Motorway	SPIR Submissions and Preferred Infrastructure Report
CPTED Crime Prevention Through Environmental Design	M5 M5 Motorway	TfNSW Transport for NSW
DDA Disabilities and Discrimination Act	M4 East WestConnex M4 East	UDLP Urban Design and Landscape Plan
DIRD Department of Infrastructure and Regional Development	MLALC Metropolitan Local Aboriginal Land Council	UPS Uninterrupted Power Supply
DPIE Department of Planning, Industry and Environment	MOC Motorway Operations Complex	VMS Variable Message Sign
DRP Design Review Panel	MUSIC Model for Urban Stormwater Improvement Conceptualisation	WHTBL Western Harbour Tunnel and Beaches Link
DRS Disaster Recovery Site	NB Northbound	WSI Wattle Street interchange
EEC Emergency Equipment Cabinet	New M5 New M5 Motorway	WSUD Water sensitive urban design
EER Electrical Equipment Room	NTS Not To Scale	WTP Water Treatment Plant
EIS Environmental Impact Statement	OLS Obstacle Limitation Surface	
ESD Ecologically Sustainable Development	OSD tank Onsite Detention Tank	
FFL Finished Floor Level		
HIP Heritage Interpretation Plan		



## Definitions

### Artist's impression

Illustrates the overall design intent and equipment shown is indicative only. Street lighting and other road furniture are not shown. Renders in-tunnel excludes equipment (eg jet fans).

### Campbell Road MOC

Campbell Road motorway operations complex.

### Cut and Cover

A trench excavated to construct shallow parts of tunnel and covered with a roof that is strong enough to carry the load of what is built above.

### Dive structure

Retaining structure and feature cladding diving to a tunnel entrance or portal.

### Draft UDLP

UDLP submitted for community and stakeholder display.

### Driven tunnel

The bored part of a tunnel.

### Endemic planting

A species that is unique to and only exists in a particular geographic location.

### Far side

Right side of the vehicle in the direction of travel (driver side).

### Final UDLP

UDLP submitted to DPIE for approval and addresses feedback from community and stakeholder consultation.

### Gateway

There are entrance points which have a high degree of visibility and a distinct sense of transition. Gateways may include landscaping, public art, gateway structures, special lighting and signs.

### Landscape shown at full maturity

Refers to landscape at 15 years, which will vary for each vegetation species.

### Modification 1 Report

WestConnex M4-M5 Link Mainline Tunnel Modification Report

### Native planting

A species considered to grow locally in a specific area or region.

### Near side

Left side of the vehicle in the direction of travel (passenger side).

### Portal

The face and retaining structure immediately at the tunnel entrance, generally located perpendicular to the dive structure.

### Secretary

Secretary of the NSW Department of Planning, Industry and Environment.

### SPI

Refers to the interchange at St Peters for the WestConnex M4-M5 Link Mainline Tunnels and the New M5.

### The project

Refers to the scope of the permanent works of M4-M5 Link Mainline Tunnels between St Peters and Haberfield and all associated surface works.

### Visual catchment

The extent of the likely visibility of the permanent project infrastructure from surrounding areas.



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# Executive summary



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.

Figure i: St Peters interchange – Campbell Road ventilation facility view looking north



Artist's impression  
Landscape shown is indicative only and includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.

Figure ii: Wattle Street interchange portals – southbound entry - night time

## WestConnex M4-M5 Link Mainline Tunnels

The WestConnex M4-M5 Link is delivered in two stages:

- Stage One – WestConnex M4-M5 Link Mainline Tunnels
- Stage Two – WestConnex M4-M5 Link Rozelle interchange.

This report relates only to the WestConnex M4-M5 Link Mainline Tunnels (the project). The project presents an important and challenging opportunity to deliver excellence in architecture, urban and landscape design for public infrastructure. The project is part of the larger 33 kilometre WestConnex program and includes twin motorway tunnels between the M4 East Motorway (M4 East) at Haberfield and the New M5 Motorway (New M5) at St Peters.

This Urban Design and Landscape Plan (UDLP) fulfils a requirement of the Critical State Significant Infrastructure (CSSI) Conditions of Approval. The UDLP for WestConnex M4-M5 Link Rozelle Interchange is being prepared by others under the same Approval.

The project is a Joint Venture between Lendlease, Samsung and Bouygues Joint Venture (LSBJV) team, which includes urban and landscape designers, engineers, environmental planners and other independent specialists such as the Design Review Panel (DRP).

## Key project features

The principal feature of this project include:

- Approximately 7.5 kilometre long twin mainline tunnels
- Tunnel to tunnel connections to the M4 East and New M5 mainline stub tunnels
- Tunnel stubs to provide mainline tunnel connection to Rozelle interchange
- Exit and entry ramp connections
- Architectural finishes to portal facade and dive walls at Wattle Street interchange (WSI)
- Campbell Road motorway operations complex (MOC), which includes the Campbell Road ventilation facility, inlet air supply building, workers amenities, workshop and storage building (ancillary facilities), and water treatment plant (WTP).

This UDLP illustrates only the project elements related to the scope of this M4-M5 Link Mainline Tunnels project. The project interfaces with elements provided by other adjacent projects, such as the M4 East cut and cover structures and landscaping at WSI, New M5 landscaping at St Peters interchange (SPI), New M5 landscaping along Campbell Road and the future Recreational Area to the east of the Campbell Road MOC.

## Project objectives

The design provides the following features to meet objectives outlined in the CSSI Planning Approval Documents:

- Linking the M4 East and New M5 Motorways so further benefits and opportunities of WestConnex can be realised
- Improving traffic conditions and reducing congestion on key arterial roads in proximity to the project
- Facilitating urban renewal in areas where the project will reduce traffic
- Improving accessibility and reliability for commercial vehicle movement in the M4 and M5 Motorway corridors to economic centres, including to the Sydney Airport and Port Botany precinct
- Managing impacts on communities associated with acquisition of residential and commercial properties
- Enabling long-term motorway network development by providing a connection to the proposed future Western Harbour Tunnel and Beaches Link (WHTBL) project to the north
- Delivering a project with a beneficial urban design outcome.

## Project narrative

The project must integrate seamlessly into the overall WestConnex urban design framework.

WestConnex will be delivered in stages, of which this project is the central link completing the motorway. To the public, however, WestConnex will be a single piece of infrastructure regardless of its delivery methodology and needs to be understood in these terms.

The driver experience will form the public's perception of the project and in turn, its identity, legibility and acceptance as a vital piece of Sydney's infrastructure.



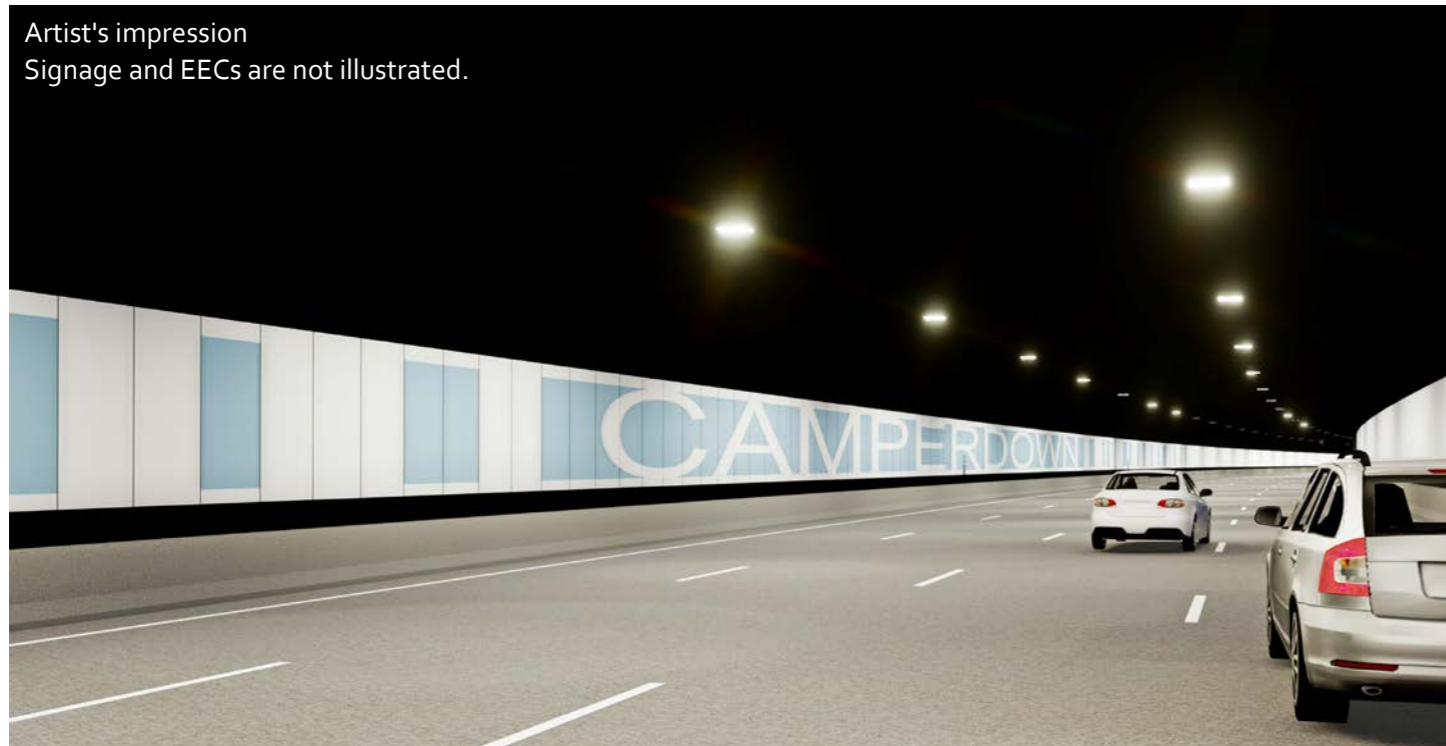


Figure iii: Tunnel visual event

## Enhanced driver experience

Key to understanding the driver experience is the identification of major decision points, an awareness of the driver's constantly shifting visual field and a sense of what may catch the driver's attention at any given point in the journey. These attributes form a continuous experience over time as one travels along the motorway.

The tunnel experience is one of a fast, direct movement through a linear space, with visual elements provided along the way.

Fundamental to the urban design of the tunnel is driver safety and continuity of a similar environment to the other tunnels within metropolitan Sydney.

The in-tunnel narrative has emerged from an observation of the project's context and its integration with the M4 East and the New M5 projects. The design compliments the visual events proposed in the M4 East and New M5, providing continuity to the overall WestConnex driver experience.

The driver experience is enhanced through visual events such as:

- Location markers – these are the points in-between exits represented through suburb names on the wall panels and enhanced lighting, to provide local identity
- Exit markers – these are the exit points, represented through pattern on the wall panels to highlight the exits.



Figure iv: St Peters interchange – Campbell Road ventilation facility view from shared path

## Project architecture

The philosophy for the project's architecture is based on adopting a consistent design approach to facilities. The design responds to function, scale and urban setting.

Pedestrians, local drivers and cyclists experience the project as individual surface elements in a varied landscape.

The architectural language of the project is developed as a family of forms, materials and textures. The architecture addresses both the motorway and human scales. The design also incorporates elements from other stages of WestConnex, providing a consistent branding and identity for WestConnex as a whole.

An Indigenous voice has transformed the architecture of the Campbell Road ventilation facility, delivering an unprecedented work of art, reinforcing a sense of place and delivering a legacy for road users and the community.

## Conclusion

The experience of those using the motorway will be continuous and seamless as one transitions from the M5 to the M4 or other destinations in and around Sydney. The urban design of the project supports this movement with clean, unobtrusive and contemporary elements. The project narrative serves to provide a sense of orientation for this journey and visual delight to, what for many will be an often repeated journey.

For those living and working around the motorway, it offers benefits in the form of reduced pressure from through traffic and the opportunity to reassert a local identity to the corridor. The surface facilities are designed with consideration to its scale, context, history and setting, as elements that are experienced at various speeds by different users.

Public access to the M4-M5 Link Mainline Tunnels motorway will be granted at construction completion of the project, and opening to traffic in 2023.



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# 1.0 Introduction

## 1.1 Purpose

This UDLP describes the urban, architectural and landscape design proposals for permanent works of the project. The purpose of the UDLP is to demonstrate compliance with the following Planning Approval documents, as required by the Minister's Conditions of Approval (MCoA):

- *WestConnex M4-M5 Link Environmental Impact Statement (EIS)* (dated August 2017)
- *WestConnex M4-M5 Link Submissions and Preferred Infrastructure Report* (dated January 2018) (the SPIR)
- *WestConnex M4-M5 Link Mainline Tunnel Modification Report* (dated September 2018)
- *WestConnex M4-M5 Link Mainline Tunnel Modification Report* (dated 25 February 2019) (Modification 1 Report) as amended by the *WestConnex M4-M5 Link Mainline Tunnel Modification Response to Submissions* (dated November 2018) (Modification 1 RtS).

The design of the various project components is developed through an integrated urban design approach. This approach encourages a continuous component evolution and refinement throughout the design and construct period.

The components will, of necessity, receive further development during detailed design stage, arising from detailed engineering requirements and construction constraints. Detailed design is currently in progress for all disciplines.

## 1.2 Design methodology

A group of designers including architects, urban designers, landscape designers and 3D visualisers have prepared this report, working closely with the engineering and construction teams of the LSBJV. Key steps included:

- Attending site visits
- Preparing site analysis
- Identifying opportunities
- Developing urban and landscape design objectives and principles based on overall WestConnex objectives
- Developing design strategies based on driver experience, wayfinding and legacy projects
- Preparing concept sketches and alternate options for ventilation facilities architectural treatment
- Attending and contributing to ongoing Safety in Design (SiD) workshops and risk workshops covering whole of life design and user interface as part of the detailed design
- Preparing presentations as required (internal and external audiences including the DRP).

### Software

- Main Report: InDesign
- Drawings: Civil / Map 3D, AutoCad
- 3D images: 3D Max, Rhino, Sketchup, Revit
- General graphics: Photoshop, Illustrator, PowerPoint.

## 1.3 The team

The project delivery team comprises the following:

- LSBJV – Principal Contractors
- Jacobs, Aurecon Joint Venture (JAJV) – Civil, tunnel and structural engineers
- Conybeare Morrison International Pty Ltd (CM<sup>+</sup>), in association with Context Landscape Design Pty Ltd (Context) – Urban, architectural and landscape designers
- Cultural Capital – Indigenous art curators
- Artists – Esme Timbery and Marilyn Russell
- Other consultants for specific design scope including lighting and SiD facilitators.

Reviews of this UDLP documentation have taken place by external subject matter experts / specialists from:

- M4-M5 Link Group
- Transport for NSW (TfNSW)
- DRP.

Comments and amendments are reflected in this submission.

## 1.4 Design Review Panel

A DRP has been established to satisfy Condition E125 (refer to Table 1-1). The panel has been nominated by LSBJV and approved by the Secretary. It comprises suitably qualified, experienced and independent professionals in each of the fields of architecture, urban design, landscape design and Aboriginal cultural heritage and non-Aboriginal heritage.

The panel is Chaired by the New South Wales (NSW) Government Architect or delegated representative. Terms of Reference have been developed, which outline all the standards and policies for the DRP to comply with.

The DRP has been reviewing the design as it develops and the UDLP, including the WSI tunnel portal dive and façade fitouts, the tunnel portal at SPI and the tunnel support facilities at Campbell Road MOC (excluding the tunnels between portals) to assess the design outcomes and design consistency with commitments and outcomes made in the documents listed in Condition A1 and the *WestConnex M4-M5 Link Mainline Tunnel Modification Report* (Modification 1 Report), refer to Chapter 1.5. The DRP has also been providing advice on the application of objectives to key design elements in relation to placemaking, architecture, heritage, urban and landscape design, public art and aesthetic aspects of the project. The refined design objectives and project principles are outlined in Chapter 2.1 in accordance with Conditions E126 and E127.

The design team has liaised with and presented to the DRP on the following dates:

- 12 February 2019
- 22 March 2019
- 30 April 2019
- 9 August 2019
- 26 March 2020.

The DRP supports the design concepts and the complementary outcome to the M4 East and New M5 design. For the portal design at WSI, the DRP supports the concept of replicating the design rationale used for the M4 East portal design.

The design as presented to the DRP is described within this document and the main comments / recommendations from the panel were related to the following:

- Addressing the refined design objectives for place
- The process of collaboration between the design team and Indigenous cultural and artistic expertise to bring an Indigenous voice to the project (refer to Chapter 5.0)
- Development of the historical context and the design narrative
- Consider the graphic expression of the roof
- Incorporating an Indigenous welcome, celebrating and acknowledging the artists via a plaque / signage
- Ensuring prototypes realise the artwork at full scale to validate the pattern, match the anticipated colours on the panels and provide colour continuity and finish longevity around the panel perforations.

### Approach to incorporating DRP commentary

A review of DRP commentary has been undertaken with consideration of the following:

- Value for money – would the incorporation of the comments be cost effective?
- Maintenance – would the incorporation of the comments lead to additional maintenance requirements?
- Benchmarking – have similar ideas been successfully incorporated in other projects across the world?
- Efficacy – would the incorporation of the commentary lead to the anticipated outcome?

This review has been undertaken as a discussion process as part of the detailed design development and not a detailed scoring assessment.

The recommendations from DRP consultation have been summarised below and incorporated throughout the UDLP. Chapter 5.0 provides the context of integrating art as an expression of the architecture for the ventilation facility at Campbell Road MOC.

- A strong conceptual basis has been incorporated in the design for a place – focused outcome
- The design has been a collaboration of architectural, structural and public art expertise, made possible through the selection of a specialist art curator
- Indigenous artists have been engaged to create the finish of the building, which makes a significant contribution to the understanding of ‘connection to country’
- An iterative design process driven by an art conversation has been developed between the design team and the artists, including identifying and exploring opportunities from Indigenous stories to support a place narrative and generate a representation of the narrative into the architectural expression of the ventilation facility
- A fully integrated artistic expression of the building along with consideration to its massing and form has been developed including:
  - Colour selection
  - Pattern
  - Perforation and implementation methods
  - Response to motion
  - Response to light and shadow
- Additional expressions of the building are:
  - Symbols of waves and shells which could also be understood as a reference to the buildings ‘water story’
  - Secondary, lower level buildings such as the WTP are recessive, to reinforce the legibility of the primary Indigenous artistic expression
  - Air movement expressed by the used of vertical metal battens on ventilation outlets
- The landscaping at SPI has been:
  - Coordinated with its surroundings with colours of flowering plants resonating with the colour palette selected for the façade panels
  - Responds to the local ecology, using a diverse mix of native plant species
  - Positioned along the eastern fence as a greening element for the fence to reduce the visual impact of the WTP facilities
- The roof design is kept simple and purely functional. However, the layout and waterproofing product does not preclude future artistic design development (by others)
- The opportunity to incorporate an Indigenous welcome to celebrate and acknowledge the artists via a plaque / signage is under development on the western side of the ventilation facility, along the shared path. This plaque will acknowledge the artists, present the story behind the beautiful piece of public art and showcase the building as an educational opportunity celebrating local Indigenous art. It will also provide an opportunity to create an Indigenous welcome and incorporate cultural language
- Various sized prototypes of the artwork will be produced as part of the construction process in collaboration with the supplier, their engineers, LSBJV and the artists.

This UDLP will be submitted to the Department of Planning, Industry and Environment (DPIE) for approval. The construction of permanent built works and landscaping as illustrated in this UDLP will commence following approval by the Secretary.



## 1.5 Key design standards and guideline documents

Key documents include:

### Planning Approval documents

- *M4-M5 Link Environmental Impact Statement*, August 2017
- *M4-M5 Link Submissions and Preferred Infrastructure Report*, January 2018
- *Minister's Conditions of Approval*, 17 April 2018
- *WestConnex M4-M5 Link Mainline Tunnel Modification Report*, September 2018
- *WestConnex M4-M5 Link Mainline Tunnel modification – Response to submissions report*, November 2018
- *Consolidated Instrument of Approval*, 25 February 2019.

### Guideline documents

- *Infrastructure Sustainability Council of Australia (ISCA) documents to meet URB-1 and URB-2 requirements*
- *Soil Landscape of Sydney*, Soil Conservation Services of NSW 1989
- *Lighting in the Vicinity of Aerodromes: Advice to Lighting Designer*, CASA, 1999
- *Crime Prevention through Environmental Design Guidelines*, NSW Police, April 2001
- *NSW Bicycle Guidelines*, Road and Traffic Authority NSW, Version 1.2, July 2005
- *Landscape Guideline*, RTA, April 2008
- *National Airports Safeguarding Framework Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports*, DIRD, 2012
- *WestConnex Motorway Urban Design Framework*, WestConnex Delivery Authority – Roads and Maritime Services Centre for Urban Design, September 2013
- *Beyond the Pavement, Urban Design Policy Procedures and Design Principles*, Transport Road and Maritime Services Centre for Urban Design, February 2014
- *Guide to Road Tunnels, Austroads*, 2015
- *Tunnel Urban Design Guideline*, Roads and Maritime Services Centre for Urban Design, October 2016

- *Water Sensitive Urban Design Guideline*, Roads and Maritime Services, May 2017
- *Better Placed – an integrated design policy for the built environment in NSW, GANSW*, 13 September 2017
- *Greener Places – establishing an urban Green Infrastructure policy for NSW, GANSW*, October 2017
- *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, Transport Road and Maritime Services Centre for Urban Design, Version 2, 14 December 2018.

### Relevant standards

- *AS 4282-1997 Control of the obtrusive effects of outdoor lighting*
- *AS/NZ 1158 – 1999 Lighting for Roads and Public Spaces*
- *National Construction Code*, 2019.

## 1.6 Document structure

This report has been structured to identify design responses and strategies along the project corridor, to demonstrate compliance with the MCoA and the Revised Environmental Management Measures (REMMs), refer to Table 1-1 and Table 1-2, respectively, for details.

Report chapters are organised to represent the journey from the south (connection to New M5 ) to the north (connection to M4 East). Description of individual chapters are as follows:

### 1.0 Introduction

Introduces the project, demonstrates compliance with the relevant approval documents and provides a summary of the consultation undertaken to date.

### 2.0 Project objectives, principles and strategies

Describes the EIS project objectives, their consideration and application. It outlines the principles and strategies established for individual project elements including buildings, the tunnel and portals.

### 3.0 Project context

Provides a brief contextual analysis of the project, and analysis at macro and micro levels with a particular focus on urban design and landscape related issues.

### 4.0 Design narrative

Outlines the overall project design narrative and benchmarking studies undertaken for various project elements.

### 5.0 St Peters interchange

Illustrates the design for the portal under the cut and cover structure supporting the Campbell Road ventilation facility, the Campbell Road MOC at SPI and their materials, finishes and colours.

### 6.0 Tunnel

Illustrates the in-tunnel urban design concepts and their materials, finishes and colours.

### 7.0 Wattle Street interchange

Illustrates the WSI portal design concepts and their materials, finishes and colours.

### 8.0 Conclusion

Summarises the overall design outcomes.



Figure 1-1: Key guideline documents



## 1.7 Consultation

Community and stakeholder consultation for the project has been carried out in line with the approved Community Communications Strategy, which identifies key stakeholders, communities, and the methods through which they are consulted.

LSBJV is committed to working with the community and key stakeholders, to wherever possible, achieve good, long term outcomes including undertaking consultation on the draft UDLP with the local community and key stakeholders, such as Inner West and City of Sydney Councils, DRP and other agencies. This consultation has been carried out in accordance with Conditions E134 (b) and E134 (c).

Consultation on the draft UDLP started in early 2019 through engagement with the DRP and Indigenous artists as well as briefings to the Inner West Council held in held on 26 August 2019 and with the City of Sydney Council held on 12 December 2019.

Feedback from the community and key stakeholders was officially invited over a six week public display period from 9 December 2019 until 20 January 2020. A six week display period was chosen instead of the usual four weeks, in recognition of the fact the exhibition was during, what is a busy period for many people. The project was also happy to extend the submission due date to anyone that needed more time.

### Evidence / outcome of consultation

Consultation and communication activities undertaken are listed below:

- Two drop in Community Information Sessions were attended by subject matter experts on Wednesday, 11 December (refer to Figure 1-3) and Saturday, 14 December
- Distributed 10,000 invitations to the Community Information Sessions on 27 November 2019
- Distributed 2,000 January tunneling progress notifications on 17 December, which included advice that the draft UDLP is on public exhibition until 20 January 2020
- Placed three rounds of advertisements in the Inner West Courier advising that feedback on the UDLP is being sought by 20 January 2020. Advertisements were published on 3 December, and 10 December 2019 as well as and 13 January 2020 (refer to Figure 1-4)

- Set up unattended information displays with hard copies of the draft UDLP at:

- Glebe Library at 186 Glebe Point Road, Glebe
- Ashfield Services Centre at 22 Charlotte Street, Ashfield
- Petersham Service Centre at 2-14 Fisher Street, Petersham
- Annandale Community Centre at 79 Johnston Street, Annandale
- M4-M5 Link Tunnels Community Information Centre at 201-205 Parramatta Road (corner of Alt Street), Haberfield (refer to Figure 1-2)
- M4-M5 Link Tunnel Project Office at 189 O’Riordan Street, Mascot

- The draft UDLP was made available on the project website [www.westconnex.com.au](http://www.westconnex.com.au)

- Emailed 3,500 people on the project database advising the draft UDLP is on display and to visit the website for more information as well as a follow up reminder on 20 December 2019 and again on 13 January 2020

- Used the WestConnex social media platform to advise the draft UDLP is on display and to encourage submission by 20 January 2020

- A media release was also prepared by the project team in conjunction with the architects and the Indigenous art curators, however this was never published

- Targeted consultation was also carried out with key stakeholder groups and included:

- Briefing Inner West Council on 26 August 2019
- Briefing the City of Sydney Council on 12 December 2019
- Door knocked 500 properties that live close to the Campbell Road ventilation facility at St Peters on 12 December and 13 December 2019.



Figure 1-2: Draft UDLP on display at the Community Information Centre 201 Parramatta Road, Haberfield



Figure 1-3: Photograph from the Community Information Session held at Sydney Park Pavilion on Wednesday 11 December 2019



Figure 1-4: Advertisements in the Inner West Courier



**Response to UDLP consultation**

A total of eight submissions comprising 41 comments were received. All submission were received via email.

The number of submissions / comments received are summarised in Table 1-1.

Table 1-1: Number of submissions and comments

Stakeholder	Submissions	Comments
Inner West Council	1	14
Residents	6	10
DPIE	1	17

The comments received and the project’s response to the comments have been submitted back to the DPIE (via the M4-M5 Link Group) prior to finalisation of the UDLP. A summary of the consultation comments were presented to the DRP dated 26 March 2020.

No comments were received from Civil Aviation Safety Authority (CASA), Department of Infrastructure and Regional Development (DIRD) or Sydney Airport operators during the public consultation period for the UDLP. However, consultation is undertaken separately to ensure the design met the requirements of E134 (p) inclusive.

No comments were received directly from local businesses during the public consultation period for the UDLP.

No comments were received from the City of Sydney Council in response to the specific UDLP briefing or during the public consultation period for the UDLP.

Comments received from the consultation have been grouped into the following categories and as a result adjustments have been made to the UDLP. They have been ranked according to the frequency of the issues raised.

1. Landscape
2. Art
3. Safety
4. DRP Methodology
5. Public consultation methodology
6. Technical requirements
7. WestConnex integration.

The comments were predominantly related to the following:

- Landscape comparison at establishment and at maturity
- Opportunities for landscape and open space provisions outside the project boundary
- Confirmation of landscape regimes, staging and maintenance
- Domination of architecture over the art expression
- Additional First Nations themes not incorporated into the art design
- Colours not being representative of Indigenous art
- Artwork to be extended to the ventilation outlets
- Confirmation of incorporation of CPTED principles
- Evidence / outcome of consultation
- Approach to design integration with other stages of WestConnex
- Integration with other sections of WestConnex.

With respect to the comments on the artwork, no change has been made to the UDLP. The artwork has been developed by the Indigenous artists and the themes proposed are important to their people and connection to country. This includes the selection and arrangement of colours, patterns, and perforated imagery. The artists are immensely proud of the outcome and the project supports the art vision for the building. Images at establishment have been included.

Some modifications have been made to improve the UDLP in light of the feedback received, as follows:

- Images at landscape establishment have now been included, illustrating the shape, height and spread of the vegetation at two snap-shots in time (Refer Figure 5-78 to 5-87)
- Landscaping has been provided within site boundaries of this project. References have been made to other documents or Approvals that are outside the scope of this project (refer to Chapter 5.11)
- Additional information on landscape regimes, staging and maintenance has been included (refer to Chapter 5.11)
- Additional details on how CPTED principles have been applied, in areas of the project with surface works, have been included in Table 2-3
- Additional information has been included to demonstrate integration with other sections of WestConnex, including justification of areas of distinction with the New M5 built forms (refer Chapter 5.9 and Chapter 8.0)

Detailed comments received and the project’s response are submitted to the DPIE (via the M4-M5 Link Group) with the final version of the UDLP.

## 1.8 Compliance with MCoA

The design is undertaken to meet the conditions outlined in the DPIE's MCoA relevant to permanent works of the project, as identified in Table 1-2 below.

Table 1-2: Compliance with MCoA

Clause No.	Minister's Conditions of Approval	Document reference
<b>Lighting and Security</b>		
E122	The Proponent must construct and operate the Critical State Significant Infrastructure (CSSI) with the objective of minimising light spillage to residential properties. All lighting associated with the construction and operation of the CSSI must be consistent with the requirements of Australian Standard 4282-1997 Control of the obtrusive effects of outdoor lighting and relevant Australian Standards in the series AS/NZ 1158 – Lighting for Roads and Public Spaces. Notwithstanding, the Proponent must provide mitigation measures to manage any residual night lighting impacts to protect properties adjoining or adjacent to the CSSI, in consultation with affected landowners.	Chapters 5.7 and 7.2
E123	The Proponent must construct and operate the CSSI with the objective of avoiding adverse or distracting lighting configuration, spillage or intensity to aircraft operations. All lighting associated with the construction and operation of the CSSI must adhere to the Lighting in the Vicinity of Aerodromes: Advice to Lighting Designer (CASA, 1999) and National Airports Safeguarding Framework Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports (DIRD, 2012). Notwithstanding, the Proponent must provide mitigation measures to manage any residual night lighting impacts to protect aircraft operations, in consultation with CASA and DIRD.	Chapters 5.7 and 7.2
E124	Notwithstanding Condition E123, the Proponent must consult with CASA, DIRD and Sydney Airport Operators prior to the commencement of construction to determine the need and potential positioning of aviation hazard lighting on any equipment or built form component associated with the CSSI where such consultation deems it necessary.	Chapter 5.7
<b>Design review panel</b>		
E125	The Proponent must establish a Design Review Panel during detailed design and prior to construction.	Chapter 1.4
E126	During design development of the CSSI, the Design Review Panel must review the design (excluding the tunnels between portals) to assess whether it is consistent with the commitments and outcomes made in the documents listed in Condition A1.	Chapter 1.4

Clause No.	Minister's Conditions of Approval	Document reference
E127	The Design Review Panel must refine the design objectives for place making, public realm and urban and heritage interpretation applicable to the length of the project and provide advice on the application of the objectives to key design elements in relation to place making, architecture, heritage, urban and landscape design and public art and aesthetic aspects of the CSSI. The Panel must also review all Urban Design and Landscape Plan(s) prior to these being submitted to the Secretary. Evidence of this review and the Proponent's consideration of the review is to be provided to the Secretary.	Chapter 1.4
E128	"The Design Review Panel must be comprised of, a suitably qualified, experienced and independent professional in each of the fields of: (a) architecture; (b) urban design; (c) landscape design; and (d) Aboriginal cultural heritage and non-Aboriginal heritage.  The NSW Government Architect (or representative) is to be the Chair of the Panel.  The Proponent and its contractor(s) are to be invited onto the Panel as observers only and to provide technical advice. The Proponent is to provide independent secretarial resources to the Panel."	Chapter 1.4
E129	The Design Review Panel members must be nominated by the Proponent and approved by the Secretary in accordance with the timeframes in Condition E125.	Chapter 1.4
E130	Nomination and appointments of the Design Review Panel must comply with the Public Service Commission's Appointment Standards: Boards and Committees in the NSW Public Sector guideline.	Chapter 1.4





Clause No.	Minister's Conditions of Approval	Document reference
E131	Once the Design Review Panel is composed, and prior to the detailed design of the CSSI, a Design Review Panel Terms of Reference is to be developed and endorsed by all panel members. The Terms of Reference must be submitted to the Secretary for information and:  (a) establish best practice governance and protocols for the operation of the Design Review Panel; (b) include a Code of Conduct; (c) outline the agreed frequency of Design Review Panel meetings, coordinated with Proponent program requirements, to ensure timely advice and design adjustment; and (d) outline secretariat functions and administration including the recording and storing of meeting agendas, minutes and actions.	Chapter 1.4
E132	The Design Review Panel is to be operated and managed in accordance with the approved Design Review Panel Terms of Reference and in accordance with the NSW Government Boards and Committees Guidelines (Department of Premier and Cabinet, September 2015).	Chapter 1.4
<b>Urban design and landscape plan</b>		
E133	An Urban Design and Landscape Plan(s) (UDLP) must be prepared based on the detailed design, and in accordance with the project objectives, and the commitments made in Chapters 13 and 29 of the EIS and updated in Part E of the SPIR.	M4M5-CMPL-UDA-PRW-LD01-DPK-0001 (This document)  Note: Refer to Chapter 2.1 for the project objectives and how the commitments made in the Planning Approval Documents have been addressed.
E134	The Urban Design and Landscape Plan(s) must be prepared by a suitably qualified and experienced person(s) in consultation with the relevant council(s), UrbanGrowth NSW, the community and affected landowners and businesses. The UDLP(s) must include, but not necessarily be limited to:	Chapters 1.2 and 1.7  Note: Consultation with UrbanGrowth is not relevant to this project, as it is required only when the Panel convenes to discuss matter related to Rozelle Rail Yards and its surrounds.
<u>Objectives, Principles and Standards</u>		
(a)	Demonstrated consideration of design objectives, principles and standards including:	Chapter 2.1
(i)	Local environmental and heritage values,	Chapters 2.2 and 2.3
(ii)	Urban design context,	Chapter 3.0
(iii)	Sustainable design and maintenance,	Chapter 2.4
(iv)	Community safety, amenity and privacy including 'safer by design' principles where relevant,	Chapter 2.5
(v)	Relevant design standards and guidelines,	Chapter 1.5
(vi)	Prioritising the visual amenity and values of adjoining receivers over the road user experience,	Chapter 5.12

Clause No.	Minister's Conditions of Approval	Document reference
(vii)	Minimising the footprint of the project (including operational facilities), and	Chapter 5.0
(viii)	The urban design principles outlined in the document referred to in Condition A1, and	Chapter 2.1
(ix)	The urban design principles outlined in Better Placed and Greener Places by the NSW Government Architect; and	Chapter 5.11
(x)	DRP review.	Chapter 1.4
<u>Consultation</u>		
(b)	Details of where and how recommendations from the Design Review Panel have been incorporated into the plan;	Chapter 1.7  Note: Consultation with UrbanGrowth is not applicable to this project as noted in Condition E134.
(c)	Evidence of consultation with the relevant council(s), UrbanGrowth NSW and the community on the proposed urban design and landscape measures, prior to finalisation of the UDLP, and details of how the outcomes of this consultation have informed the development of the UDLP;	Chapter 1.7  Note: Consultation with UrbanGrowth is not relevant to this project, as it is required only when the Panel convenes to discuss matter related to Rozelle Rail Yards and its surrounds.
<u>Context and Form</u>		
(d)	An analysis of the built, natural and community context and the urban design objectives, principles and standards for the CSSI;	Chapters 2.0 and 3.0
(e)	Detailed consideration of integration and continuity with urban design and landscape outcomes for the M4 East and New M5 projects taking into account the respective UDLP(s) for each project;	Chapter 8.0
(f)	Landscaping and building design opportunities to mitigate the visual impacts of road infrastructure and operational fixed facilities (including ventilation outlets, tunnel portals, Motorway Operations Complexes, noise walls etc.);	Chapters 5.0, 6.0 and 7.0
(i)	Building placement, designs and landscaping that are reflective of the local built form	Chapter 4.0 and Chapter 5.0
<u>Design</u>		
(j)	The design of the project landform and earthworks;	Chapters 4.0 and 5.0
(k)	The design of the CSSI elements including their form, materials and detail (including the City West Link pedestrian and cycling green link identified in Condition E120);	Chapters 5.0, 6.0 and 7.0  Note: City West Link pedestrian and cycling green link identified in Condition E120 is not applicable to this project.

Clause No.	Minister's Conditions of Approval	Document reference
(l)	A description of the CSSI design features, including graphics such as sections, perspective views and sketches of key elements of the CSSI;	Chapters 5.0, 6.0 and 7.0
(m)	Visual screening requirements;	Chapters 5.11
(o)	Demonstrated integration of Crime Prevention Through Environmental Design principles into the detailed design process;	Chapters 2.5
<b>Lighting</b>		
(p)	An assessment of the location, design and impacts of operational lighting associated with the CSSI and measures proposed to minimise lighting impacts in accordance with Conditions E122, E123 and E124;	Chapters 5.7 and 7.2
<b>Heritage</b>		
(r)	The location of existing heritage items;	Chapters 3.4, 3.5 and 3.6
(s)	Information on the reuse of heritage items and items of significance to the urban form and landscape character including identification of opportunities for interpretative and innovative reuse of salvaged items from the Rozelle Rail Yards to ensure the character of the land remains connected to previous and surrounding industrial, transport and maritime land uses;	Chapter 2.3
<b>Landscaping</b>		
(t)	A description of disturbed areas (including construction ancillary facilities) and details of the strategies to progressively rehabilitate, regenerate and / or revegetate these areas;	Chapter 5.11
(u)	Details on the location of existing vegetation and proposed landscaping (including use of endemic and advanced tree stock where appropriate). Details of species to be replanted/ revegetated must be provided, including their appropriateness to the areas and habitat for threatened species;	Chapter 5.11
(v)	Demonstrated integration of water-sensitive urban design principles into the detailed design process and maximisation of integration of existing and enhanced water features into the open space features of the site including enhancements to Whites Creek and other waterways as well as the constructed wetland;	Chapter 5.11 Note: Enhancements to Whites Creek and other waterways including constructed wetland is not relevant to this project.
<b>Implementation and monitoring</b>		
(w)	The timing for implementation of access, landscape and open space initiatives; and	Chapter 5.11
(x)	Monitoring and maintenance procedures for the built elements, rehabilitated vegetation and landscaping (including weed control) including performance indicators, responsibilities, timing and duration and contingencies where rehabilitation of vegetation and landscaping measures fail.	Chapter 5.11

Clause No.	Minister's Conditions of Approval	Document reference
<b>E135</b>	The Urban Design and Landscape Plan(s), and its sub-plans, must be reviewed by the Design Review Panel. The Proponent must respond to the outcomes of the Design Review Panel's review and submit the UDLP to the Secretary for approval no later than one (1) month prior to the construction of permanent built surface works that are the subject of the Urban Design and Landscape Plan(s) (in the area to which the UDLP applies) or earth works for the final surface contouring of the Rozelle Rail Yards open space, whichever is the sooner.	Chapter 1.4 Note: Items related to Rozelle Rail Yards are not relevant to this project.
<b>E136</b>	Construction of permanent built works or landscaping that are the subject of the Urban Design and Landscape Plan must not be commenced (in the area to which the UDLP applies) until the Urban Design and Landscape Plan(s) has been approved by the Secretary, after taking into consideration advice received from the Design Review Panel.	Chapter 1.4
<b>E137</b>	The Urban Design and Landscape Plan(s), as approved by the Secretary, must be implemented during construction, as required, and operation.	Chapter 1.1
<b>Overshadowing</b>		
<b>E138</b>	Existing residential properties (and approved residential developments, at the time of this approval) that are affected by overshadowing from the CSSI (including any noise mitigation measures) are to receive a minimum of three (3) hours of direct sunlight in habitable rooms and in at least 50% of the principal private open space area between 9:00 am and 3:00 pm on 21 June. Such properties must be identified for further consideration by the Proponent in a Solar Access and Overshadowing Report which addresses compliance with these requirements.	Chapter 5.10
<b>Operational Maintenance</b>		
<b>E139</b>	The ongoing maintenance and operation costs of urban design, open space, landscaping and recreational items and works implemented as part of this approval will remain the Proponent's responsibility until satisfactory arrangements have been put in place for the transfer of the asset to the relevant authority. Prior to the transfer of assets, the Proponent will maintain items and works to at least the design standards established in the Urban Design and Landscape Plan, and its sub-plans, required by Condition E133.	For landscape maintenance summary, Refer to Chapter 5.11. Note: Maintenance and operation costs of built elements are provided in engineers and contractors Operation and Maintenance manuals.





Clause No.	Minister's Conditions of Approval	Document reference
<b>Biodiversity</b>		
E174	The clearing of native vegetation must be minimised with the objective of reducing impacts to any threatened species, populations and ecological communities to the greatest extent practicable. Impacted vegetation must be rehabilitated with endemic species (in the first instance) and locally native species to the greatest extent practicable.	Chapter 5.11
<b>Non-Aboriginal Historical Archaeology</b>		
E167	The Proponent must prepare a Heritage Interpretation Plan, as committed to in the SPIR (NAH02) which identifies and interprets the key heritage values and stories of heritage items and heritage conservation areas impacted by the CSSI. The Heritage Interpretation Plan must include, but not be limited to:	Chapter 2.3
(a)	A discussion of the key interpretive themes, stories and messages proposed to interpret the history and significance of the affected heritage items and sections of heritage conservation areas; and	Chapter 2.3
(b)	Identification of interpretive initiatives implemented to mitigate impacts to archaeological relics, heritage items and conservation areas affected by the CSSI.	Chapter 2.3
<b>Pre-clearing Surveys</b>		
E177	The CSSI must be designed to retain as many trees as possible. Where trees are to be removed, the Proponent must provide a net increase in the number of replacement trees. Replacement trees must be planted within, and on public land up to 500 metres from the CSSI boundary. Replacement tree plantings can be undertaken beyond 500 metres on public land within the local government areas to which the CSSI approval applies if no more plantings are practicable within and up to 500 metres from the CSSI boundary. The location of the trees must be determined in consultation with the relevant authority(s).	Chapter 7.1
E178	Replacement trees are to have a minimum pot size of 75 litres except where the plantings are consistent with the pot sizes specified in a relevant authority's plans / programs / strategies for vegetation management, street planting, or open space landscaping, or as agreed by the relevant authority(s).	Chapter 7.1
E179	The Proponent must submit to the Secretary a report which details the type, size, number and location of replacement trees. The report must demonstrate how any replacement plantings with a pot size less than 75 litres are consistent with the requirements of Condition E178. The report must be submitted to the Secretary one (1) month prior to operation.	Chapter 7.1

## 1.9 Compliance with REMMs

Table 1–3 demonstrates compliance with the REMMs as identified in Part E, Chapter E1 of the SPIR and further amendments or deletions as identified in Chapter 8 of the Modification 1 Report. Only the REMMs applicable to the permanent works are addressed in Table 1-3.

Table 1-3: Compliance with REMMs

Ref No	Environmental management measure	Document reference
PL4	Existing residential properties (and residential developments approved prior to project approval) that are affected by overshadowing from the final detailed design of the project (including any noise mitigation measures) are to receive a minimum of three hours of direct sunlight in habitable rooms and in at least 50 per cent of the principal private open space area between 9.00 am and 3.00 pm on 21 June. Such properties must be identified for further consideration by the Proponent in a Solar Access and Overshadowing Report which addresses compliance with these requirements: <ul style="list-style-type: none"> <li>Where existing residential development currently receives less than the required amount of solar access, existing access to sunlight during operation should not be unreasonably reduced</li> <li>Where affected properties include dwellings held under strata or community title, these requirements must be interpreted in relation to individual units within those properties.</li> </ul>	Chapter 5.10
UD1	Prepare an Urban Design and Landscape Plan (UDLPs) for permanent built works and landscaping in consultation with relevant councils, stakeholders and the community. The construction of permanent built works will not commence until the element is included in a suitably prepared and approved UDLP, unless otherwise agreed to by the Secretary.	This document M4M5-CMPL-UDA-PRW-LD01-DPK-0001 forms the UDLP and will be approved by the Secretary once consultation with relevant stakeholders (including the community and the DRP) is completed.
UD3	Specific design measures at surface operational infrastructure to prevent crime, based on principles of CPTED, will be identified and implemented at each facility prior to the commencement of facility operation.	Chapters 2.5
UD4	Wayfinding signage for the road infrastructure will be developed to the satisfaction of Roads and Maritime. Consultation will occur with the relevant local council regarding road signs for council roads. Signage for road infrastructure will be installed prior to the commencement of operation.	Chapters 6.0
UD5	Establish an Urban Design Review Panel to provide advice and input into the development of the UDLP and associated sub-plans. Where an UDLP is required to address heritage matters, the panel will include an independent heritage architect.	Chapters 1.4 and 2.1

Ref No	Environmental management measure	Document reference
LV8	Visible elements of operational facilities will be designed to satisfy functional requirements and adopt the design principles detailed in the M4-M5 Link Urban Design Report. The proposed designs will be documented in the relevant UDLP for the project.	Chapters 5.0, 6.0 and 7.0
LV9	The slopes of vegetated batters that form part of the final urban design and landscaping solution will be limited to no more than 1:4 where possible in order to maximise the impact of vegetation on these batters and minimise maintenance.	Chapter 5.11
LV20	The architectural design, detailing, fencing and landscaping of the water treatment plant would consider potential views from the proposed adjacent open space areas for the New M5 project.	Chapter 5.8
LV21	The UDLP sub-plan for the area adjoining Campbell Road motorway operations complex is to be consistent with the New M5 St Peters Interchange Recreational Area Sub-plan.	Chapter 5.11
LV22	Investigate measures during detailed design to reduce the height, bulk, scale and enhance the landscape setting of the ventilation outlets, subject to achieving desired ventilation outcomes, and in accordance with the design principles detailed in the M4-M5 Link Urban Design Report.	Chapter 5.7 and 5.12
B6	As many trees as possible will be retained during construction. In the event that tree removal cannot be avoided, a tree replacement strategy will be prepared. Replacement trees will be included in the relevant UDLP. Opportunities for the provision of replacement trees outside the project boundary will be investigated in consultation with local councils.	Chapter 7.1
OB9	The UDLP will include compensatory planting for trees removed by the project. The plan will include: <ul style="list-style-type: none"> <li>- A tree replacement strategy</li> <li>- Species recommendations for the landscape design to consider, including foraging trees for the Grey-headed Flying-fox</li> <li>- Relevant project specific rehabilitation and revegetation measures associated with the M4 East and New M5 projects, where there is an overlap in use of project footprint.</li> </ul>	Chapter 7.1



## 2.0 Project objectives, principles and strategies

### 2.1 Project objectives

The urban design objectives align with the objectives outlined in the *WestConnex Motorway Urban Design Framework* and the Planning Approval documents, as summarised in Table 2-1.

#### WestConnex Motorway Urban Design Framework - urban design objectives

Table 2-1: WestConnex Motorway urban design framework - urban design objectives



<b>A</b>	<p><b>Leading edge environmental responsiveness</b></p> <p>Planning, design, construction and long-term management shall be based upon a natural systems approach which is responsive to the environment and promotes the highest levels of sustainability.</p>
<b>B</b>	<p><b>Connectivity and legibility</b></p> <p>Build connectivity across the city, beyond the boundaries of the motorway corridor and promote increased legibility of places, buildings, streets and landmarks.</p>
<b>C</b>	<p><b>Placemaking</b></p> <p>Create beautiful places, streets, structures and landscapes that draw their form, character and materiality from local context, the intrinsic natural and cultural qualities of each locale.</p>
<b>D</b>	<p><b>Urban renewal and liveability</b></p> <p>Enable opportunities for urban renewal and provide high levels of urban amenity and liveability.</p>
<b>E</b>	<p><b>Memorable identity and a safe, enjoyable experience</b></p> <p>Provide a memorable project identity and experiences for road users and adjacent stakeholders which are safe, convenient and enjoyable.</p>
<b>F</b>	<p><b>A new quality benchmark</b></p> <p>Provide design and construction quality of world class standard. WestConnex shall establish a new benchmark for integrated sustainability, engineering, art, architecture and urban design.</p>

#### WestConnex M4-M5 Link Environmental Impact Statement - urban design objectives

The principles and considerations documented from the source documents (as listed in Condition A1), have developed as the design has evolved. The principles and updated considerations form the refined objectives as described in Table 2-2. These refined design objectives have been agreed with the DRP such that the design achieves aspirations for placemaking and urban regeneration, in so far as the project scope and boundary permits. The methodologies described in Table 2-2 inform the development of individual project elements for buildings, tunnels, portals and landscape.



Project urban design objectives

Table 2-2: Project principles and implementation methodology

Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
<p><b>F</b></p>	<p><b>An integrated and collective approach</b></p> <p>Create holistic and integrated design solutions generated by collaboration across disciplines, the community, stakeholders and government bodies.</p> 	<ul style="list-style-type: none"> <li>▪ Work across disciplines</li> <li>▪ Hold regular stakeholder workshops to contribute to design options</li> <li>▪ Prioritise community input</li> <li>▪ Work with all future plans and government bodies</li> <li>▪ Consider relevant regulatory frameworks on the site and in the surrounding areas</li> <li>▪ Consult and collaborate with Indigenous Groups</li> <li>▪ Engage with the DRP early in the design process to seek timely advice.</li> </ul> 	<ol style="list-style-type: none"> <li>1. Realisation of design improvements through effective design management</li> <li>2. Creation of a co-located project office to share ideas and data</li> <li>3. Collaborative team approach with architects, urban and landscape designers coordinating across all technical engineering disciplines, sustainability and environmental teams</li> <li>4. All teams work in a 3D model space and share data on a weekly basis to check clashes, enable a fully integrated solution and coordinate design details as the design is developed, as well as the use of 3D renders to illustrate and convey the design intent</li> <li>5. Review of M4 East and New M5 designs to fully integrate the project's design elements and unify the WestConnex stages via use of similar materials, finishes, colours, lighting and size of elements</li> <li>6. Consideration of future use of adjacent land parcels in developing urban design treatments for the project</li> <li>7. Establishment and ongoing engagement with the DRP and NSW Government Architect. This engagement prior to developing the concept design enables independent peer review early in the design process</li> <li>8. Consultation with the DPIE to review progress</li> <li>9. Rigorous three stage Technical Design Review Process with the M4-M5 Link Group and Roads and Maritime, including Centre for Urban Design Excellence</li> <li>10. Ongoing consultation process with the public / landowners and local Councils via newsletters, social media and public briefings, also attended by Design Managers and Directors</li> <li>11. Specific consultation with Indigenous Groups via a dedicated LSBJV Indigenous Participation Manager, knowledgeable in cultural protocols including engaging and managing artists and Metropolitan Local Aboriginal Land Council (MLALC)</li> <li>12. Ongoing review of relevant design packages with the independent Environmental Site Auditor for contamination and Environmental Approval advice</li> <li>13. Consultation with regulatory bodies and utility asset owners for review and approval of new and existing asset connections via a dedicated Interface Manager and utilities team.</li> </ol>









Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
A	<p><b>An environmental vision</b></p> <p>Create a sustainable and enduring design response which enhances and connects local ecologies, and green spaces.</p>	 <ul style="list-style-type: none"> <li>Enhance waterways and creeks using water sensitive urban design (WSUD) where possible</li> <li>Connect green spaces</li> <li>Enhance local ecologies and vegetation</li> <li>Use durable, sustainable and long lasting materials and timeless design</li> <li>Connect local ecologies and green spaces between the landscaped area at SPI, Sydney Park and the proposed future recreational space adjacent to the site</li> <li>Consider and integrate with the urban and landscape design for the New M5 and M4 East projects.</li> </ul>	 <p><b>Placemaking through a blended environmental and architectural vision</b></p> <ol style="list-style-type: none"> <li>Holistic review of the Campbell Road MOC landscaped area, considering the placement of the existing Sydney Park and the connection with the future recreational space adjacent to the Campbell Road ventilation facility and water treatment plant (WTP). Maintain pedestrian and cyclist movements from St Peters, Albert Street, Campbell Road and Sydney Park</li> <li>Review of future green spaces provided by the adjacent New M5 and the opportunities presented within our site, to reinforce the local ecology with compatible planting</li> <li>Sensitive selection of vegetation, where space permits, to include native plants with varying structure and foliage to add interest and promote a consistent and sustainable design outcome</li> <li>Capitalising on the visible, in-the-round, façade of the Campbell Road ventilation facility to celebrate this place with bold coloured articulated metal sheeting façade, using geometry to capture light and shadow to bring the building to life, providing unique individual perspectives that humanise a large-scale building</li> <li>Specifying durable architectural finishes for the building façade and perimeter palisade fencing. Elements repeated across the site to unify the space with a harmonious set of colours and materiality</li> <li>Review New M5 landscaping design through digital renders, considering the look and feel of street trees along Campbell Road with mature and native landscaping profiles to understand the context of Campbell Road ventilation facility.</li> </ol>

Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
<p><b>B</b></p>	<p><b>Cross scale connection of spaces</b></p> <p>Prioritise local and regional significant connections that respond to broader issues, and support aims and initiatives of the local neighbourhoods and the city.</p>	<div style="display: flex; align-items: center;"> <ul style="list-style-type: none"> <li>▪ Enhance connectivity between streets, facilities, neighbourhoods, green spaces, cycle and pedestrian connections across the site and the city</li> <li>▪ Integrate and connect transport modes</li> <li>▪ Connect local and regional road, cycle, public transport and pedestrian links</li> <li>▪ Maintain and connect to the planned local and regional road network, cyclist, public transport and pedestrian networks for the New M5 project.</li> </ul> </div>	<p><b>Improving the public realm by maintaining continuity of active transport inter-connectivity</b></p> <ol style="list-style-type: none"> <li>1. Ensuring the large scale of surface facilities respect project boundaries, enabling continuity of active transport connectivity, by others</li> <li>2. Thoughtful transitioning of the shared path and active transport links around the Campbell Road ventilation facility, tying in the construction of the hard standing with the softer landscaping along the western side of the building</li> <li>3. Maintaining an appropriate and welcoming street frontage environment and public domain along Campbell Road</li> <li>4. Consideration of future green space connectivity by envisaging surrounding urban regeneration and development, consistent with micro land use analysis</li> <li>5. Maintaining connectivity of the St Peters area constructed by the New M5 project.</li> </ol>



Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
<p><b>B</b></p>	<p><b>A motorway integrated within its context</b></p> <p>Understand the existing landscape and respond in a respectful manner that seeks to enhance and contribute to its context.</p>	 <ul style="list-style-type: none"> <li>▪ Respond to the natural patterns</li> <li>▪ Respect and work with the local landform</li> <li>▪ Enhance the interface between existing open spaces and the motorway</li> <li>▪ Avoid sterilisation of land by providing connections across motorway infrastructure</li> <li>▪ Simple unadorned structures</li> <li>▪ Review the history of the St Peters area and existing landscape and respond with an urban design that includes a narrative that connects and contributes to the area's context. Include an Indigenous focus to the narrative</li> <li>▪ Provide a consistent urban design with the M4 East project at the tunnel portals.</li> </ul>	 <p><b>Enhancing the built form by researching the history and context of the place</b></p> <ol style="list-style-type: none"> <li>1. Integration of the project with the works constructed by other stages of WestConnex, across all disciplines from street lighting to landscaping</li> <li>2. The Campbell Road ventilation facility uses a design narrative that responds to the site context and landform in subtle ways: <ul style="list-style-type: none"> <li>- The existing streetscape is reflected in the building's simple materials and the vibrant colour palette, mimicking the urban culture, street art and murals of the inner west</li> <li>- The industrial history of the area is reflected in the use of masonry on the lower portion of the façade, further grounding the building</li> <li>- The building's scale is celebrated through bold colour wrapping around the building perimeter, reinterpreting the industrial surroundings and suggesting regeneration in the area</li> <li>- The notion of movement at different speeds around the building is reflected in the angular profile of the façade panels, allowing a shifting perspective as one moves around the building welcoming both driving and walking speeds</li> <li>- The cultural history and Indigenous influence of the area is embedded in the building by creating a façade that in itself is a work of art, featuring contemporary patterning and colours generated by highly respected local artist, and fully wrapping this around the building</li> </ul> </li> <li>3. The motorway is connected to the surface by using materials and patterns, compatible to other stages of the WestConnex project providing a 'Gateway' to / from the tunnel: <ul style="list-style-type: none"> <li>- At the SPI portal, the architectural treatment is reflected on the ventilation outlets and the same vertical rhythm is employed on the palisade fencing at the surface, providing lateral integration with the surroundings</li> <li>- At Wattle Street, architecturally treated portal walls and metal screening signify the entrance and exit to the user and is consistent with the adjacent portal treatments for the M4 East project providing linear integration across WestConnex</li> <li>- Within the project tunnels, design features are compatible with those of other portions of WestConnex providing linear identity and a consistent experience for drivers</li> </ul> </li> <li>4. Use of palisade fencing at Campbell Road MOC, enables the public to observe the functional aspects of the tunnel facilities, providing an educational experience when using the infrastructure and enables views through the site to the parkland beyond.</li> </ol>

Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
C,D,E	<p><b>Place sensitive design</b></p> <p>Celebrate and work with the character of each place and destination, responding to their unique histories, materiality, architecture, built fabric, cultural context, landform and topography.</p>	 <ul style="list-style-type: none"> <li>▪ Incorporate local heritage values</li> <li>▪ Respect and responding to cultural contexts</li> <li>▪ Complement the existing built fabric</li> <li>▪ Consult with local communities</li> <li>▪ Increase the legibility of places, buildings, streets and landmarks</li> <li>▪ Integrate art as part of the architectural expression of the project narrative</li> <li>▪ Establish placemaking at the Campbell Road MOC that includes a connection to country with an Indigenous focus and respond to the unique layers of the industrial history of the area.</li> </ul>	 <p><b>Placemaking through effective use of materials and Indigenous artwork</b></p> <ol style="list-style-type: none"> <li>1. Development of the design narrative to provide a placemaking approach for the project, responding to the layers of history and culture of the area, reflected in the choice and aesthetic of materials</li> <li>2. The involvement of Indigenous artists, local to the project, in the development of the design of the Campbell Road ventilation facility allows the building itself to be an expression of the traditional custodians of the land, with the colour, form, and articulation of the architectural surfaces reflecting the ongoing nature of this place as land for making and creating</li> <li>3. This design outcome also reflects the evolution of the place from early industrial history to current creative placemaking through a celebration of its scale with the colour and geometry of the façade treatments</li> <li>4. Consideration of all aspects of the building as an opportunity for creativity and placemaking</li> <li>5. Ongoing artist involvement throughout the design process, in conjunction with wider stakeholder engagement.</li> </ol>
	E	<p><b>A multidimensional user focus</b></p> <p>Consider holistically how a diversity of users experience space including all ages, abilities and transport modes for a truly inclusive, universally accessible and safe outcome.</p>	<ul style="list-style-type: none"> <li>▪ Ensure Crime Prevention Through Environmental Design (CPTED) driven designs</li> <li>▪ Incorporate safe, legible connections with way finding for all users</li> <li>▪ Ensure universal design outcomes</li> <li>▪ Consider the user experience for all transport modes including drivers, pedestrians, cyclists and public transport</li> <li>▪ Maintain the planned local and regional road network, cyclist, public transport and pedestrian networks for the New M5 project.</li> </ul>



Related WestConnex framework objectives	Design objectives		Implementation methodology
	Project design principles	Considerations	
<b>B</b>	<p><b>Revitalisation, opportunity and economics</b></p> <p>Establish opportunities for development that supports and connects existing neighbourhoods, complements and stimulates local economies and provides opportunity for growth across existing and future local industries.</p>	<div style="text-align: center; font-size: 2em; color: #00A0C0;">&gt;</div> <ul style="list-style-type: none"> <li>▪ Contribute to urban structure and revitalisation</li> <li>▪ Capitalise on traffic reduction to enhance local streets and increase neighbourhood liveability</li> <li>▪ Create opportunities for urban renewal</li> <li>▪ Use architectural treatments and urban design that creates an interest point, connections to the local region and local economies and signifies bold, urban regeneration through placemaking.</li> </ul>	<div style="text-align: center; font-size: 2em; color: #00A0C0;">&gt;</div> <p><b>Encouraging urban renewal through creative architectural treatments</b></p> <ol style="list-style-type: none"> <li>1. The Campbell Road ventilation facility fits contextually within the existing building environment and takes into consideration the adjacent land uses and visual amenity</li> <li>2. The project design encourages adjacent future urban renewal by using transparent perimeter elements to connect spaces</li> <li>3. The architectural design response to the ventilation facility is to connect the built form with the local area, drawing on the industrial focus of the area, public art and vibrant urban culture and interpreting it through the colour palette and geometry of the façade</li> <li>4. The ventilation facility in conjunction with the planned streetscape landscaping by others will enhance liveability and provide diversity in the shape of the built environment, complementing the traditional historic terraces and re-imagining the potential of adjacent warehouses.</li> </ol>

## 2.2 Environmental values

The design is developed within approved site boundaries. The sites for permanent infrastructure minimise the disruption of existing green spaces. As part of the landscaping, greenery is provided in the visual catchment of the project, where possible.

Specific initiatives include:

- Locating the Campbell Road ventilation facility on top of the cut and cover, to minimise the footprint of the surface works
- Locating the Campbell Road ventilation facility in accordance with approved planning conditions
- Maintaining landscape continuity, where practical and permissible
- Maintain the streetscape of the local areas, through localised planting.

## 2.3 Heritage values

Heritage values have been considered in the design of the project's facilities. With the majority of the project being underground, impacts to surface heritage items are minimised.

Specific initiatives include:

- Commissioning a local artist to deliver art as part of building façade, providing an interpretation of Indigenous heritage, recognising the history and specific character of the neighbourhood
- Providing a good definition of space and ownership through good building design.

A Heritage Interpretation Plan (HIP) has been prepared by the project's heritage consultants as an independent document. It includes recommendations for the appropriate interpretation and reuse of any items of significance salvaged from construction areas of the project.

Strategies for reuse of items may include:

- Identification of elements that are considered to be of salvage value
- Identify opportunities for interpretive reuse
- Contacting organisations to ascertain any interest in taking the elements salvaged, should no opportunities for re-use within the project be available.

The only heritage item that has been demolished as part of surface construction works is the former Bank of NSW on 164 Parramatta Road, where the site is used for temporary construction access and tunnel spoil storage.

At the time of the submission of the UDLP, opportunities for the reuse of salvaged artefacts in the design or construction of permanent works is yet to be determined.

## 2.4 Sustainability

Sustainability is considered in the overall design approach across the lifecycle of the infrastructure, including during construction, operation and maintenance.

Initiatives include:

- Processes in place to reduce wastage of material during construction
- Use of digital engineering and 3D modelling for construction planning to optimise sequencing and enable more efficient building works
- Commitment to achieve 'excellence' in the ISCA certification
- Use of modular, durable materials and detailing across surface works to reduce the level of maintenance, repair or replacement
- Implementation of WSUD initiatives in the collection and treatment of tunnel and surface water, as well as control discharges from the WTP to supplement flow in the receiving waters and improve aquatic habitats for wildlife
- Selection of appropriate plant species to withstand extreme Australian summer heat and low rainfall, with groundcovers and mulch to suppress weeds and reduce frequency of maintenance.

## Infrastructure Sustainability Council of Australia

This UDLP meets the requirements of Urb 1 – Urban design criteria in the ISCA IS Version 1.2 Technical Manual with the inclusion of the following items:

- Site analysis and planning – Macro and Micro – Refer to Chapter 3.0
- Vision and objectives – Refer to Chapter 2.0.

The requirements for Urb 2 – Implementation criteria in the ISCA IS Version 1.2 Technical Manual is achieved through the delivery of detailed design and documentation of the design elements illustrated in this UDLP. The detailed design process provides documentation that will be constantly refined and value engineered throughout the project up until the point the design is 'Issued for Construction' stage. The design will then be implemented in construction.

## 2.5 Community safety and security

Community safety and security is considered in the design of the projects facilities with the adoption of CPTED principles. There are four principles that are outline in the approved CPTED guideline documents to minimise the opportunity for crime:

- Surveillance
- Access control
- Territorial reinforcement
- Space management.

Table 2-3 provides the strategies for the above principles and their application on the project.

Table 2-3: CPTED principles

Strategies	Application – Campbell Road MOC	Application – WSI
Aligning new structural elements, where possible, with existing elements to open areas	<ul style="list-style-type: none"> <li>▪ Alignment of Campbell Road ventilation facility cut and cover to the New M5 cut and cover under Campbell Road enables structural continuity between the two projects</li> <li>▪ Alignment of new fence along western side of Campbell Road ventilation facility along shared path with existing New M5 fence</li> <li>▪ Alignment of the Campbell Road MOC buildings to tie into existing infrastructure to maximise visual permeability.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The cut and cover structures for the dive walls and portal façades at WSI have been built by M4 East. The scope is limited to providing finishes for the portal dive walls and portal façades, located between Parramatta Road and Ramsay Street</li> <li>▪ The primary design objective for the portal dive walls and façades are to provide an integrated and aesthetically cohesive outcome for the WSI.</li> </ul>
Maintaining continuity of all pedestrian, cyclist and shared paths, including shared paths proposed as part of other stages of WestConnex	<ul style="list-style-type: none"> <li>▪ Provision of appropriately selected planting species to maintain visual continuity of the shared path alignment and seamlessly tying into the New M5 landscape.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Shared paths are not part of the scope of works for The project.</li> <li>▪ Maintain continuity of pedestrian, cyclist and shared paths provided by others.</li> </ul>
Providing sufficient visual distance at changes in directions of pedestrian, cyclist and shared paths to avoid accidental contact with other users	<ul style="list-style-type: none"> <li>▪ Providing appropriate visual distances at the corner of Campbell Road, Albert Street and the shared path along the western side of Campbell Road ventilation facility to avoid accidental contact with others through selection of appropriate planting species.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Shared paths are not part of the scope of works for The project.</li> </ul>
Maintaining lighting levels below structures	<ul style="list-style-type: none"> <li>▪ Lighting is provided at Campbell Road ventilation facility to subtly highlight the façade.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lighting is limited to street lights along the roadway and vertical LEDs strip lighting in the recesses of the panel dive walls</li> <li>▪ The lighting design is consistent with the M4 East mainline tunnel portals, with LEDs used to guide road users safely into the tunnel, avoiding light spill above.</li> </ul>
Maintaining clear sight lines where vegetation is planted along pedestrian, cyclist and shared paths	<ul style="list-style-type: none"> <li>▪ Provision of appropriately selected planting species to maintain visual continuity of the shared path alignment and seamlessly tying into the New M5 landscape</li> <li>▪ Providing setbacks to vegetation along the shared path on the western side of the Campbell Road ventilation facility to maintain clear sight lines and clear zones</li> <li>▪ Sightlines maintained at the corner of Campbell Road and the shared path on the western side of the Campbell Road ventilation facility</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vegetation at WSI is provided by M4 East, which has been reviewed and included in the digital renders to present consistency of the final roadway.</li> <li>▪ Providing permeable fencing for safety, security, to delineate road users and maintain sightlines across the surface road corridors.</li> </ul>
Providing active streetscape frontages and interesting visuals to minimise graffiti / anti-social behaviour	<ul style="list-style-type: none"> <li>▪ Providing interesting facades to the Campbell Road ventilation facility (integrated with Indigenous art) and feature lighting to create visual interest and enhance streetscape amenity, thereby minimising potential graffiti / anti-social behaviour</li> <li>▪ Providing security fence along the Campbell Road MOC, which prevents access, but is visually permeable to enable passive monitoring from the surrounding and is integrated with the architecture.</li> </ul>	<ul style="list-style-type: none"> <li>▪ WSI is primarily roadway comprising fast moving, linear traffic from the surface into the tunnel, with no opportunity for graffiti and anti-social behaviour</li> <li>▪ Providing throwscreens above the entry and exit portal façades to reduce the risk of projectiles being thrown or dropped from above the roadway.</li> </ul>





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## 3.0 Project context

### 3.1 Regional context

The entire 33 kilometre WestConnex extends from the M4 Motorway at Parramatta to Sydney Airport and the M5 Motorway at Kingsgrove, and includes both surface and tunnel motorway infrastructure. These surface elements introduce an opportunity to strengthen the identity of a busy corridor within Sydney's motorway network, refer to Figure 3-1.

At an even greater scale, WestConnex is part of a long-term strategy to complete missing links within Sydney's motorway network, including:

- Outer Sydney Orbital
- Port Botany Links
- Connection to the M6
- WHTBL.

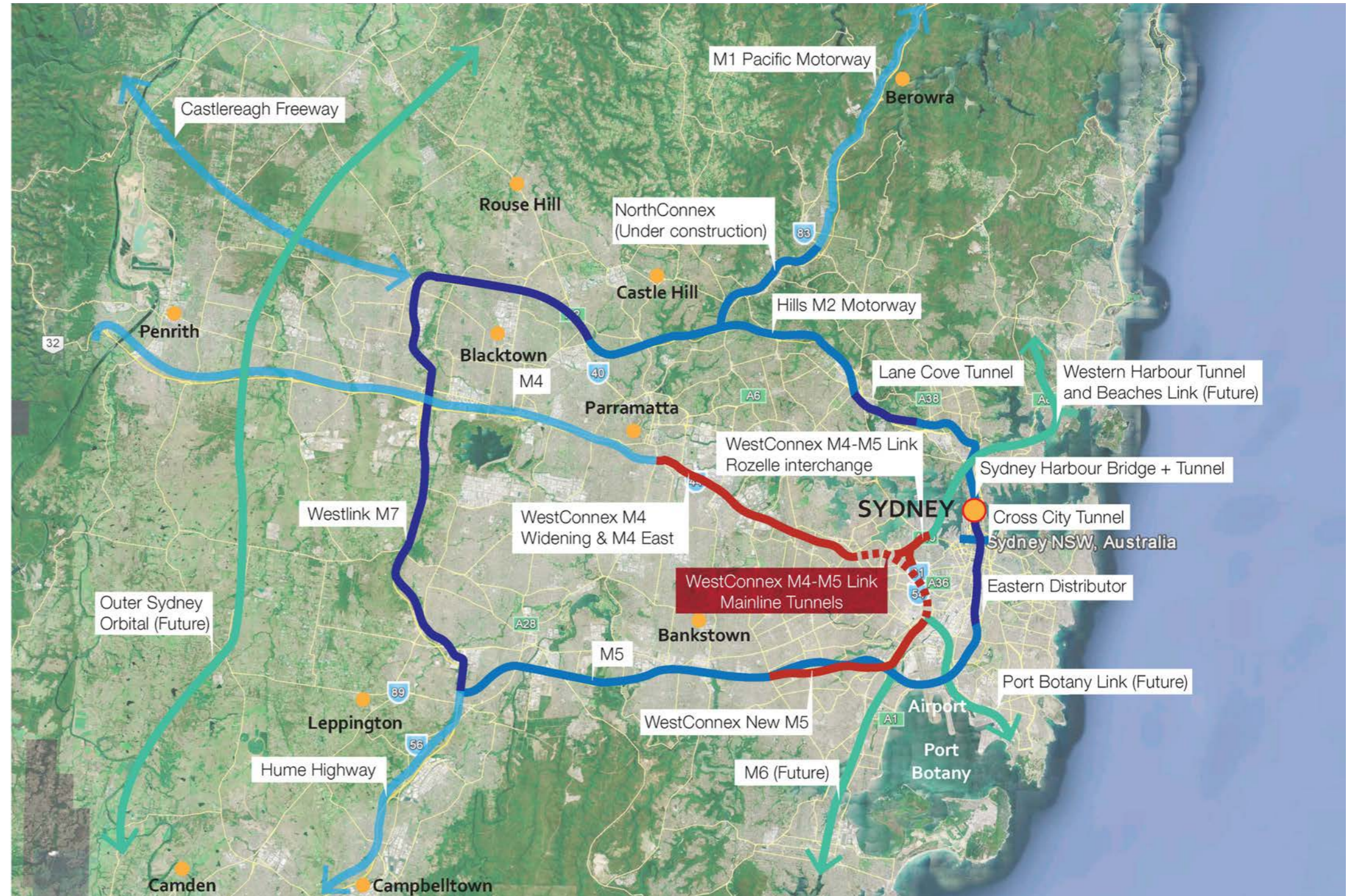


Figure 3-1: Regional context | NTS



### 3.2 Motorway orientation

The overall project urban design strategy is built around the idea that the driver experience should take its cues from the immediate urban environment through which the project passes, acknowledging the project's context within the overall WestConnex framework.

The project is located in a visually complex area, rich in social and cultural history. In understanding the big picture, it is evident that orientation is the major issue relating to the development of a project narrative (refer to Figure 3-2). This orientation needs to be provided at a metropolitan scale for the project, which has a regional sense of place and a city wide identity. The project provides opportunities to create gateways to connect other regions, refer to Figure 3-3.

The experience of WestConnex is split into differing surface and tunnel experiences. The journeys on WestConnex will be individual experiences that vary according to entry and exit points of the drivers. The project design strategy has been developed to create design continuity with other portions of WestConnex, while retaining some forms of individual identity to add interest, wayfinding and orientation to users.

Surface and tunnel elements have been designed as part of a wider WestConnex brand, yet retain elements of distinction. The project narrative provides a framework for design that is complimentary to the overall design narrative of WestConnex.



Figure 3-2: Understanding the big picture

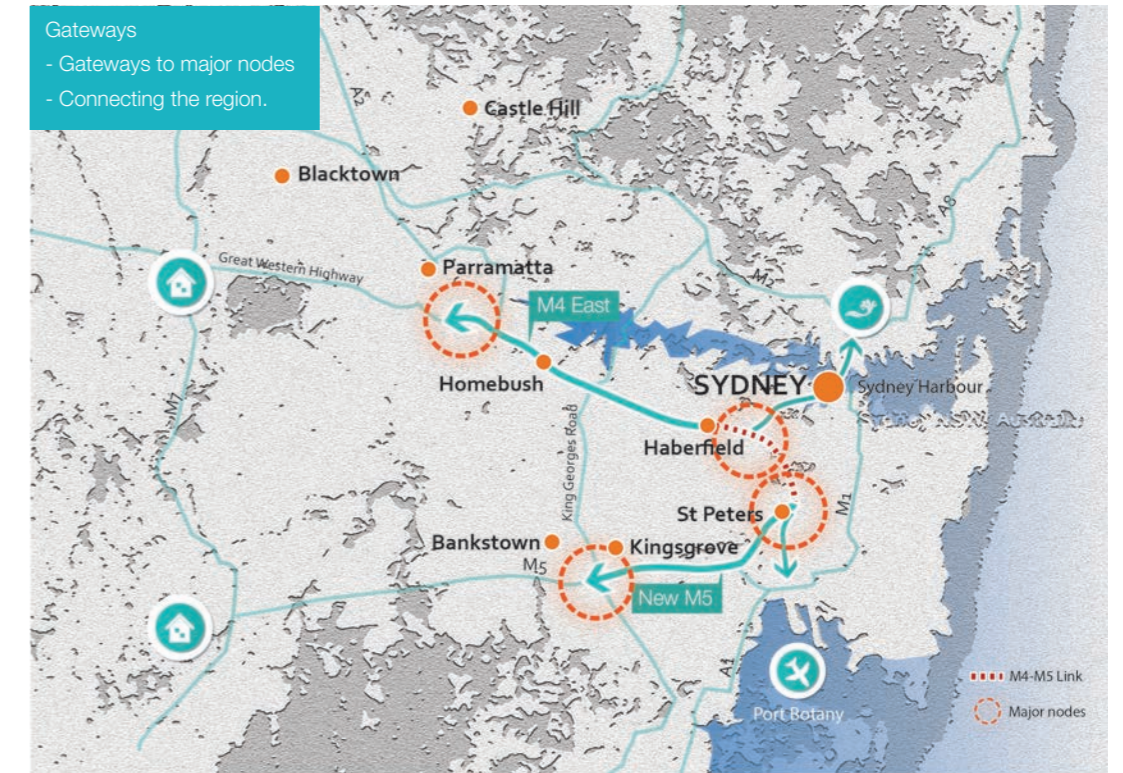


Figure 3-3: Gateways to major nodes



## 3.3 Project context

### Overview

The project comprises the design and construction of an approximately 7.5 kilometre twin mainline tunnels between the M4 East at Haberfield and the New M5 at St Peters.

The project joins other stages of WestConnex to form a seamless motorway underground. Figure 3-5 illustrates the project's connectivity with other portions of WestConnex. In total, including all surface roads, WestConnex will comprise 33 kilometres of road network for Sydney.

The project will:

- Strengthen connections to Sydney's gateways, western Sydney and connects to other parts of metropolitan Sydney, along current motorway networks
- Reduce east-west travel time through the Sydney metropolitan area, and improve local road safety
- Provide an alternate route and reduce traffic demand on the currently congested Parramatta Road, M5, Princes Highway and other local roads
- Provide a safer, more pleasant environment with corresponding decrease in noise and environmental pollution.

The urban design proposal will:

- Enhance the driver experience by providing points of interest to manage driver fatigue within the tunnel
- Fit appropriately into the existing built and natural environment.

WestConnex needs to be understood as part of a regional system of movement corridors across Sydney. These form a seamless network through which drivers will navigate the Metropolitan area and connect to regional NSW and beyond. Broad references to large scale geographic features are very useful for driver orientation.

The M4-M5 Link Mainline Tunnels can be thought of as providing a water-to-water connection as its alignment runs close to Iron Cove, connected to Sydney Harbour, and near the Alexandra Canal, connected to Botany Bay. The tunnel graphics in this portion of WestConnex reference this through the use of blue as a theme colour.

The M4 and M5 corridors, of which WestConnex is a part of, essentially provide east-west connectivity. The M4-M5 Mainline Tunnels corridor has a different identity and orientation as it provides a change in direction to loop around to connect the M4 to the M5. Some variation in the design of tunnel features in this portion of WestConnex can aid in legibility and driver awareness of this situation, refer to Figure 3-4.

WestConnex is a staged piece of critical state infrastructure, delivered by various delivery partners over a period of time. Public access to the M4-M5 Link Mainline Tunnels will be granted at construction completion of the project, opening to traffic in 2023. The project has contractual dates to complete works and hand back residual land used temporarily for site compounds. This enables access for future development.

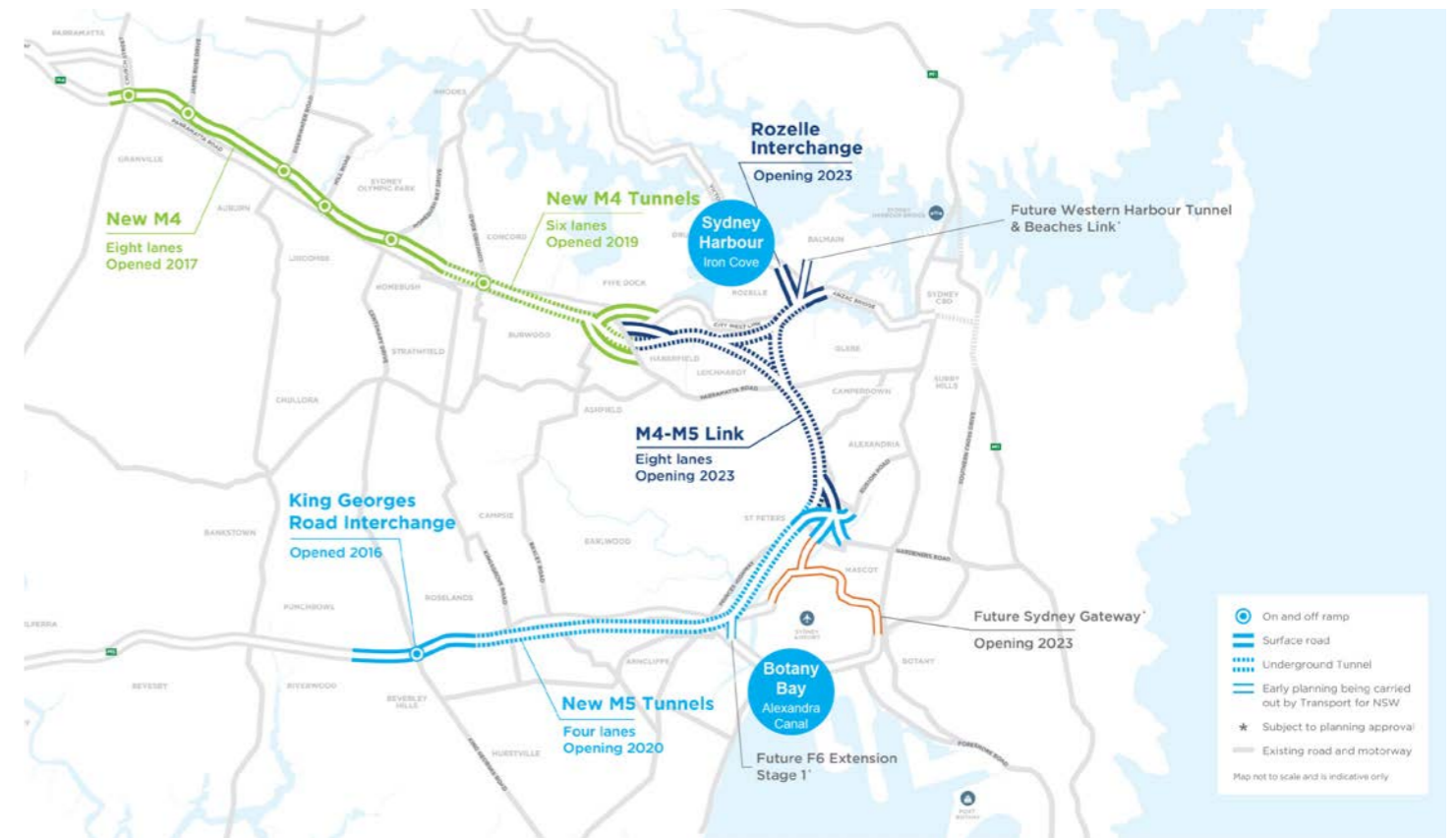


Figure 3-4: WestConnex and related projects (NTS) | Source (base map): M4-M5 Link Group

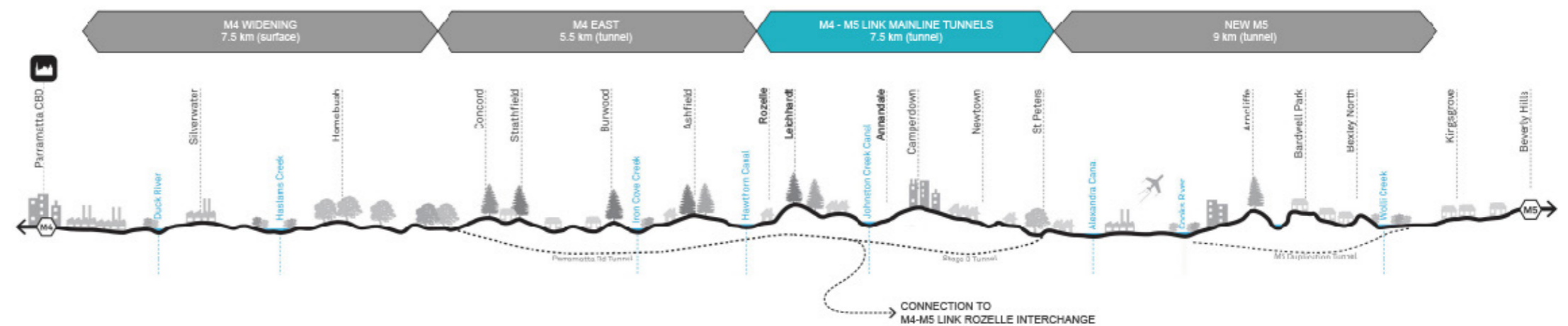


Figure 3-5: WestConnex M4-M5 Link Mainline Tunnels' relationship with other portions of WestConnex



Key project elements

Key project elements include:

- Tunnel to tunnel connections to the M4 East and New M5 mainline stub tunnels
- Exit and entry ramp connections
- Campbell Road ventilation facility at SPI
- Landscape treatments at Campbell Road ventilation facility, refer to Figure 3-6.

In addition, portals and tunnel services buildings are also located at the following locations:

Wattle Street interchange (Refer to Chapter 7.0)

- Portals.

St Peters interchange (Refer to Chapter 5.0)

- Portals
- Campbell Road MOC
  - Campbell Road ventilation facility
  - Water treatment plant (WTP)
  - Supply inlet building, workers amenities, workshop and storage building (ancillary facilities).



Figure 3-6: Project illustration plan



### 3.4 Macro analysis

The purpose of the macro analysis is to understand the local and community context of the natural and built elements, which will inform the design.

#### Land use

Land use within the vicinity of the route is predominantly medium density residential and light commercial and industrial, with business and commercial areas at St Peters and Annandale, refer to Figure 3-7.

#### Design implications:

These land use patterns:

- Influence the locations of built forms
- Influence visual qualities of the corridor's landscape
- Demonstrate the need for, and nature of, lateral connections
- Identify opportunities related to public open spaces such as parks.

#### Heritage

The corridor lies within the vicinity of several Conservation Areas and listed heritage items including, Haberfield Conservation Area, Annandale Conservation Area and Goodsell Estate Conservation Area, refer to Figure 3-8.

Heritage zones and listed items are mostly unaffected by the road corridor as the project is predominantly in tunnel, with the exception of the former Bank of NSW, as discussed in Chapter 2-3.

#### Design implications:

Capitalise on the social and physical history of the corridor to provide a better driver experience:

- Identify public landmarks that provide a common experience along the corridor to inform the driver experience
- Provide an appropriate response and reference to the history of the area.



Figure 3-7: Land use



Figure 3-8: Heritage



### Built form

The project passes through several residential neighbourhoods such as St Peters, Annandale and Haberfield. The existing built forms of these neighbourhoods are unaffected by the road corridor as the project is predominantly in tunnel.

The Campbell Road MOC at St Peters is the only surface facility of this project and has an approved height limit of around 22 metres above existing ground level, refer to Figure 3-9.

#### Design implications:

- Organise surface facilities massing to be compatible with nearby built form scale
- Design surface facilities which fit into the existing built environment, and take into consideration nearby land uses and visual amenity
- Celebrate the scale of Campbell Road ventilation facility, using it as an opportunity for placemaking.

### Built form density

The project corridor traverses a zone of relatively low density. Built form controls range from 0.7 to 1.0 in areas where the project will appear at surface level, refer to Figure 3-10.

#### Design implications:

- Design surface facilities to appear appropriate to nearby density
- Consistently treat smaller surface buildings and operational facilities with dark colours to make them appear 'recessive' in the built environment and reduce visual impact
- Maintain appropriate landscape buffer areas between surface facilities and nearby structures.



Figure 3-9: Built form

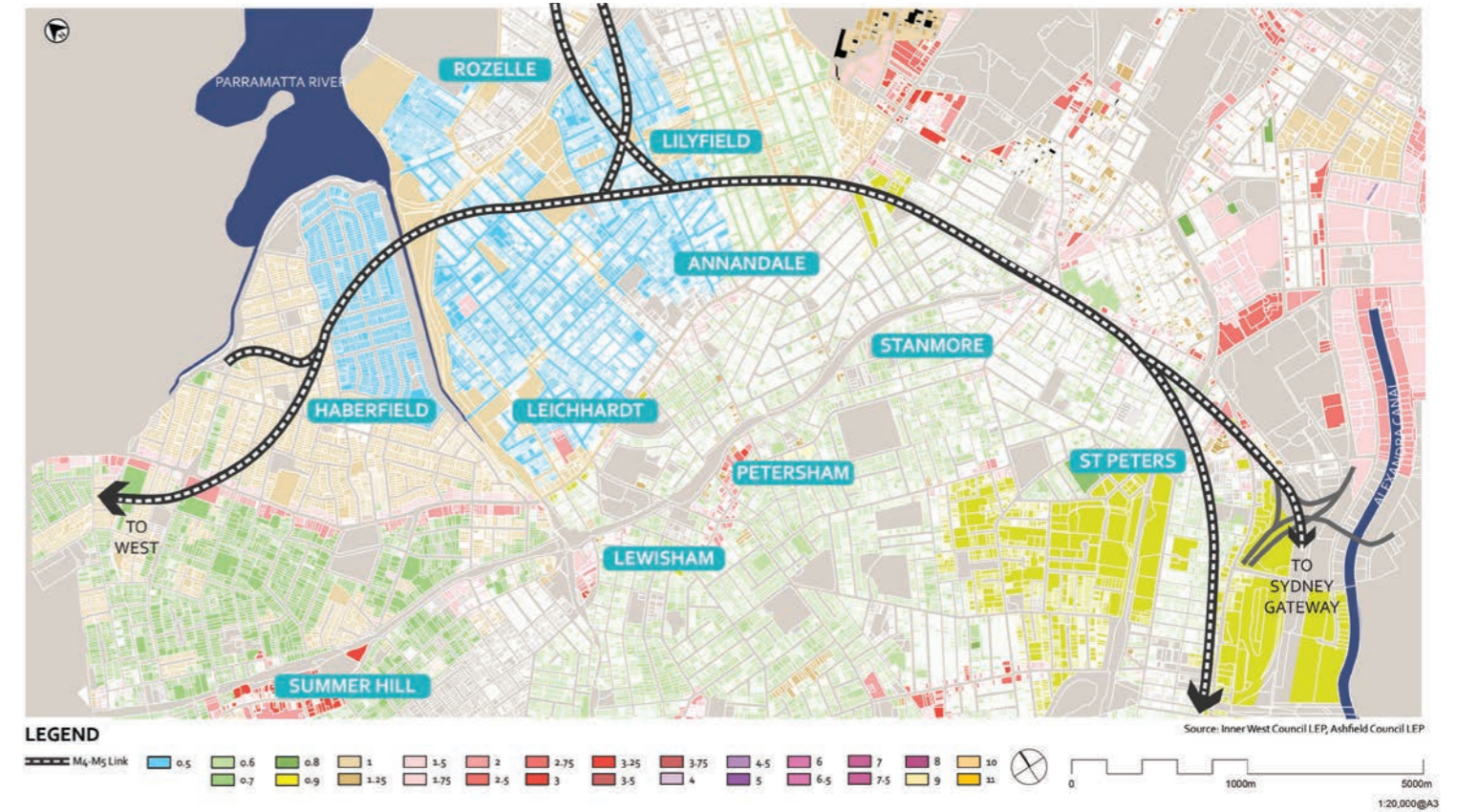


Figure 3-10: Built form density



### Open space, vegetation and biodiversity links

The corridor traverses through several biodiversity links on the surface, this analysis identifies existing open spaces and vegetation types, refer to Figure 3-11.

#### Design implications:

Analysis enables the selection of planting palettes which:

- Derive from existing native vegetation
- Integrate responsively with existing vegetation and soil landscape types.

### Soil

The soils within the corridor are predominantly residual, with areas of swamp soil at Wattle Street and rich Alluvial soil in the Newtown, St Peters and Alexandria area. Hence, many early brick, pottery and tile factories were set up in this area to make use of this readily available natural resource, refer to Figure 3-12.

#### Design implications:

- Select appropriate landscape types to suit the soil and climatic conditions at specific locations
- Capitalise on the historical context to derive the colour and type of material for built forms.

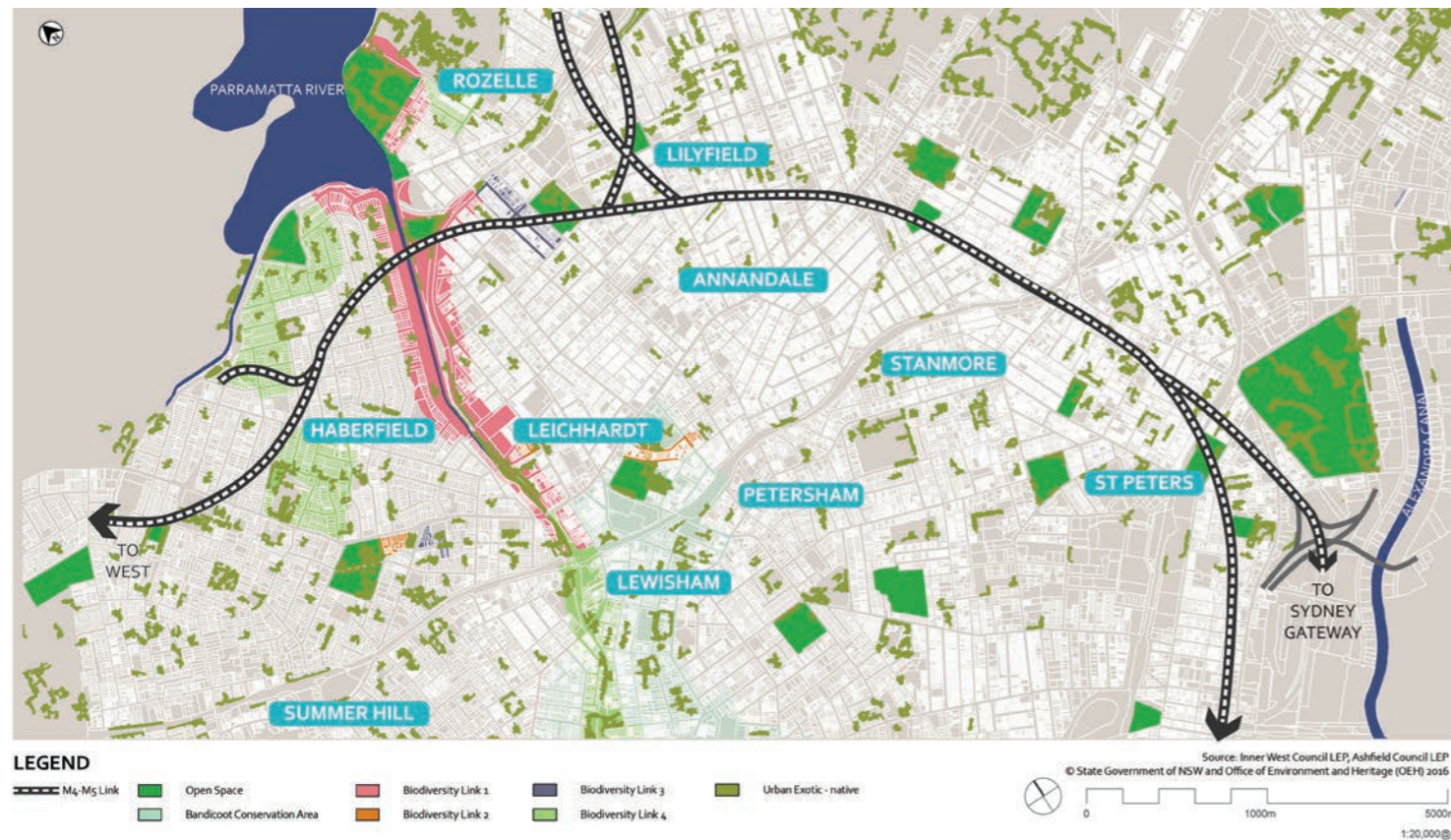


Figure 3-11: Open space, vegetation and biodiversity



Figure 3-12: Soil



### Connectivity

The analysis identifies the existing adjoining pedestrian networks, cycleways / shared paths, vehicular and public transports routes.

The project ties in with the existing pedestrian, cycleways / shared path networks as well as proposed pedestrian and cyclist routes / shared paths routes as part of other stages of WestConnex. The road alignment is underground and has little influence on surface connectivity and active transport, refer to Figure 3-13.

#### Design implications:

- Ensure existing pedestrian, vehicular and public transport networks are maintained during and after implementation
- Ensure the design does not impact on any of the works provided by others.

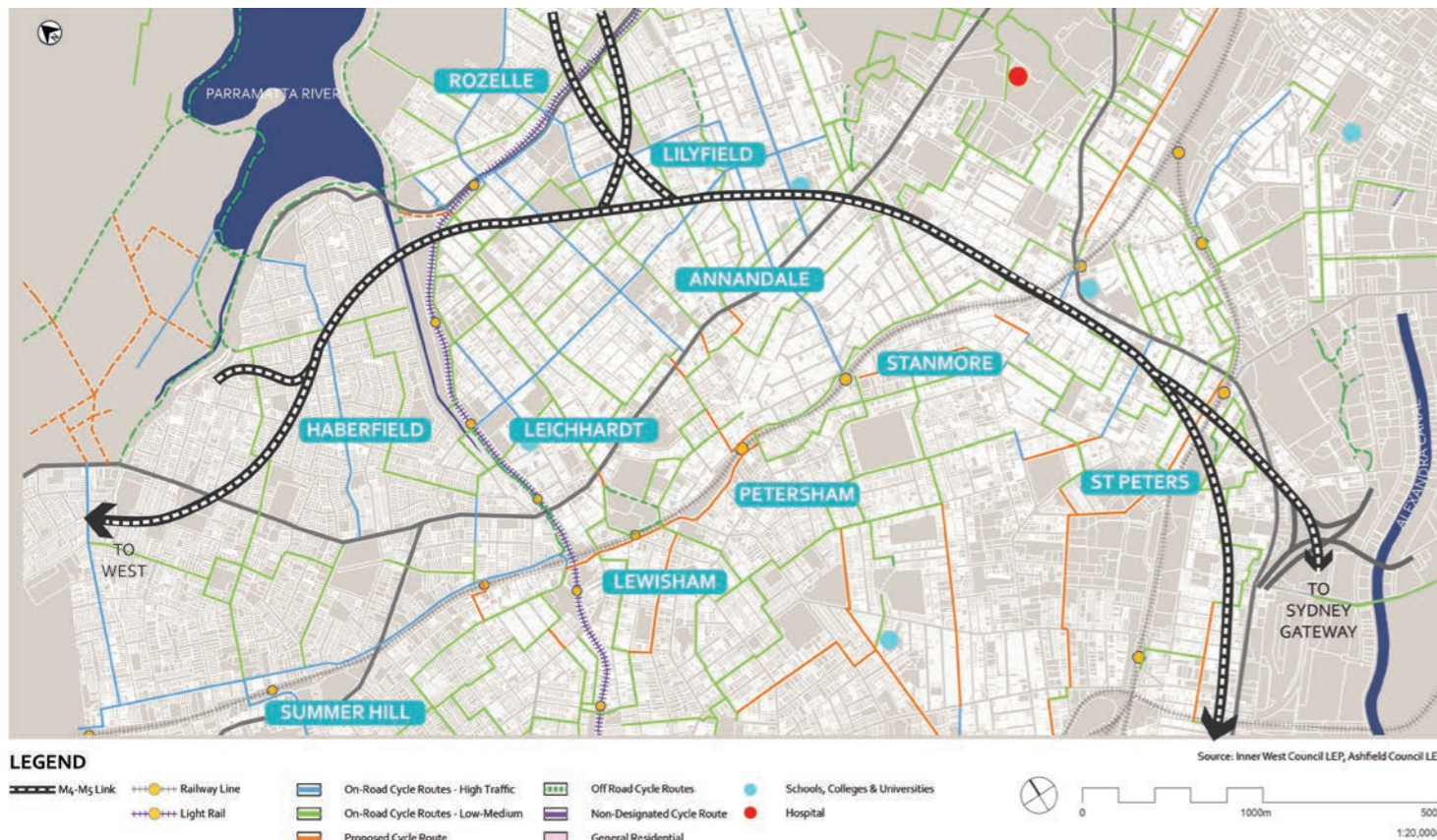


Figure 3-13: Connectivity



## Precincts

The project corridor traverses a number of distinct character zones. Based on its surface connections, the project can be broadly divided into two main precincts. These have varying built form and landscape features that provide the current, surface driving experience along the corridor, refer to Figure 3-14. These are:

### Precinct 1 - Wattle Street interchange

- Residential
- Views to suburbs
- Green edge
- Heritage Conservation Area
- Traversed by main road enabling vehicles travelling west.

### Precinct 2 - St Peters interchange

- Commercial and industrial area
- Motorist dominated uses
- Larger land parcels
- Low density residential such as terraces, and residential flat buildings
- Open views
- Large open space with visually prominent hills and panoramic views
- Heritage Conservation Area
- Roads – main routes to Wollongong / South Coast.



Figure 3-14: Existing precincts



Precinct 1 - Wattle Street interchange



Figure 3-15: Intersection of Wattle Street and Parramatta Road



Figure 3-16: View along Wattle Street



Figure 3-17: View towards Ramsay Street from Wattle Street



Figure 3-18: Intersection of Wattle Street and Parramatta Road



Figure 3-19: View along Wattle Street looking towards entry portal



Figure 3-20: View of Parramatta Road ventilation facility



### 3.5 Micro analysis – Wattle Street, Haberfield

This area is predominantly low scale residential within close proximity to Timbrell Park. It has open views to surrounding suburbs, open spaces and Parramatta River. This area also contains associated facilities for the M4 East, refer to Figure 3-21.

#### Site context

#### Heritage

The entire suburb of Haberfield is listed as a Heritage Conservation Area due to its architectural, streetscape and historical significance as being the first suburb established in the year of Federation (1901). The Haberfield peninsula was also, once home to the Indigenous people of Port Jackson, part of the Eora language group.

Key heritage items include:

- Commercial building (former Peak Freens biscuit factory now converted to Bunnings Warehouse, retaining the clock tower), refer to Figure 3-18
- Hammond Park

Other heritage items in the area include Hawthorne Canal and residential houses on either side of Parramatta Road.

#### Open spaces and watercourses

The major open space in the vicinity is Timbrell Park and the main waterway is the heritage listed Hawthorne Canal.

#### Significant views

- View along Wattle Street looking towards portal entry, refer to Figure 3-19
- View towards Ramsay Street from Wattle Street, refer to Figure 3-17.

#### New built form

The narrative is to provide a seamless, contemporary portal connection with M4 East and provide linear continuity.

#### Portal

Project portals and dive structures at the WSI are located on the southern side of Ramsay Street. The architectural finishes for the portal façades and approaches replicate the design rationale adopted for the M4 East portal façades and dive walls.

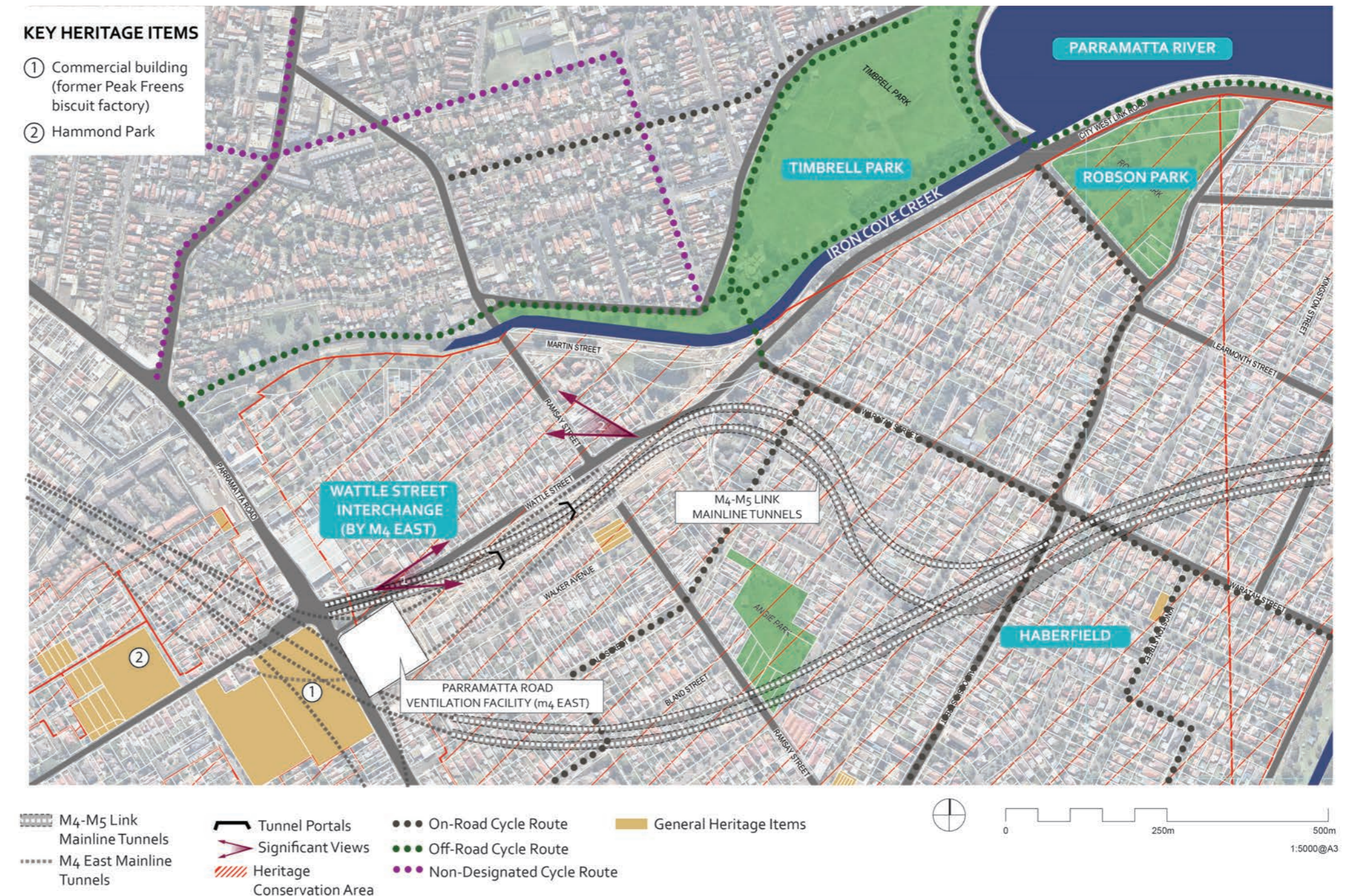


Figure 3-21: WSI micro analysis



Precinct 2 - St Peters interchange



Figure 3-22: View of Sydney Park



Figure 3-23: View towards Campbell Road from Barwon Park Road



Figure 3-24: Existing brick kilns



Figure 3-25: Panoramic view of Campbell Road from Sydney Park



Figure 3-26: Local character



### 3.6 Micro analysis – St Peters interchange, St Peters

This area is predominantly a light industrial area surrounded by low density residential, including double storey 'Victorian' terraces and residential flat buildings located along the northern side of Campbell Road, in close proximity to Sydney Park, Princes Highway and Campbell Road, refer to Figure 3-27.

#### Site context

##### Heritage

Key heritage items include:

- Goodsell Estate Conservation Area

Aesthetic significance in its built form, comprising cottages and houses which are representative of Victorian era worker housing.

- St Peters Church of England

Example of early Gothic architecture in Australia.

- Alexandra Canal (Sheas Creek)

Example of high historic, aesthetic and research significance. One of two purpose built canals, its construction had a significant impact on the development of surrounding areas.

- St Peters Station

The structures demonstrate the early history of railway building in the area dating from the 19th to early 20th century.

- Sydney Park brick kilns and chimney

Example of industrial heritage preserved with the brick kilns and chimneys at the corner of Sydney Park Road and Princes Highway, refer to Figure 3-24.

Other heritage items in the area include residential houses.

##### Open space and watercourses

The major open space within the vicinity is Sydney Park, flanked by Alexandra Canal, and is prone to flooding.

##### Significant views

1. View of Campbell Road from Sydney Park, refer to Figure 3-25
2. View towards Campbell Road from Barwon Park Road, refer to Figure 3-23

#### New built form

The narrative is to provide Indigenous and contemporary continuity to the site facilities which include:

- Campbell Road ventilation facility for supply and exhaust
- Worker's amenities, workshop and storage (ancillary facilities)
- WTP.

The site for permanent works is about 8,750m<sup>2</sup>.

#### Portal

Portals and approaches at SPI are located adjacent to Campbell Road at the northern end of the interchange, within the former Alexandria landfill area.

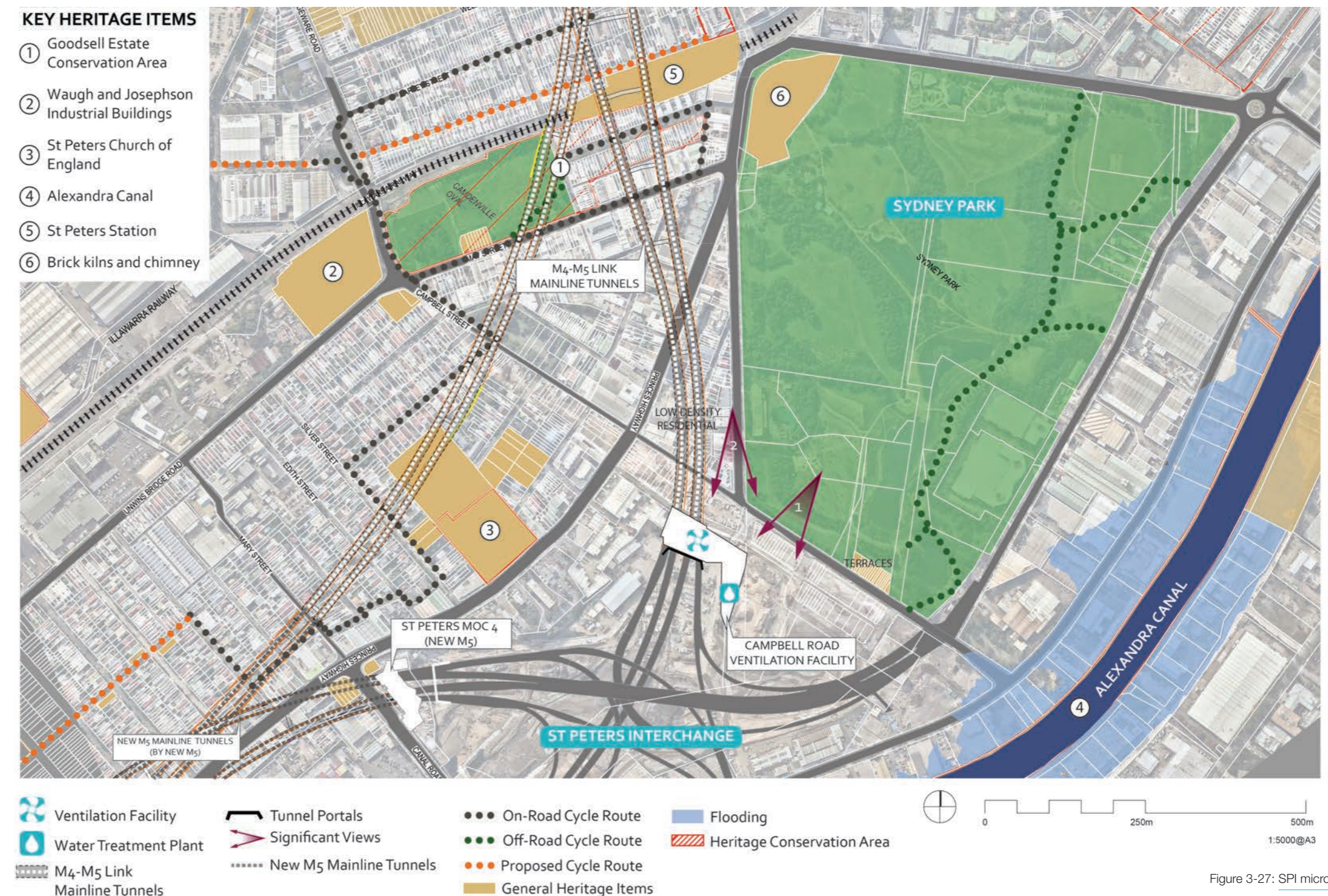


Figure 3-27: SPI micro analysis



A place of nourishment and gathering: Indigenous continuity

- Using the earth to manage food supplies
- Land management activities
- Ceremonial use of waterways
- Meeting Gadigal, Gameygal and relocated Bidjigal.



Figure 3-28: Place evolution – Pre-European



### 3.7 Historical context

The Campbell Road MOC site was once very different than it is today. Geography changes to flora and fauna, and economic activities have all played a role in shaping the site in which WestConnex is being constructed.

Broadly speaking, the site can be considered to have, three distinct phases of evolution. These, of course, overlap and are essentially snapshots of a dynamically changing place, but they provide useful reference points in building and understanding the site today and can be used to inform the design of the Campbell Road MOC. This assessment is not intended to replace any detailed archaeological assessment, but is intended to understand the dynamics of this place. The three phases have been defined as:

#### Pre-European

The Pre-European site identity encompasses time before European contact and looks at ancient geography and the Indigenous connection to the land. It is important to understand that this relationship underpins a continuing importance of this site to Indigenous Australians and their connection to this place, refer to Figure 3-28.

Key place defining attributes of this place included:

- A water based place with the Gumbramorra Swamp to the northwest and open water towards the southeast
- A ridge line and circulation path ran from northeast to southeast along what was essentially a peninsula
- Sheas creek was once the edge of the land and a salt marsh. During the construction of the Alexandra Canal stone axes and Dugong bones were uncovered suggesting that this place was a place of food production
- Kangaroos grazed across the open land of peninsula and were a source of food
- Indigenous archeological sites, at Kendrick Park where remains of middens have been found and at Undercliffe where hand stencils have been found suggest that this place was a place of gathering and ceremony
- The site is located where the language groups of Gadigal and Gameygal come together. More recently Bidjigal have developed a connection to this place as part of their La Pouse relocation. Today the area retains its importance to these groups
- Evidence of activity on this site suggests that this place was a place of food production, hunting and social gathering ... a place of 'making and doing'.

#### Industrial peak

The industrial peak has been identified as circa 1890 during the decades towards the end of the 19th century when this area was heavily industrialised. This activity gradually built up over the years and then tapered off during the 20th century. Evidence of this time is extant in and around the site and serves as a reminder of this time, refer to Figure 3-29.

Key place defining attributes of this place included:

- Water had receded by this time and the land formed a ridge line within a low lying area
- The ridge line and circulation path had been formalised into the Princes Highway
- Sheas creek was dredged and formed into the Alexandra Canal with sandstone walls, some of which exist today as heritage items. Woolstores lined a portion of the canal
- By 1894 much of the Sydney railway network was complete including the portion running to the west of the site with St Peter's and Sydenham stations
- A variety of brickworks, machinery fabricators and other industrial facilities lined the railway corridor with workers cottages located on higher ground along the Princes Highway at St Peters Village and Brompton Village
- Quarry activity took place locally to supply the brickworks and provide stone for building. Notably, Sydney Park and the Campbell Road MOC site provided material for the brickworks
- Brickwork kilns and chimneys remain as heritage items in Sydney Park and are used occasionally for temporary or seasonal art displays
- The site retained its identity as a place of activity ... a place of 'making and doing'.

#### Contemporary productivity

The site today retains its identity as a place of 'making and doing', but with 21st century methods. With the opening of Sydney Airport and Port Botany, coupled with the decline of in-town heavy industry this site was transformed into a logistics hub. The container stacks on the horizon, freight movements along railways and air access make this location part of a global network of connectivity. The receding heavy industries also left space for start-up enterprises, technology businesses, innovative high-tech manufacturing and the street life that comes from this creative mix of activities, refer to Figure 3-30.

Key place defining attributes of this place include:

- A three dimensional circulation landscape of ground, air and sub-surface movement
- Transformation of railway circulation through construction of Sydney Metro
- Reclamation of industrial areas by open space such as Sydney Park and SPI
- Creative uses overlaid on places such as the City Farm in Sydney Park or street fairs within enterprise areas
- A shifting visual landscape of logistics with colourful containers stacked, moving on railways and carried by trucks
- Creative reinvention of identity through temporary art installations and built fabric rehabilitation
- Buildings used as an urban canvas through street art
- Campbell Road ventilation outlets as new landmarks complementing the brick chimneys at Sydney Park.

The site continues to evolve as a place of contemporary productivity ... a place of 'making and doing'.

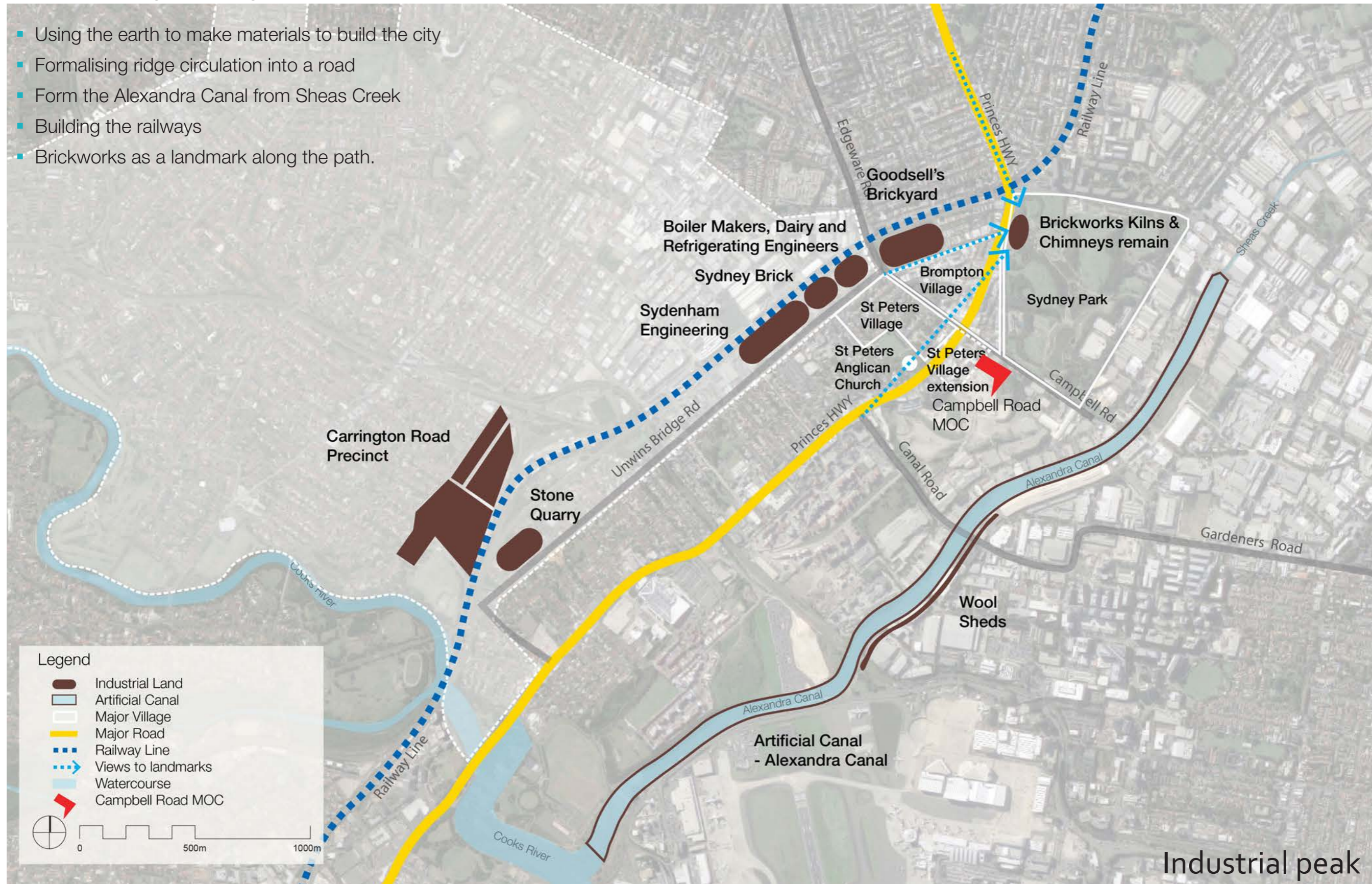
#### Understanding place

The design narrative for this place has been derived from understanding the layers of time that created what this site is today; the enduring Indigenous connection to this place, the industrial tradition of making and doing, the excitement of contemporary logistics and the strong street culture that has emerged here, refer to Figure 3-31.



A place for making and moving - 1890s

- Using the earth to make materials to build the city
- Formalising ridge circulation into a road
- Form the Alexandra Canal from Sheas Creek
- Building the railways
- Brickworks as a landmark along the path.



Industrial peak

Figure 3-29: Place evolution – industrial peak



A place for organising and creating - towards tomorrow

- Flight paths pass over the site
- WestConnex provides below ground circulation
- City and Southwest Metro under construction
- Sydney Park replaces brickworks and borrow pits
- City farm created in Sydney Park
- A shifting landscape of logistics
- Urban culture uses the urban fabric as a canvas
- Campbell Road ventilation outlets relate to brick chimneys as landmark elements.



Figure 3-30: Place evolution – contemporary productivity



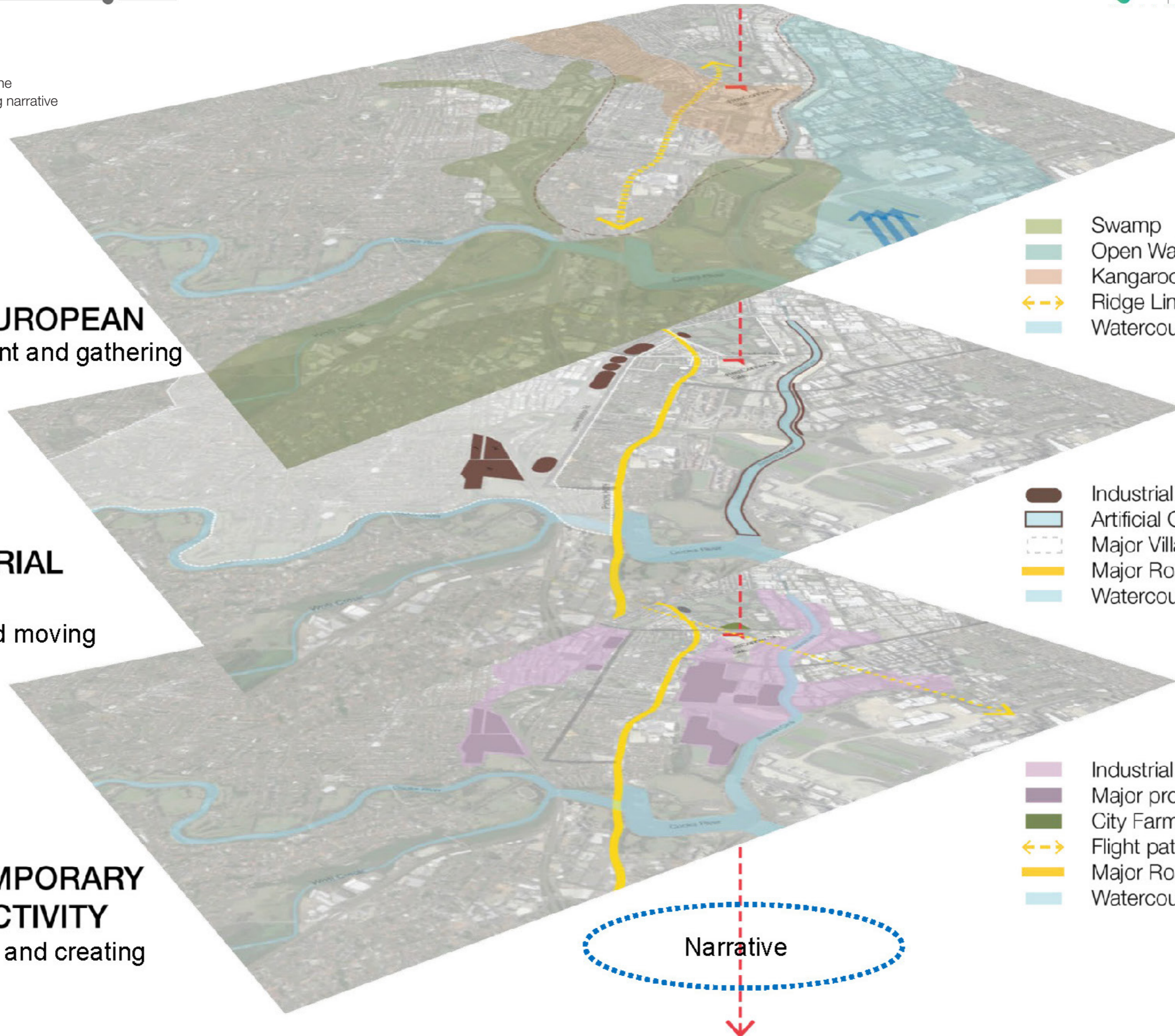
**Place evolution**

Layers of place in time set up the platform to develop the building narrative

**PRE - EUROPEAN**  
Nourishment and gathering

**INDUSTRIAL PEAK**  
Making and moving

**CONTEMPORARY PRODUCTIVITY**  
Organising and creating



- Swamp
- Open Water/ Wetland
- Kangaroo Ground
- Ridge Line
- Watercourse

- Industrial Land
- Artificial Canal
- Major Village
- Major Road
- Watercourse

- Industrial Land
- Major productivity site
- City Farm
- Flight path - Arrival
- Major Road
- Watercourse

Narrative  
↓

Figure 3-31: Place evolution – summary



## 4.0 Design narrative

### 4.1 Overall project narrative

#### Design philosophy

The overall urban design philosophy for the project is to create an integrated experience that is derived from, and adds to, recognition of the corridor's sense of place.

The design of the project needs to:

- Be unobtrusive within a complex visual environment
- Provide a holistic solution applicable for all of WestConnex
- Be stimulating to add interest to the journey
- Support road safety
- Be informative to add a sense of curiosity
- Allow users to mentally complete a picture of their environment thus making them active participants in the experience.

#### Theme

To celebrate the place and create an experience through movement and time by individuals using the infrastructure. The project addresses two scales of urban experience:

- The driver experience – motorway scale and speed
- The surface experience – various modes of movements and speeds in and around the neighbourhoods, parklands and industrial areas at a local scale.

The driver experience is one of a fast, direct movement through a linear tunnel, with visual elements provided along the route.

The surface experience will be generated as individuals see and experience surface facilities, and understand how they create a connection to place.

#### Driver experience

Fundamental to the design of the motorway is driver safety and continuity of the environment, both with other portions of WestConnex and similarity with other tunnels within metropolitan Sydney. This driver experience is enhanced through a series of tunnel visual events created by tunnel events at:

- Location markers – these are the points in-between exits represented through suburb names on the wall panels and enhanced lighting, to provide local identity
- Exit markers – these are the exit points, represented through pattern on the wall panels to highlight the exits.

#### Surface experience

The surface experience is created through the design of surface elements and their integration with the surroundings. Pedestrians and cyclists experience the project as individual elements in a varied landscape. This experience is achieved via:

- Integrated art on facilities
- Landscape continuity with surroundings.



### Linear identity and lateral integration

The placemaking language of the project is built around the concepts of linear identity and lateral integration, refer to Figures 4-1 and 4-2.

These can essentially be defined as:

#### Linear identity – project identity

This supports a motorway identity, reinforces the branding of the route as part of the larger WestConnex project and provides placemaking at a regional scale.

Elements include:

- Portals and dive structures
- Tunnel cladding
- Tunnel graphics and location markers (in tunnel features).

#### Lateral integration – contextual response

This supports a connection to the surroundings and is generally expressed through individual surface works and contributes to placemaking in a local context.

Elements include:

- Ventilation facility
- Service building
- Exterior artwork
- Active transport elements
- Landscape.

Together, linear identity and lateral integration provide a complete placemaking strategy for the project that responds to the needs of users and the community adjacent to the project.

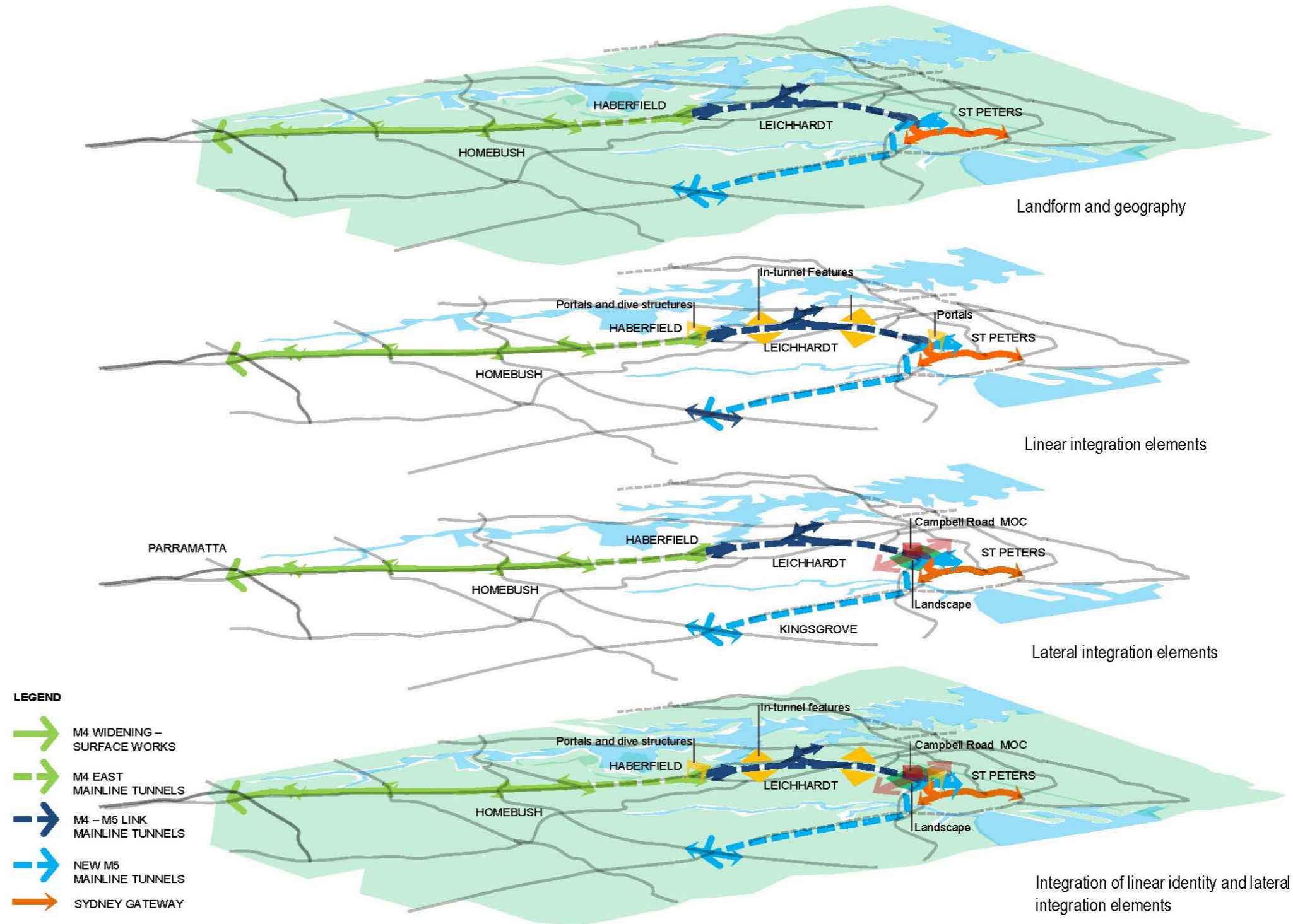


Figure 4-1: Linear identity and lateral integration



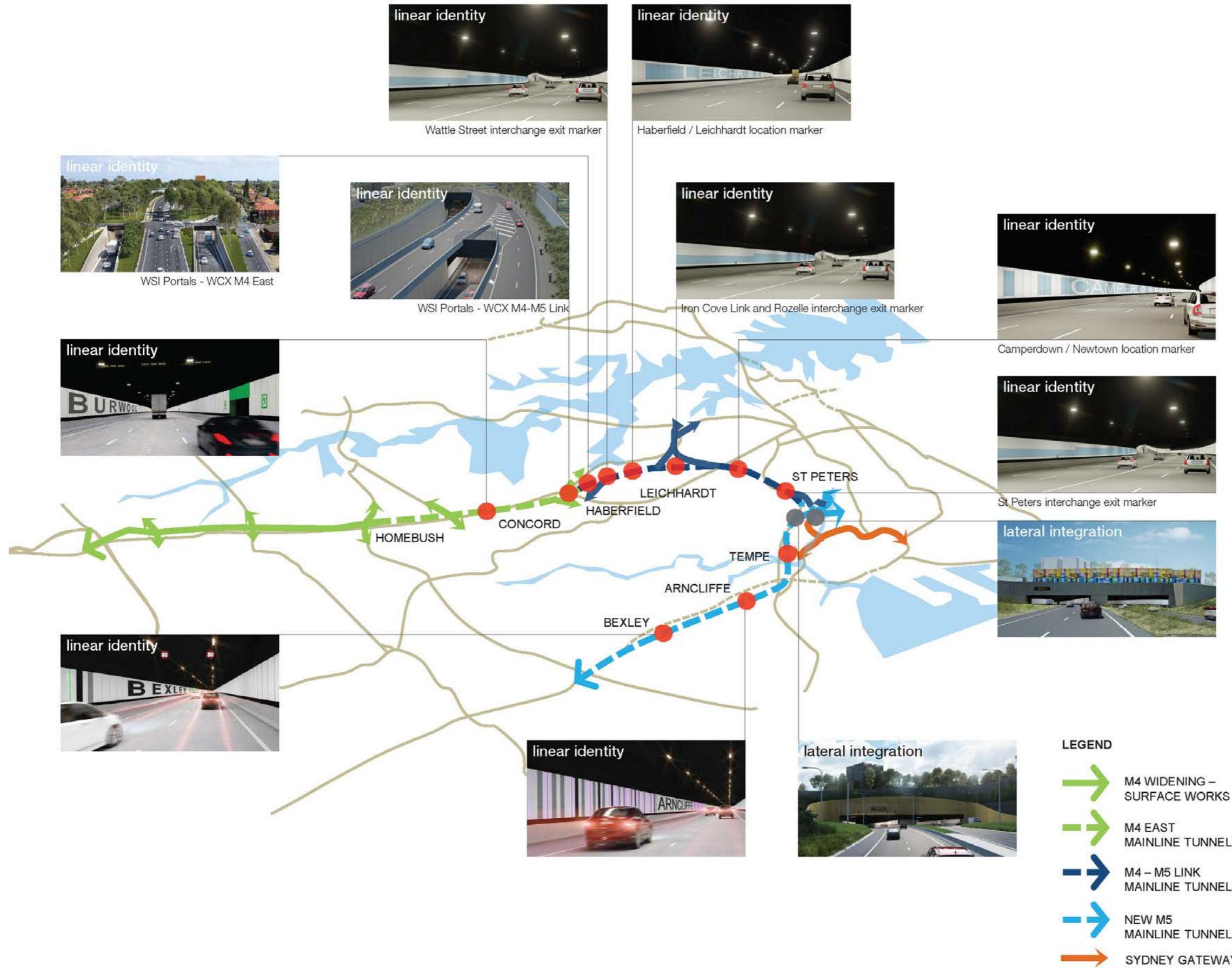


Figure 4-2: Linear identity and lateral integration along WestConnex

Image source: Other WestConnex public documents



## 4.2 Project benchmarking

A review of how design challenges have been addressed on other projects can serve to inform the design development of the project narrative.

### Surface facilities

These typically house mechanical and electrical equipment to provide safe tunnel operations and ventilation.

Figure 4-3 illustrates a collection of precedents and benchmarking studies of similar projects on the Sydney motorway network and other examples in Australia and around the world. These demonstrate the best practice architectural integration with sculpture and art, an approach that has been adopted for the Campbell Road ventilation facility and illustrated in Chapter 5.0.

### Challenges

- Compound security
- Functional / operational requirements of facilities
- Being a 'good neighbour'
- Managing the scale of surface facilities.

### Management strategies

- Providing unobtrusive security and allowing buildings to provide site security enclosures
- Articulating functional facilities to 'tell the story' of the building
- Integrating buildings with landscaping and selecting appropriate finishes
- Incorporating art and articulation into facilities to create interest and alleviate large blank walls.

### Compound security:

- The Integration of built form and boundary fencing is undertaken as a holistic design approach to each site
- CPTED issues addressed with simple building forms with high passive surveillance ability.



St Peters Motorway Operations Complex (MOC4)

Bexley Motorway Operations Complex (MOC2)

Arncliffe Motorway Operations Complex (MOC3)

Concord Motorway Operations Complex

### Functional / operational requirements of the facilities:

- Managing the bulk of ventilation outlets
- Expression of distinct forms, use of light, addition of sculpture and art
- Acoustic treatment requirements of the ventilation facilities generally require solid construction.



Kingsway Tunnel Vent Building, Liverpool (1671)

Kowloon Railway Station Vent Building (Farrells 1998)

Haberfield Motorway Operations Complex

Mullum Mullum Tunnel Eastlink, Melbourne

### The building as a good neighbour:

- Expressing a narrative of the site's history and context
- Consideration of the human scale.

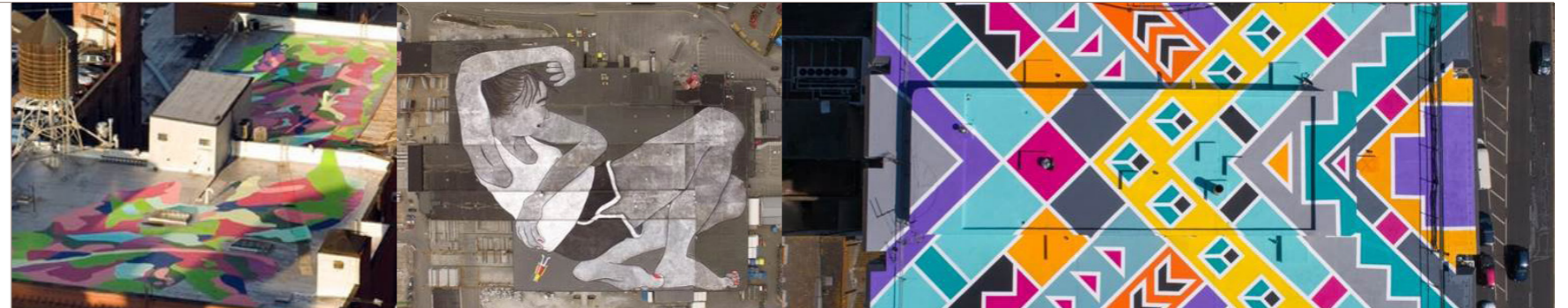


M4 East, Parramatta Road Ventilation Facility

M4 East, Parramatta Road Ventilation Facility

### Large undifferentiated roof area:

- Provides opportunities for artwork and colour to create placemaking from above.



547 W 27th Street, New York

ella & pitr for Nuart Festival, Norway

Holiday Inn Brighton Seafront

Figure 4-3: Project benchmarking – surface facilities



## Tunnels

Tunnels vary in width, dictated by traffic merges, diverges, orientation and volume of traffic.

Figure 4-4 illustrates a collection of precedents and benchmarking studies of similar projects on the Sydney motorway network and other examples in Australia and around the world. These demonstrate the best practice integration of in tunnel placemaking, driver safety and wayfinding, an approach that has been adopted for the project tunnels, refer to Chapter 6.0.

### Challenges

- Driver boredom
- Lack of understanding of location and distance travelled on the journey
- Ensuring a smooth transition between inside and outside environments
- Managing the perception of safety in the tunnel, particularly of merging, diverging and wayfinding.

### Management strategies

- Providing graphic interest in the tunnel with colour and pattern contrast
- Including place reference names, as in other WestConnex stages
- Providing clear information about location and to aid drivers in gauging their journey
- Incorporating clear graphic signals at cross passages and other escape routes.

#### Driver boredom:

- Create visual events to provide interest and break the journey.



Clem 7, Brisbane



Laerdal tunnel, Norway



Rainbow Light tunnel, Netherlands

#### Lack of understanding of location and distance travelled on the journey:

- Create visual references to above ground elements
- Provide place markers to reference distance between points.



New M5 tunnel



NorthConnex tunnel



Hida tunnel, Japan

#### Ensuring a smooth transition between inside and outside environments:

- Use placemaking elements to create a visual event
- Provide transitional elements.



M4 East portal



New M5 portal



Airport Link, Brisbane

#### Managing the perception of safety in the tunnel:

- Clearly identify emergency areas with appropriate and legible signage
- Use colour to improve legibility of special features.



M4 East tunnel



M4 East tunnel



NorthConnex tunnel

Figure 4-4: Project benchmarking – tunnels

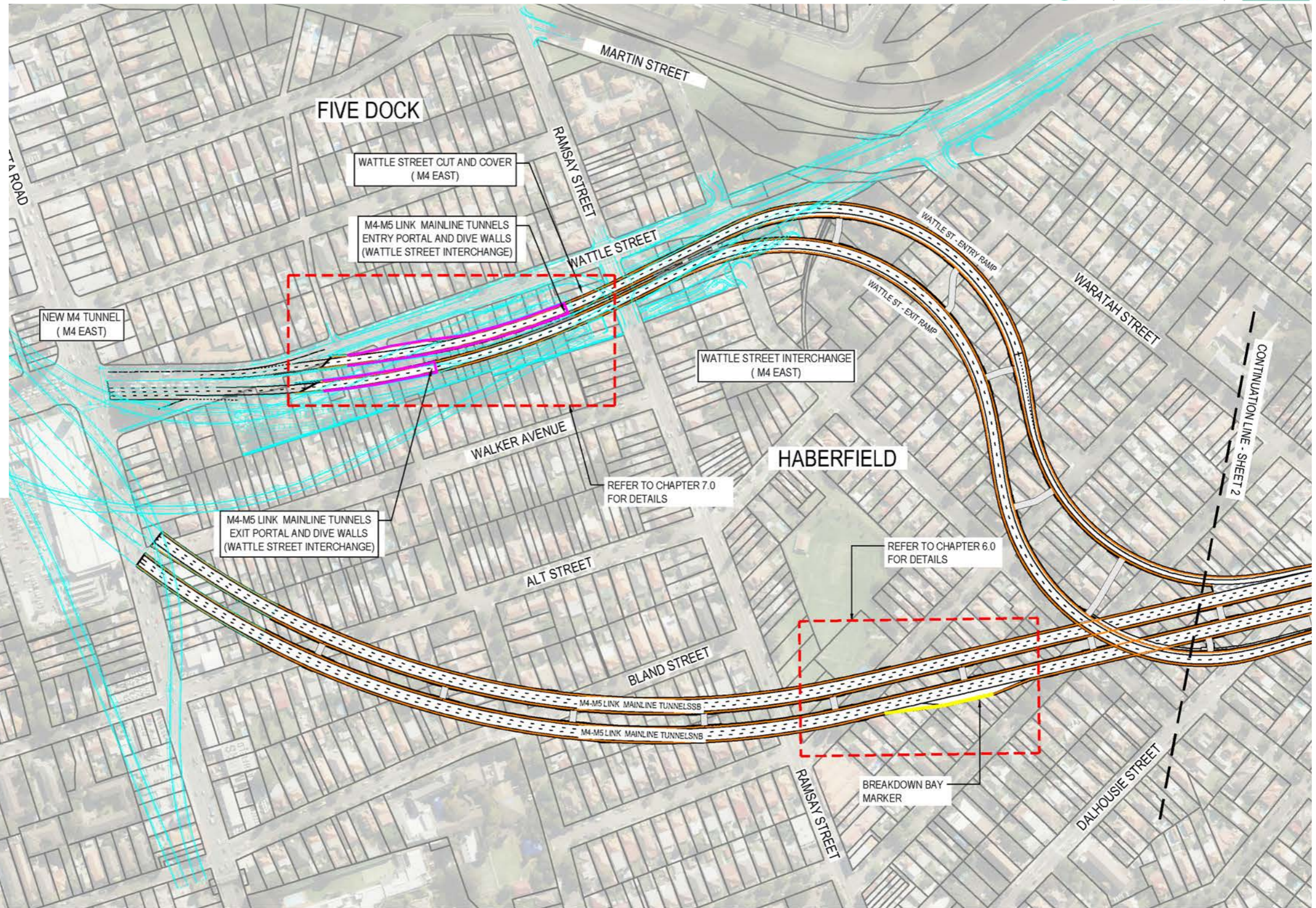


### 4.3 Project plans

The urban design for the project is undertaken with the understanding that the urban experience occurs in two environments. These are:

- Tunnel experience, moving through the driven tunnel and its transitions
- Surface experience of local characters for above ground facilities.

This section provides the layout of project elements in relation to the road geometry and its surrounding context. Refer to Figures 4-5 to 4-11. Details of individual project elements are divided into three main components of SPI, tunnel and portals and are illustrated in Chapters 5.0 St Peters interchange, 6.0 Tunnel and 7.0 Wattle Street interchange.



1 PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

- LEGEND**
- TUNNEL PANELS - VISUAL EVENT - LOCATION MARKER
  - TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - TUNNEL PANELS - STANDARD
  - PORTAL AND DIVE WALLS
  - PROJECT WORKS BY OTHERS

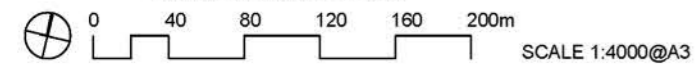
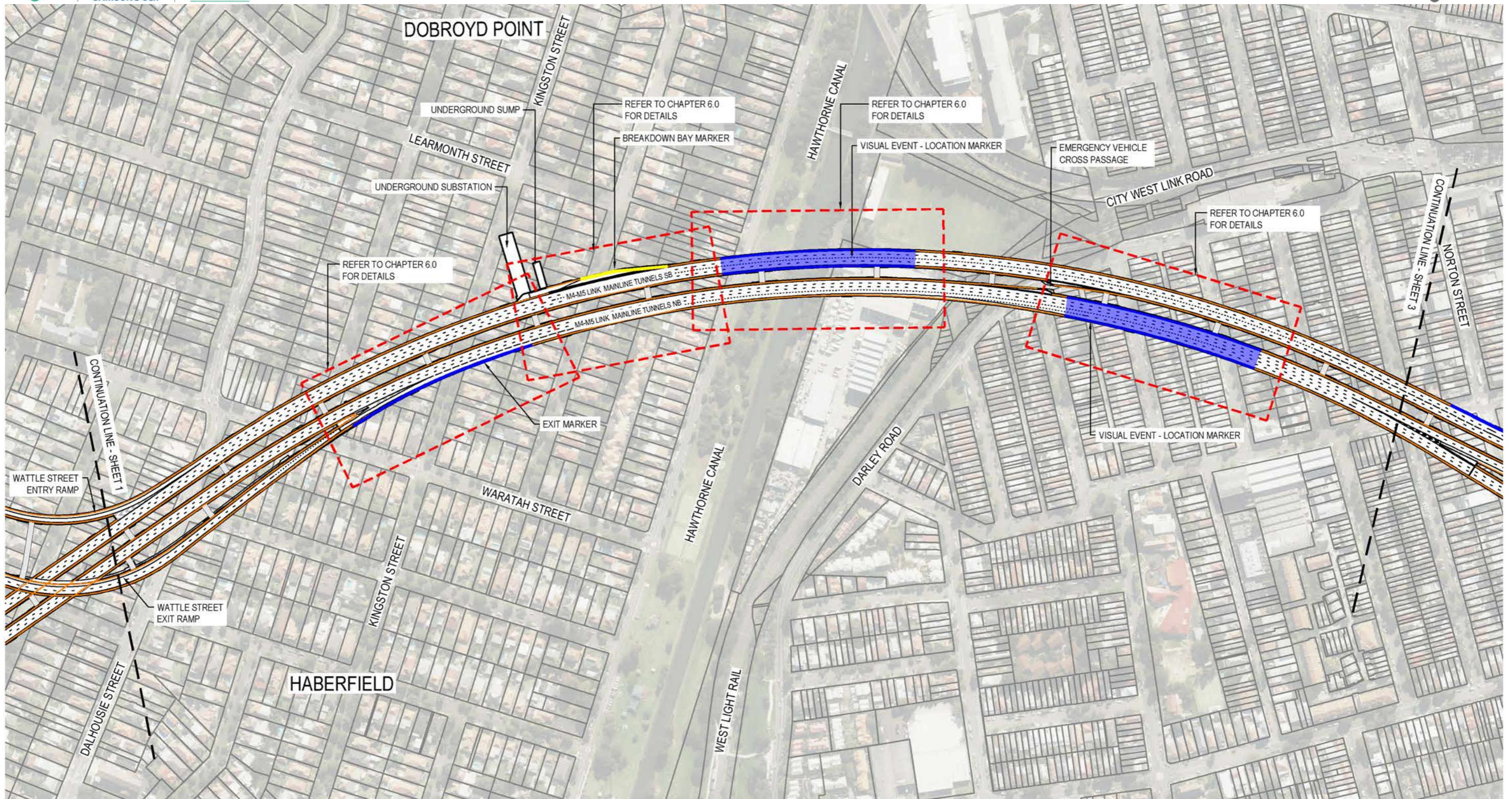


Figure 4-5: Urban design concept plan – 1 of 7





2 PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

- LEGEND**
- █ TUNNEL PANELS - VISUAL EVENT - LOCATION MARKER
  - █ TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - █ TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - █ TUNNEL PANELS - STANDARD
  - █ PORTAL AND DIVE WALLS
  - █ PROJECT WORKS BY OTHERS

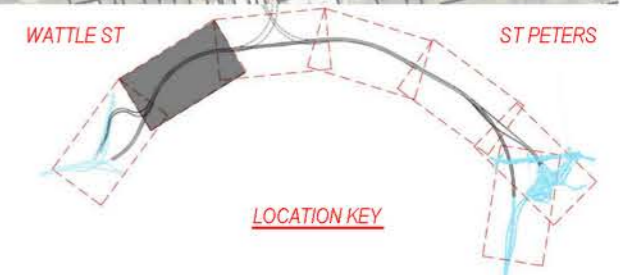
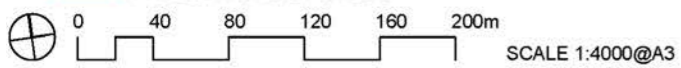
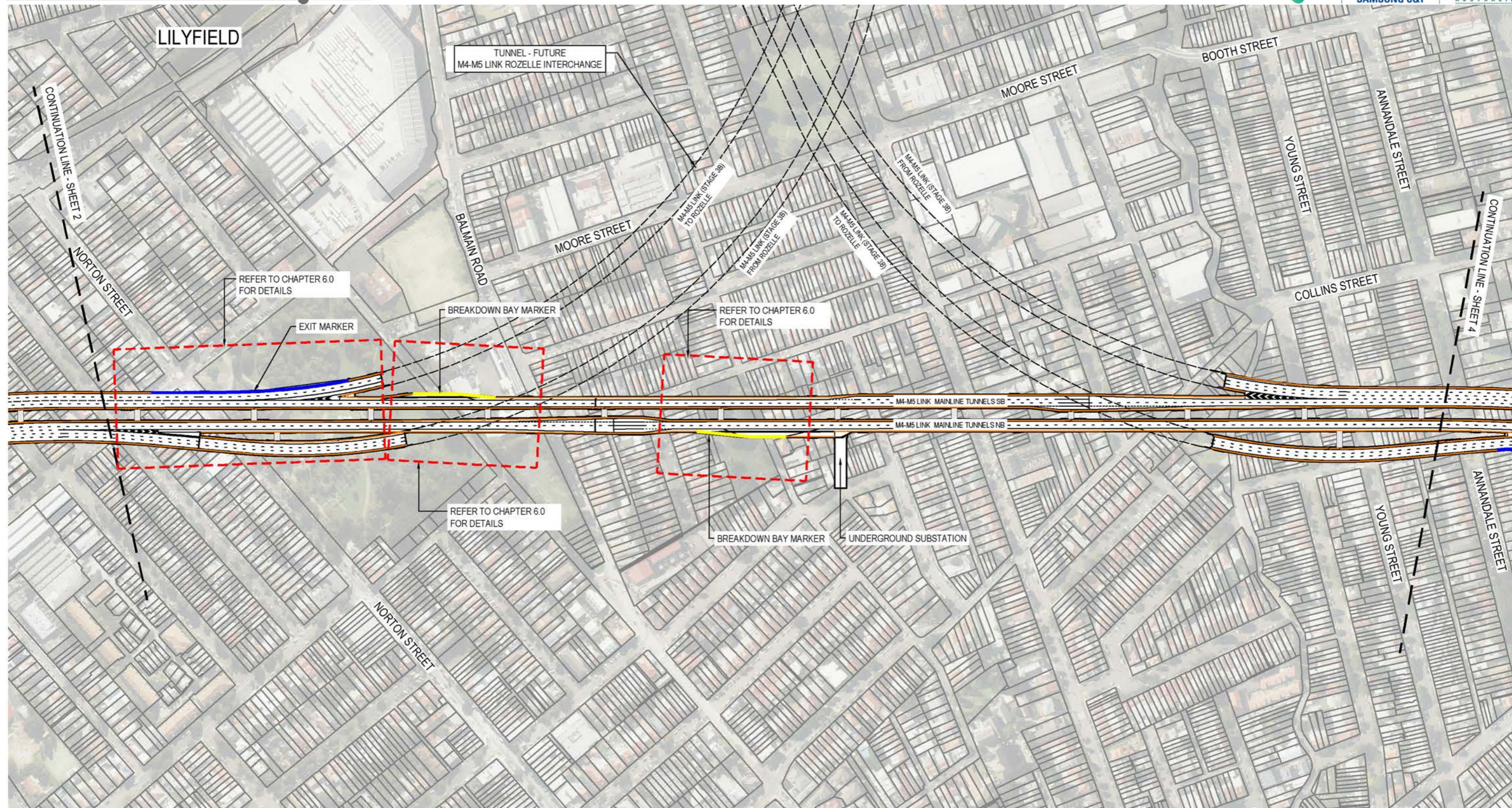


Figure 4-6: Urban design concept plan – 2 of 7





3 | PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

LEGEND

- █ TUNNEL PANELS - VISUAL EVENT - LOCATION MARKER
- █ TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
- █ TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
- █ TUNNEL PANELS - STANDARD
- █ PORTAL AND DIVE WALLS
- █ PROJECT WORKS BY OTHERS

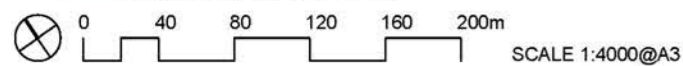
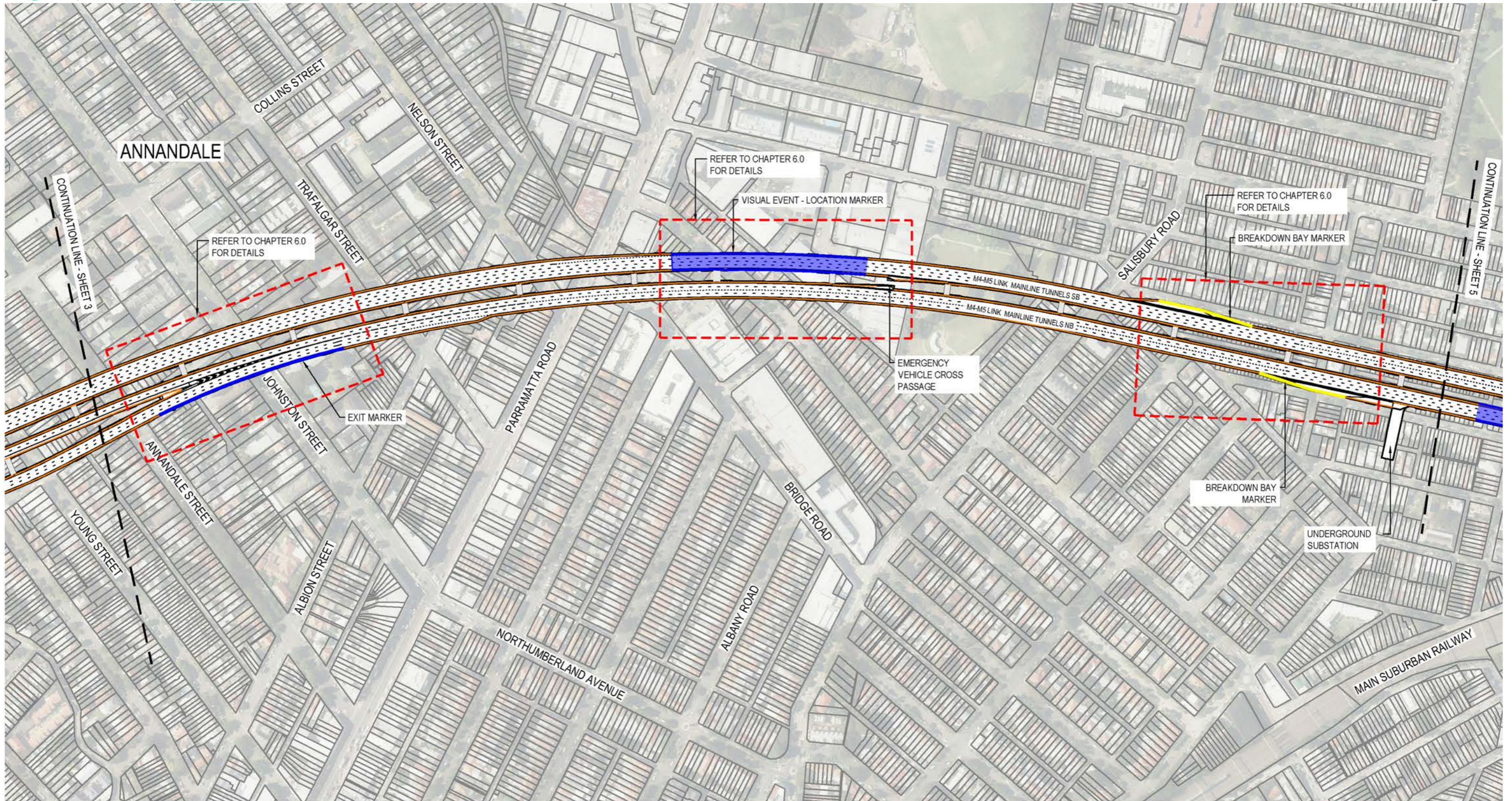


Figure 4-7: Urban design concept plan – 3 of 7





4 | PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

- LEGEND**
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  - █ TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - █ TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - █ TUNNEL PANELS - STANDARD
  - █ PORTAL AND DIVE WALLS
  - █ PROJECT WORKS BY OTHERS

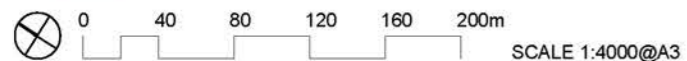
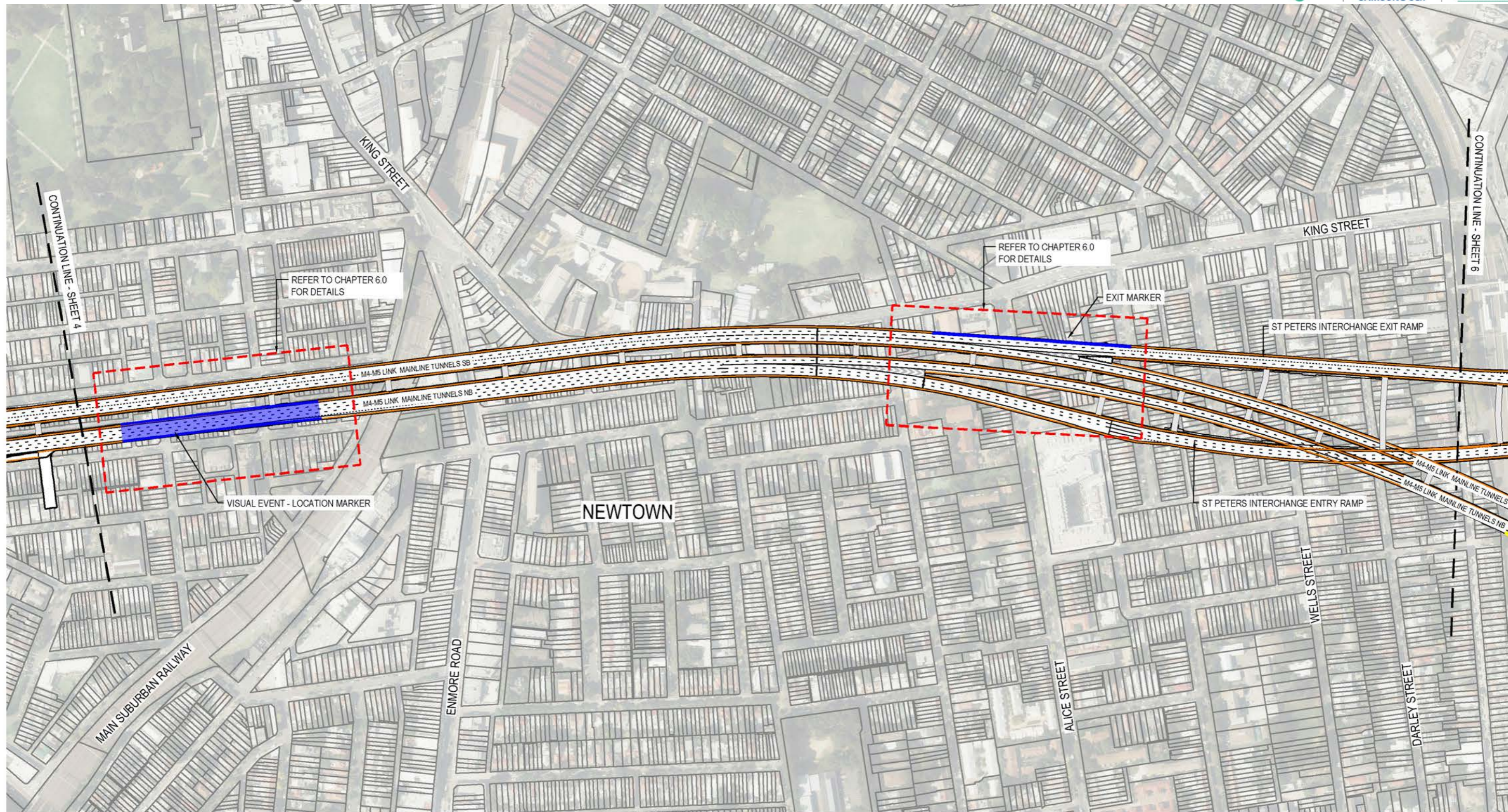


Figure 4-8: Urban design concept plan – 4 of 7





5 PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

- LEGEND**
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  - TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - TUNNEL PANELS - STANDARD
  - PORTAL AND DIVE WALLS
  - PROJECT WORKS BY OTHERS

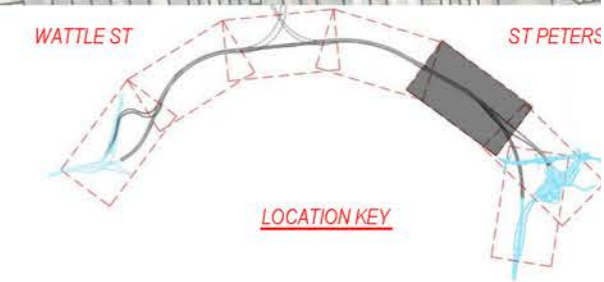
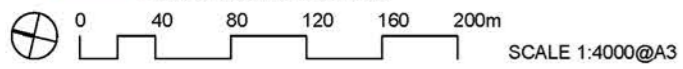
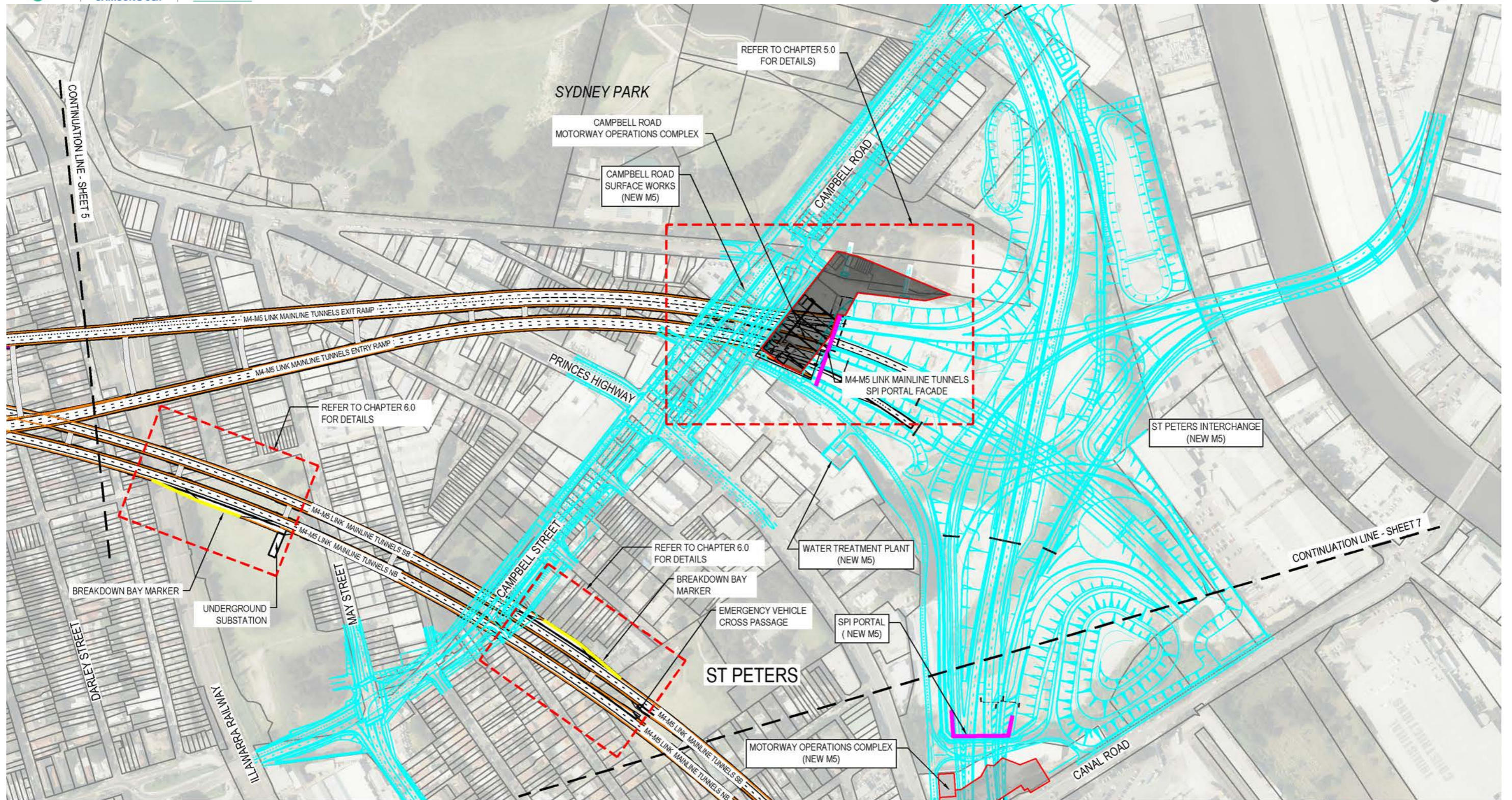


Figure 4-9: Urban design concept plan – 5 of 7





**6 PLAN - URBAN DESIGN CONCEPT PLAN**  
SCALE 1:4000

- LEGEND**
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  - █ TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - █ TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - █ TUNNEL PANELS - STANDARD
  - █ PORTAL AND DIVE WALLS
  - █ PROJECT WORKS BY OTHERS

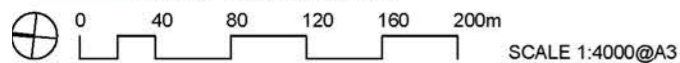
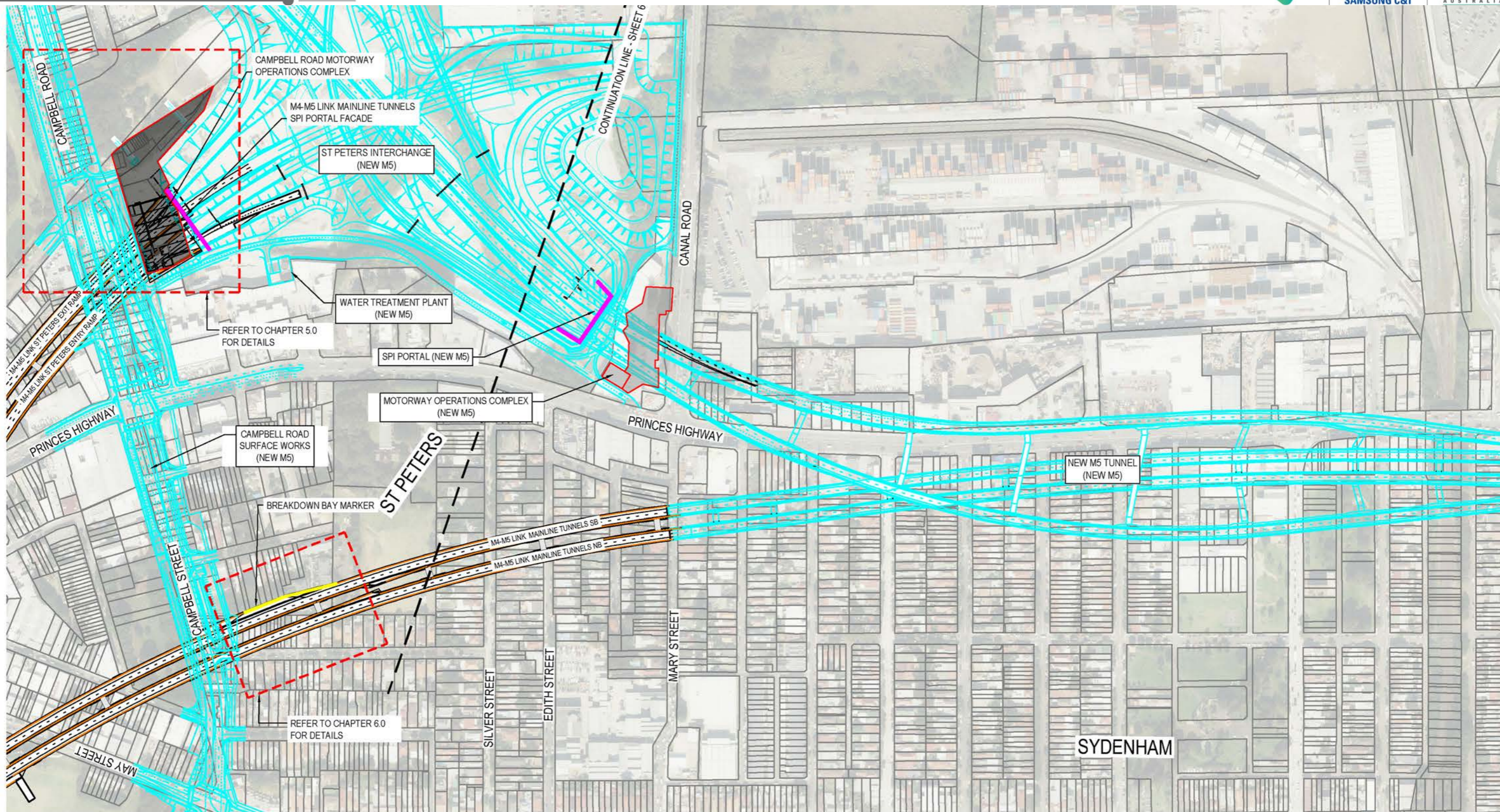


Figure 4-10: Urban design concept plan – 6 of 7





7 PLAN - URBAN DESIGN CONCEPT PLAN  
SCALE 1:4000

- LEGEND**
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  - █ TUNNEL PANELS - VISUAL EVENT - EXIT MARKER
  - █ TUNNEL PANELS - VISUAL EVENT - BREAKDOWN BAY MARKER
  - █ TUNNEL PANELS - STANDARD
  - █ PORTAL AND DIVE WALLS
  - █ PROJECT WORKS BY OTHERS

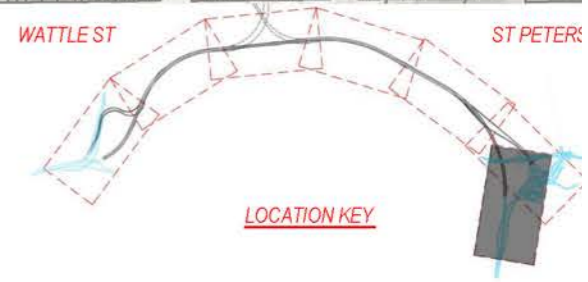
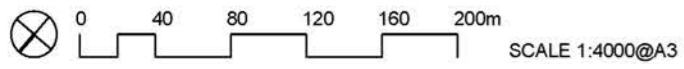


Figure 4-11: Urban design concept plan – 7 of 7



# 5.0 St Peters interchange

## 5.1 Overview

St Peters interchange and the Campbell Road MOC is located to the south of Campbell Road and includes the New M5 tunnel support facilities, MOC 4 and MOC 5.

The Campbell Road MOC forms part of the wider SPI and is located on a relatively small footprint to the northern end of the interchange (refer to Figure 5-1). The site for permanent works is about 8,750m<sup>2</sup> and includes the following:

- Campbell Road ventilation facility
- Inlet air supply building
- Workers amenities, workshop and storage building (ancillary facilities)
- Water treatment plant.

Nearby land use include some residential terraces and residential flat buildings to the north, with Sydney Park across Campbell Road to the north east. Light industrial and commercial developments are situated to the west, with the proposed recreational open space to the east.

The built form typology is generally characterised by two storey terraces. A four storey apartment building is located at the corner of Barwon Park Road and Campbell Street, which has an outlook largely directed towards Sydney Park. The industrial and commercial developments are generally single and two storey buildings.

The access in and out of the site is from Campbell Road. The design levels along Campbell Road range from RL13.2 near the western end of the site to about RL9.6 at the entry driveway at the eastern end of the site. The buildings are located on the southern side of Campbell Road. The facilities have been designed to provide a positive outcome for the neighbourhood.

To the west of the Campbell Road ventilation facility is a shared path (designed and constructed by the New M5), which will provide cyclists and pedestrians access to view the western elevation of the building and a variety of standalone artwork installed by the New M5. There is no opportunity to increase the site boundary into the road corridor or compromise the future public amenities.

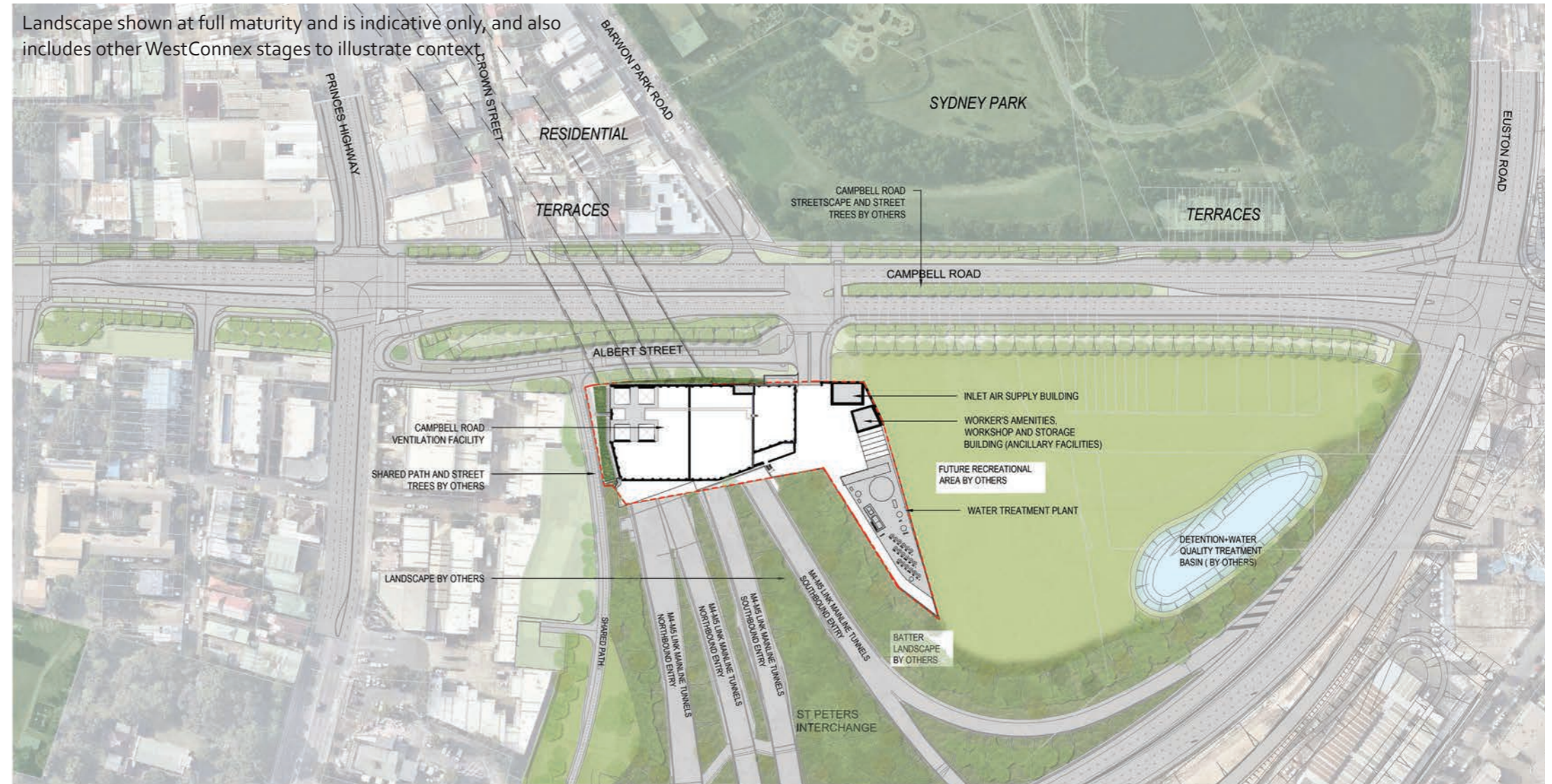
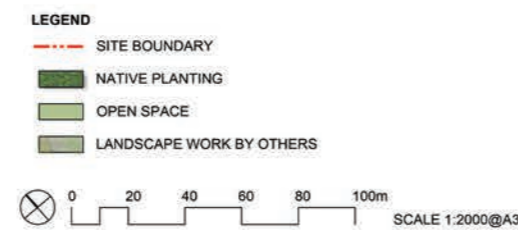


Figure 5-1: Campbell Road MOC – site plan





## 5.2 The building blocks

The Campbell Road MOC structures have been grouped into two elements, refer to Figure 5-2:

- Prominent facilities – Campbell Road ventilation facility
- Recessive facilities – water treatment plant and ancillary facilities.

These groups have the following characteristics:

### Prominent facilities

Prominent facilities are more visible from the motorway or surrounding neighbourhoods and provide an opportunity for incorporating signature elements and stronger branding references in the form of colour, articulation and texture.

These facilities are designed to:

- Be good neighbours with a consideration of site and context
- Be bold in their architectural expression of volume and scale
- Consist of signature features that tie building elements together.

### Recessive facilities

Recessive facilities are less visible from the motorway or surrounding neighbourhoods and need to blend in with their contextual setting. They do not relate to the motorway experience and therefore, will incorporate only subtle branding elements in the form materiality and colour.

These are:

- Visually recessive in colour and architectural façade treatment
- Articulated in design to reduce their scale and bulk
- Similar in architectural expression.

The site composition has been built up in layers comprising:

- Basic building blocks of prominent and recessive functional elements
- A series of secondary screening elements that comprise
  - Site security enclosure fencing
  - Ventilation outlet screening elements
  - Portal screening element.
- A graphic surface encircling the prominent facility.

These layers result in an overall composition that can express the lateral integration narrative of this place, refer to Figure 5-2.

The architectural treatment for the building has been informed by:

- Site context (built form fabric)
- Local artistic expression through street art
- Understand Indigenous influences of the local area.

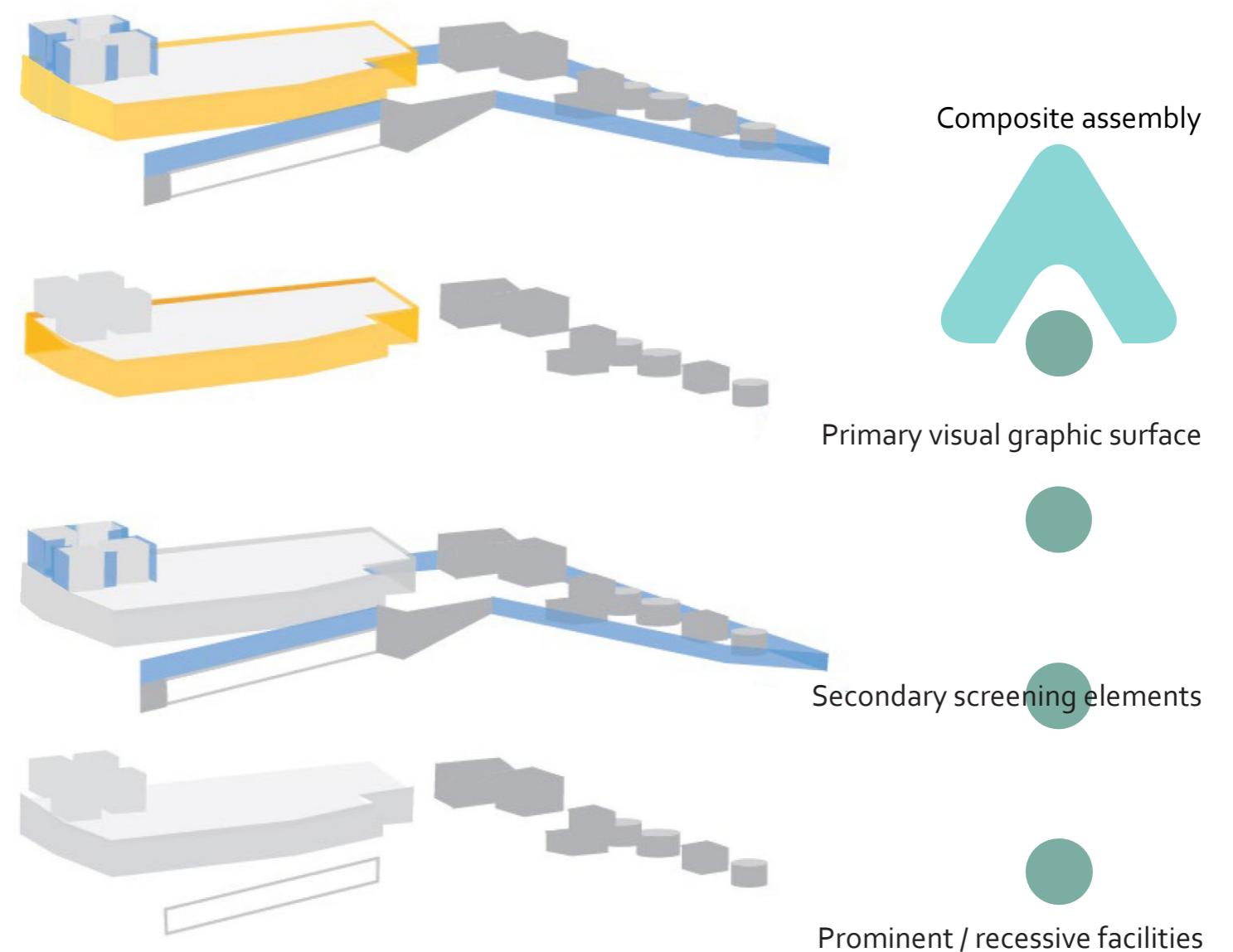


Figure 5-2: Building up the composition



## 5.3 Site narrative

### Economic activity and physical patterning

The area is a centre for logistics and goods transport. Air, land and sea movements come together near this area and the effects of this activity are evident in the urban landscape.

The physical structure of the area is a mix of fine grained elements such as worker's terrace houses and small industrial buildings. This is complemented by a layer of 'big box' industrial and commercial buildings. Even within the larger industrial buildings, a layer of finer grained activities, such as co-work spaces and shared offices occurs. The area also has several container yards where containers are stacked in a continuously shifting array of geometry and colour, a kinetic abstract sculpture that is lively and a highly visible part of the urban experience, refer to Figure 5-3.

This has informed the architectural treatment in the following ways:

- Selection of large scale 'corrugated' aluminium façade material to the Campbell Road ventilation facility
- Selection of brick base areas to the Campbell Road ventilation facility
- Use of earth tones, modular colouring and patterning
- Concepts of 'supergraphic' scale to the design.



Figure 5-3: SPI local character



### Cultural activity and informal expression

Creative industries, the 'backyard' atmosphere and gritty urban fabric of the area provide an environment conducive to informal activities that challenge urban norms about politeness. These activities include warehouse events, tolerated in proximity to seemingly incompatible uses and a community openness to accept street art as part of the landscape, refer to Figure 5-4.

Street art, while being generated informally or 'on the run' exhibits a discipline of its own. Observations of street art in the area show that there is a deliberate style to each piece of art distinguishing it from the crowd. These characteristics include:

#### Graphic techniques

- A stylistic approach to form and colour
- A distinct and recognisable pattern in calligraphy
- A family of colours embedded in each piece
- Deliberate edges
- Layered approach to space.

#### Narrative techniques

- A reference to place, event or idea
- A word in reference to an idea.

This has informed the architectural treatment in the following ways:

- Concept of building façade as a canvas
- Concept of representational art on building façades
- Use of bolder tones, modular colouring and patterning
- Selection of a range of colours across all building façades.



Figure 5-4: SPI local cultural activity



### Indigenous continuity

The idea of this place as an area of cultural activity extends to the continuing Indigenous connection to this place and the making of art that is 'of this place'. The Bidjigal people who were originally from the area in and around Castle Hill were relocated to La Perouse on one of the first dedicated Indigenous communities. This relocation coupled with the seaside location of La Perouse gave rise to a tradition of shell craft among the Bidjigal women.

This shell craft involves an understanding of the movement of the sea, fossicking along the beaches and bays of the coast collecting specific shells, and creating art with the shells. This tradition speaks to knowledge of the area, understanding of the coastal environment and the craft of making and reinvention. Local artists and Bidjigal elders, Esme Timbery and Marilyn Russell continue this tradition today linking past and present; water and land; and people and place.

This has informed the architectural treatment in the following ways:

- Concept of shell and water narrative as expression of connection and continuity
- Concept of perforated texture to reference shell art
- Use of bolder tones, modular colouring and patterning.

### Narrative synthesis

The building will be a celebration of the ongoing and vibrant culture of the site – its robust sense of movement, making, colour and reinvention, refer to Figure 5-5.



Figure 5-5: Synthesis of elements taken from place



## 5.4 Architectural building treatment

### The building blocks – materiality

The building components provide a base for expressing the narrative of place, refer to Figure 5-6.

- Dark charcoal masonry references the site's industrial past

- Corrugated metal cladding and varying colours reflect the site's current transport and logistics uses
- Metal battens express the verticality of the built form and relationship with other buildings of WestConnex.



Figure 5-6: The building blocks – materiality

### The building blocks – 3D canvas

The folded aluminium skin provides a three dimensional 'canvas' and allows a kinetic experience with differing views and colours unfolding as one moves around the building, refer to Figure 5-7.

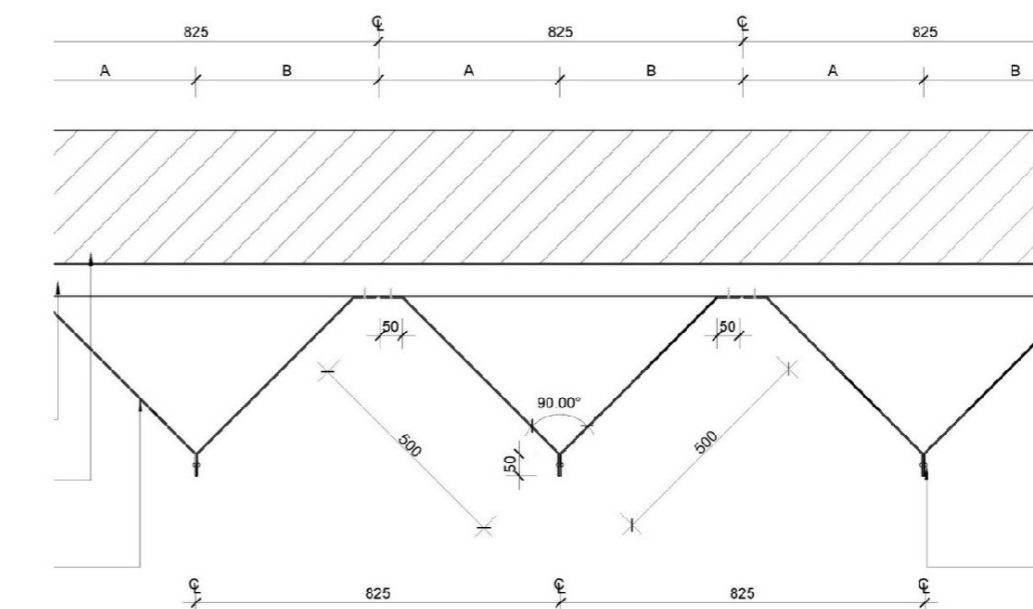


Figure 5-7: The building blocks – 3D canvas



## 5.5 The art

### Philosophy

The overall urban design philosophy for the project is to create an integrated experience that is derived from, and adds to, recognition of the corridor's sense of place.

### Approach

Originally, Indigenous art and artistic projection were required within the interior walls of the project tunnels. General consensus within the project team and external reviewers has moved the artwork to the ventilation facility. This enables increased exposure of the artwork to motorists travelling to and from St Peters and celebrates the scale of the surface works by drivers on local roads, pedestrians and cyclists.

The surface art strategy addresses the importance of this project and route through Sydney, the history of the place and the connection to the Indigenous community.

Art that is integrated into the physical fabric of the above ground experience will bring a distinctive character to this project. Public art and interpretation will reflect the project's ambition to create connections to the community of people who live, work and play above the WestConnex network and those that travel in the tunnel.

Partnerships are critical in the delivery of high-quality public art for permanent works. Leveraging these relationships can unlock exciting new ideas and realise exceptional public art. The approach implemented has brought together multiple voices and viewpoints; allowing discovery, creativity, innovation and participation, recognising both Indigenous history as well as the specific characters the neighbourhood above ground and connected to the tunnel.

### Commissioning processes

The Campbell Road ventilation facility presents a unique opportunity for placemaking and the integration of Indigenous culture. A curator has been engaged by LSBJV to engage and manage the preferred Indigenous artist, assisting with translating the artists' vision. Cultural Capital were selected to provide cultural advice due to their blended experience undertaking art projects for the government and the development industry.

Their project portfolio connects art and infrastructure, place and culture with services. They managed standalone art installations planned by the adjacent New M5 in the public parkland overlooking the SPI site, and brought with them a knowledge of the local area, continuity between the two projects, an understanding of the contributions of WestConnex and a level of empathy for the local community.

LSBJV's community engagement has gained the support of the MLALC, Deerubbin Land Council and numerous community organisations in the Redfern area. LSBJV have hosted two formal Indigenous Community Engagement forums in Redfern and Western Sydney (Penrith) with up to 100 people in attendance and maintain informal communication with community elders. This strong Indigenous community engagement is critical to project delivery and has assisted LSBJV with the local artist selection.

The methodology used to select the artist was a considered process. From the start, the focus has been on engaging female Indigenous artists to help balance the mix of known artists already chosen to commission public art within SPI, as part of the New M5. The theme for NAIDOC week in 2018 (and coinciding with project commencement) was 'Because of her we can' celebrating the invaluable contributions that Indigenous and Torres Strait Islander women have made – and continue to make – to their communities, families, history and to our nation. LSBJV wished to honour this theme by curating a public art work by an Indigenous female artist.

The artist selection process has been as follows:

1. A long list of 25 Indigenous artists was established from databases, previous project engagements, not limited by age or experience of the artists
2. The long list of artists was refined by Cultural Capital via an internal curatorial workshop to a short list of 12 Indigenous artists, based on their preferred medium of art work and their existing commitments:
  - Artistic excellence, originality
  - Appeal to a wide audience
  - Positive impact on the day-to-day use of the public domain
  - Adaptations of work to building structure
  - Ability to deliver
  - Minimal aesthetics with simple form / use of colour
3. The shortlist was further refined by Cultural Capital via a second internal curatorial workshop based on artist availability and geographical location to finalise a shortlist of three Indigenous artists for review internally by the LSBJV nominated panel comprising design managers, Lendlease Indigenous art engagement manager, LSBJV Indigenous engagement manager and building architects
4. Consultation with local Indigenous groups guided the selection of the preferred artist. Opinions were sought regarding the engagement of Indigenous artists from senior leaders within:
  - MLALC
  - Tribal Warrior Indigenous Corporation
  - Mudgin-gal Indigenous Women's Centre
  - Wyanga
  - National Indigenous College
  - Indigenous Housing Company
  - Mudgin-gal Indigenous Corporation
  - Boomalli Indigenous Artists Co-op.

The feedback from these stakeholders communicated the importance of:

1. Having the right artists engaged for what is considered a prominent art piece
2. Engaging with local NSW artists, recognised internationally; strongly opposing the selection of interstate artist
3. Following cultural protocol and engaging an artist with connection to Bidjigal Country with a direct link to place.

For this reason, LSBJV are delighted to be working with Esme Timbery ('Aunty Esme') and her daughter Marilyn Russell. The artists have been invited to create a work that celebrates local First Nations stories, histories, language and culture, honouring the oldest, continuous living culture in the world. Both of these artists are integrated within the LSBJV design team and have collaboratively developed and further informed the architectural treatment of the ventilation facility. At this stage the agreed artists' concept will be refined by working with the artist and the façade factory supplier in order to replicate the concept with precision. The Indigenous artists are a valued member of the design team. LSBJV pride themselves in designing and constructing a legacy piece of infrastructure with a creative and modern building façade that pays homage to the Indigenous community.

### Artist brief

Initially, the artists were provided with a brief of the project narrative, building constraints and current thinking to date. The artists were then given the time to think of a design which was significant to them personally, their family and culture, with the symbology and colour representing this significance. The idea was to better understand the place and the linkage of the place to local Indigenous culture.



## Significance of the artist selection

'People belong to the country' – the land comes first as a placemaking narrative and the actions of people over time are part of the story of the land. As such, the story of the land needs to find its way into the shape and narrative of buildings placed on the land. Intangible heritage (people's stories and memories of place) are as important as the physical heritage and therefore the design narrative is an opportunity to tell the story of the land on which the building is located, shaping the façade around the functional interiors.

Connection to country and the continuing Indigenous understanding of place are a key part of the site narrative built on the ideas of texture, vibrant colour, layering and making.

The shell work of the Timbery and Russell families, Bidjigal people of La Perouse, carries within it stories of invasion, displacement, adaptation and cultural revival. It speaks of skills and traditions passed from generation to generation of Bidjigal women of La Perouse.

In 1885 an Indigenous Reserve was established in La Perouse. This saw the return of Indigenous families to the area and the growth of the arts and crafts tradition. The Bidjigal women of La Perouse women have been earning an income from shell work for generations.

The significance of the artists is their direct family and cultural links to the generations of Indigenous people who gathered shells on Sydney's beaches. Engaging such culturally respected artists has enabled the project to realise the significance of the location and enable the building to become a landmark; an educational piece which represents the culmination of history and art, representing this contemporary craft for future generations of Sydney to enjoy.

## Signature artwork

The shell work of La Perouse could be called the first and oldest Indigenous art movement in Australia. Shells have been used by coastal Indigenous communities for countless generations for tools, including fish hooks, and jewellery (worn by both men and women), and religious and ritualistic objects. Collecting shells to create contemporary shell artwork was first encouraged by the Christian missionaries in the 1880s, an interest born out of the Victorian-era fashion.

Historical accounts describe Indigenous men making and decorating clubs and boomerangs and women decorating these weapons and other objects with shell work to sell to tourists who visited this historic area.

Indigenous curator and academic, Hetti Perkins says "this work interrogates what is and what isn't Indigenous art... it challenges stereotypes... what's contemporary... what's traditional... what's art.... what's craft... how craft becomes collectible art."

Models of the Sydney Harbour Bridge, elaborately decorated with shells, are amongst the signature artworks produced by La Perouse Bidjigal artist and elder Esme Timbery and her daughter Marilyn Russell. For Esme and Marilyn, making shell bridges is part of a long family and cultural tradition. Esme Timbery, like other La Perouse shell artists, sculpts cardboard bases as a foundation. These forms are then covered in material and shelled, and in some cases topped with glitter. The designs and patterns created using different types of shells and layouts are inherited and continued, with individual family styles recognised and understood.

## Artist biography

### Esme Timbery

Esme Timbery, born in 1931 (and her late sister Rose Timbery) like most shell artists, learnt shell work as young girls- from the age of 6 years, from their mothers, grandmothers and aunts by first sorting the shells by type, size and colour. In these formative years Esme Timbery (refer to Figure 5-8) learnt from her female relatives the names of shells and the times of the year she was most likely to find them. Shells used then and still are delicate 'starries', 'buttonies', 'couries', 'conks', 'pennywinkles', the long and narrow 'beachies', round 'limpets', oval 'fingernails' and small 'fans'.

Still today, the craft of shellwork is passed on with Marilyn learning to make shellwork models of the Sydney Harbour Bridge in the same way: by watching her mother and delighting in passing on her knowledge and passion to others.

Esme's great grandmother was a celebrated nineteenth century La Perouse artist known as 'Queen' Emma Timbery. The work of 'Queen' Emma Timbery, an important community leader, was collected and displayed in an Australian manufacturers exhibition in London in 1910. According to the Australian Aborigines Advocate her work 'was almost fought for' and large purchases were made by significant members of society.

In the 1940s Esme Timbery (and Rose) joined the shell-working network and started selling their work. During the 1950s and 1960s, the women exhibited their works at the NSW Royal Easter Show, at markets, fairs and department stores alongside the carved and designed boomerangs, shields and clubs by the men. Esme Timbery, was later commissioned to make a piece of the Sydney Opera House, which was then purchased by the Opera House.

Esme, now in her 80s, has been represented in exhibitions since 1977 and is in National and State museum collections across Australia, such as the National Museum of Australia, the Art Gallery of NSW and the Museum of Contemporary Art in Sydney. In 2005 she became the inaugural winner of the Parliament of New South Wales Indigenous Art Prize, with two shelled bridges. Working with this icon of Sydney, Esme Timbery and her family have re-crafted the country's history.

The subjects and objects embraced by the La Perouse artists speak to the region's cultural realities and connection to country: the Sydney Harbour Bridge represents Indigenous peoples' ability to transcend boundaries, and its shelled manifestation provides a richer, alternative understanding of the Sydney landscape. Their shell work is a continuation of Bidjigal artistic practice and a very important healing practice. It gives them a context within which to reflect upon their past and to share personal and traditional stories.



Figure 5-8: Esme Timbery

Creator: JACQUIEMANNING

©JACQUIEMANNING



### Marilyn Russell

Marilyn Russell is a Bidjigal shellworker from La Perouse on the shores of Sydney's Botany Bay (refer to Figure 5-9). She learnt the skills required to shellwork from her mother, Esme Timbery, when she was a child. This echoes Esme's own experiences learning from her mother, aunts and grandmother when she was a small child.

Marilyn began shellworking as an artistic enterprise when she returned to the family home to live with and help support her mother in 2007. Her tiny shellworked harbour bridges shellworked booties (refer to Figures 5-10 and 5-11) continue the La Perouse tradition of applying fabric, shells, glitter and sometimes, shell grit to the booties and bridges.

She assisted Esme in the commission for Campbelltown Arts Centre for their exhibition, *Ngadhu, Ngullli, Ngewaninyagu. A Personal History of Aboriginal Art in the Premier State in 2008*. This installation of 200 shellworked booties was later acquired by the Museum of Contemporary Art, Australia.

Marilyn regularly conducts popular shellworking workshops for various arts organisations including the National Gallery of Australia, the Art Gallery of NSW, Casula Powerhouse as well as the Black Arts Market held annually at Carriageworks.



Figure 5-9: Marilyn Russell

Creator: DENNIS GOLDING

©DENNISGOLDING



Figure 5-10: Signature artwork: shellwork model of the Sydney Harbour Bridge by Marilyn Russell



Figure 5-11: Signature artwork: shelled child's shoes by Marilyn Russell

### Hubert 'Laddie' Thomas Timbery

The Timbery family is also known for their creative and beautiful cultural artefact work. This has been a family tradition for generations and involves the shaping and decorating onto wooden objects including boomerangs.

Hubert 'Laddie' Thomas Timbery (refer to Figure 5-12) was born at La Perouse on February 12, 1941 and has had a long association with the craft, the La Perouse community and the La Perouse Museum. He recently passed away and is fondly remembered for his dedication to his family and his contribution to keeping Indigenous culture relevant and alive in contemporary Australia. He held community activities at the museum with boomerang throwing demonstrations and 'yarns' about his craft and culture, refer to Figure 5-13.

His career took him throughout Australia and also brought opportunities to travel overseas to Canada and Switzerland, where he brought his knowledge and experience to the wider world. In Australia he contributed to the design of the Equestrian Centre for the Sydney 2000 Olympics.

Laddie used a technique of 'burning in' to decorate a variety of artefacts and artworks, including his boomerangs (refer to Figure 5-14). The distinctive interlocked 'S' shape refers to the boomerangs and has been incorporated into the artwork for the Campbell Road ventilation facility. This complements the shell work by the women's side of the family as undertaken by Marilyn Russell and Esme Timbery. Including the pattern tells a more complete story about the continuous connection to country in this area, the significant contribution of the Timbery family to keeping the tradition alive and provides further depth to the art, story, in connecting the 'water' element to the 'land'.



Figure 5-12: Hubert 'Laddie' Thomas Timbery. Source: <https://mgns.org.au/articles/uncle-laddie-timbery>

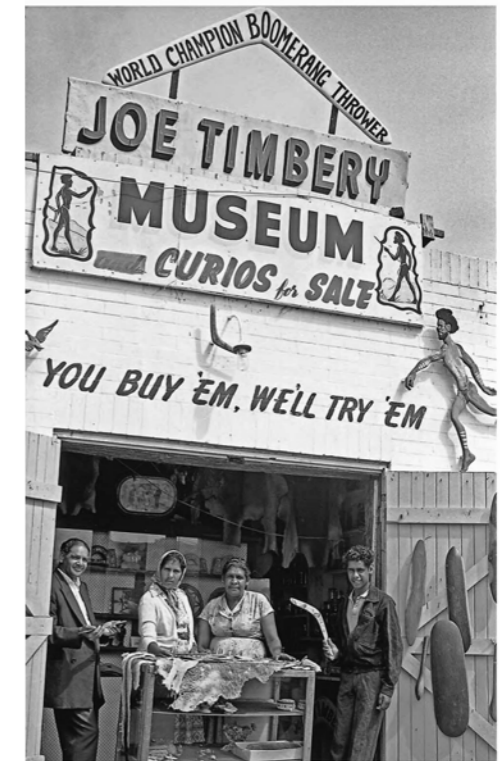


Figure 5-13: Joe Timbery Boomerangs Source: <https://laperouseheadland.com>



Figure 5-14: Boomerang pattern on wooden paddle. Designed by Hubert 'Laddie' Timbery.



## Artwork pattern

There are countless First People's stories and traditions to acknowledge and celebrate. The artwork design acknowledges the value and contribution of the Timbery family to our nation's history – past and contemporary. This artwork celebrates the culturally significant shell-making tradition that is unique to the Sydney Indigenous community of La Perouse.

Initial sketches (refer to Figures 5-15 and 5-16) were created prior to the workshops and started the art conversation. The artwork is a layered concept which reflects the methodical nature of the traditional shellwork craft, comprising of a deliberate arrangement of colour over which a pattern is laid.

The pattern comprises two components:

1. The flow of water across the centre of the design signifies the Timbery's family connection to water, the flow of tides, oceans and connection to country. The symbology references the Timbery family as saltwater people, and the tradition of shellwork handed down from mother to daughters throughout the past generations.
2. The shell design, which evolved from a scallop shape to the shape of the family's favourite and locally found shells of 'Pussycat Beach', also known as starries. This pattern symbolises the history of shellwork as a story of connection – between generations of Indigenous mothers, sisters and daughters; between Indigenous and non-Indigenous communities, a combination of 'white man' technique and Indigenous culture.

The artwork by Esme Timbery and her daughter Marilyn Russel is a continuation of traditional knowledge and connection to country, with the shells embodying local traditional knowledge.

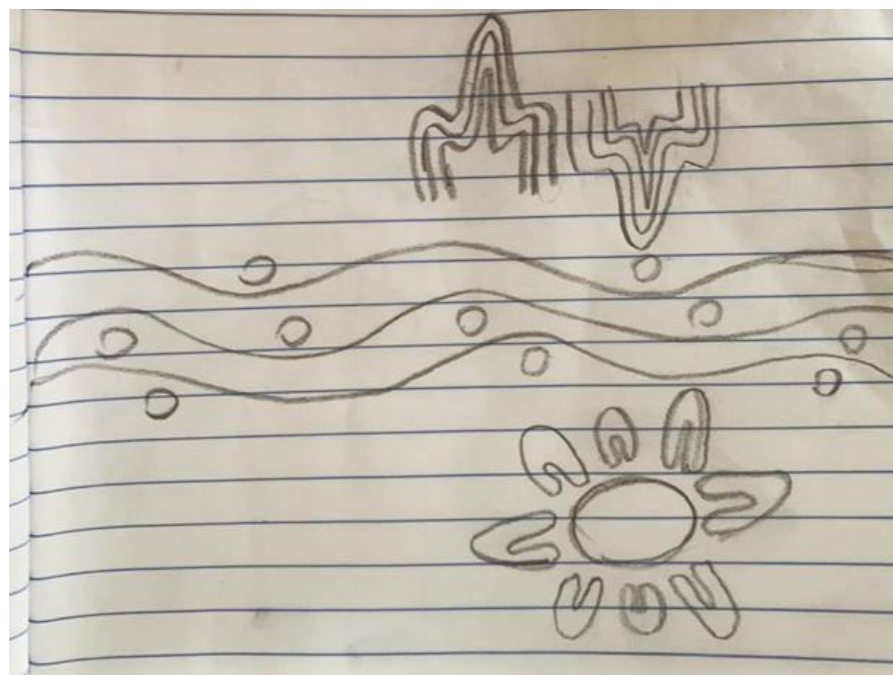


Figure 5-15: Original artwork concept by Esme Timbery and Marilyn Russell



Figure 5-16: Original artwork coloured drawing by Esme Timbery and Marilyn Russell



### Early explorations

The design team has held seven workshops with the artists. These have provided a platform for an iterative journey with inputs from the artists followed by architectural refinements, and then additional inputs from the artists. This has allowed the artists to participate in the 'making' of the building with the result that the façade of the building is itself a work of art and art is truly integrated into the project.

The initial conversation centred around the original artwork sketches and the notion of shellwork, its texture and a reference to how the shore and sea might be expressed on the skin of the building. The idea of a colourful façade, as initially envisioned, that is folded and can provide differing expressions from different viewpoints was embraced by the artists. The potential of the scale of the façade to create a work of art that is visible from a distance and can serve as a bold statement of welcome to Australia from the airport was also embraced.

Initial artistic inputs included the shell texture, wave pattern and intricate line work symbolising gathering spots and hunting tools (refer to Figure 5-17) and the colour palette was a range of warm, earthy tones, refer to Figure 5-18.

The initial architectural follow through included an exploration of scale and pattern layered over the colourful façade, refer to Figure 5-19.

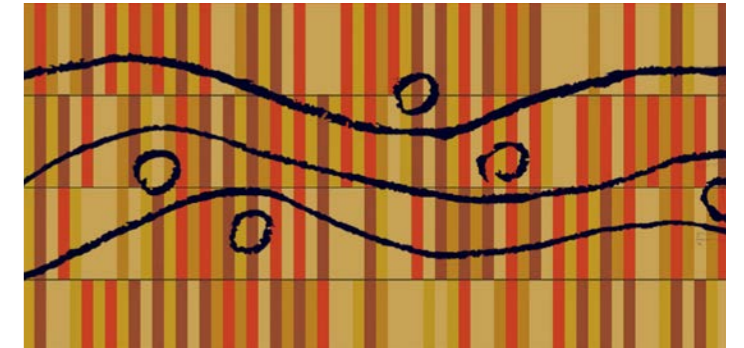


Figure 5-17: Early digitised concept

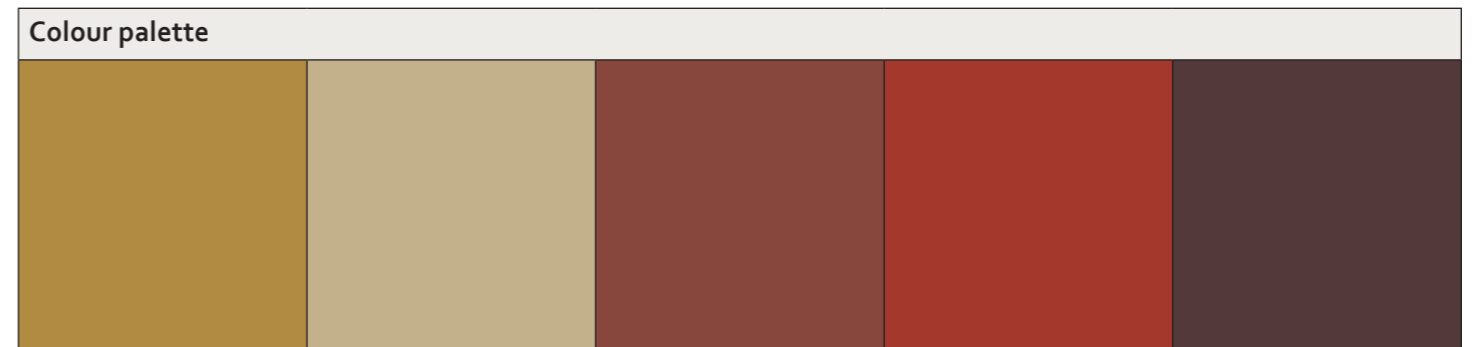


Figure 5-18: Colour palette



Figure 5-19: Early art and design concept



### The pattern as a flat façade image

The continuing conversation centred on a development of the wave and shell pattern with a drawing of a more stylised motif set on a neutral background. Colours were also further explored (refer to Figure 5-22) with a desire to exploit the potential of the panelised façade to, perhaps, move beyond the limited pencil crayon colours of the drawing. The shells used were scallop shells with linework used to detail the ridges and curvatures.

Further architectural inputs included development of a graphic that translated the sketch into a pattern that could be manufactured for installation on the wall. The resulting façade patterning and colouration were based on the colour and character of the sketch (refer to Figures 5-20 and 5-21). Artist feedback on this development centred around the flatness and static nature of the architectural outcome and the need to further investigate colour and texture to capture the spirit of the art, refer to Figure 5-23.

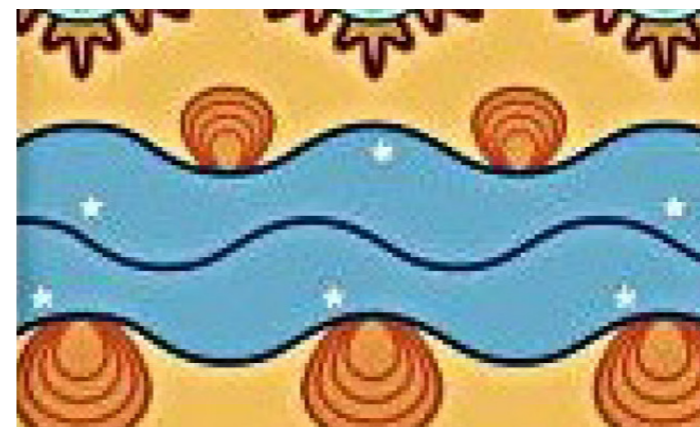


Figure 5-20: Refined artwork

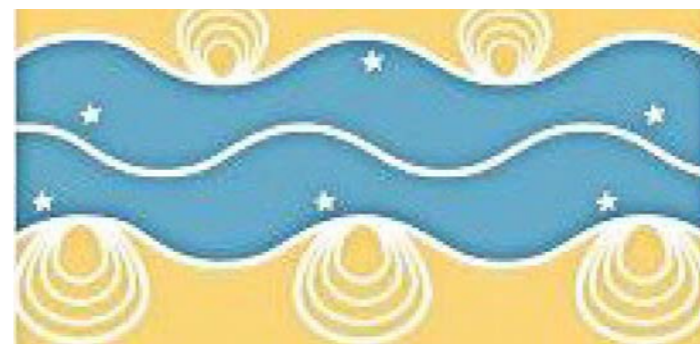


Figure 5-21: Perimeter building skin

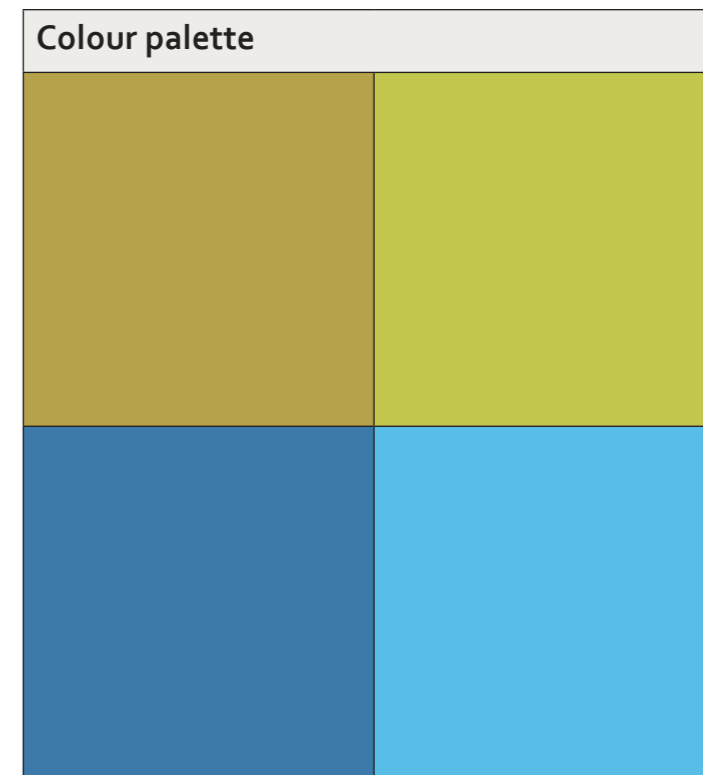


Figure 5-22: Colour palette



Artist's impression  
Landscape (by others) shown indicatively.  
Trees (by others) not shown for clarity of artwork.

Figure 5-23: Early art and design iterations



### The significance of colour

The shellwork objects created by Esme and Marilyn are adorned in bright vibrant colours such as teal, magenta, brilliant green, crimson red or deep blue – their reasoning is simple, they like them, they bring out the colours in the shells and accentuate their beautiful silhouettes.

The revised and expanded colour palette was integrated with the basic palette across the articulated panelling to reflect some of the vibrant colours employed by the artists on their contemporary shellwork objects, refer to Figure 5-24.

### Three dimensional investigations

A perforated expression was investigated that capitalised on the idea of texture, shifting light and shadow, and the idea of seeing both the image and the colour as separate layers, much like the shellwork itself, in experiencing the art. This technique offers an opportunity to create a three-dimensional dynamic outcome. Perforated patterns can be carefully calibrated to achieve abstract to almost photo realistic imagery, to suit the artistic intentions. This approach was well received by the artists and it was acknowledged that it could capture the spirit of the original shellwork, refer to Figure 5-25.

### Artwork implementation

The artwork will be a series of perforations to a determined size on a rolled Aluminium metal panel, that is then powder coated with electrostatic spray paint. The artwork will be a true representation of the imagine derived from the artist; factory made and installed panel by panel on site, to the designated pattern.

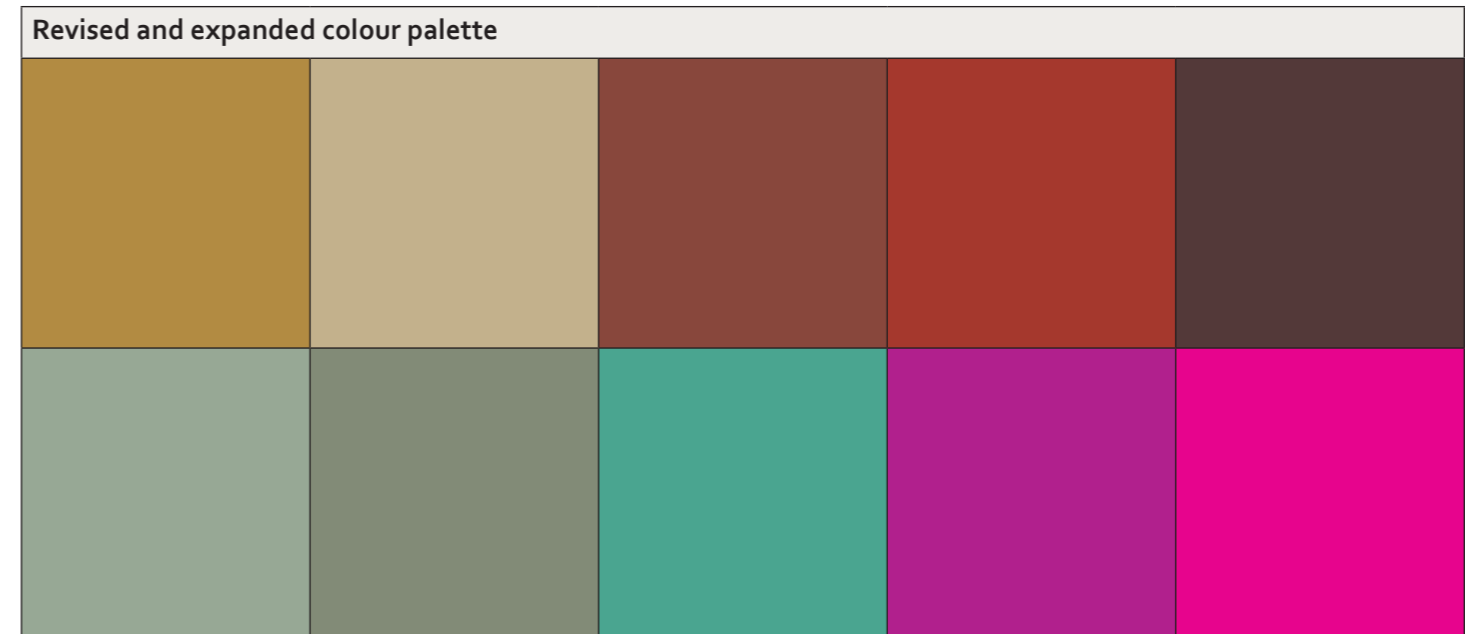


Figure 5-24: Colour palette

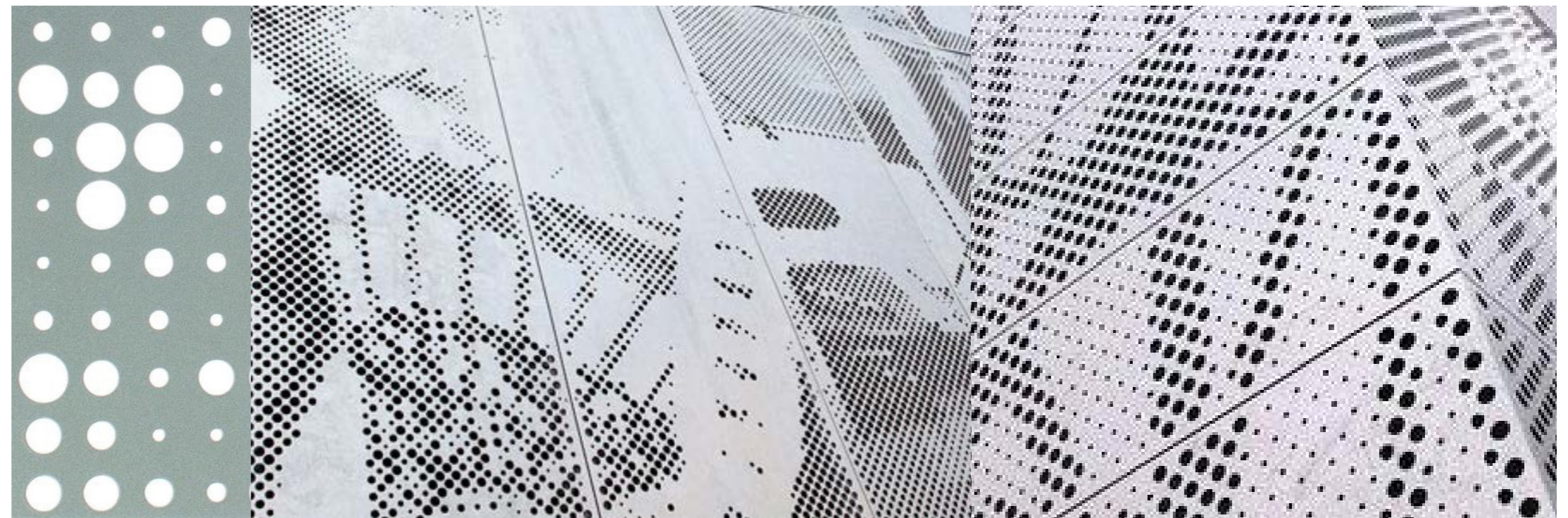


Figure 5-25: Perforated patterns



## Scale investigations

Perforated graphics of several scales were investigated. It was felt that a single powerful wave with a playful collection of shells best captured the artistic vision, refer to Figure 5-26.

Pattern with three dimensional dynamic potential – small graphic outcome

- 3D perforated small graphic:
  - Dual waves
  - Scattered shells.

Pattern with three dimensional dynamic potential – small graphic outcome

- 3D perforated small graphic:
  - Single wave
  - Scattered shells.

Pattern with three dimensional dynamic potential – supergraphic outcome (preferred)

- 3D perforated supergraphic:
  - Single powerful wave
  - Scattered super shells.

Artist's impression  
Landscape (by others) shown indicatively.  
Trees (by others) not shown for clarity of artwork.



Figure 5-26: Scale investigations



### Refining the pattern

Close collaboration with the artists has resulted in a scale drawing of the pattern being mapped on the façade. This included a refined approach to the wave pattern and scale, a decision to focus on the most significant shell type – the starries (refer to Figure 5-27), and inclusion of the boomerang ‘S’ as a base underpinning a more fluid arrangement above.

A series of hand sketches were completed by the artist to test the shape and contrast of the shells. This hand sketch was translated into a grey tone image (refer to Figure 5-31) that could be sent to manufactures for testing the perforation patterning. Both high and low resolution is under investigation to confirm which is better suited for the scale and legibility of the façade, refer to Figure 5-31 and Figure 5-32.

The starrie shells are in two areas, some are in the band of water, others are positioned above this band. This playful, albeit deliberate positioning is reminiscent of shells washing up on the beach (and references the shellwork patterns of the artists), refer to Figure 5-28.

A final layout was developed in grey tones to confirm light and dark values across the façade. The pattern was developed by focusing on the northern elevation of the Campbell Road ventilation facility (refer to Figure 5-29), which comprises about 50 panels. The pattern is repeated as it wraps the building.

Further refinement of colours (refer to Figure 5-30) was also undertaken with larger blocks of colour being identified and a stronger reference to sand and light at dawn and dusk.

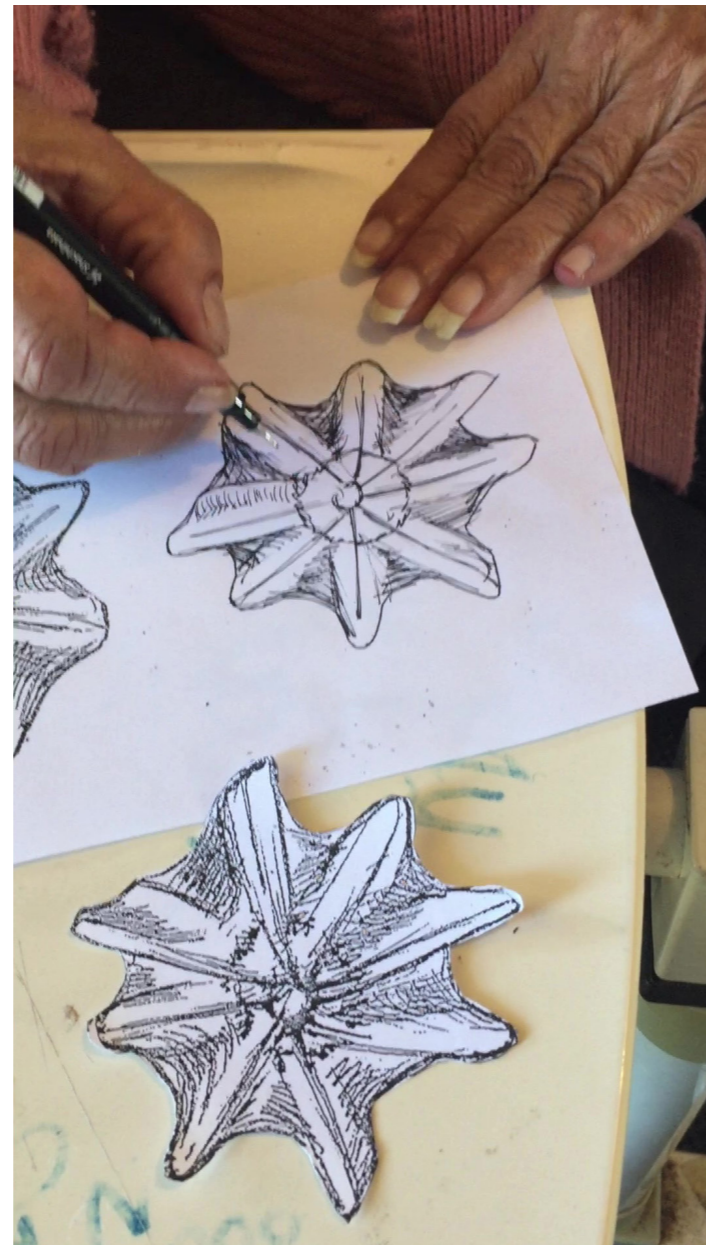


Figure 5-27: Series of original hand sketches by artist

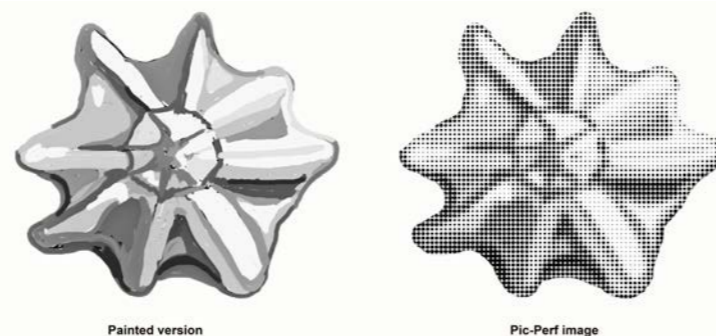


Figure 5-31: Grey toned image

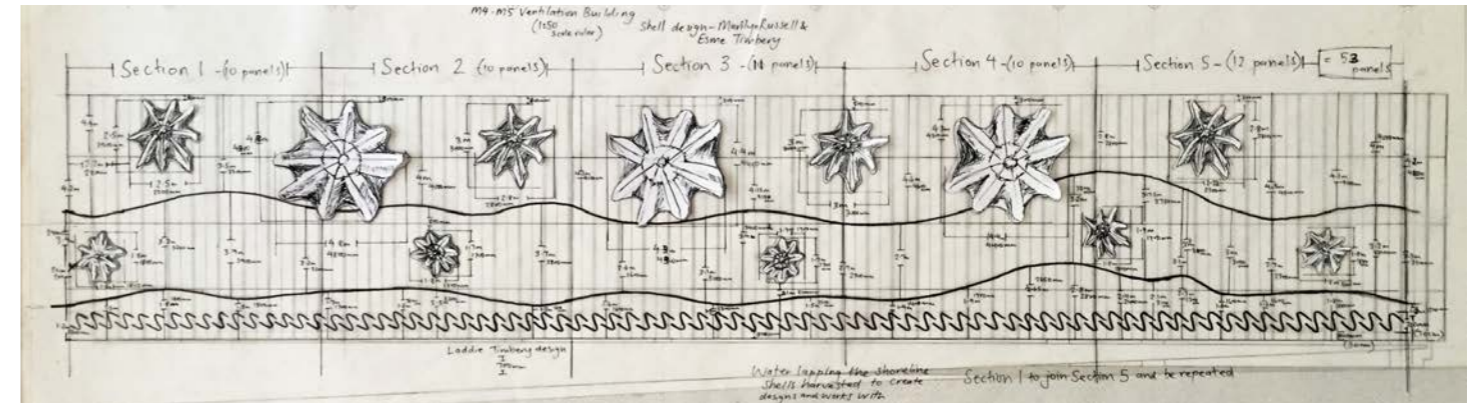


Figure 5-28: Original artist sketch over Campbell Road ventilation facility northern elevation

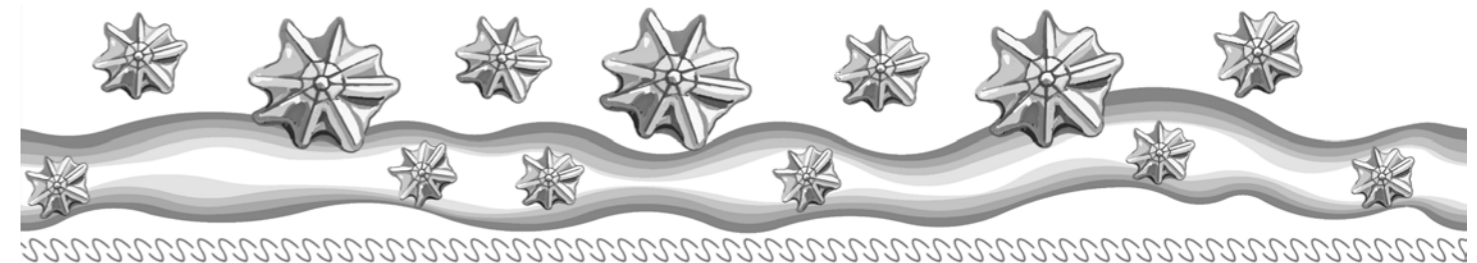


Figure 5-29: Digitised version of artwork

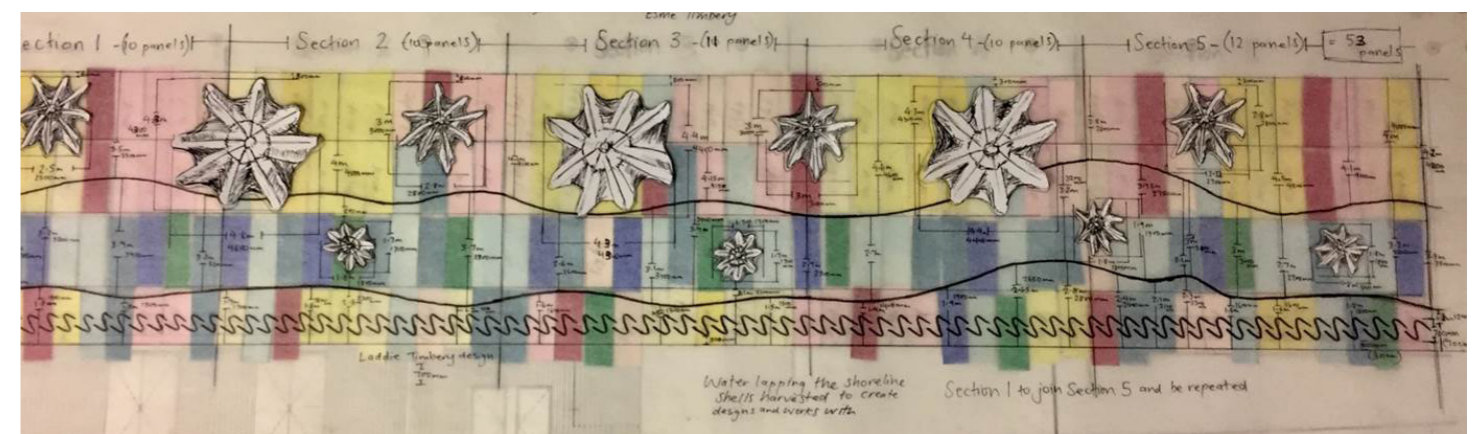


Figure 5-30: Original artists' sketch with colour overlay over Campbell Road ventilation facility northern elevation

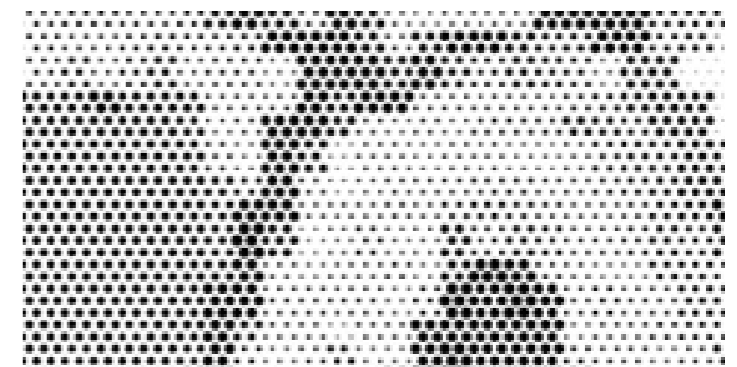


Figure 5-32: Image detail depicted in perforations



### Refining the colours

Colour refinement was undertaken as the artists wanted to move away from earth tones and explore a wider variety of colours. This is consistent with the context of the ventilation facility being in an industrial precinct and the concept of tying into the aesthetic of the existing street art.

Throughout the art and design journey, the artists have expressed their design for the façade to be “quite graphic and bold”. Initially, the artists were working with coloured pencils and water colours. However, the artists moved on to working with paints to interpret the bold flat colours that included yellows for sand; green, teal and blues for water. These bright colours are used in their contemporary shellwork sculptures creating beautiful and expressive crafts, so it seems fitting to integrate these, as much as possible, within the limits of powder-coating colour matching.

The artists have expressed interest in using a combination of matte and gloss paints to highlight aspects of the designs, with specific colours in a metallic finish to provide the sparkle as the sun shimmers on the surface-further referencing the glitter used on their shellwork.

An additional significant aspect of colour is its reference to the Indigenous planting of the area and the species chosen for the project.

The updated colours selected by the artist provide a stronger reference to the art practice associated with the Timbery family and the ocean, sand, shells and skies as opposed to the earthy and more ochre colours associated with desert people and traditional art. The yellows refer to the darker and lighter shades of wet and dry sands and the variety of shell sizes. The blues and greens provide connections with earth and water. This resulted in a pattern of larger blocks of colour and a lighter overall tone for the building, refer to figure 5-33.

A review of available colours from manufacturers that met durability requirements and were compatible with WestConnex operations and maintenance requirements suggested that a further refinement of colour was needed to finalise the artwork, and to ensure its legibility in bright sunlight and lasting quality after installation.



Figure 5-33: Pattern with larger blocks and lighter tone



Figure 5-34: Final colour patterning

This review resulted in a yellow being substituted for some of the lighter pinks and a darker blue being substituted for the palest blue. The artists have confirmed the final colour patterning, including some half panels and added additional green panels, and over the updated perforated patterns to finalise the graphics of the façade (refer to Figure 5-34). Further refinements, if required, will be undertaken during the construction of the façade, working closely with the manufacturer through sampling and mock-up methods.



### Artwork journey

The opportunity to create a work of art, integral to the building's architecture, nine metres high and wrapping the full perimeter of the Campbell Road ventilation facility, sitting in a highly visible place at the gateway to Sydney, is an unprecedented opportunity to provide a 'welcome to country' for international and local visitors alike.

The artwork journey has been a process of creative development and mutual education.

What the artists have presented the design team with is a design with a story. This story has taken a few iterations to translate from a two-dimensional coloured hand sketch to a building render, refer to Figure 5-35.

The art conversation has provided a rich learning opportunity between the artists and the project designers.

Further refinement and consultation between the artists and manufacturers will take place to finalise the perforation hole size in the realisation of the art wall.

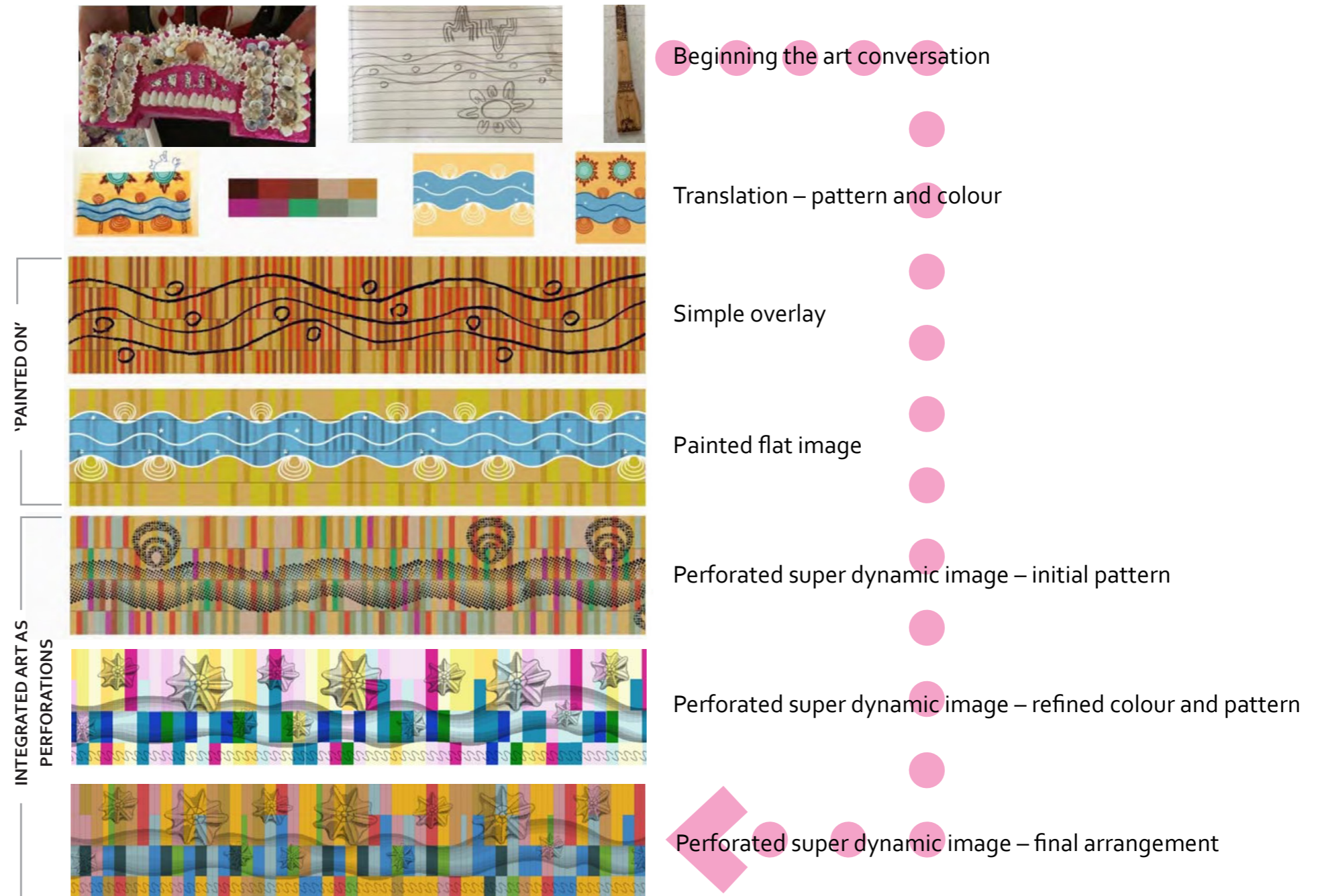


Figure 5-35: The artwork journey



## Kinetic art – participating in creation



Figure 5-36: Kinetic art

### Achieving a successful urban design / art integration

The M4-M5 Link Mainline Tunnels is a unique opportunity for a NSW infrastructure project with the inclusion of an Indigenous artist throughout the detailed architectural design.

Through exploring the types and positions of the New M5 artwork, it was determined that an opportunity exists to use the building as a canvas for public art, showcasing Indigenous creativity and enabling knowledge transfer through colour and pattern. In turn, creating a building which provides a sense of curiosity and is hoped to encourage people to engage with the story of the artwork and the importance of maintaining and respecting the local Indigenous community.

The final artwork form is an integral part of the building's architecture. A dynamic experience is created through the application of different colours, in some locations, on different sides of the folded panels. This playful colour arrangement provides a range of different outcomes depending on the viewing perspective, as shown in Figure 5-36.

The elements of the architecture provide the materials and surface that have been translated into a work of art. The art has been developed to sit 'proud' on the building, above the datum line between ground elements and the folded façade. It is important that the art is a cohesive, legible element and is not being used indiscriminately on the site.

The art is experienced at both long and short distances from roads and footpaths. Pedestrians can view the art up close from the adjacent shared path (by others) or Albert Street footpaths. As one moves around the building one participates in the creating of the visual outcome.

Differences in colour are revealed, patterns merge and emerge and the light and shadow of the sun shift across the façade bringing the architectural work of art to life. The perforated image appears floating in front of the coloured façade as the colours shift behind. This will be further heightened along Campbell Road by the ever shifting dappled light coming through the street trees providing a finer grained, experience for pedestrians and cyclists.



## 5.6 Summary of the narrative

The Campbell Road MOC sits in a complex area. This area is full of movement and activity and is within the heart of one of Sydney's logistics centres. The proximity of Sydney Airport and Port Botany drive much of the area's activity and underpin the site narrative. WestConnex will add additional layers of activity and complexity to this narrative, refer to Figure 5-37.

Key characteristics of the site narrative include:

**Movement** - A three dimensional movement system occurs by surface vehicular movements along major roads, aircraft arriving and departing from Sydney Airport and new below grade vehicular movements enabled by WestConnex.

**Landmark wayfinding** - The Brick Chimneys of Sydney Park, along with their use for temporary art installations, provide a recognisable marker in the area. These suggest that art can be a significant part of the wayfinding experience. Added to these elements will be the ventilation outlets, which include the outlets of the New M5 and M4-M5 Link Mainline Tunnels, located just to the south of Sydney Park along Campbell Road.

**Making** - The area has a history of production. This activity continues today and is evident in the many small manufacturing, logistics and creative industries that have chosen to be located here. The creative identity of this place is also expressed in the street art found on many walls in the area.

**Indigenous continuity** - There has been a continuing Indigenous connection to this place and its legacy as a productive place. Where there once was hunting and food production, the culture of productivity is today brought out in the work of Indigenous artists who express a 'connection to country' for this place through the expression of making art from natural objects found in coastal areas such as this once was.

### Celebrating a robust lineage of production and creation

- Embed visual references to making and movement
- Bring 'connection to country' into the language of the building
- Acknowledge a language of wayfinding landmarks.

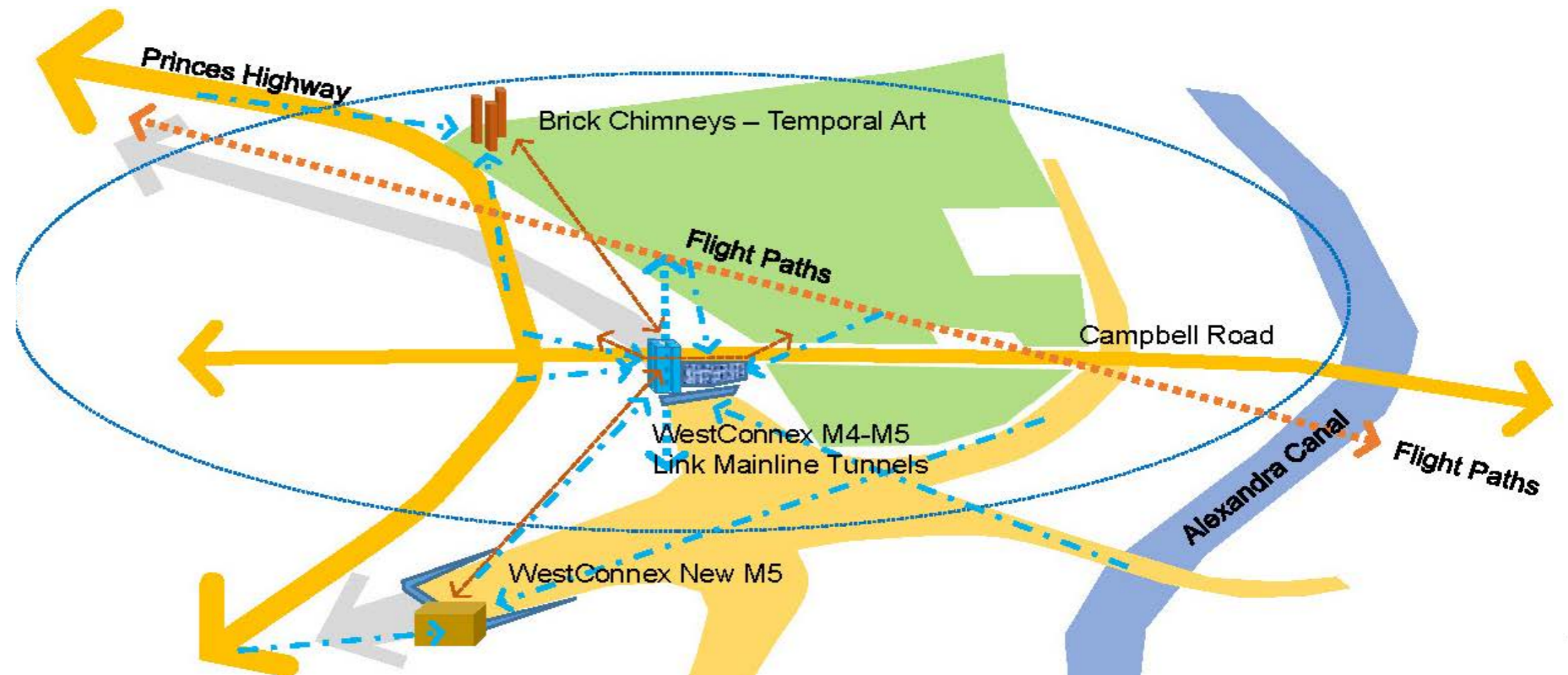


Figure 5-37: The overall narrative



Artist's impression  
 Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.



Figure 5-38: Campbell Road ventilation facility – southern side illustrating the 'Gateway to Sydney' view



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.

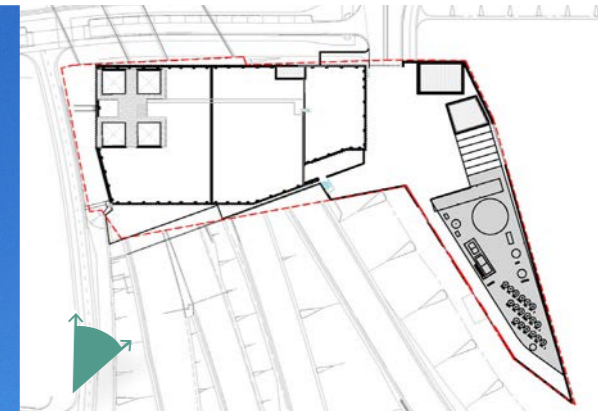


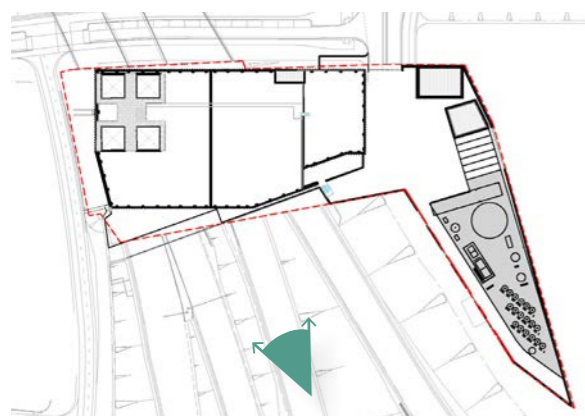
Figure 5-39: Campbell Road ventilation facility – view from shared path



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.



Figure 5-40: Campbell Road ventilation facility – view looking north





## 5.7 Campbell Road ventilation facility

### General layout

The Campbell Road ventilation facility contains the mechanical and electrical services required to exhaust air from the M4-M5 Link mainline tunnels. The building occupies a footprint of about 4,100m<sup>2</sup> and is the largest structure within the Campbell Road MOC. The ventilation facility houses the fans, attenuators, dampers and other ventilation equipment. The ventilation exhaust outlets are located at the northwestern end of the building and are within the coordinate envelopes outlined in the Planning Approval documents, refer to Figure 5-41.

The ventilation facility has four internal levels and is essentially made of two halves. One half houses the mechanical fan room at RL13.2 and sits directly on top of the cut and cover structure. The other half is situated to the east with three internal levels. At RL7.1 is a cable basement which services the Low Voltage switch room, High Voltage transformer room and Ausgrid rooms above. At RL9.6; the High Voltage transformer switch room is located adjacent to two Ausgrid switch rooms as well as a Low Voltage substation room. This level also houses the tolling room. The level at RL15.4 includes the disaster recovery site room and its adjacent server room, traffic enforcement room, radio re-broadcast room, storage room, mobile phone room, damper control room and service corridor. The roof level contains a series of condensers for the rooms below and a catwalk to the exhaust stack testing platforms. Circulation stairs and a common corridor are provided to access these rooms in accordance with The Building Code of Australia (BCA). Access to the facility is directly via Campbell Road.

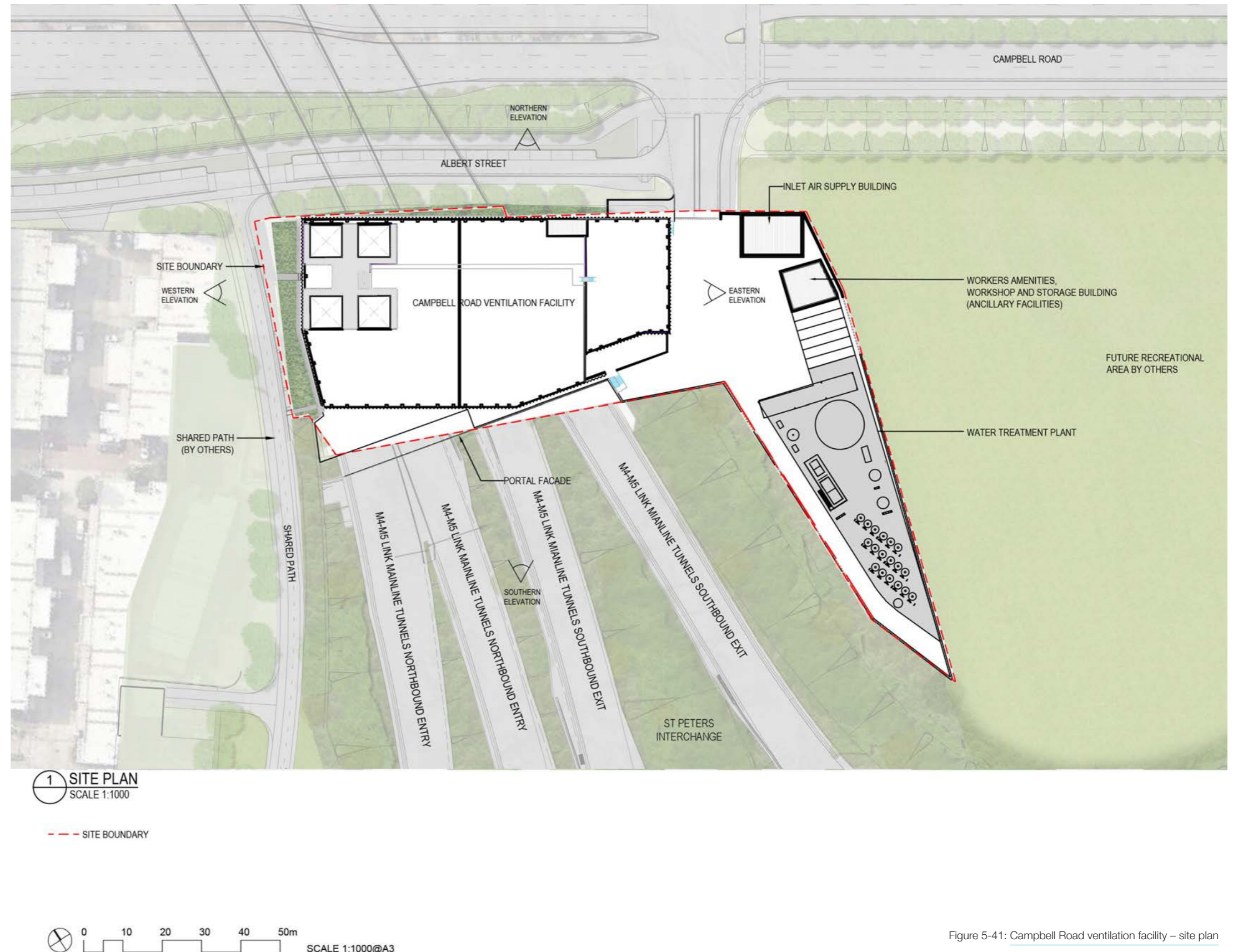


Figure 5-41: Campbell Road ventilation facility – site plan



### Campbell Road ventilation facility materials and finishes

The materials selected provide a cost effective, durable façade of high aesthetic quality, refer to Figure 5-42.

The brick base of the building references the site's industrial past as a brickyard. The brick module provides a 'human scale' to the façade and is situated at a low level where it is most evident to passing pedestrians and cyclists. The use of brickwork at low level provides a durable, cost efficient and low maintenance façade in locations closest to public interaction.

The vertical folded, powder-coated, and perforated aluminium façade above the brickwork acts as a lightweight rain screen and clads the utilitarian reinforced concrete and blockwork box housing the mechanical fan rooms and electrical rooms. The folded façade is broken down into standard panel sizes to allow efficient manufacture and installation.

The façade of the ventilation outlets responds to the physical and operational requirements of these built elements. A neutral colour palette is applied to the overall composition of the ventilation outlet elements to reduce its bulk and scale and provide a recessive aesthetic, recognising its location in a landscape setting.

White vertical powder coated aluminium battens screen maintenance walkways around the structure and accentuate the vertical nature of these structures. The vertical battens reference similar treatments applied to the nearby New M5 motorway operations complex.

White aluminium cladding is applied to the external facing concrete walls of the ventilation outlets to reduce their visual impact by providing a light façade that is recessive, when compared to the articulated façade below.

The white cladding and battens provide a clean, neutral aesthetic to this structure and provide a subtle reference to other WestConnex buildings.

The internal facing concrete walls of the ventilation outlets are painted grey to reduce their visual impact. The expression of negative spaces within the ventilation outlet enclosure expresses the forms of the four individual ventilation outlets and references the St Peters – brick chimneys which are of a similar form.

As the Campbell Road ventilation facility is within the flight path zone to Sydney Airport, opportunities have been considered to provide a distinct expression to the roof, as a fifth façade. Ideas explored included using patterns, textures and colours to create an artwork that can be experienced from the air.

However, as the footprint is smaller compared to the surrounding roofs of larger industrial buildings and flight paths being directly overhead, this opportunity has not been pursued.

The roof is a shallow graded concrete roof, covered with a waterproof membrane.

### Monitoring and maintenance

Specific consideration has been provided to the operation and maintenance requirements of the built elements in selecting materials, finishes and colours to achieve the project durability requirements. Longevity of the built form is achieved by:

- Selecting materials with known properties and performance under similar operating environments, as tested/ specified in other infrastructure and building projects in Sydney
- Specifying infrastructure finishes with known reliability and warranties for design life, for example powder coating paint finished.
- Considering the exposure classifications on in ground and above ground elements, designing, specifying increased material cover and/ or protective coatings to mitigate corrosion.
- Perform regular inspection on all built form element condition and operation, with the frequency in accordance with manufacturer's guidelines.
- A maintenance regime to prolong built element lifespan with recommendations of regular cleaning as required by manufacturers.
- Comprehensive record keeping covering all inspections and work carried out, to inform further maintenance/ replacements as required.

Material	Finish/colour	Image
Face brick	Charcoal/dark grey	
Powder-coated aluminium battens	White	
Aluminium cladding	White	
Articulated cladding system	Variety of urban colours	

Figure 5-42: Campbell Road ventilation facility – materials and finishes



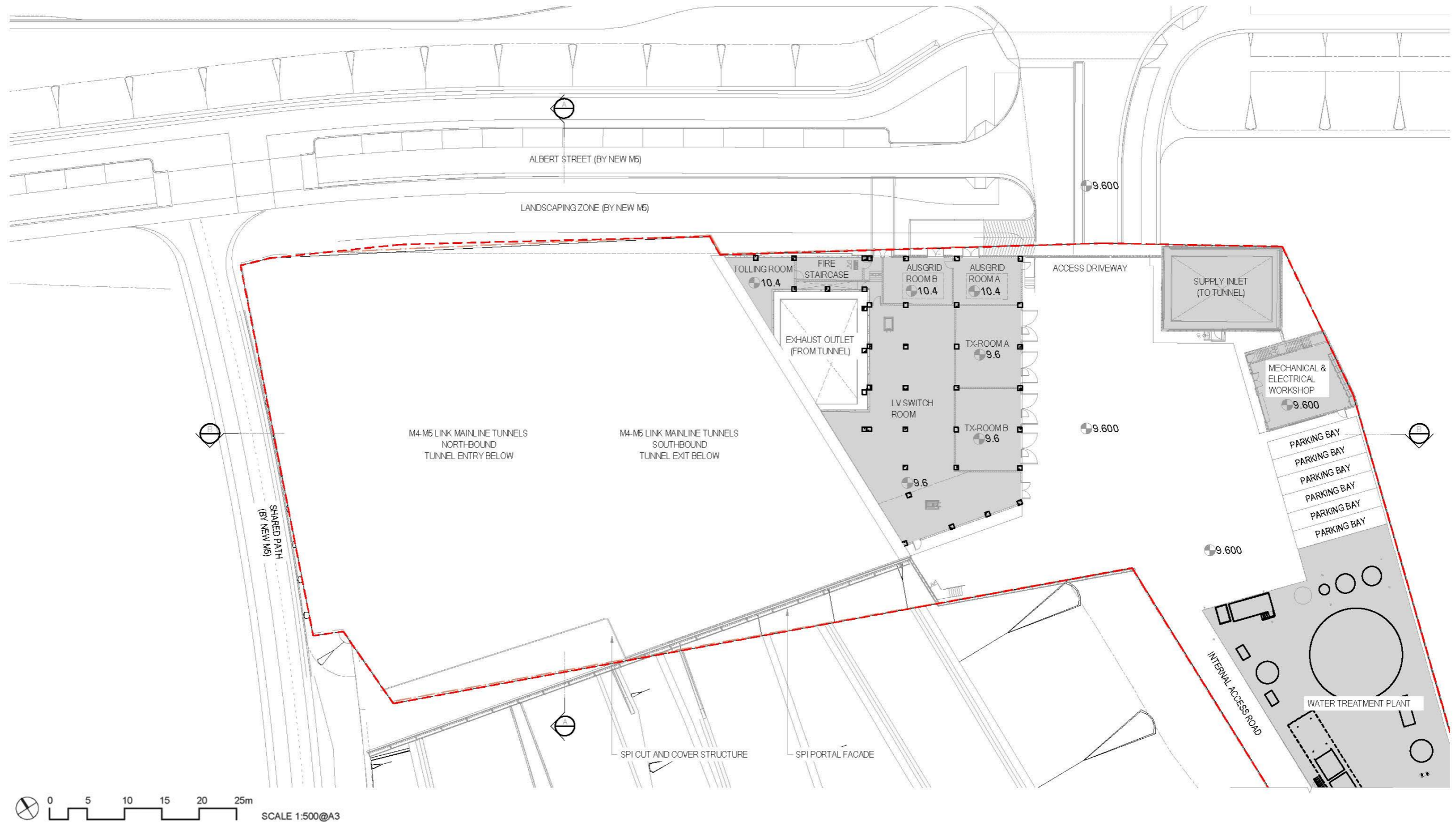


Figure 5-43: Campbell Road ventilation facility – ground floor plan





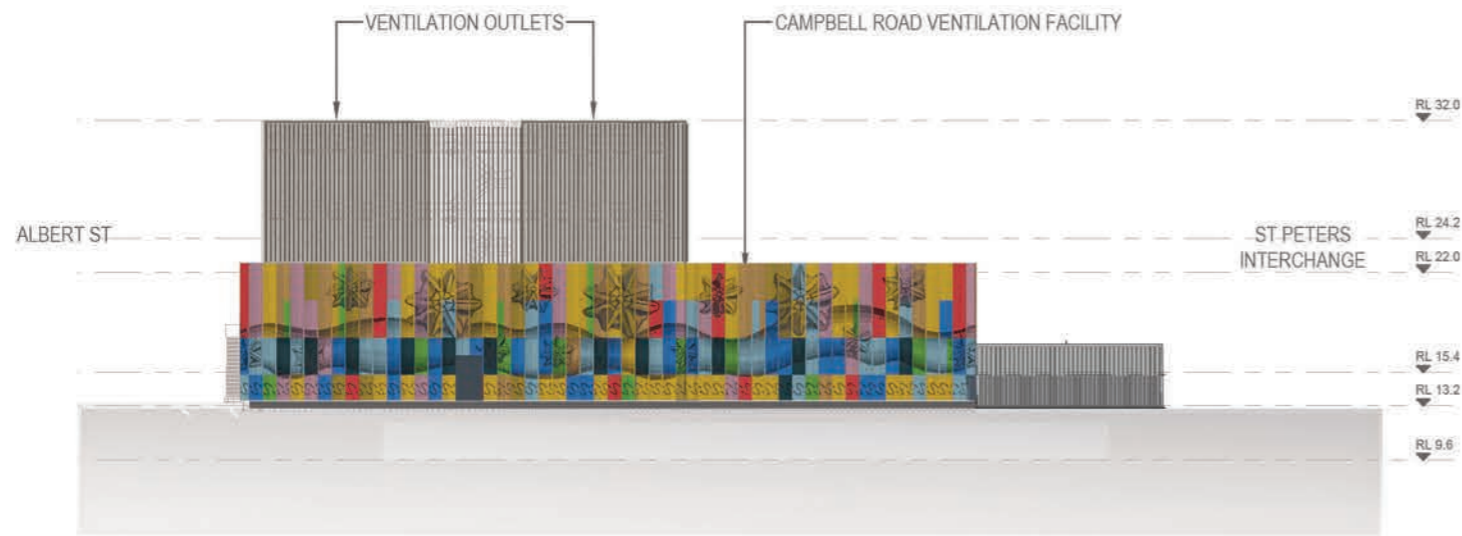
1 PLAN - FIRST FLOOR  
SCALE 1:500

--- SITE BOUNDARY

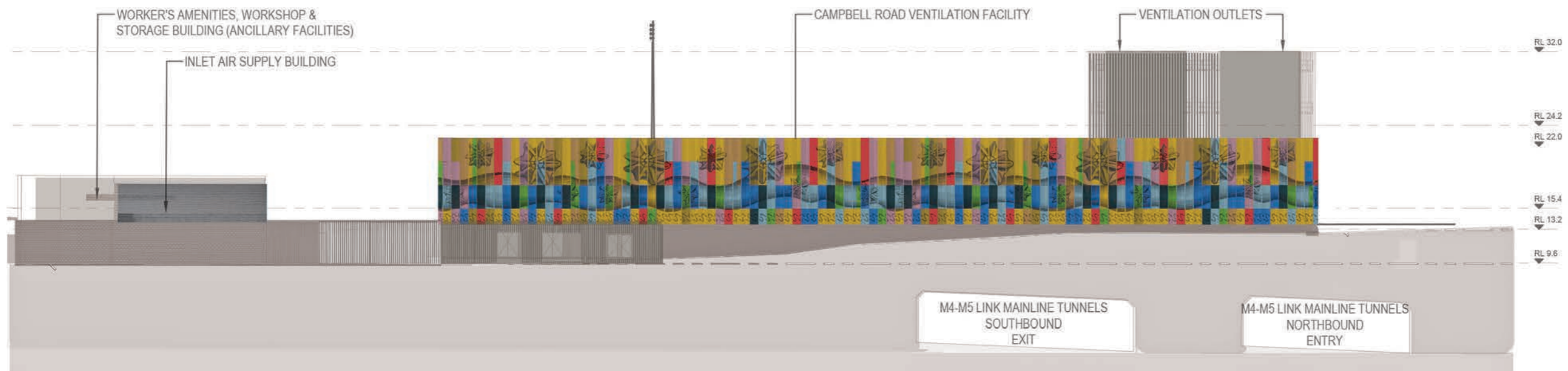


Figure 5-44: Campbell Road ventilation facility – first floor plan





1 WEST ELEVATION  
SCALE 1:500  
(VIEW LOOKING FROM SHARED PATH)



2 NORTH ELEVATION  
SCALE 1:500  
(VIEW LOOKING FROM CAMPBELL ROAD)

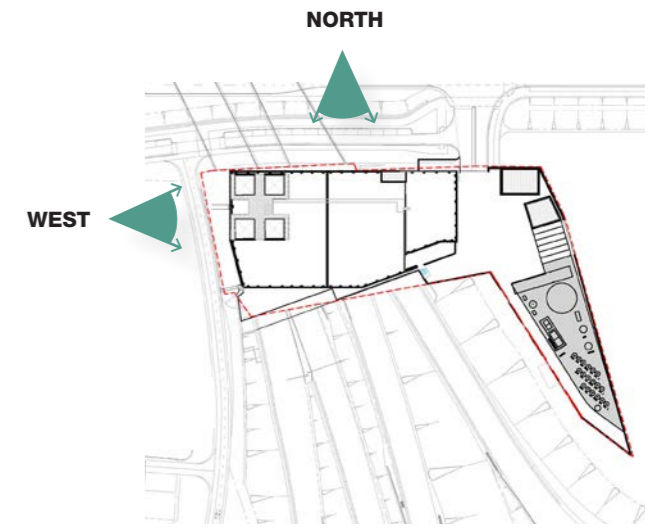


Figure 5-45: Campbell Road ventilation facility – key plan

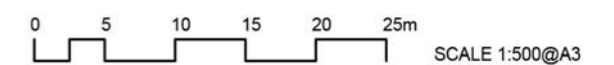


Figure 5-46: Campbell Road ventilation facility – north and west elevations



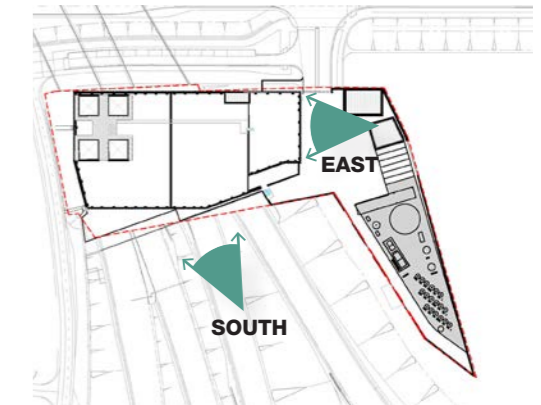
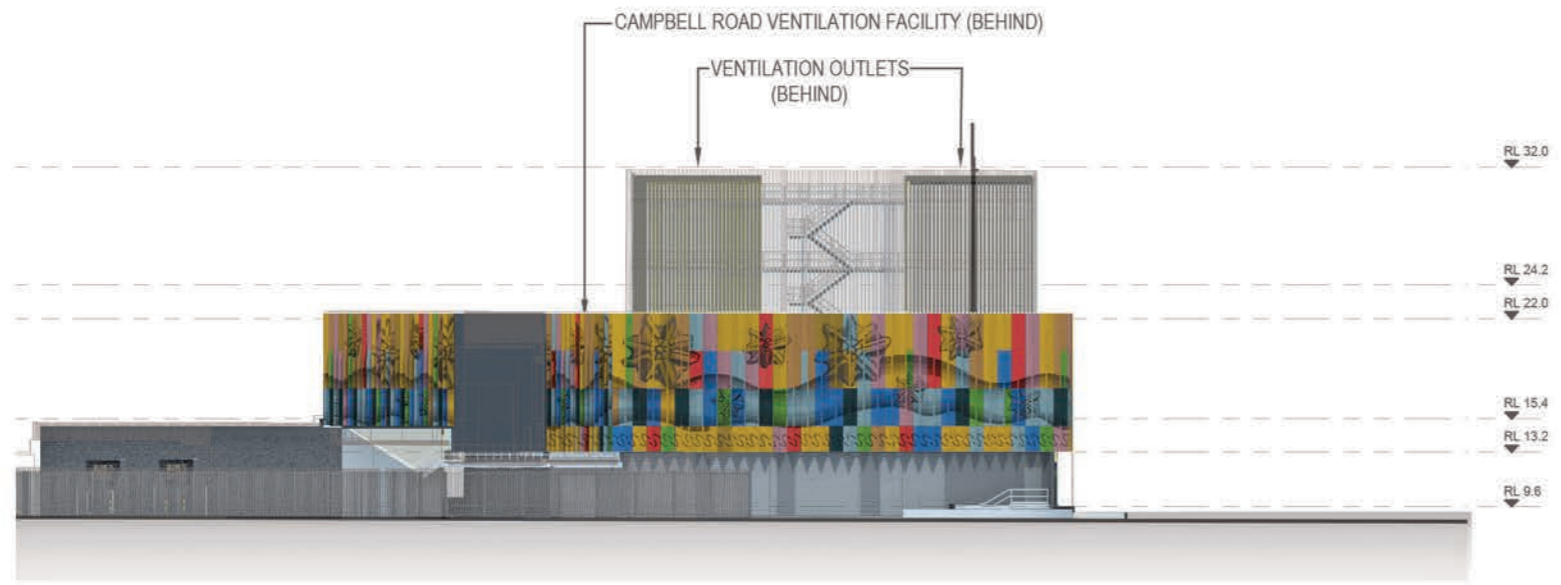
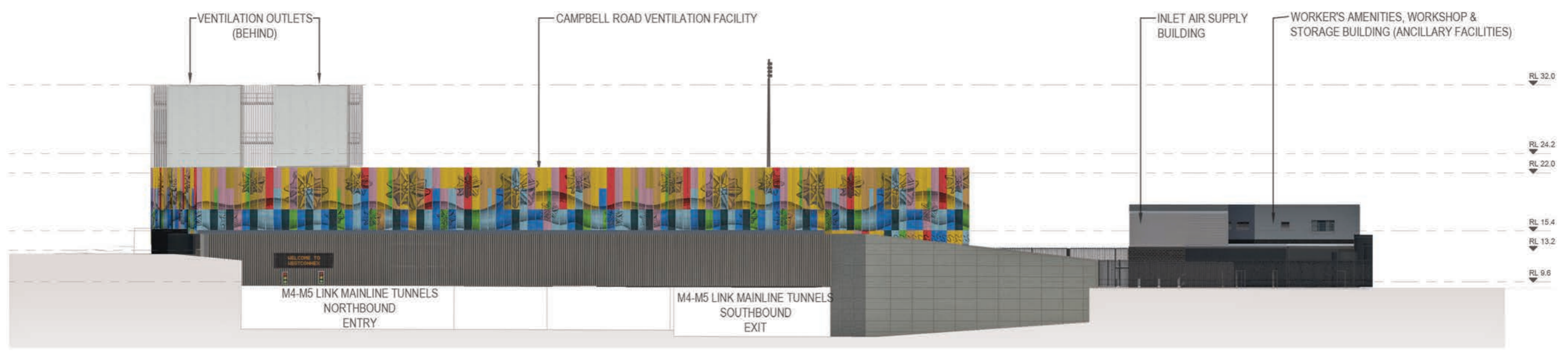


Figure 5-47: Campbell Road ventilation facility – key plan

1 EAST ELEVATION  
SCALE 1:500



2 SOUTH ELEVATION  
SCALE 1:500

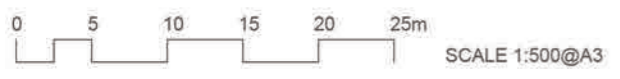
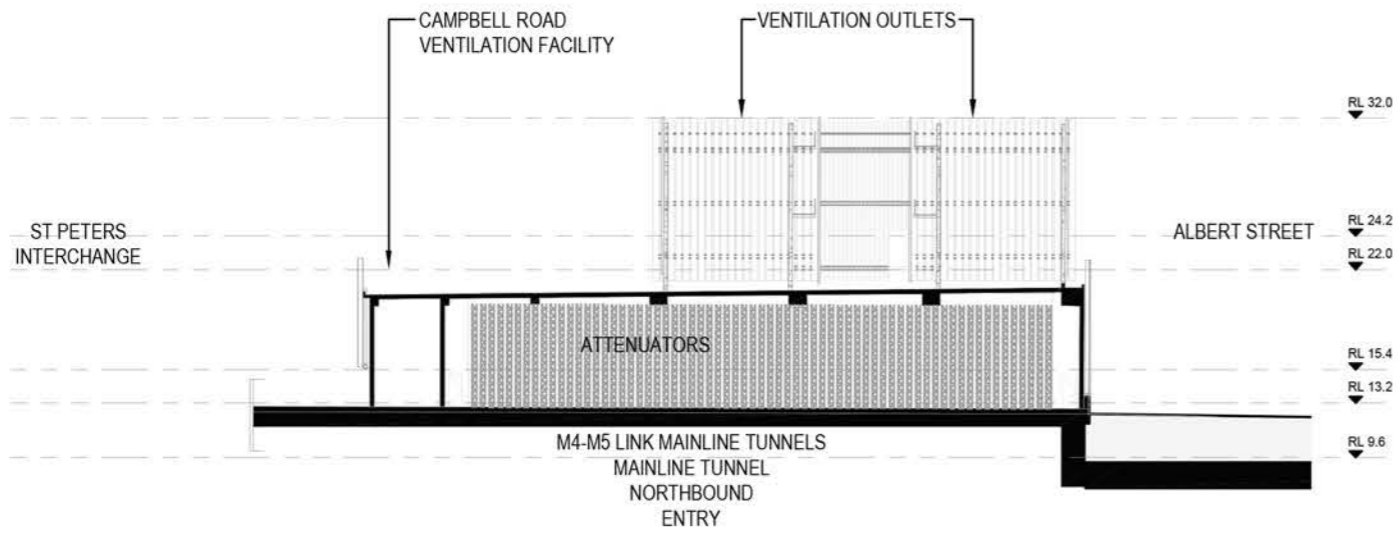


Figure 5-48: Campbell Road ventilation facility – south and east elevations





1 SECTION A-A  
SCALE 1:500

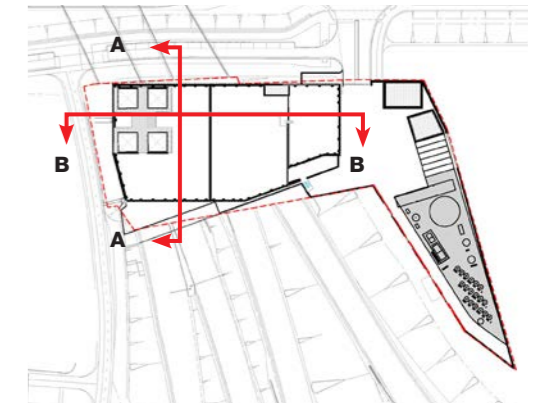
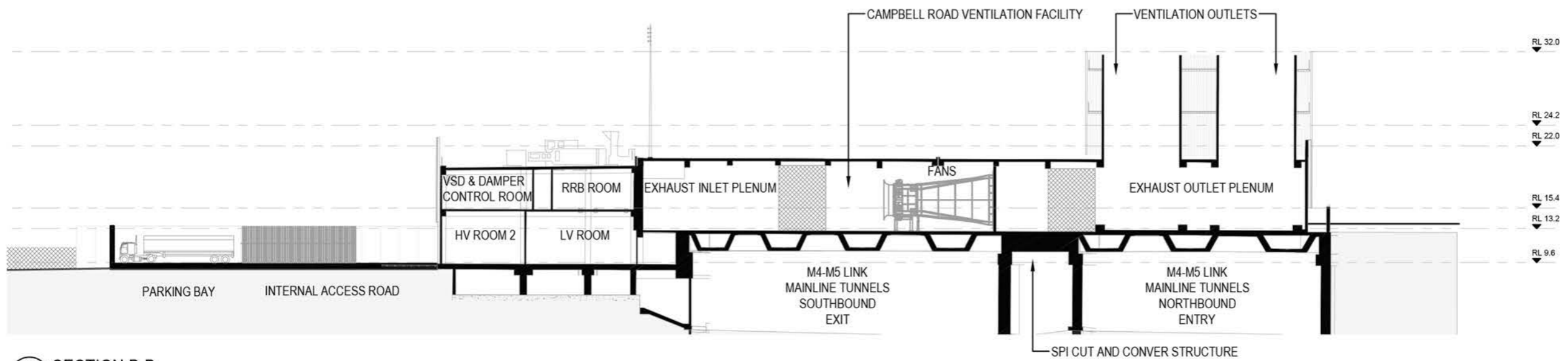


Figure 5-49: Campbell Road ventilation facility - key plan



2 SECTION B-B  
SCALE 1:500

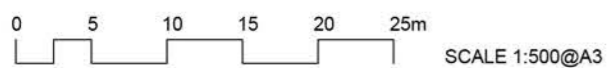


Figure 5-50: Campbell Road ventilation facility - sections



## Lighting

Given the proximity to Sydney Airport, lighting is designed to minimise any adverse or distracting lighting configuration, spillage or intensity to aircraft operations above, respecting the Obstacle Limitation Surface (OLS) of aircraft operations.

This lighting strategy has been confirmed to adhere to the Lighting in the Vicinity of Aerodromes: Advice to Lighting Designer (CASA, 1999) and National Airports Safeguarding Framework Guideline E: Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports (DIRD, 2012). Consultation has been conducted with CASA and DIRD as part of detailed design.

The lighting design is consistent with the requirements of Australian Standard 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting and relevant Australian Standards in the series AS/NZ 1158 – Lighting for Roads and Public Spaces and will achieve all requirements of the relevant design standards, and guidelines and Condition E134(p) inclusive.

Figure 5-51 illustrates the different types of lighting used to illuminate the Campbell Road MOC for functional, aesthetic and security purposes.



Figure 5-51: Campbell Road MOC – lighting plan



The lighting at Campbell Road MOC comprise the following:

1. Adjustable, dimmable in ground wall wash lights focus on the building façade to provide an even wash of light, subtly highlighting the façade artwork at night. This lighting allows for the building to be enjoyed from Campbell Street by local traffic, pedestrians and cyclists as well as above the portal for motorists using the tunnel below (refer to Figure 5-53). The lighting provided also increases security around the building, providing a safe and accessible streetscape. Light spill to the residential properties opposite is minimised with the use of light shields.
2. At the tunnel entrance / exit, uplights will highlight the portal element. It is incorporated into the design of the portal screen by linear LED light fittings within an aluminium housing, fixed to the bottom of the aluminium battens, in consistent lengths across the full width of the road corridor. It references a similar design philosophy adopted on other stages of WestConnex, including the nearby New M5 portal. The lighting is designed to minimise any adverse or distracting lighting configuration to road users below, refer to Figure 5-52.
3. Paths, hardstand and security lighting is placed at external doors by focused wall mounted down lights to allow for 24 / 7 access requirements.

Lighting of taller elements above the roof level, such as the ventilation outlets has been avoided to eliminate any residual night lighting impacts and impacts on OLS.

The lighting at WTP comprise of:

1. External wall mounted lighting on the single storey structures and tanks will enable safe access to the facility at any time of the day, and maintain security camera operations across the site.

Additional mitigation measures to manage residual night lighting impacts to properties adjoining or adjacent to the project are not considered necessary.



Figure 5-52: Campbell Road ventilation facility view looking north – lighting



Figure 5-53: Campbell Road ventilation facility looking east along Campbell Road – lighting



## 5.8 Water treatment plant and ancillary facilities

### General layout

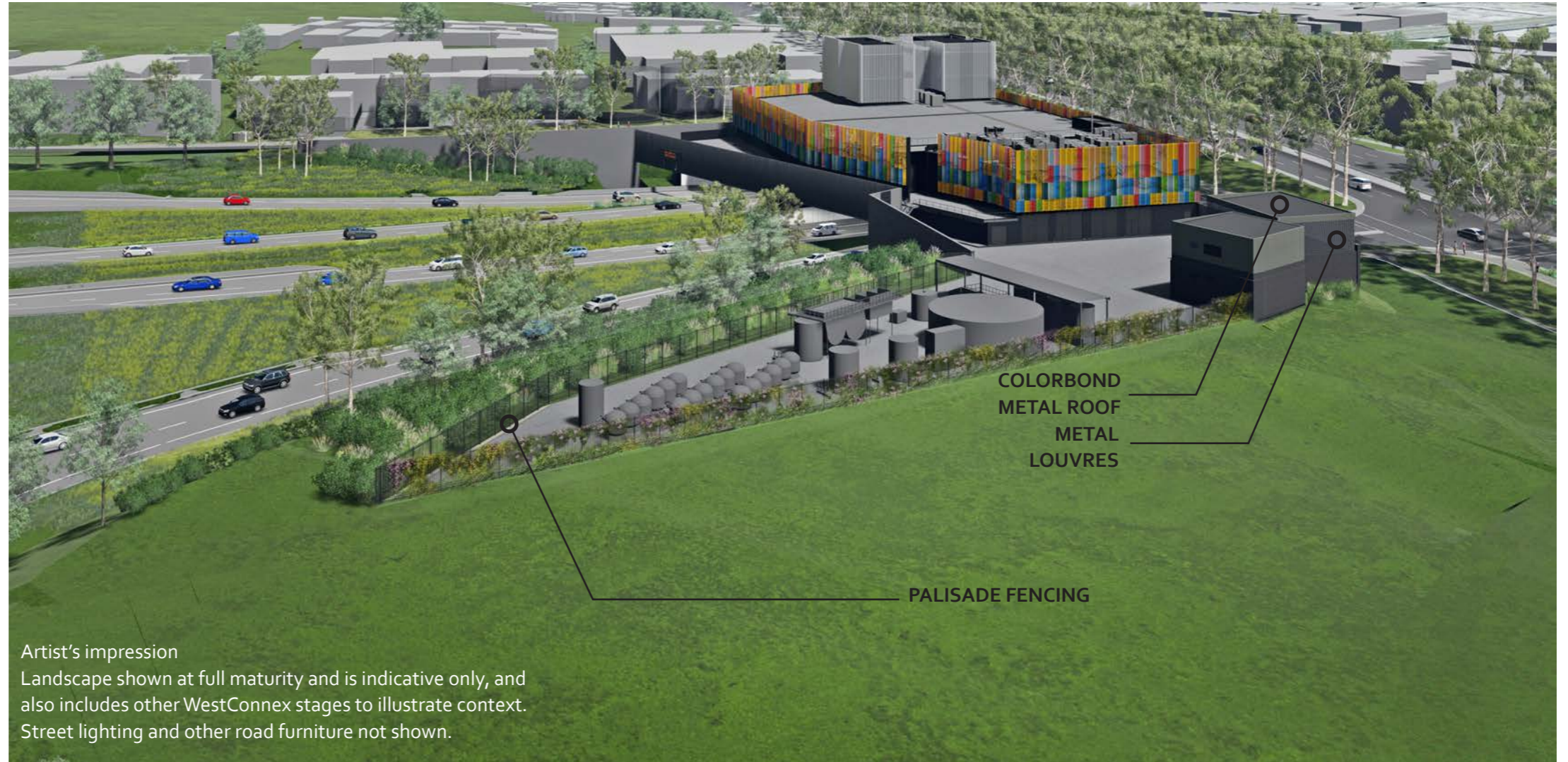
The WTP, inlet air supply building and ancillary facilities cover a footprint of approximately 1,710m<sup>2</sup>.

The inlet air supply building sits on the north east corner of the site adjacent to the main vehicular and pedestrian entrance gate and is the most visually prominent structure within this area of the facility. The building consists of a 4.5 metre high solid masonry base, with a louvred façade for air intake.

To the south of the inlet air supply building, on the eastern boundary of the site sits the workshop and ancillary facilities building that houses the mechanical and electrical workshop on the ground floor and lunchroom and unisex amenities on the first floor. The unisex amenities contain two unisex toilets, showers and change rooms, refer to Figure 5-54.

The WTP consists of a control room, chemical containment area, polymer batching system and large circular tanks. The WTP is located to the south of the ancillary facilities building parking spaces at RL 9.5. Access to the WTP is via internal circulation within the Campbell Road MOC.

The architectural design, detailing, fencing and landscaping of the WTP has been kept recessive to consider potential views from the adjacent future Recreational Area (by others). The fence design references the rectangular battens of the building at a much smaller scale and, with its dark colour, is intended to blend into the landscape. Native climbing plants are also located atop the eastern boundary fence to provide visual screening, and also serve as a backdrop for the works to be undertaken by others, as part of the adjacent future Recreational Area.



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.

Figure 5-54: WTP – view from recreation precinct

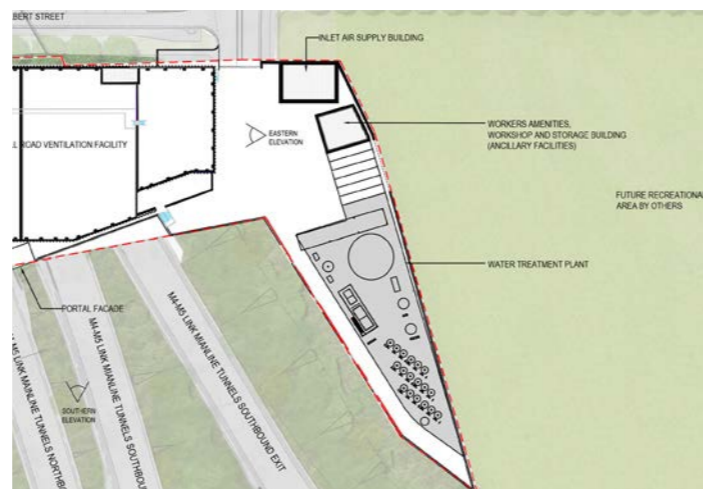


Figure 5-55: WTP – key plan



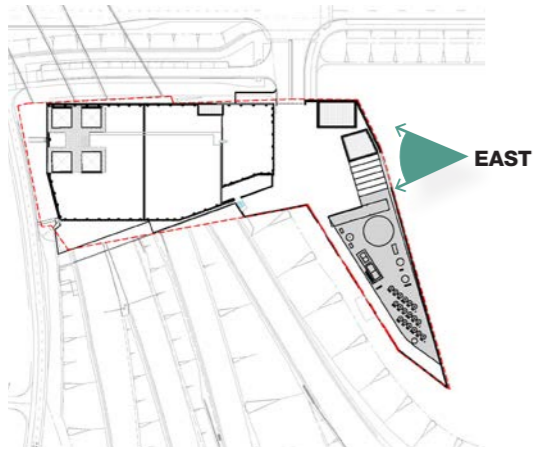


Figure 5-56: WTP - key plan

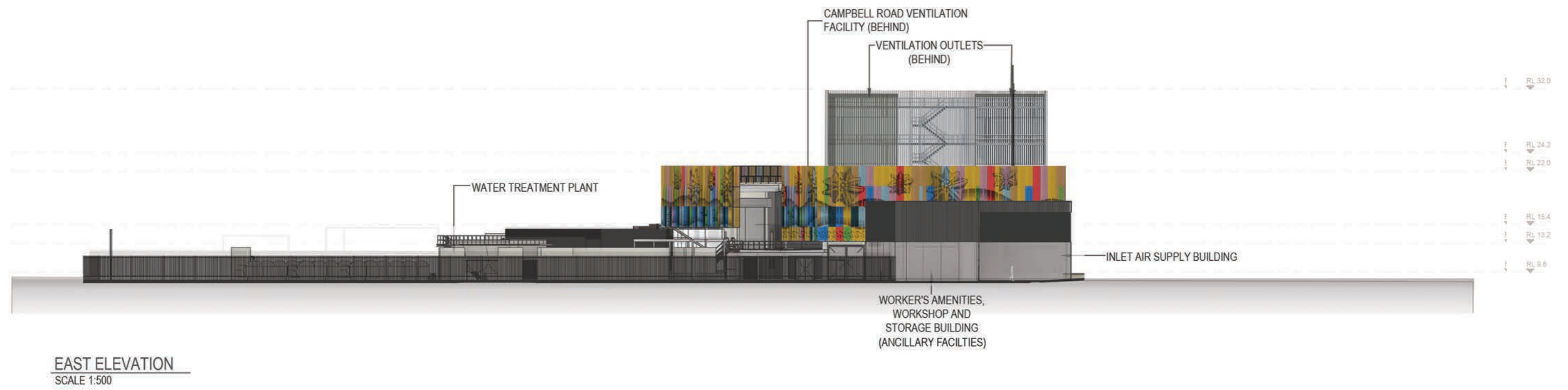


Figure 5-57: WTP – east elevation precinct



### Materials and finishes

The façade of the inlet air supply building, and ancillary facilities responds to the physical and operational requirements of these built elements. The materials selected provide a cost effective, durable façade of high aesthetic quality and are captured in the materials and finishes palette, refer to Figure 5-59.

The brick base of the building references the site’s industrial past as a brick yard. The brick module provides a human scale to the façade and is situated at low level where it is most evident to passing pedestrians and cyclists. The use of brick-faced precast panels at low level (up to 4.5 metres high) provides a durable, cost efficient and low maintenance façade in locations closest to public interaction. The brickwork is a continuation of the design aesthetic for the ventilation facility and provides a consistent design approach that unifies the structures, to form one visual language for the Campbell Road MOC.

The brick-faced precast panels form the supply building base and are also used to clad the workshop and amenities building.

Above 4.5 metres, the supply building façade consists of horizontal powder coated aluminium louvres for air intake, while the amenities building will have Colorbond vertical, standing seam cladding.

Campbell Road MOC vehicular access gate from Campbell Road is another visually prominent element and has been designed to continue the design language of powder coated, vertical, aluminium battens that are reflected on the ventilation facility outlets and the portal screen to the south. A consistent size and spacing of the aluminium battens, supported on a steel frame, is intended to assist in unifying these elements across the site while providing a functional secure access point for authorised vehicles and Campbell Road MOC personnel.

The Campbell Road ventilation facility provides much of the security enclosure for the site. Elsewhere, security fencing has been provided. Fencing and lower height buildings have been kept neutral to avoid competing with the building art.

The structures associated with the WTP are recessive in colour, to minimise visual impact to surrounding areas, and not to visually distract from the main focal point of the ventilation facility.

Various options for perimeter fencing have been explored and a three metre high, black powder coated, aluminium vertical palisade fence was selected as the most appropriate solution for its visual appearance, cost efficiency and ease of construction. The vertical batten nature of the fence aligns with the consistent design language of vertical aluminium battens used elsewhere within the development.

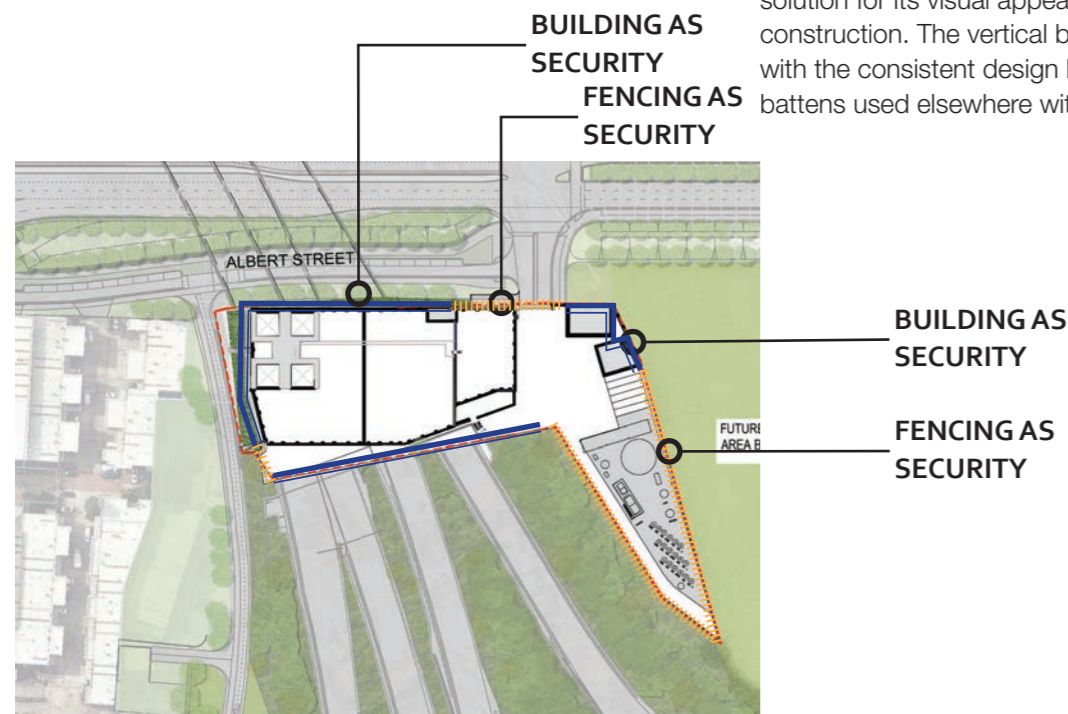


Figure 5-58: WTP – fencing design concept

Material	Finish / colour	Image
Face brick	Charcoal / dark grey	
Colorbond	Charcoal / dark grey	
Colorbond cladding deep ribbed profile	Charcoal / dark grey	
Powder-coated metal louvres	Charcoal / dark grey	
Palisade fence	Black	

Figure 5-59: WTP – materials and finishes



## 5.9 St Peters interchange portals

### General arrangement

Located within a landscaped setting, the portal will be a prominent visual element, seen from the motorway and also from other parts of the public domain, refer to Figure 5-60. The portal forms a gateway to the project and accommodates the northbound and southbound entry and exit ramps and provide access to and from the following:

- Northbound entry from Euston Road
- Northbound entry from Sydney Gateway
- Southbound exit to Sydney Gateway
- Southbound exit to Euston Road
- Southbound exit to Gardeners Road.

### Design intent

The design intent is to provide an appropriate frame for entering the tunnel and a robust datum to visually support the artwork above. It is important that the portal is recessive in nature and allows the artwork to retain prominence in the visual landscape. Due to the constraints imposed by the tightness of the approved project boundary around the project facilities, the design of the SPI portal adopts a linear screen form, connecting both sides of the road corridor without complex shape changes or additional articulation.

The portal elements are designed to reference other portions of WestConnex, while providing consistency with the architecture above. It's simple, orthogonal and rhythmic elements provide vertical shadow lines to reference the folded plates and louvres of the Campbell Road ventilation facility above and add visual interest without competing with them.

The portal blends seamlessly with the surrounding topography and adjacent retaining walls while providing a safe and legible transition between the surface and the tunnel.



Figure 5-60: SPI portals – northbound entry



### Relating to Sydney and the overall WestConnex

It is important to understand that the Campbell Road MOC, including the SPI portal are part of a family of forms within a greater SPI context. The closest facilities are the New M5 facilities of the portal, MOC4, and MOC5, refer to Figure 5-61.

The design philosophy for the SPI interchange is to create a rich visual experience that builds on a complementary approach to placemaking at a motorway scale that links these facilities. The SPI portal provides a gateway to the City, while the New M5 portal provides a gateway to the countryside. An approach to using a similar language of architectural treatments has been undertaken, which also allows for points of distinction.

The SPI portal as gateway to the City provides a grand gesture that will be read as a lit 'sculpture in the park' and sit comfortably with the other elements that make up this place.

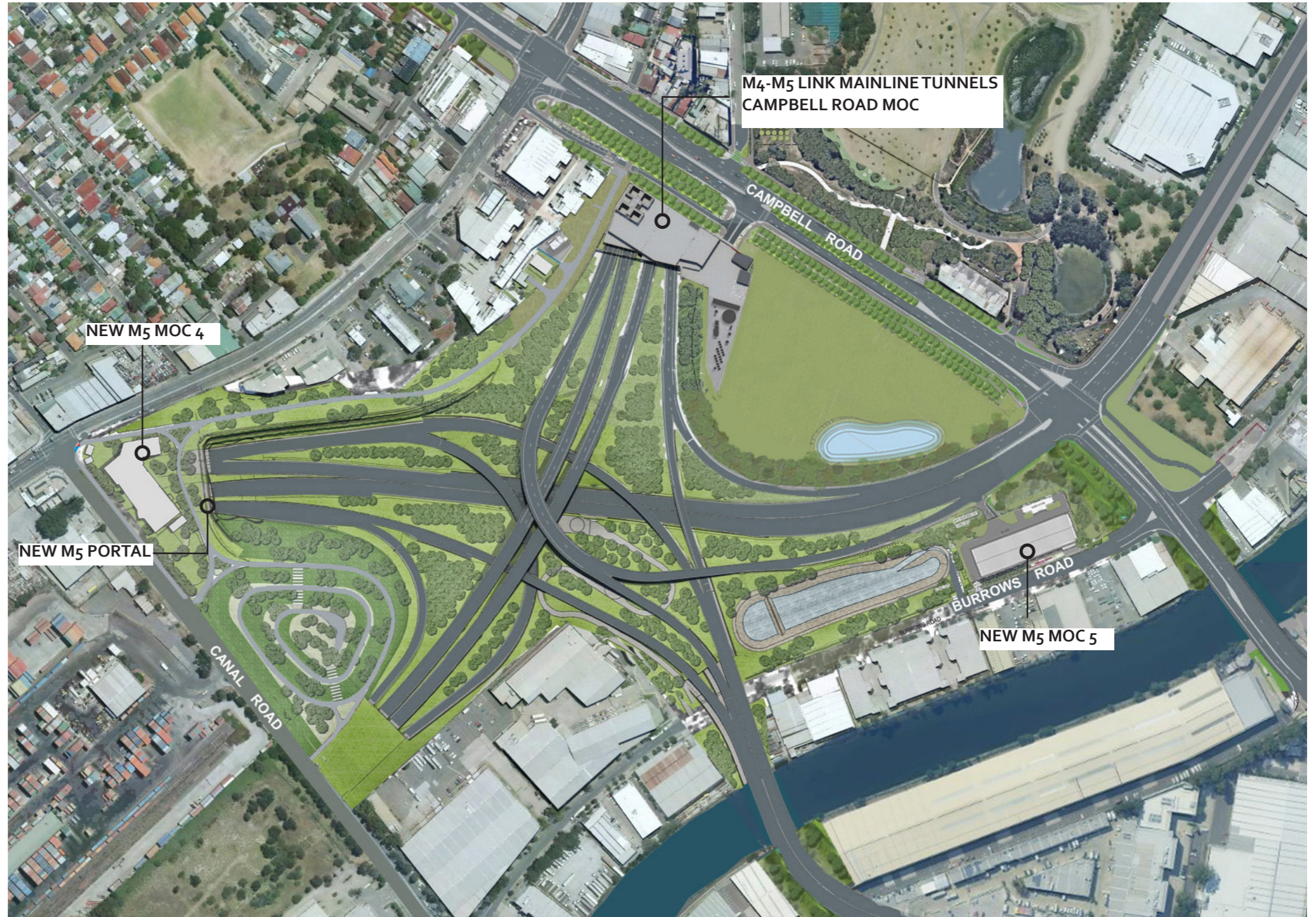


Figure 5-61: Aerial view of SPI



The SPI portal is situated almost immediately below the Campbell Road ventilation facility, which is adorned in the pattern and colour of highly respected Indigenous artists. Motorists arriving from the airport will pass under this artwork (refer to Figure 5-62) to enter the M4-M5 Link to reach the Sydney CBD, Sydney Opera House, Sydney Harbour Bridge and the harbour. This element provides an Indigenous voice that makes a connection to country, a welcome for travellers and a preamble to these iconic parts of the Sydney identity.

Therefore, it was considered more appropriate to make the portal element a recessive, functional screen only, allowing the eye to be drawn to the building above. The design philosophy for the SPI portal builds on the design approach used for the New M5, that is to provide a simple, refined and unobtrusive design that unifies the complex portal façade geometries by extending the concept of a ‘sculptural screen’. The vertical elements and shadow lines of the SPI portal also reference the New M5 portal with its use of vertical battens and their play of light and shadow.

On the other hand, the New M5 portal is offset some distance in front of the New M5 ventilation building, therefore the portal façade itself was utilised as a design feature. A ‘sculptural veil’ was designed to present a unique and memorable experience for drivers, capitalising on the availability of open space at the foot of the adjacent retaining walls, refer to Figure 5-63.

The portals also share similarities in:

- The use of vertical aluminium battens on the portal screen allow the portals to share a similar aesthetic language
- The gold colour used on the New M5 portal façade and across other buildings within the SPI context is translated onto the Campbell Road ventilation facility façade artwork
- Compressed fibre cement (CFC) cladding panels replicates similar proportions to that of the M5 precast concrete walls, situated on the west of the site
- The overall scale of the portals, relative to the height from the motorway.



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.

Figure 5-62: 1 | Campbell Road MOC – view looking north



Figure 5-63: 2 | New M5 St Peters MOC (view from motorway). Source: NM5 UDLP dated 2017



## Materials and finishes

The design intent of the SPI portal screen is to provide an elegant resolution and integration of the various elements of the portal including:

- Variable message signs (VMS)
- Traffic management systems
- Mechanical and electrical (M&E) equipment.

The aluminium batten screen is a design element that is used in several key locations within the Campbell Road MOC.

The batten screens interact with the building's basic forms and assist in 'pulling' the various forms together, so they are experienced as one cohesive facility. The aluminium battens are used on the portal screen, ventilation outlet and are incorporated in perimeter fencing and access gate, refer to Figure 5-64.

The portal cladding consists of two layers:

- A solid CFC sheet cladding covers the various structural systems employed along the leading edge of the cut and cover structure. This cladding provides a consistent finish on top of which the aluminium battened screen is constructed. This CFC cladding extends to the east to provide a consistent aesthetically refined resolution of this edge of the facility. The cladding is detailed so that vertical joints within the CFC cladding are expressed while horizontal joints are butted together with the intent that from a distance the cladding replicates similar proportions to that of the M5 precast concrete walls, situated on the west of the site. The CFC cladding panels selected have a pre-finished coarse texture which is also intended to relate to the M5 precast concrete walls. Similarly, the colour of the cladding has also been chosen to best align with the finish of the New M5 precast concrete walls
- An aluminium battened screen comprised of 100 millimetres wide x 150 millimetres deep powder coated, rectangular aluminium hollow section battens are fixed vertically at 260 millimetre centres.

Material	Finish/colour	Image
Solid compressed fibre cement sheet cladding	Charcoal / dark grey	
Aluminium battened screen	Black	

Figure 5-64: SPI portals – materials and finishes



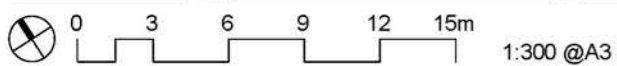
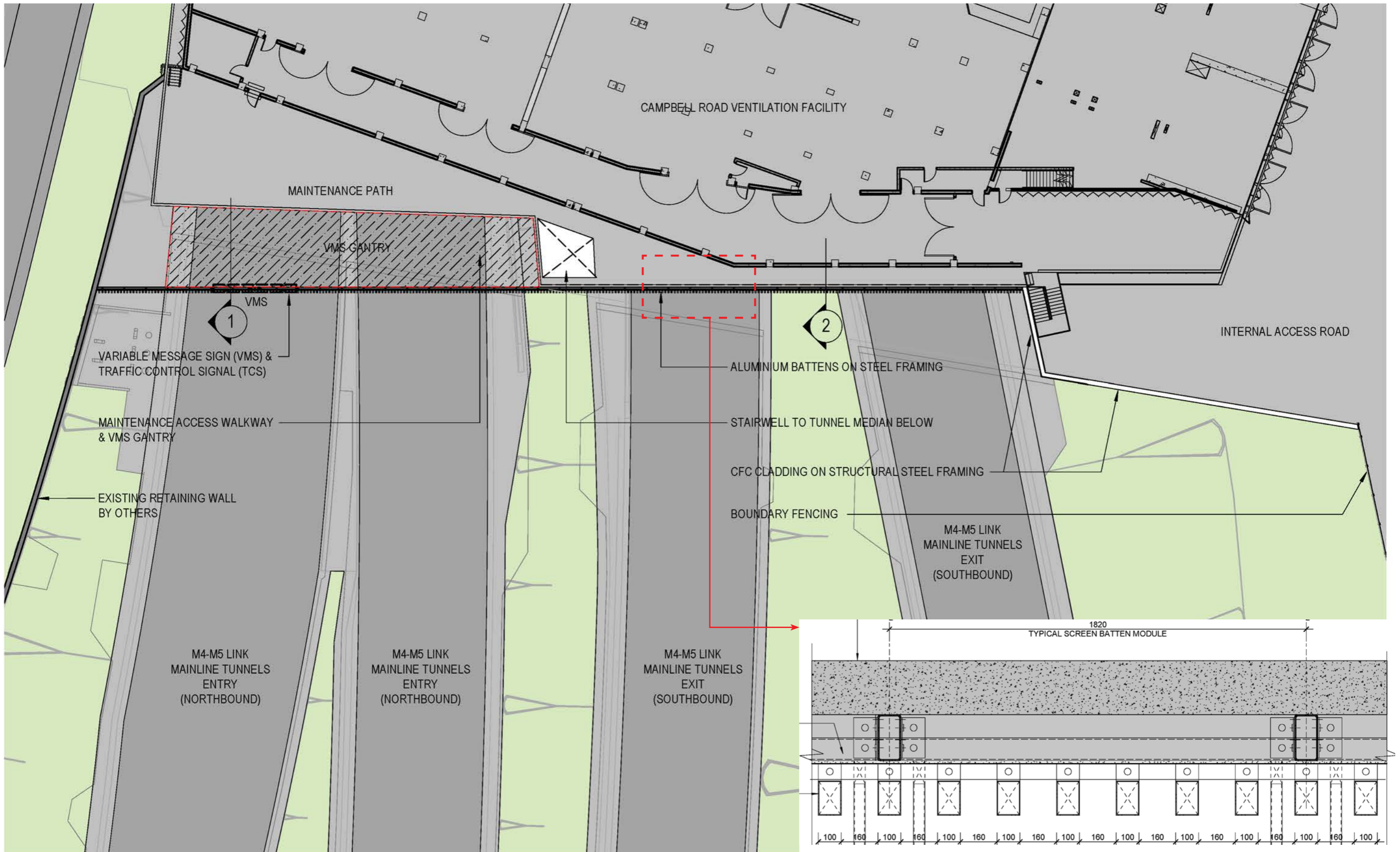
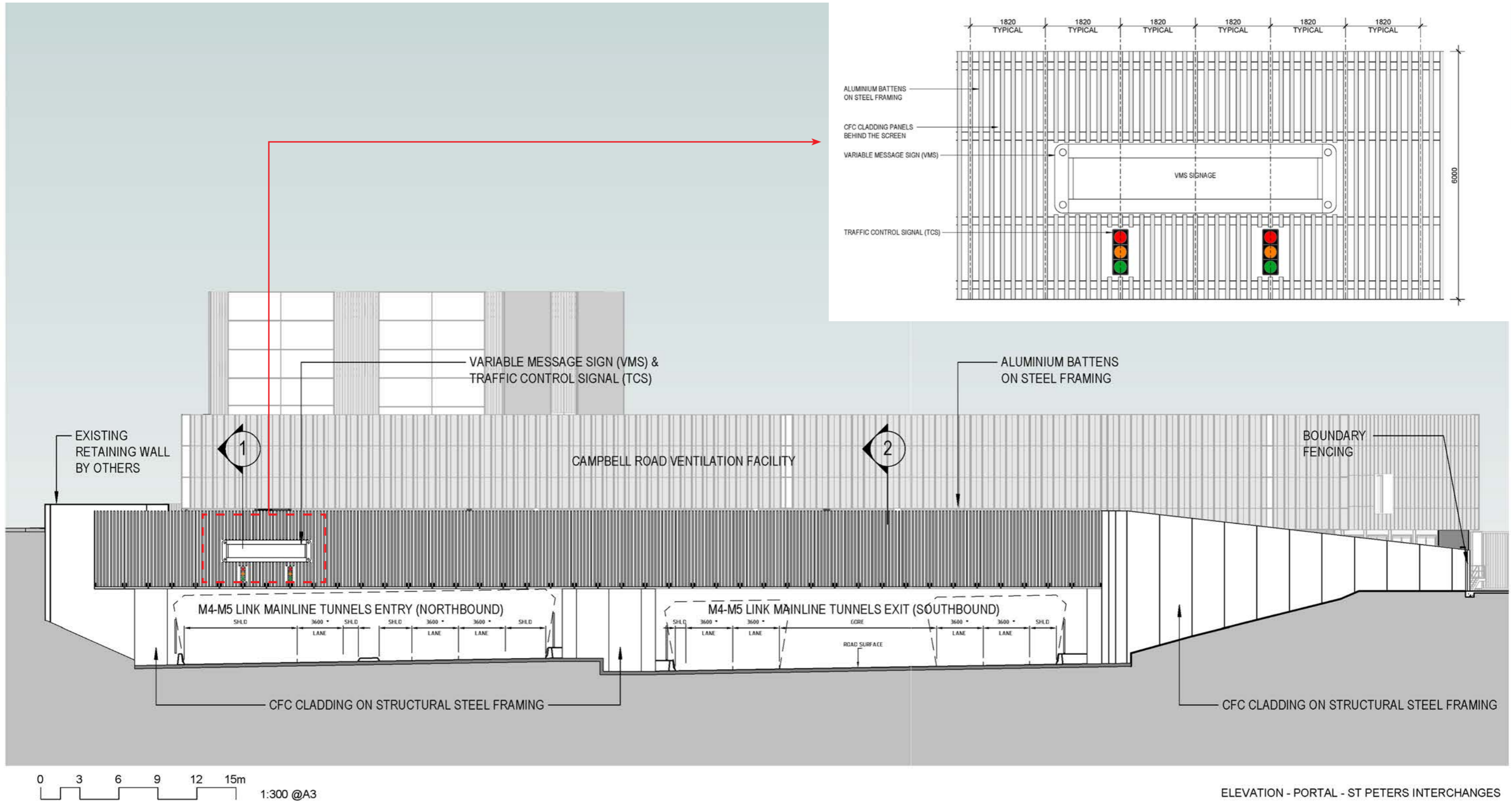


Figure 5-65: SPI portals – site facility - upper level plan

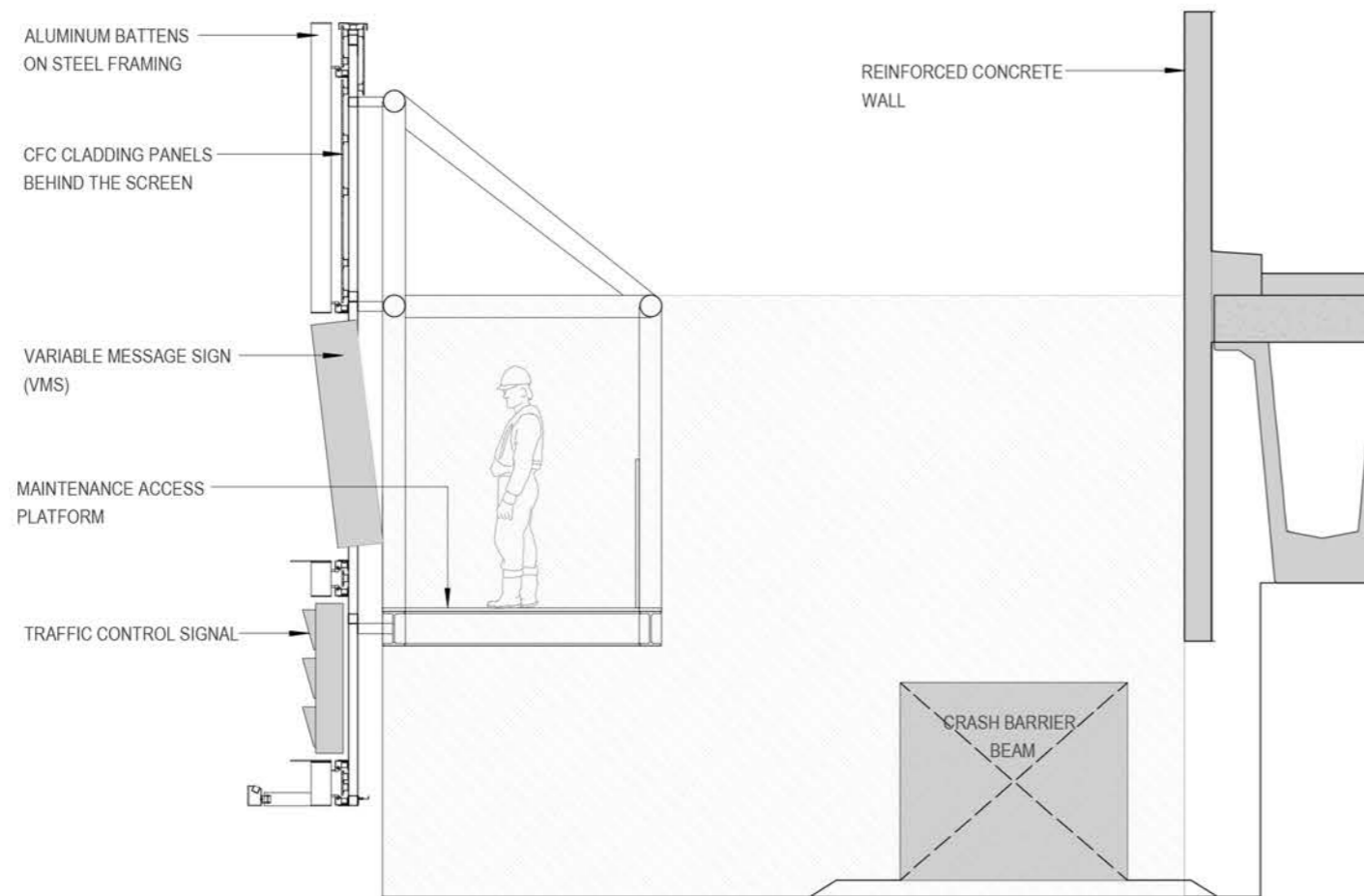




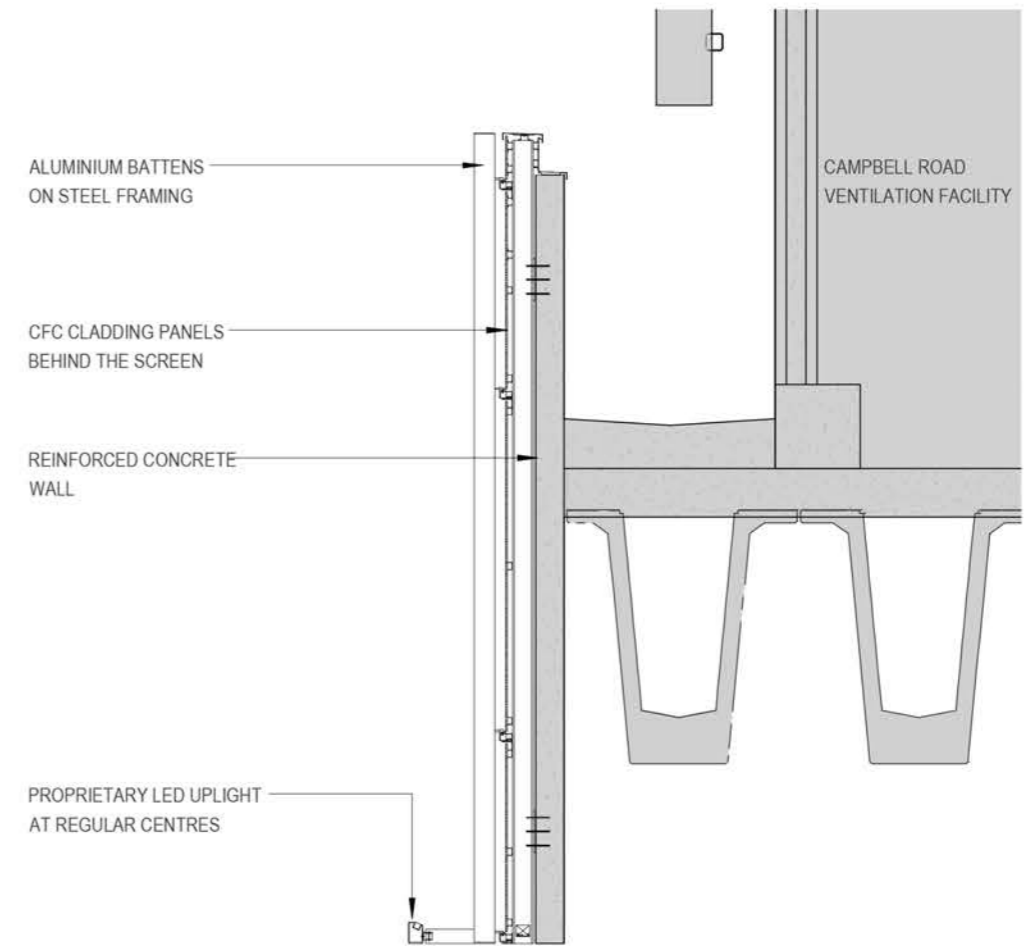
ELEVATION - PORTAL - ST PETERS INTERCHANGES

Figure 5-66: SPI portals – elevation

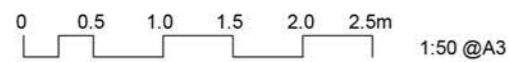




1 SECTION - THROUGH ENTRY PORTAL  
1:50



2 SECTION - THROUGH EXIT PORTAL  
1:50



SECTION - PORTAL SCREEN - ST PETERS INTERCHANGES

Figure 5-67: SPI portals – details



### 5.10 Shadow studies

The sun shadow studies assess the overshadowing impacts of the project on neighbouring residential properties. Existing residential properties that are affected by overshadowing from the project (including any noise mitigation measures) are to receive a minimum of three hours of direct sunlight in habitable rooms and in at least 50 percent of the principal private open space area between 9:00am and 3:00pm on 21 June.

The following sun shadow diagram studies are based on existing conditions to assess how the facilities at the Campbell Road MOC impact on nearby residential properties, including terraces and residential flat buildings located between Barwon Park Road and Crown Street.

This study considers the Summer Solstice - December (refer to Figure 5-70), Winter Solstice - June (refer to Figure 5-68) and the Equinox - September (refer to Figure 5-69) at the times of 9:00am, 12:00pm and 3:00pm.

The sun shadow diagrams demonstrate that the existing residential properties between Barwon Park Road and Crown Street are located away from the shadow zones of the Campbell Road MOC for the respective time periods and therefore their principal private open spaces and habitable rooms are unaffected by the project.

--- SITE BOUNDARY  
 --- SUBJECT OF OVERSHADOWING ASSESSMENT

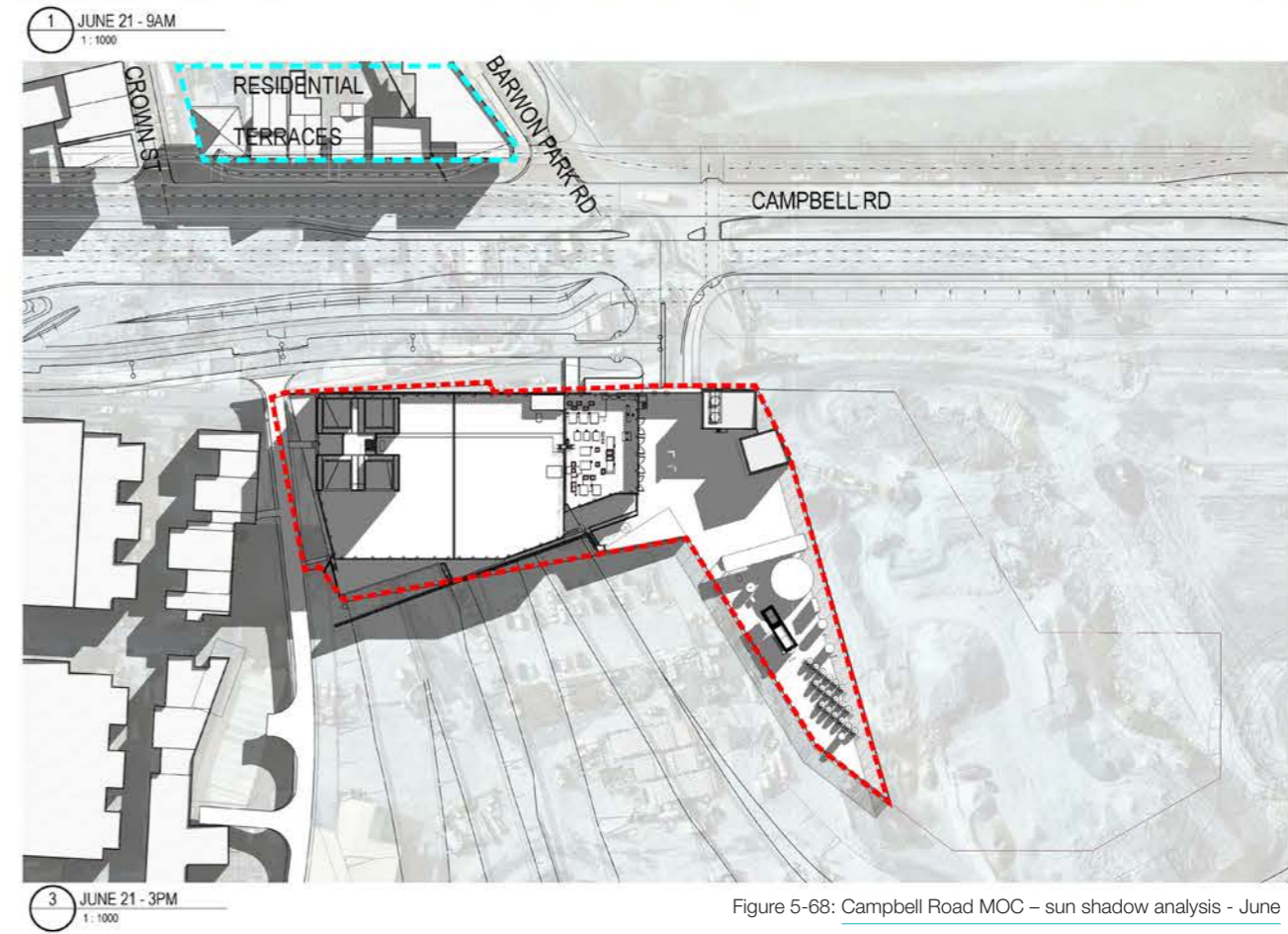
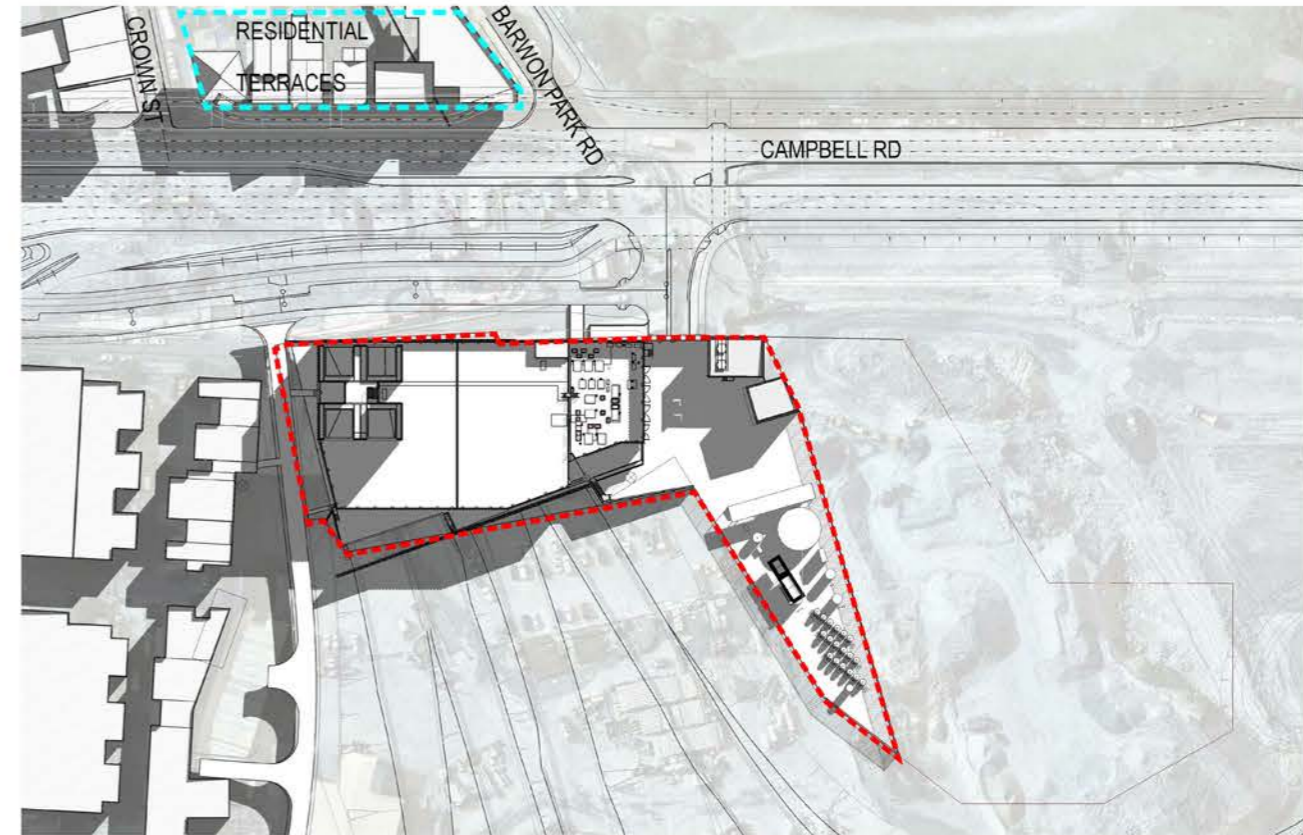
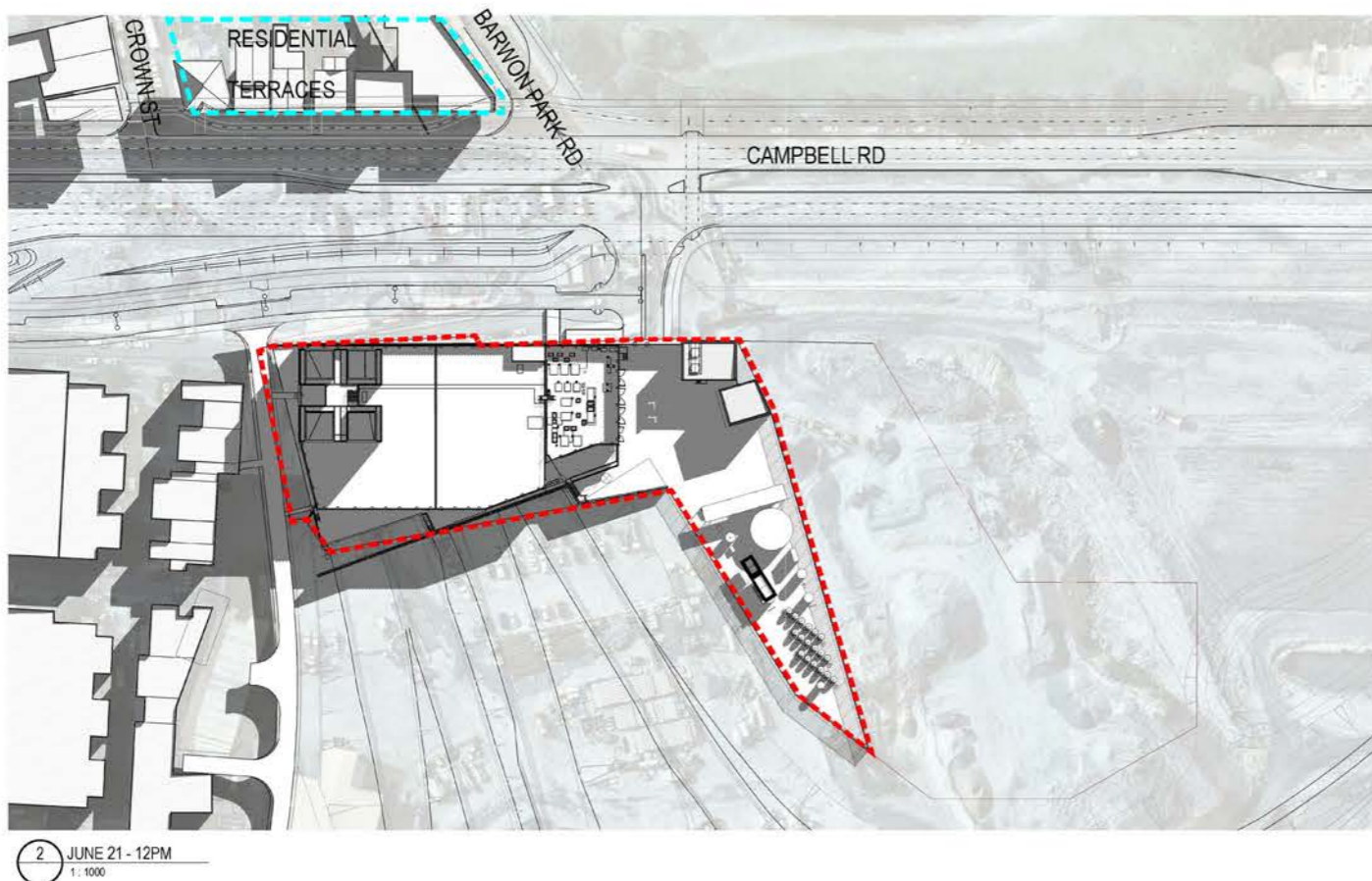
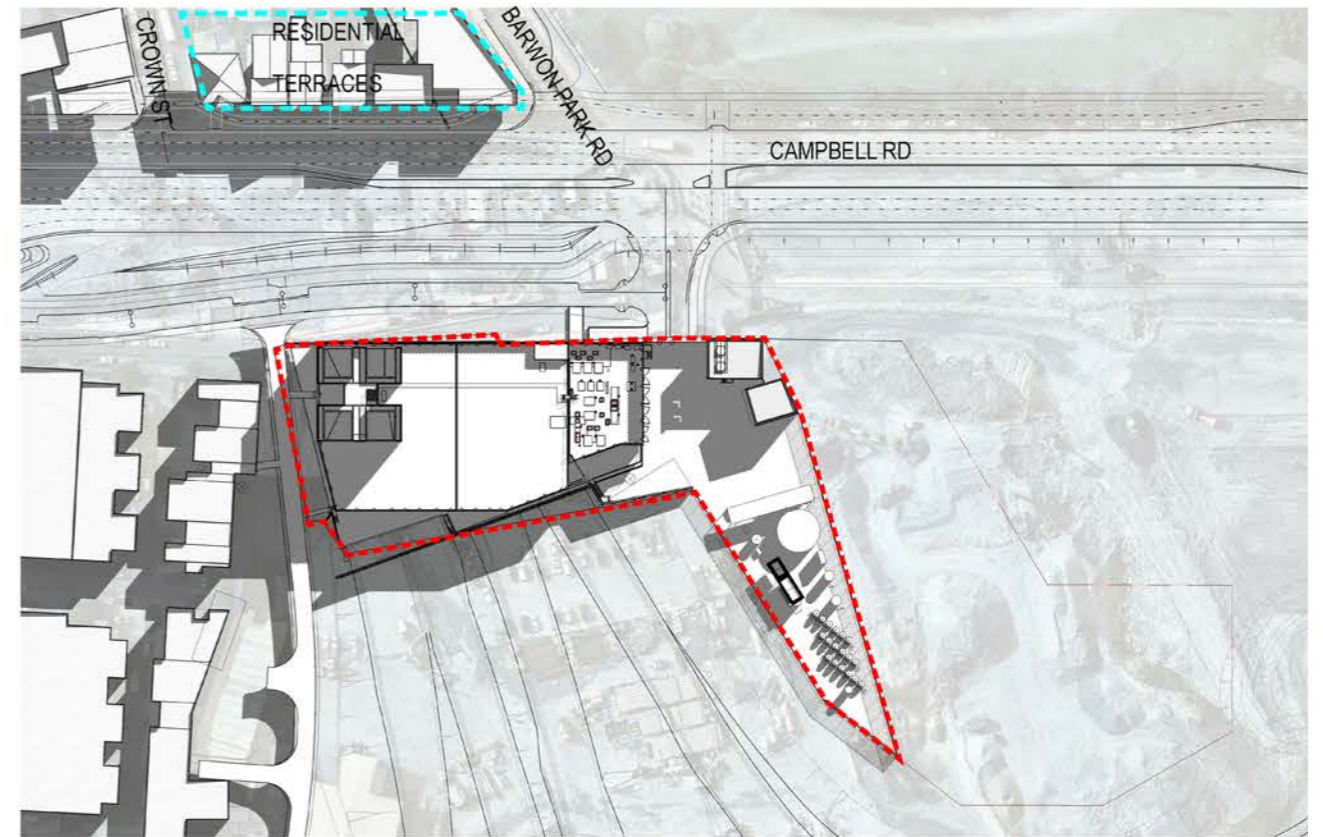


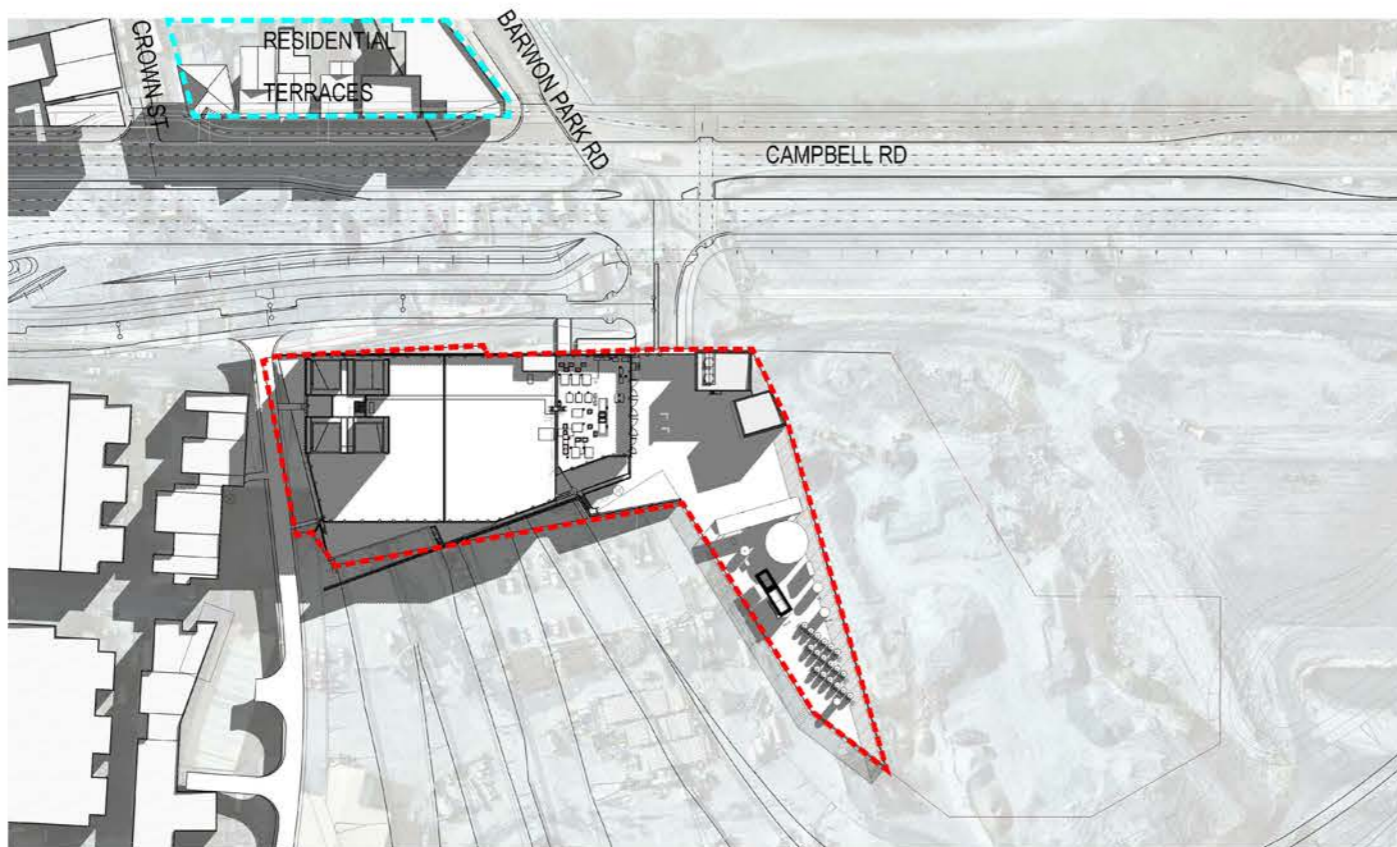
Figure 5-68: Campbell Road MOC – sun shadow analysis - June



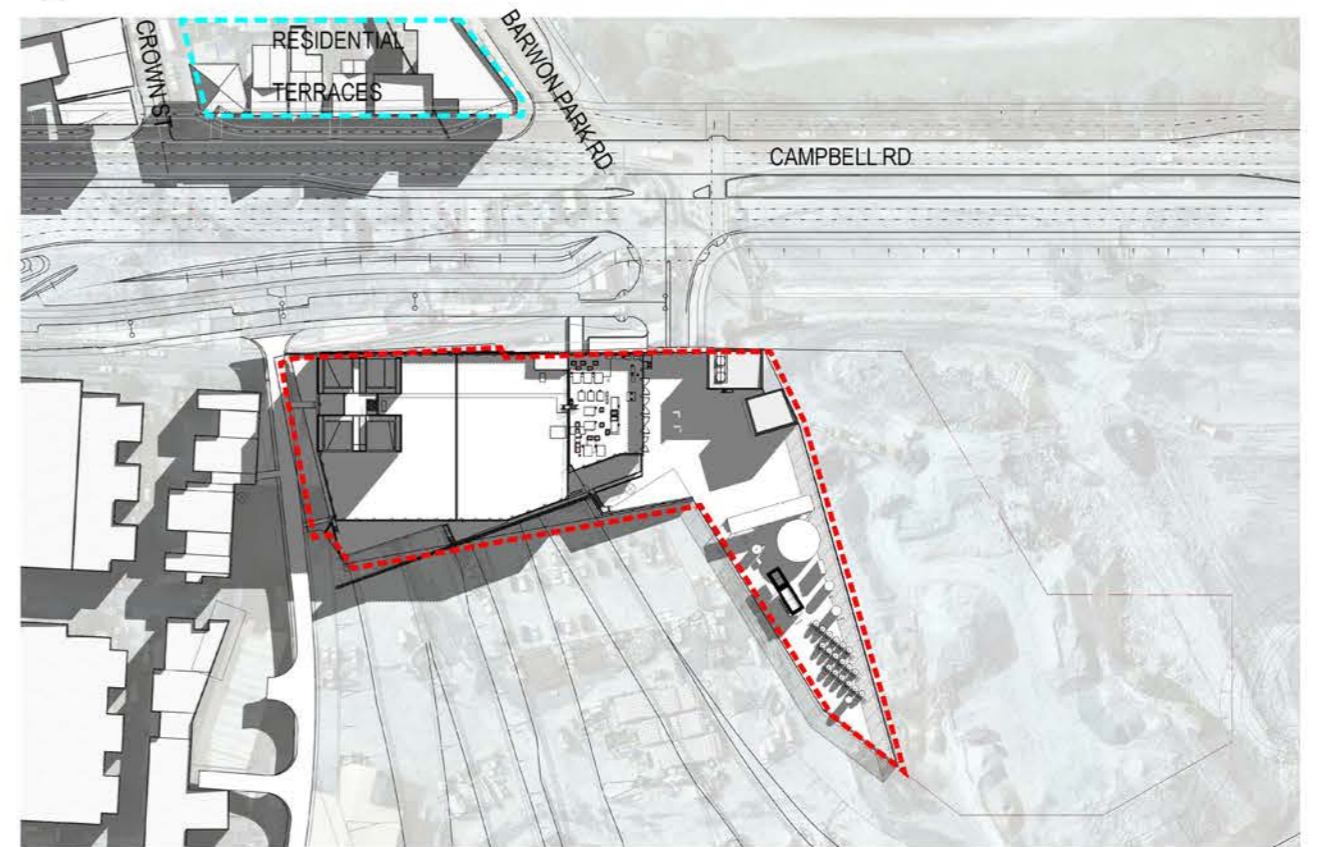


1 SEPTEMBER 23 - 9AM  
1:1000

--- SITE BOUNDARY  
--- SUBJECT OF OVERSHADOWING ASSESSMENT



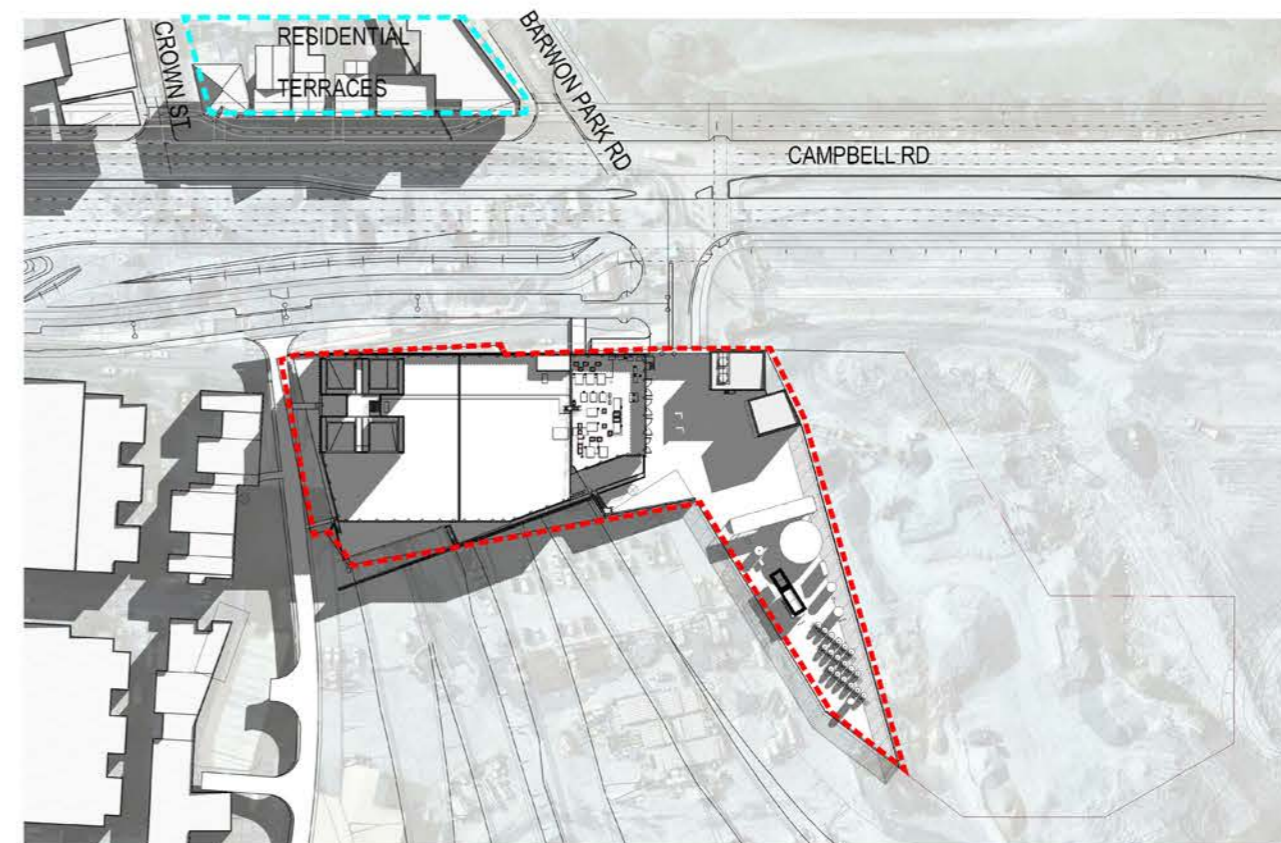
2 SEPTEMBER 23 - 12PM  
1:1000



3 SEPTEMBER 23 - 3PM  
1:1000

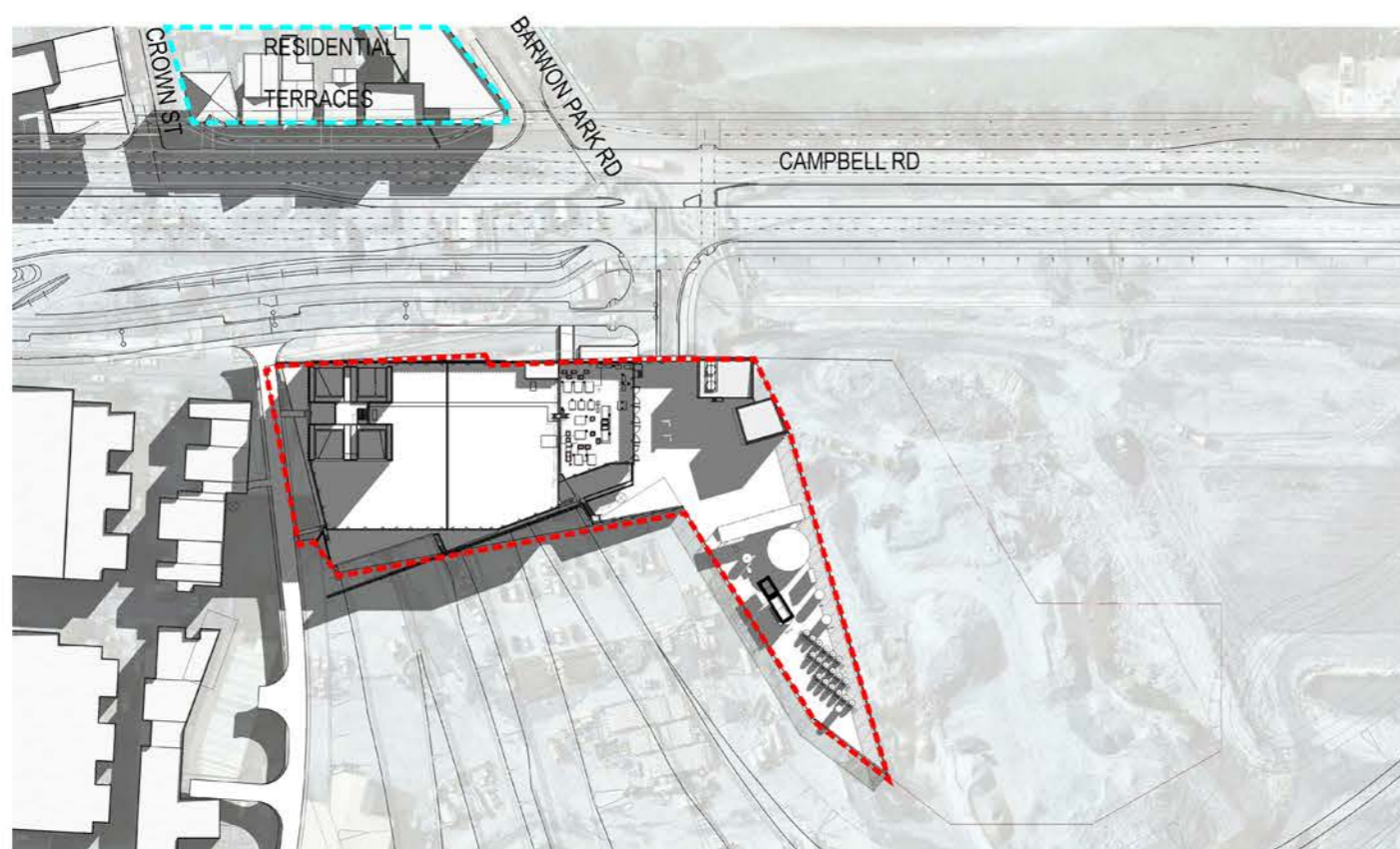
Figure 5-69: Campbell Road MOC – sun shadow analysis - September



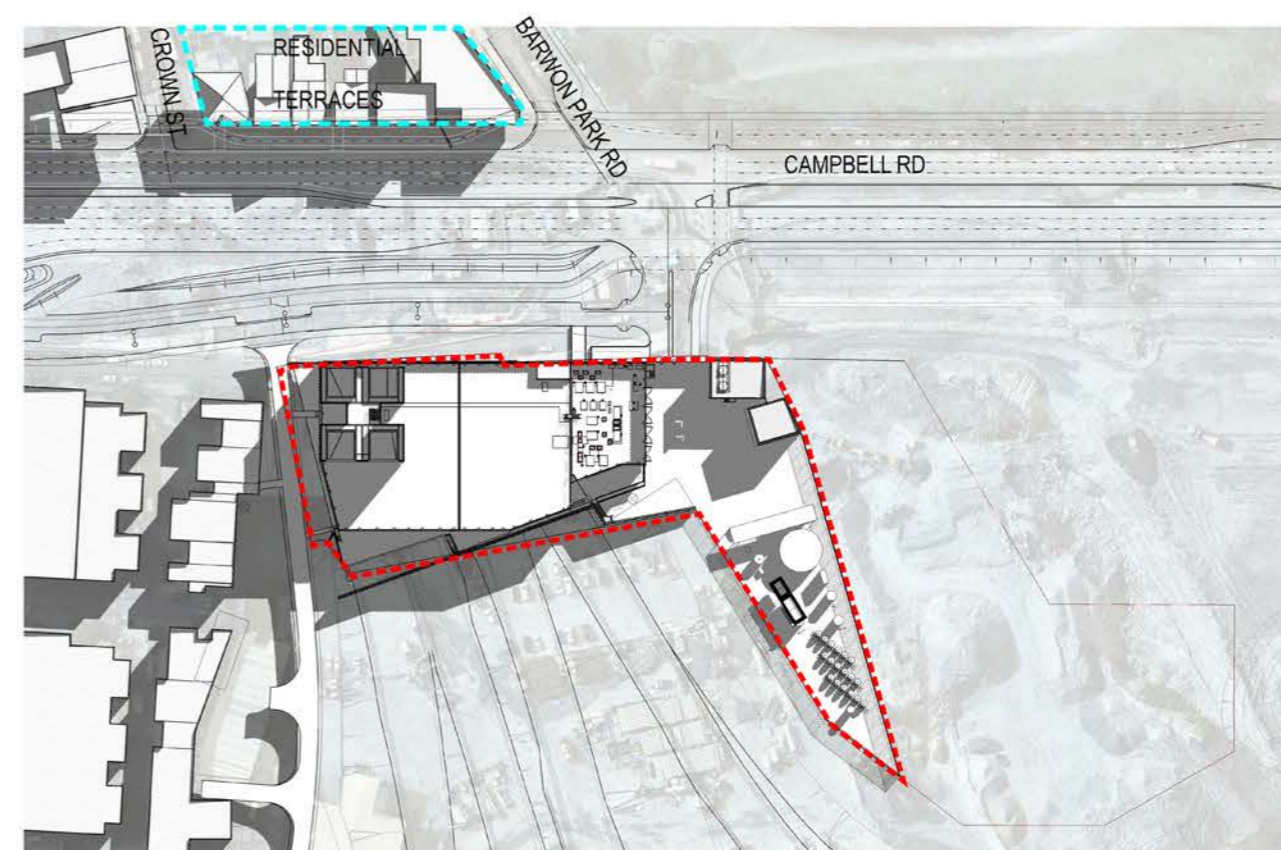


1 DECEMBER 22 - 9AM  
1:1000

--- SITE BOUNDARY  
--- SUBJECT OF OVERSHADOWING ASSESSMENT



2 DECEMBER 22 - 12PM  
1:1000



3 DECEMBER 22 - 3PM  
1:1000

Figure 5-70: Campbell Road MOC – sun shadow analysis - December



## 5.11 Landscape design

Landscape for this project is only at the Campbell Road MOC and the scope for landscape treatment is limited due to operational requirements of the site, leaving very little residual space (refer to Figure 5-72). The overall landscape strategy includes a tie in to landscape works on adjacent sites by others.

Landscaping by other stages of WestConnex is provided above the Wattle Street portals, constructed by the M4 East and along Campbell Road and within the various earthwork mounds of SPI as part of the New M5. Landscaping at SPI for the M4-M5 Link Mainline Tunnels provide a cohesive response to tie into planting by others and takes full advantage of the narrow strips of land to the west of the ventilation building, adjacent to the shared path and along the east of the water treatment plant to soften the palisade boundary fence.

The St Peters area, including Sydney Park and surrounds was originally a collection of Turpentine and Ironbark forests, heath lands, swamps and marshes known as the ‘Kangaroo grounds’ to the local Gadigal and Wangal people. Post settlement of the site, there have been a number of uses from a brick pit and a major municipal waste depot in the 19th and 20th century, before some areas were remediated, such as Sydney Parkland in the 1980s.

Vegetation clearing has been undertaken by previous stages of WestConnex. The limited residual area for the project landscape works will be rehabilitated with endemic species to enhance biodiversity.

The landscape design for the Campbell Road MOC is provided up to the limits of the site boundary and ties into the landscape works provided by others to the northern and western sides. The future Recreational Area (by others) adjoins the eastern boundary of the site, and is outside the scope of this project. The masterplan for this site is understood to be underway. The UDLP and any relevant sub-plan(s) is not available at this stage, refer to Figure 5-71.

The dappled light cast onto the ventilation facility by the open canopies of the Eucalyptus street trees (by others) heightens the experience of the colourful façade. This creates a dynamic piece of art that changes during the day, much like the shifting sands of the Indigenous landscape from which the colour palette draws inspiration.

### Disturbed areas

Disturbed areas are all areas impacted by the project, including temporary construction sites for civil works or tunnelling access. This UDLP addresses only the urban design and architecture for permanent infrastructure works. All remaining disturbed areas will have the opportunity to be used for future development or as open space, as determined by the land owner and is outside the scope of this project. In the interim, these areas will be left as hardstand, in readiness for potential future use.

### Open space initiative

The future open space / recreational area, to be located on the land east of the Campbell Road ventilation facility, will be landscaped in accordance with the draft St Peters Interchange Recreational Area Sub-plan, which was prepared by the New M5 (M8) Project to address CoA B62 (a+b) of the New M5 (M8) Project Approval. Discussions between DPIE, TfNSW, the City of Sydney Council and the Inner West Council regarding the land use of the future recreational area are ongoing. Therefore, a note has been added to the applicable figures in the UDLP denoting this area as “Future Recreational Area (by others)”. The implementation of this open space / recreational area initiative will be undertaken by a separate contractor following the completion of the M4-M5 Link Mainline Tunnels Project.

### Design philosophy

The design considers the key principles of integration, connectivity, multi-functionality and participation as outlined in “Greener Places” by the Government Architect NSW. The landscaping will integrate the Campbell Road MOC into the surrounding environment and connect into the open space network, which includes the Campbell Road verge and median planting, Sydney Park and the St Peters interchange landscaping. This connection will deliver multiple ecosystem services such as the provision of habitat, nutrient cycling and pollination.

Objectives for ‘Good Design’ outlined in the Government Architect NSW’s “Better Placed” have also guided the approach to the landscape design. The use of locally native plant species ensures the landscaping is of its place, sustainable and durable. The landscape creates a better space for the community, a comfortable place for people and more inviting and attractive environment around the building.

The revegetation of the site will be undertaken using direct planting. Planted vegetation includes tall shrubs and a mix of native shrubs, grasses and groundcovers to increase biodiversity, refer to Figure 5-72.

Planting schedules are developed based on vegetation communities surrounding the Campbell Road MOC. Two vegetation communities have been identified:

- Eastern Suburbs Banksia Scrub
- Sydney Sandstone Heath.

The landscape palette has been selected to withstand extreme heat of the Australian summer and low rainfall, and include a range of plant species to provide interest, colour and height, with ground covers and mulch to suppress weeds.



## Landscape implementation and monitoring

Landscaping is a small part of the surface works for the project, yet is a vital component of integrating with previously constructed sections of WestConnex.

Once construction works are largely complete, the landscaping works are anticipated to commence. As a guide, landscaping will commence one month prior to the target project handover to the operator to enable visual monitoring of the plants. This will also ensure that the plants are not damaged by construction activities and enables clear surveillance of the landscape zones for watering, mulching etc. Some street trees along Campbell Road will also be planted towards the end of the M4-M5 Link Mainline Tunnels construction. This enables access to remain for the construction of the Campbell Road ventilation facility and avoid damage to the roots and trunks of the trees.

The preparation and installation of soil for the landscape works shall comply with AS4419:2018 *Soils for Landscaping and Garden Use* and AS4454-2012 *Composts, Soil Conditioners and Mulches*.

The contractor is obligated to select landscaping which is suitable for the environment. The long-term operator is to follow recommended best practice, maintaining optimal growing conditions through regular tasks such as watering and weed removal.

By project completion, all landscaping works by the M4-M5 Link Mainline Tunnels and the adjacent New M5 Project will be installed. Areas used for temporary construction site compounds will be returned to the relevant land holders and public access will be granted to the motorway, public paths and local roads.

## Preparation

Typical preparation steps for landscaping are as follows:

1. Remove unwanted matter, including stones exceeding 50 millimetres in diameter, sticks and weeds
2. Cultivate planting areas by loosening the ground to the appropriate depth for the respective plant species, avoiding disturbing existing services or tree roots. Apply appropriate soil conditioners and finely cultivate the surface, raking free soil clods at the surface. Planting areas shall consist of a 50/50 mix of clean site soil and imported site topsoil improvement 'Benedict Organic Native Planting Mix (SmartMix® 6)' or approved equal. For areas where soil testing indicates toxins or extremes in pH, or soils that are extremely poor, allow to excavate and supply 300 millimetres of additional imported topsoil
3. Subgrade levels of planting areas shall be brought to or excavated to a minimum 300 millimetres below finished surface level before planting, backfilling with topsoil and mulching.

## Planting

Plants should be vigorous, well established, of good form, hardened off, free from disease and pests with healthy root systems, not pot bound with no evidence of root spiralling. The root system shall be well balanced in relation to the size of the plant.

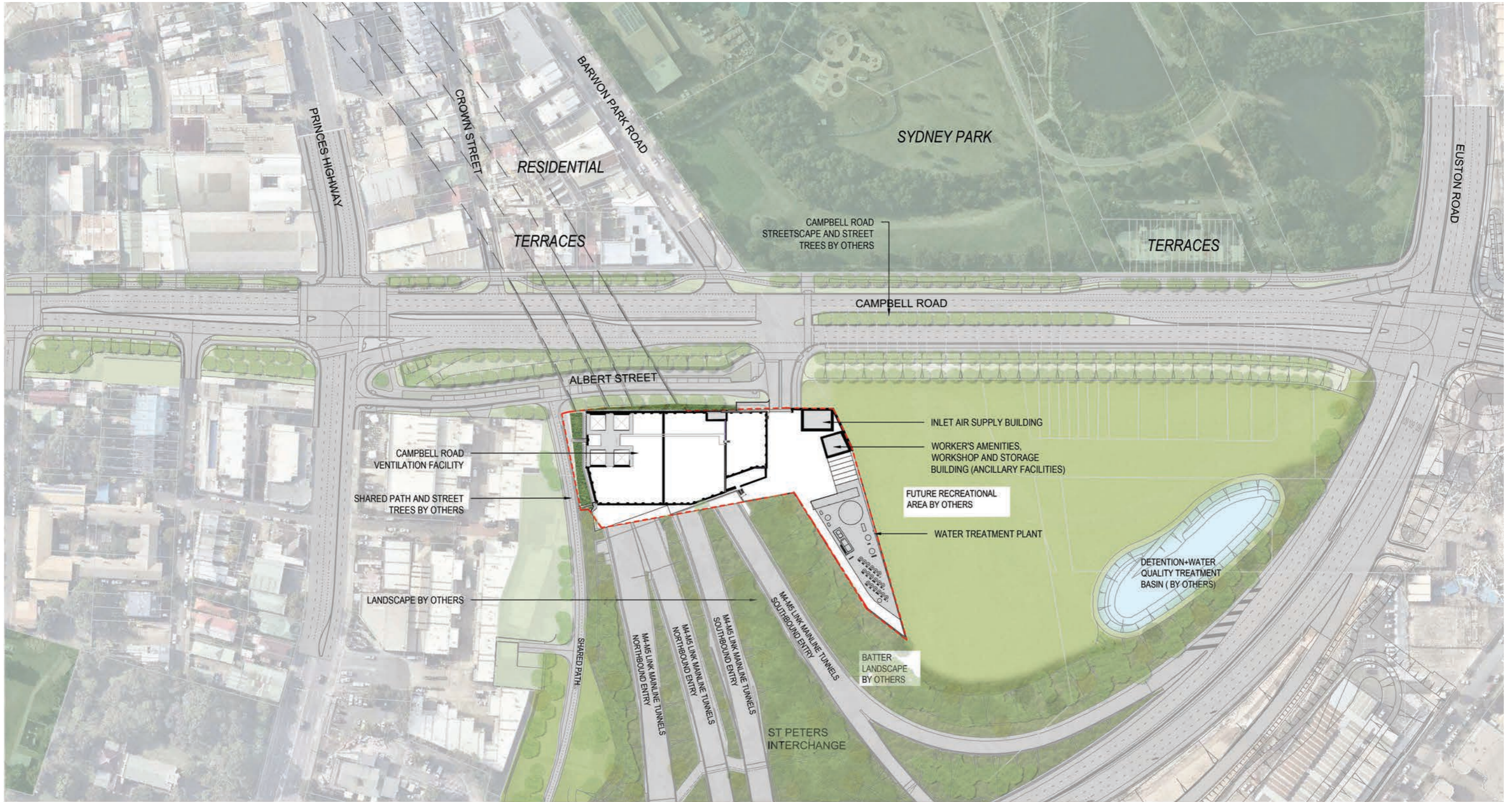
Before planting, the plants and planting area are to be thoroughly watered.

During planting, the plants and the planting area with both be kept moist. When planting, excavate a hole for planting each plant large enough to provide not less than 100 millimetres all around the root system of the plant, backfill with topsoil as specified. The surrounding topsoil shall be sloped to make a shallow dish around each plant to facilitate watering.

Water the plants immediately after planting, and thereafter as required to maintain growth rates free of stress. Planting is not to take place in unsuitable weather conditions such as extremes of heat, cold, wind or rain.

Finished planting areas will be covered with 75 millimetre depth of horticultural grade pine bark mulch.





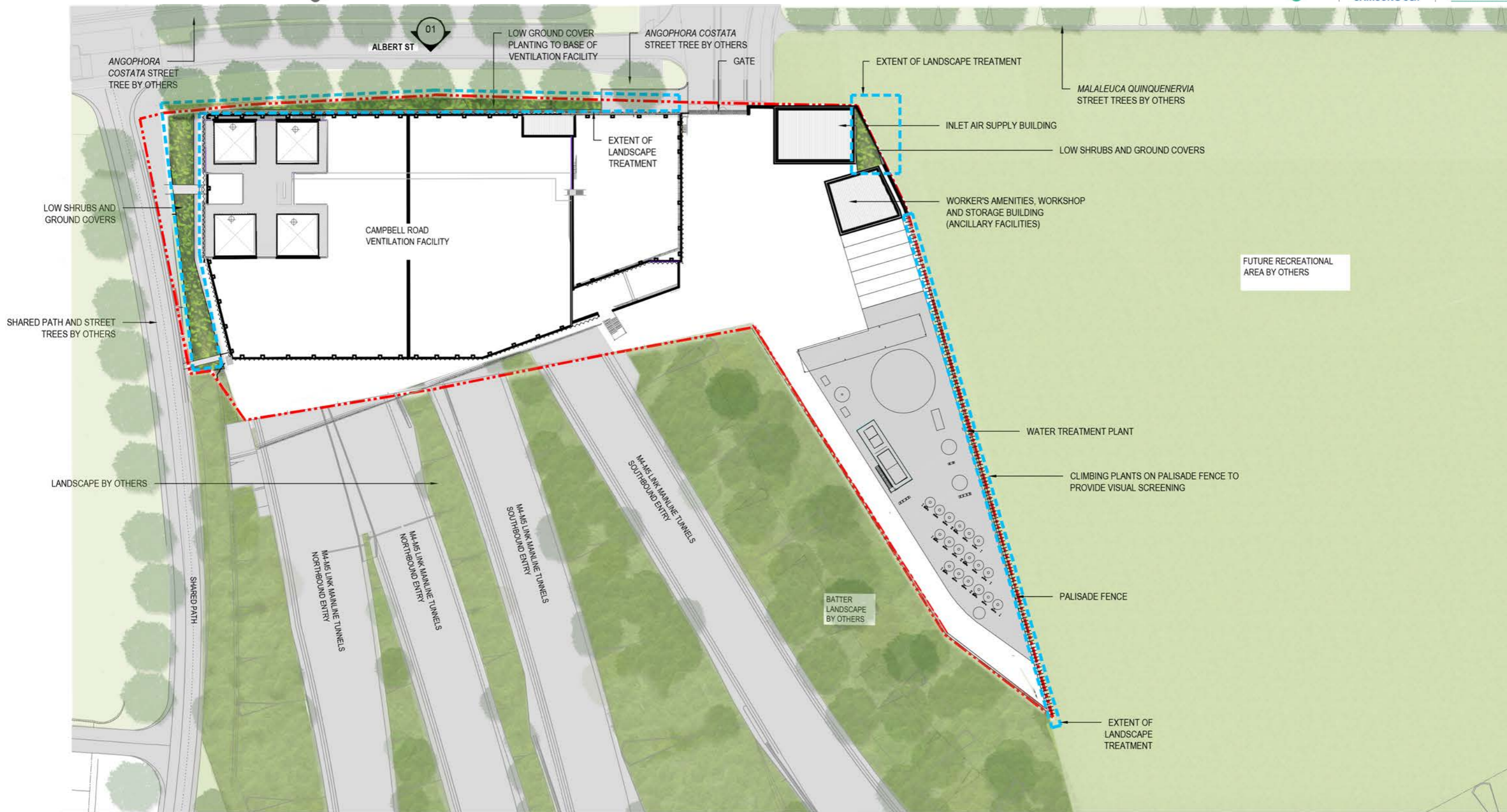
**LEGEND**

- - - SITE BOUNDARY
- NATIVE PLANTING
- OPEN SPACE
- LANDSCAPE WORK BY OTHERS



Figure 5-71: Campbell Road MOC – landscape site plan





1 CAMPBELL ROAD MOC - LANDSCAPE PLAN  
SCALE 1:750

- LEGEND**
- SITE BOUNDARY
  - EXTENT OF LANDSCAPE TREATMENT
  - NATIVE PLANTING
  - OPEN SPACE WORK BY OTHERS
  - LANDSCAPE WORK BY OTHERS

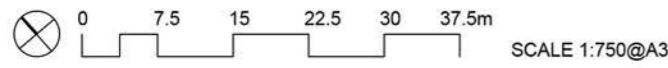


Figure 5-72: Campbell Road MOC – landscape plan



## Landscape monitoring and maintenance

Long term maintenance after the project construction handover will be undertaken by a dedicated maintenance contractor.

As a guide, fortnightly monitoring and maintenance of the landscaping area will include the following items for the first twelve month period (establishment) as a minimum requirement:

- Watering- monitor planting for leaf droop and drainage and adjust watering according to the site conditions and plant species as needed. The suggested water application rate for planting during the establishment period) is 20 per cent of the rootball volume for free-draining soils eg 9L of water for a 45L pot size plant and 15 per cent for heavy / clay soils e.g. 7L of water for a 45L pot size plant
- Weeding and rubbish removal – remove by hand, rubbish and weed growth that occurs throughout all planting areas
- Pruning and deadheading – prune plants and remove spent flowers after their flowering season to maximise future growth, plant health and repeat flowering. Prune native grasses in winter for new growth in spring
- Fertilising / mulching – maintain mulch surfaces in a clean and tidy condition. At a minimum reinstate mulches to specified depths and extents as specified on an annual basis
- Pest and disease control – organic insecticide or fungicide spraying, for incidences of pest or disease attack on plants, shall be carried out in accordance with the manufacturer's instructions
- Plant replacement – replace plants, which die or fail to thrive or are damaged or stolen, with plants of same size (at time of planting) and quantity.

## WSUD

WSUD aims to improve the ability of urban environments to capture and treat stormwater before it has a chance to pollute and degrade creeks and rivers.

Given the heavily constrained nature of the site, existing drainage elements have been utilised, where possible, including the New M5 detention and water quality treatment earth basin, biofiltration channel and clean water diversion drain.

WSUD has been incorporated into the project, as follows:

- All tunnel water is collected and treated by the Campbell Road WTP. This treatment process improves water quality prior to controlled release into the stormwater network, supplementing flow through the urban network and improving the quality of receiving water
- A multi-level treatment process at the Campbell Road MOC has been developed with various design options considered to mitigate water quantity and water quality impacts for captured flows during operation. Model for urban stormwater improvement conceptualisation modelling (MUSIC) was employed to assess impacts on the receiving drainage network and downstream watercourses for various design options

- Surface water landing on the catchment of the Campbell Road MOC is collected via drainage sumps and pipes. Surface water quality controls have been incorporated into the site as follows:

- The use of the vegetation lined clean water diversion channel constructed as part of the New M5 prevent upstream flows entering the Campbell Road site and provide upstream habitat and refuge for wildlife
- Water landing within the confined of the water treatment plant may be potentially contaminated with chemicals. An appropriately sized water quality tank is positioned to capture first flush runoff and provide additional spill containment. Water is then pumped back into the WTP, for treatment. Discharges from the WTP can be controlled to supplement flow in the receiving waters, improving aquatic habitats for wildlife
- Water is released into the existing open drainage channels along Campbell Road and the detention and water quality treatment earth basin provided by the New M5
- Scour protection via rip-rap is provided for all open channels to attenuate flow velocities and prevent sediment disturbance and re-suspension in receiving waters. Rip-rap simulates natural obstructions in water channels to provide diversity of flow regimes and habitat and refuge for wildlife
- The existing New M5 detention and water quality treatment earth basin will be increased in size to provide additional storage for flood water. This basin is utilised to treat residual pollutant loads from collected surface water prior to discharge into Alexandra Canal via a pipe culvert beneath Burrows Road. Works to expand the basin include a new oil baffle wall, rip-rap spillway protection, a trash rack covering the new outlet and reinstatement of turf. The biofiltration channel attenuates flow, provides diversity of habitat for wildlife, and mitigates urban heating and cooling effects.

The detailed design of the drainage incorporates the WSUD initiatives to provide a level of treatment considered appropriate to manage water quality and quantity impacts. Water discharge from the project during operation are anticipated to have a mutual to beneficial impact on the receiving environment.

Additionally, the selection of plant species used for the landscaping areas has been selected with consideration of the water demands. Plants which are drought tolerate and therefore have low water demands are specified. A range of plants of various ages aid the establishment of the landscaping areas and are arranged in densities to provide sufficient ground cover, aiming to intercept and efficiently utilise rainwater.

## Visual screening

Native climbing plants will be located atop the eastern boundary fence of the Campbell Road MOC, to provide visual screening. These climbing plants will include species producing coloured flowers of purple (*Hardenbergia violacea*), yellow (*Hibbertia scandens*) and white (*Pandorea pandorana*) further reinforcing the colour palette of the Campbell Road MOC, refer to Figure 5-54.





1 NORTH ELEVATION  
SCALE 1:500  
(VIEW LOOKING FROM CAMPBELL RD)

Figure 5-73: Campbell Road MOC elevation – looking south (vegetation by others shown)



Figure 5-74: Campbell Road MOC section AA – Albert Street looking east

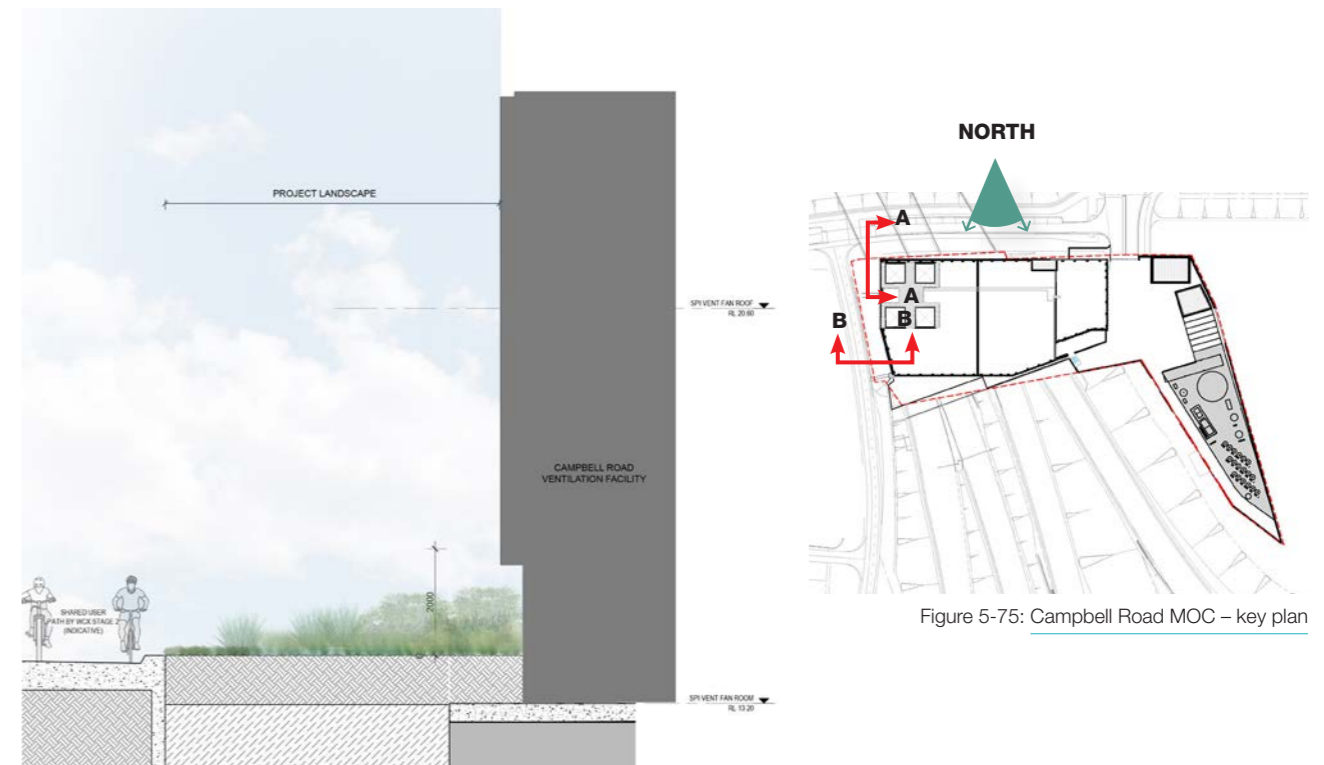


Figure 5-76: Campbell Road MOC section BB – shared user path looking north

Figure 5-75: Campbell Road MOC – key plan

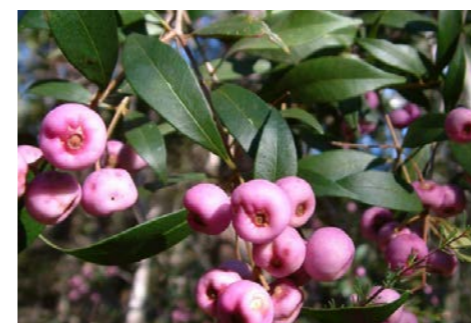
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context.



### Campbell Road MOC - planting palette

Botanical name	Common name	Pot size	Mature height and spread
<b>Tall shrubs</b>			
<i>Acmena smithii</i>	Lilly Pilly	75 Litre	3-5m x 1-3m
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	75 Litre	3-5m x 2m
<i>Leptospermum petersonii</i>	Lemon-scented tea-tree	75 Litre	5m x 4m
<i>Syzygium luehmannii</i>	Small Leaved Lilly Pilly	75 Litre	2-5m x 3-5m
<b>Feature shrubs</b>			
<i>Doryanthes excelsa</i>	Gynea Lily	25 Litre	2-4m x 2m
<b>Native shrubs, grasses and groundcovers</b>			
<i>Brachyscome multifida</i>	Cut-leaved Daisy	150 mm	0.4m x 0.5m
<i>Carpoborutus glaucescens</i>	Pig Face	150 mm	0.1-0.3m x 2m
<i>Dianella caerulea</i>	Flax-lily	150 mm	0.5m x 0.8m
<i>Ficinia nodosa</i>	Knobby Club-rush	150 mm	0.6m x 1m
<i>Gahnia aspera</i>	Rough Saw Sedge	150 mm	0.8m x 0.5m
<i>Hardenbergia violacea</i>	Purple coral pea	150 mm	1m x 2m
<i>Lomandra confertifolia</i>	Mat-rush	150 mm	0.5m x 1m
<i>Lomandra filiformis</i>	Mat-rush	150 mm	0.3-0.6m x 0.3m
<i>Lomandra longifolia</i>	Mat-rush	150 mm	0.8m x 1m
<i>Ozothamnus diosmifolius</i>	Rice Flower	200 mm	1.5m x 0.8m
<i>Poa affinis</i>	Tussock grass	150 mm	0.8m x 1m
<i>Scaevola aemula</i>	Fairy Fan Flower	150 mm	0.6m x 0.8m
<i>Themeda australis</i>	Kangaroo Grass	150 mm	1m x 0.5m
<i>Westringia fruticosa</i>	Native Rosemary	200 mm	0.8m x 2m
<i>Xerochrysum bracteatum</i>	Golden Everlasting	150 mm	0.2-0.5m x 0.2-0.5m

The following artist's impressions illustrate how the built environment will evolve as landscaping matures.



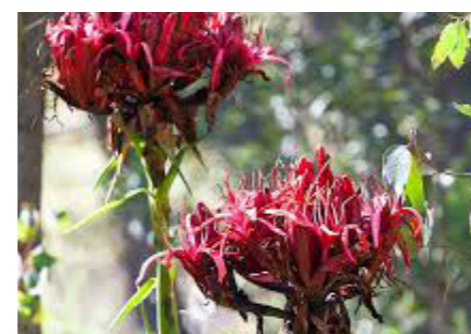
*Acmena smithii*



*Elaeocarpus reticulatus*



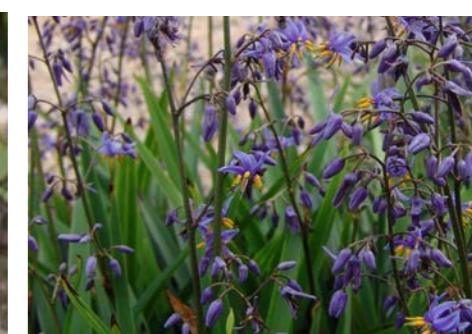
*Leptospermum petersonii*



*Doryanthes excelsa*



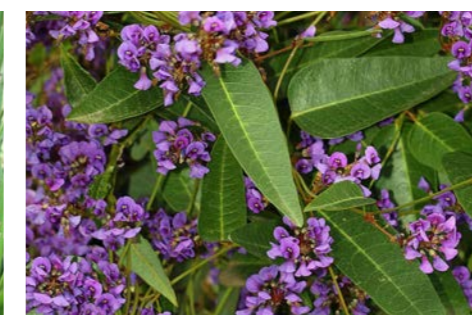
*Brachyscome multifida*



*Dianella caerulea*



*Lomandra longifolia*



*Hardenbergia violacea*



*Westringia fruticosa*

Figure 5-77: Campbell Road MOC – planting palette



Artist's impression

Landscape shown at completion and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-78: Campbell Road ventilation facility – view looking west along Campbell Road (at completion)



Artist's impression  
Landscape shown at full maturity (15 years) and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-79: Campbell Road ventilation facility – view looking west along Campbell Road (at maturity 15 years)



Artist's impression

Landscape shown at completion and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-80: Campbell Road ventilation facility – view from Campbell Road terraces looking west (at completion)



Artist's impression  
 Landscape shown at full maturity (15 years) and is indicative only,  
 and also includes other WestConnex stages to illustrate context.  
 Future land bridge and any alterations to vegetation not shown.  
 Street lighting and other road furniture not shown.



Figure 5-81: Campbell Road ventilation facility – view from Campbell Road terraces looking west (at full maturity 15 years)



Artist's impression

Landscape shown at completion and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-82: Campbell Road ventilation facility – view from Barwon Park Road (at completion)



Artist's impression  
Landscape shown at full maturity (15 years) and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-83: Campbell Road ventilation facility – view from Barwon Park Road (at maturity 15 years)



Artist's impression

Landscape shown at completion and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-84: Campbell Road ventilation facility – view looking east along Campbell Road (at completion)



Artist's impression

Landscape shown at full maturity (15 years) and is indicative only, and also includes other WestConnex stages to illustrate context. Future land bridge and any alterations to vegetation not shown. Street lighting and other road furniture not shown.



Figure 5-85: Campbell Road ventilation facility – view looking east along Campbell Road (at maturity 15 years)



Artist's impression  
Landscape shown at completion and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.



Figure 5-86: Campbell Road ventilation facility – view from Campbell Road (near Crown Street) terraces looking south (at completion)



Artist's impression  
Landscape shown at full maturity (15 years) and is indicative only,  
and also includes other WestConnex stages to illustrate context.  
Street lighting and other road furniture not shown.



Figure 5-87: Campbell Road ventilation facility – view from Campbell Road (near Crown Street) terraces looking south (at full maturity 15 years)



## 5.12 Visual impact

The adjoining sensitive receivers at the Campbell Road MOC are located along Campbell Road and include the following, refer to Figure 5-88:

1. Two storey residential terraces located across Campbell Road between Barwon Park Road and Crown Street
2. Four storey residential flat building located at the corner of Barwon Park Road and Campbell Road
3. Two storey residential terraces located across Campbell Road between Sydney Park and Euston Road.

The architectural design of the facilities in the Campbell Road MOC has taken into consideration the context of the local area including the built form, materiality and urban regeneration / development and landscaping by others to enhance the visual amenity and values of the adjoining sensitive receivers (refer to Figure 5-88). The building placement and magnitude is consistent with the Planning Approval and has an approved height limit of around 22 metres above existing ground level.

A comparison between EIS design and current design is shown in Figures 5-89 and 5-90.



Figure 5-88: Sensitive receivers



Figure 5-89: View from Barwon Park – EIS design



Figure 5-90: View from Barwon Park – current design



### Campbell Road ventilation facility - sequential views

These images illustrate the sequential experience of the Campbell Road ventilation facility architecture, refer to Figures 5-91 to 5-98.

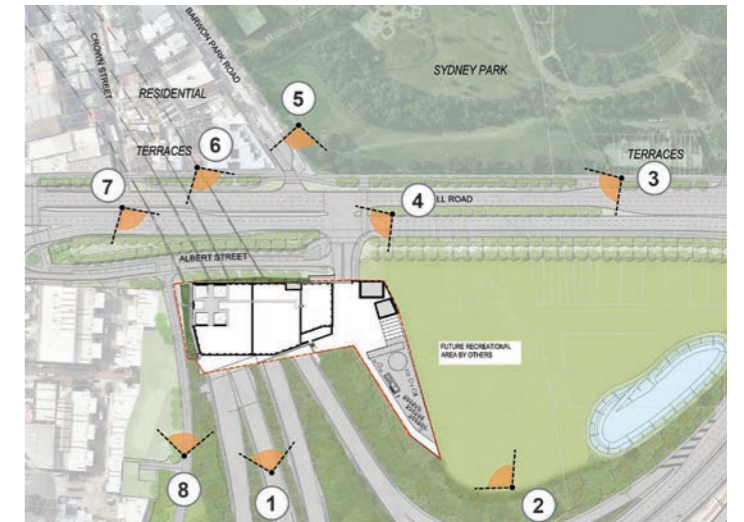


Figure 5-99: Sequential experience – key plan



Figure 5-91: View 1 – from motorway looking north - eye level



Figure 5-92: View 2 – from future Recreational Area (by others) looking west



Figure 5-93: View 3 – from Campbell Road terraces looking west



Figure 5-94: View 4 – from Campbell Road looking west



Figure 5-95: View 5 – from Barwon Park Road looking south



Figure 5-96: View 6 – from Campbell Road (near Crown Street) terraces looking south



Figure 5-97: View 7 – from Campbell Road looking east



Figure 5-98: View 8 – from shared path looking north





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## 6.0 Tunnel

### 6.1 Overview

The tunnel, as the primary experience of the project forms the main element for understanding the urban design concept for the project.

The tunnels represents almost a third of the overall length of WestConnex and traverses the following suburbs, refer to Figure 6-1:

- St Peters
- Newtown
- Camperdown
- Stanmore
- Annandale
- Leichhardt
- Haberfield.

The tunnel urban design incorporates measures to address long tunnel issues, mainly driver fatigue and monotony.

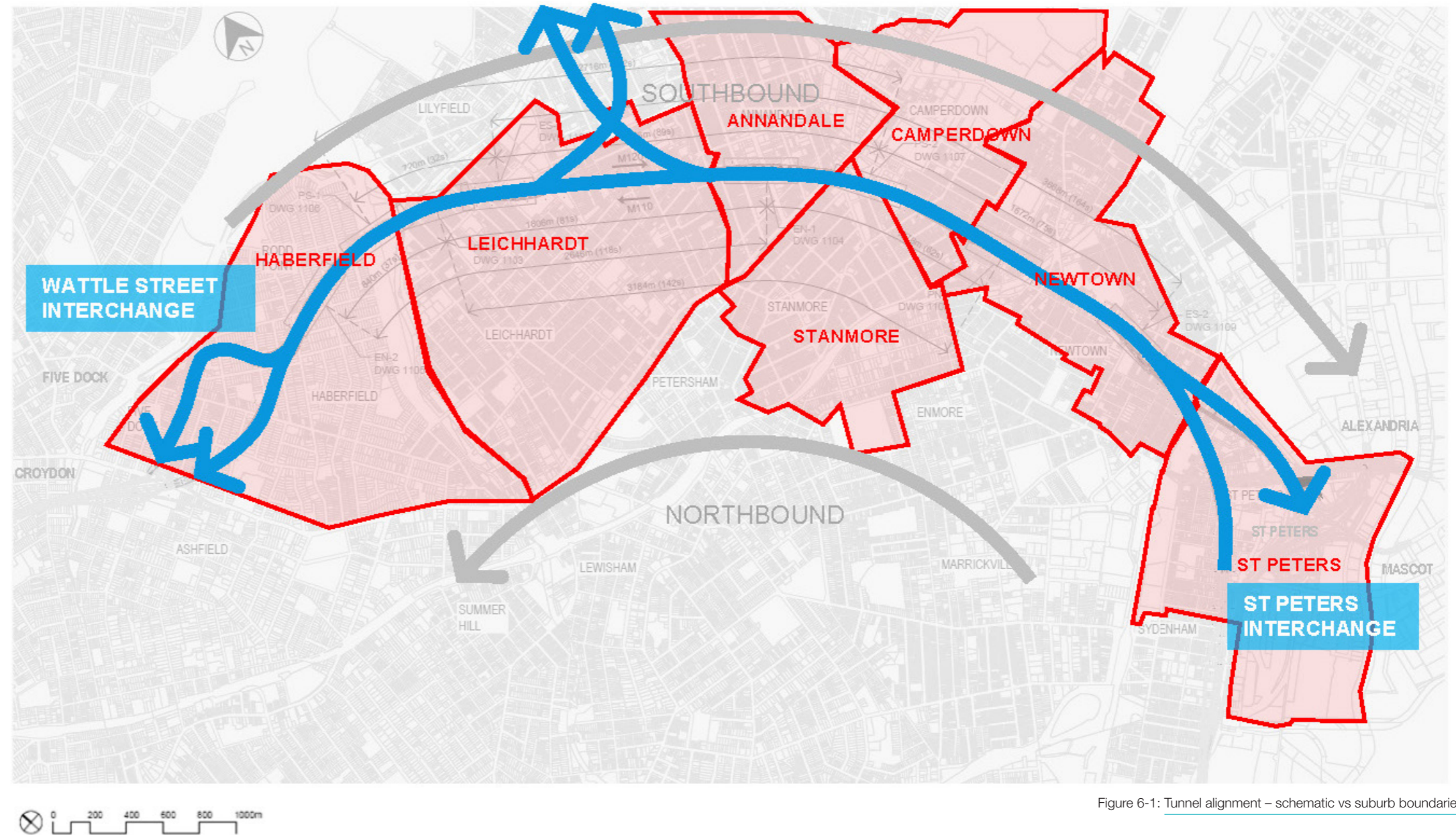


Figure 6-1: Tunnel alignment – schematic vs suburb boundaries



## 6.2 Tunnel narrative

The design philosophy for the tunnel is to provide a narrative that references the surface identities along the corridor through visual events.

This is done in a way that provides an aesthetically cohesive design that ties into the design language of WestConnex. A review was undertaken to understand the urban design features provided in other WestConnex tunnels. The review showed that in all other WestConnex sections, design features were created by adding graphics and colour to standard tunnel panels. This concept has also been adopted on this project.

The tunnel visual events help to reduce driver fatigue, monotony and boredom by breaking the journey into shorter segments. The visual events provide a reference to their geographical surface location by using location markers on the architectural panels. Major decision points have been enhanced by feature panels at tunnel exit points. Other areas in the tunnel will have standard panels.

## 6.3 Tunnel issues

### Overall

Some common issues to be addressed that affect the design of a long tunnel. These include:

- Tunnel safety – maintaining operational criteria of all safety features
- Driver fatigue / monotony / boredom – how can the tunnel journey be made interesting?
- Driver orientation – how are drivers aware of where they are in Sydney? Along the route?
- Driver recognition of safety elements – how to make exit passages distinct and maintain their legibility
- Driver distraction – how can interest be added without compromising road awareness?

### Project specific

Some issues that need to be addressed are specific to the conditions of WestConnex, including:

- Full comprehension – develop a concept that works for all of WestConnex
- Build on the existing narrative of the journey
- Capitalise on changes in tunnel configuration – use tunnel exits and merge areas for visual events
- Keep driver interest – minimise in-tunnel monotony.

## 6.4 Driver experience

- Create a safe, pleasant and attractive journey
- Improve driver expectations
- Provide legibility for the journey enabling awareness of location
- Achieve a high quality, minimal maintenance public domain
- Provide a tunnel that is sensitive to its context
- Reinforce the linear identity of WestConnex.

A successful driver experience for WestConnex needs to include special features that:

- Occur at differing intervals to add interest and variety
- Reference history and geographical features that support an understanding of location
- Provide wayfinding clues with colour and lighting.

### Intended user groups

The design needs to cater for the range of motorway users. This is done by providing a tunnel environment which is intuitive and enables user orientation.

- Daily commuters – familiar with the route and benefit from references and special effects that transform over time
- Occasional drivers – likely to benefit from ‘initial visual impact’ of special effects. References can assist with introducing the traveller to this area
- Commercial freight / transport drivers – familiar with the route and benefit from references and special effects that transform over time.



## 6.5 Visual events

The visual events are the feature elements in the tunnel and include coloured panels and supergraphics. They are expressed as:

- Location markers
- Exit markers
- Breakdown bay markers.

Location markers and exit markers are provided as placemaking elements, which are complementary to the M4 East and New M5. The breakdown bay markers are provided to highlight the emergency bay areas and demarcate them consistently across all three stages of WestConnex.

The mainline tunnels comprise two exit points in each direction of travel, refer to Figure 6-2. They are:

### Northbound

- Exit to future Iron Cove Link and Rozelle interchange
- Exit to WSI.

### Southbound

- Exit to Iron Cove Link and Rozelle interchange
- Exit to SPI.

The location of visual event zones have been coordinated so that they do not clash with M&E requirements. The tunnel is generally comprised of the following elements:

### Near side areas:

- Standard (off-white colour) architectural cladding panels (typically 1.2 metres wide)
- Feature (accent colour) architectural cladding panels (typically 1.2 metres wide)
- Directional exit lighting
- Emergency equipment cabinets (EECs).

### Far side areas:

- Standard architectural cladding panels (typically 1.2 metres wide)
- Cross passages (located typically at 120 metre intervals)
- Long egress passage
- Directional exit lighting
- EECs.

The alignment of the architectural cladding panels follow the road surface along the length of the tunnel and provide a smooth line at the top and bottom of the panels. Other than tunnel visual event areas, all other areas will have standard off-white architectural cladding panels. The feature coloured panels are provided only along the near side of the tunnel, in the direction of travel. The use of coloured panels has deliberately been avoided on the far side, so that they do not clash with the legibility of fire emergency zones, such as cross passages.

Other emergency areas such as vehicle cross passages, also have only standard panels and have not been highlighted to avoid confusion between feature and standard zones.

Appropriate signage, along with changes the widened cavern geometry from standard conditions, provides visual cues and legibility of these emergency areas.

### Enhanced lighting

Enhanced lighting is provided at the visual events to differentiate between standard and special tunnel environments to assist with tunnel feature legibility.

At the breakdown bays, an additional row of lighting is provided, which will clearly highlight the location of the breakdown bays in the tunnel.

### Tunnel colour strategy

Accent colour is provided with blue as a theme colour to provide reference to 'water' and the project's context with Sydney Harbour and Botany Bay. Refer to Chapter 3.3 Project Context and related project maps.

Breakdown bays have a yellow mosaic colour pattern similar to that of the M4 East and New M5, to provide a sense of continuity and legibility of these safety zones in all three stages of WestConnex.

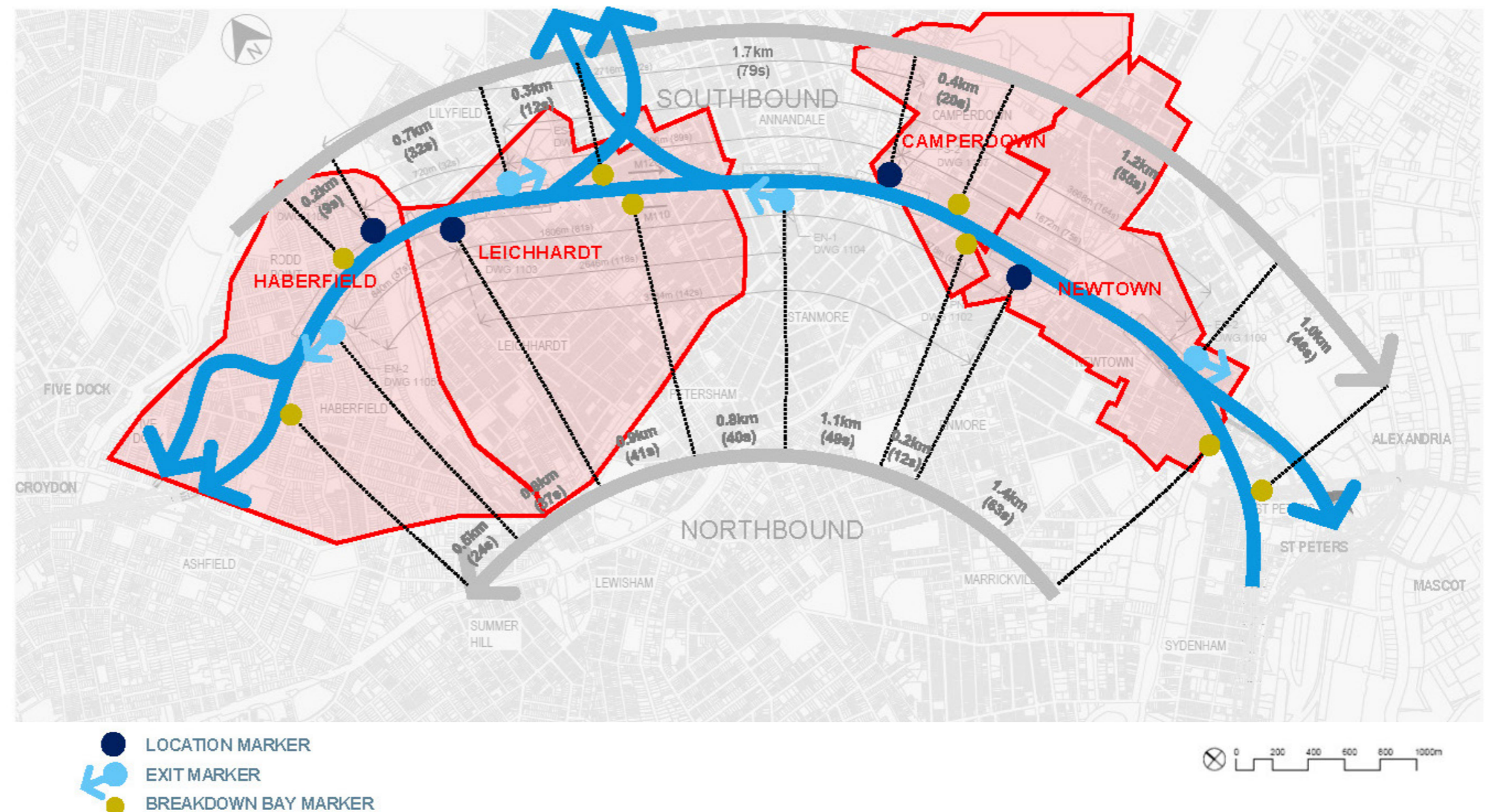


Figure 6-2: Visual events location strategy



### Location markers

Location markers are created using patterns and supergraphic text. They serve as reference points indicating suburbs above ground in that portion of the tunnel (refer to Figures 6-4 and 6-5). These also provide an opportunity to mark progress through the tunnel.

The location markers are located at strategic locations, away from exit points. The colours and supergraphic text are coordinated to meet the required reflectivity values, providing contrast and interest to differentiate from the standard tunnel treatments. The supergraphic text is read in a forward direction.

The location markers are only provided on the near side of the tunnel, extending up to a height of 3.5 metres above the road surface. Areas above this zone will be painted black. They extend for a length of about 200 metres, with the supergraphic text located between two typical cross passages, refer to Figures 6-3 and Figure 6-6.



Artist's impression  
Signage and EECs are not illustrated.

Figure 6-5: Tunnel visual event

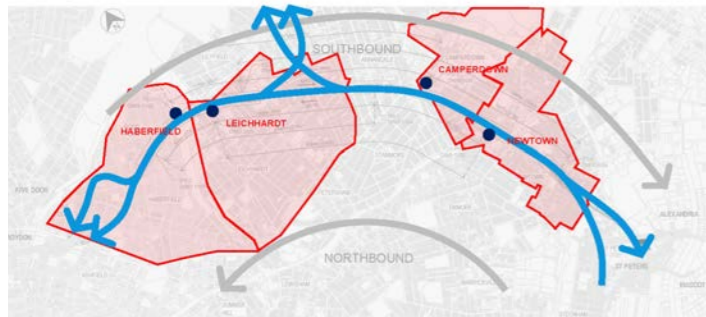
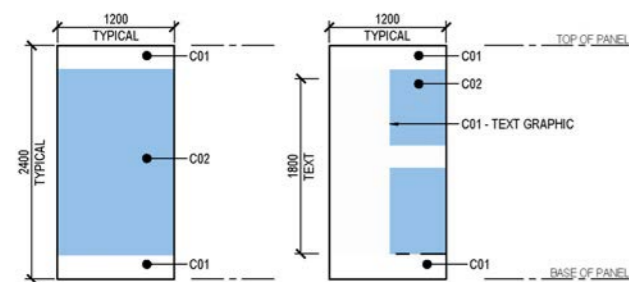
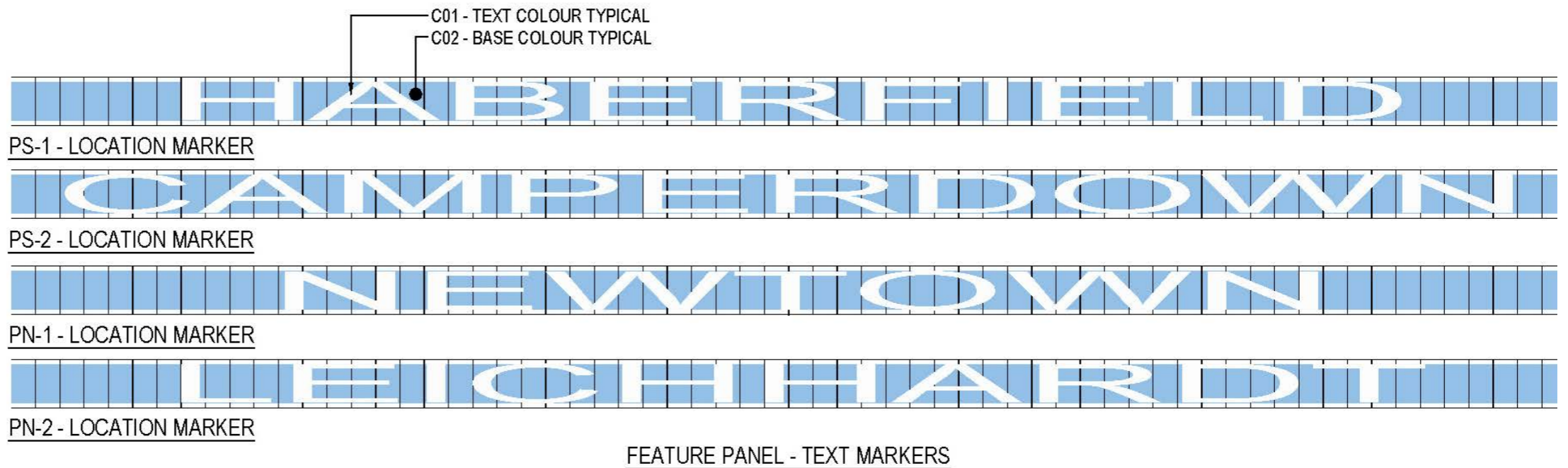


Figure 6-4: Tunnel location markers



FEATURE PANEL - FPZ1  
FEATURE PANEL - FPZ2  
FEATURE PANEL ZONE - LOCATION MARKER

Figure 6-3: Feature panel detail



FEATURE PANEL - TEXT MARKERS

Figure 6-6: Tunnel – feature panel zone detail – location markers

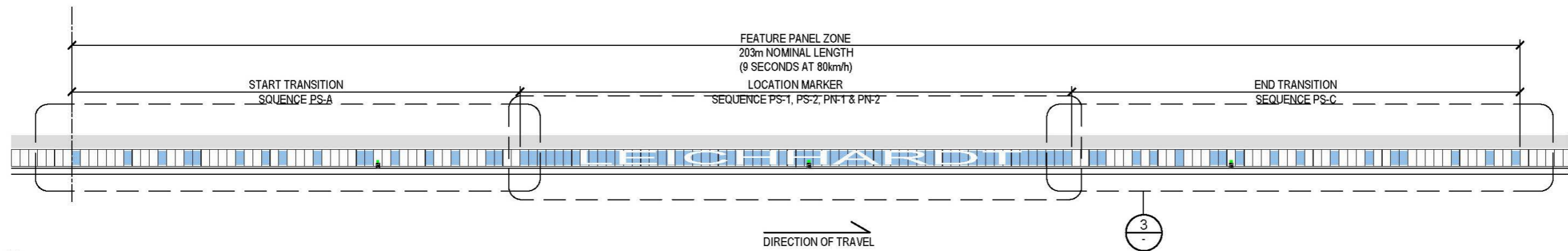


Artist's impression  
Signage and EECs are not illustrated.

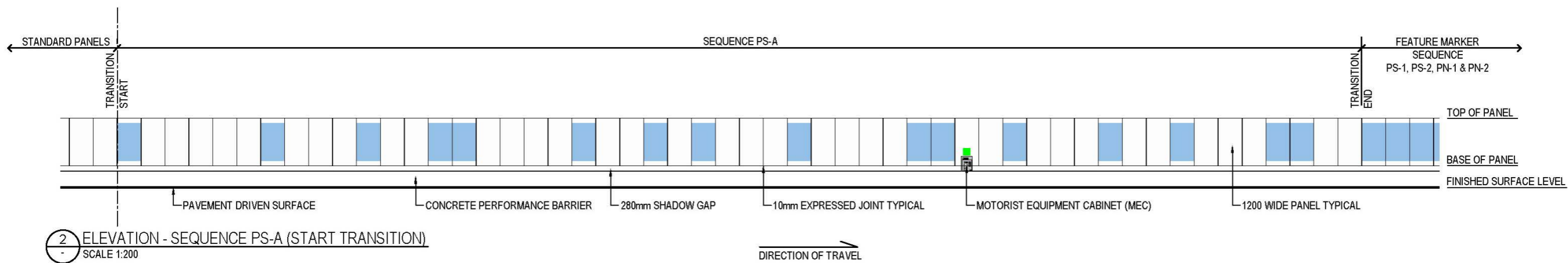


Figure 6-7: Tunnel location marker



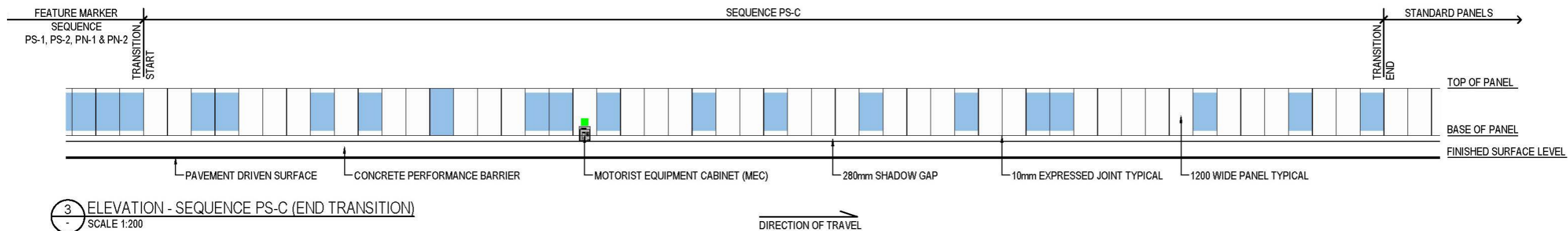


1 ELEVATION - FEATURE PANEL ZONE - LOCATION MARKER  
SCALE 1:600



2 ELEVATION - SEQUENCE PS-A (START TRANSITION)  
SCALE 1:200

NOTE: ALL TUNNEL LINING PANELS AND JOINTS ARE TO BE ALIGNED PERPENDICULAR TO THE FINISHED SURFACE LEVEL



3 ELEVATION - SEQUENCE PS-C (END TRANSITION)  
SCALE 1:200

NOTE: ALL TUNNEL LINING PANELS AND JOINTS ARE TO BE ALIGNED PERPENDICULAR TO THE FINISHED SURFACE LEVEL

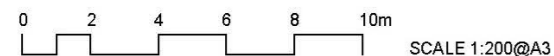


Figure 6-8: Tunnel – feature panel details 2 of 4



### Exit markers

Exit markers provide a reference to tunnel exit paths. They are located where they are legible and aid in decision-making to the exits. They are represented through an accent colour on wall panels, in a stepped arrangement. This provides horizontal emphasis and highlights the direction to exit. In addition to the pattern and coloured panels, appropriate signage is provided at key decision points to exit.

Like the location markers, exit markers are also provided only on the near side of the tunnel on standard panels, which extend up to a height of 3.5 metres above the road surface. The areas above this zone will be painted black. They extend for a length of about 200 metres, refer to Figure 6-10.



Artist's impression  
Signage and EECs are not illustrated.

Figure 6-10: Tunnel exit marker (exit ramp to M4-M5 Link Rozelle interchange shown in its final configuration)

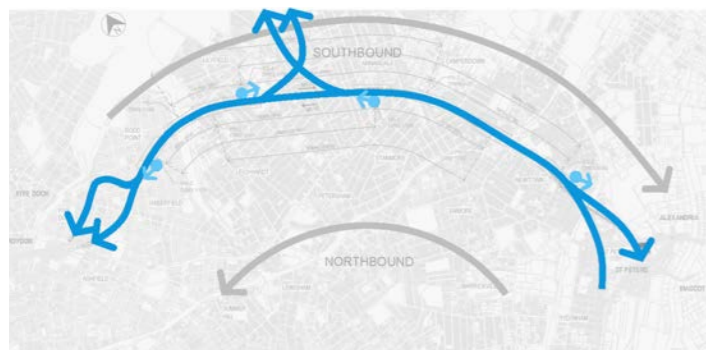


Figure 6-9: Tunnel exit marker

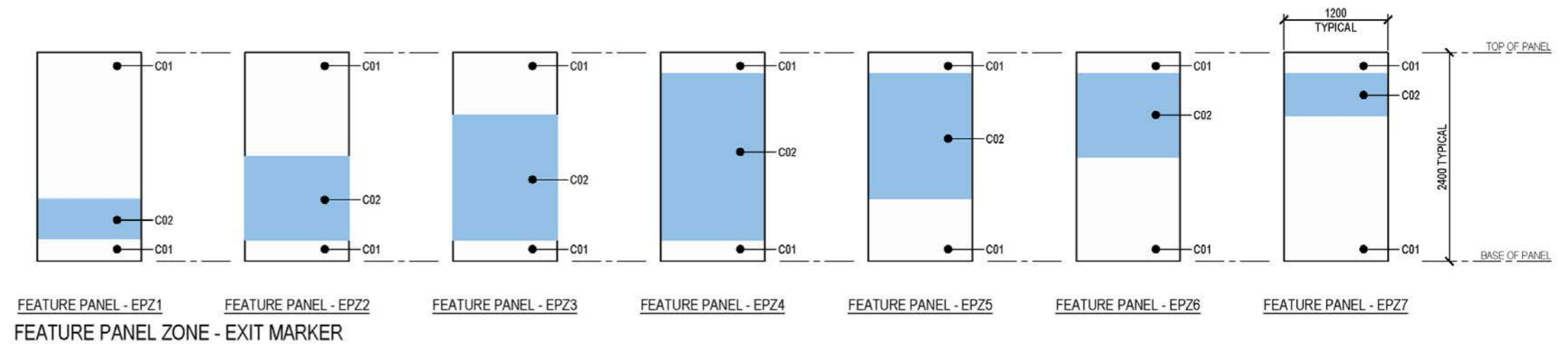


Figure 6-11: Tunnel – feature panel zone detail – exit markers



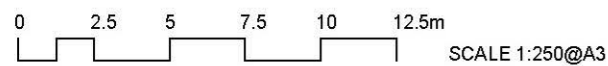
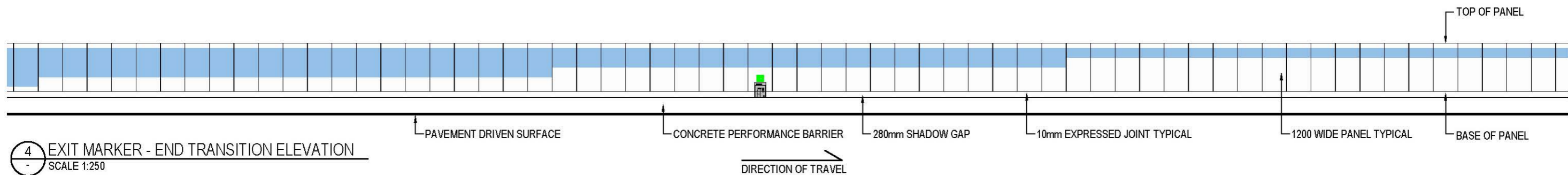
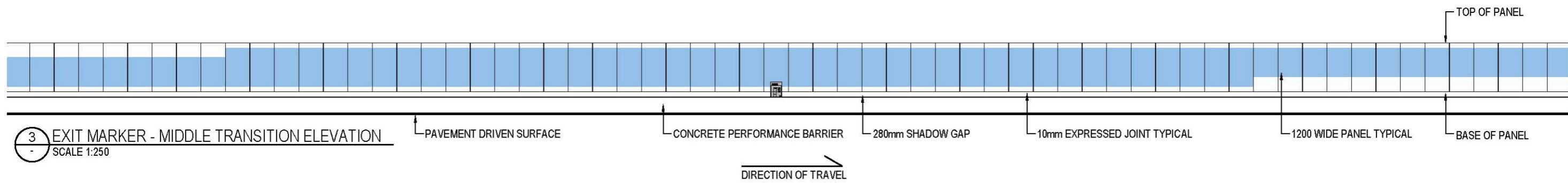
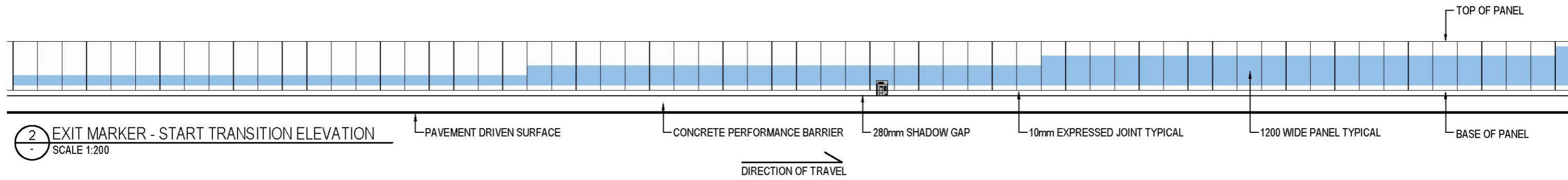
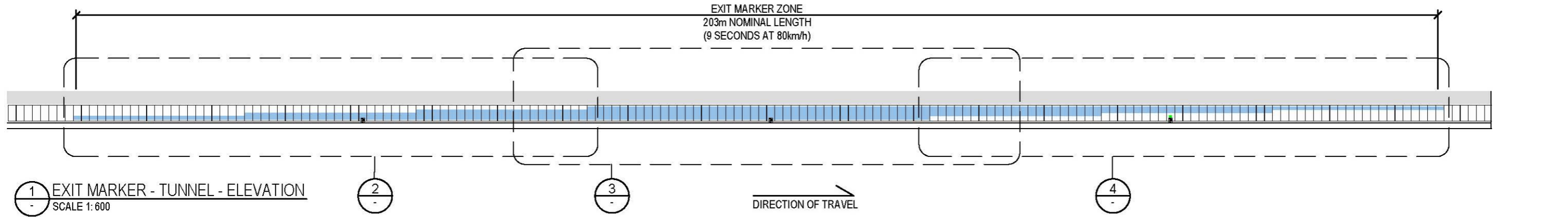


Figure 6-12: Tunnel – feature panel details 4 of 4



### Breakdown bay markers

There are four breakdown bays located on the near side of the tunnel, in each direction of travel. They are represented through a yellow mosaic pattern on wall panels, similar to the M4 East and New M5 tunnels to provide visual continuity and demarcation of these emergency zones, refer to Figure 6-13.

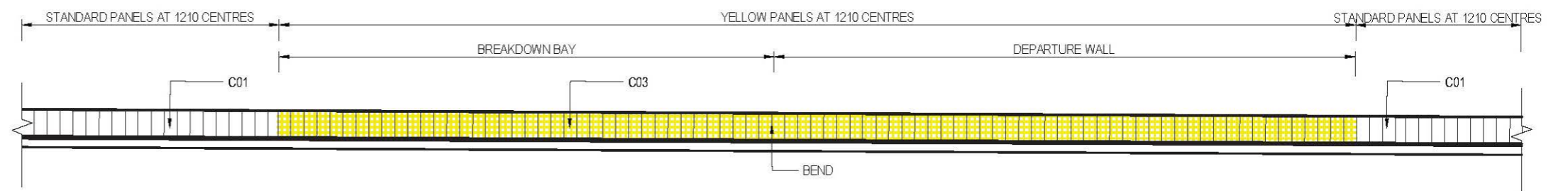
The pattern extends up to a height of 3.5 metres above the road surface and extends along the length of the breakdown bay and the departure wall, refer to Figure 6-15.



Figure 6-13: Tunnel – breakdown bay



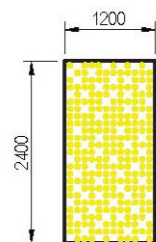
Figure 6-14: Breakdown bay marker



2 ELEVATION - TYPICAL BREAKDOWN BAY  
SCALE 1:500

**LEGEND**

- TUNNEL LINING PANEL - STANDARD PANEL
- TUNNEL LINING PANEL - BREAKDOWN BAY PANEL



FEATURE PANEL ZONE - BREAKDOWN BAY MARKER

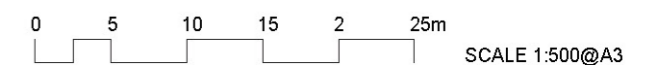


Figure 6-15: Tunnel – typical breakdown bay - elevation

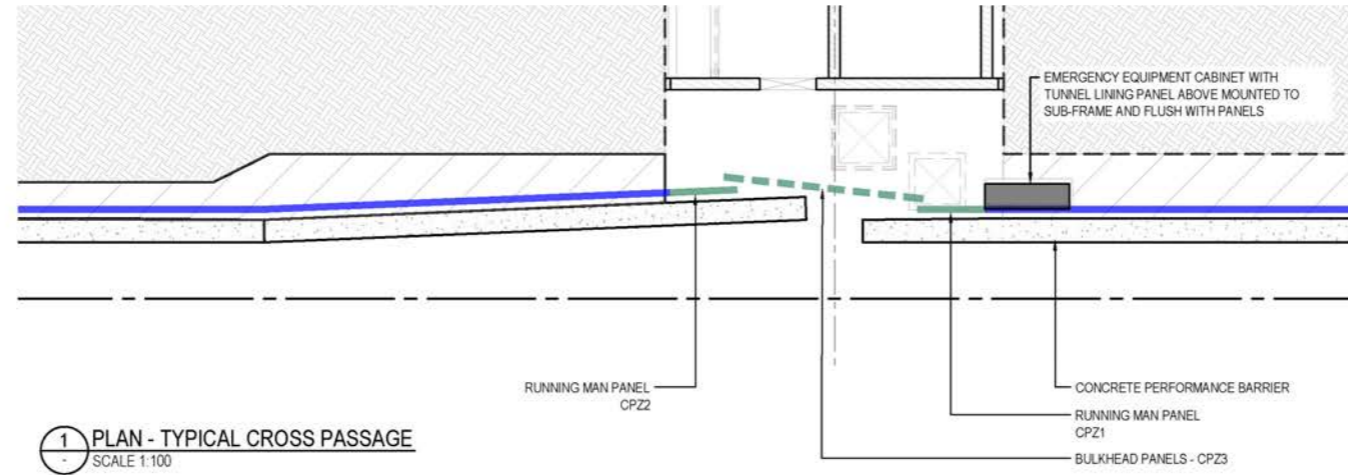


### Cross passages

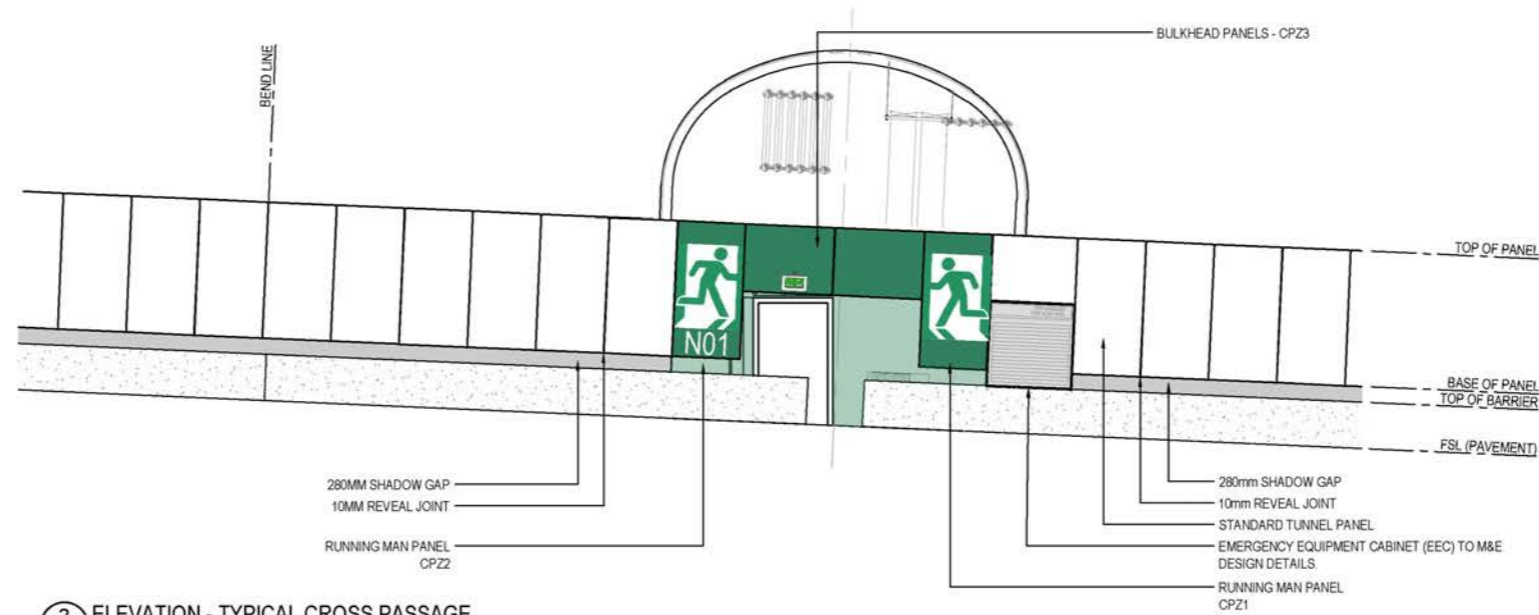
Cross passages are located typically at 120 metre centres along the far side of the tunnel in the direction of travel. The cross passages are highlighted in the standard jade green colour like most Sydney tunnels. All individual elements, including the length of the cross passage zone, running man, doors, cross passage number and other emergency equipment elements are integrated to form a cross passage zone, highlighted in jade green. The cross passage number is embedded within the jade green zone to provide better legibility. A bulkhead is provided above the door with architectural cladding panels coloured in jade green, to frame the cross passage entry, refer to Figure 6-17.

The following pages include typical details for:

- Typical cross passage
- Typical long egress passage
- Typical vehicular passage
- Typical tunnel passage M&E equipment – near side
- Typical tunnel passage M&E equipment – far side
- Typical breakdown bay.



1 PLAN - TYPICAL CROSS PASSAGE  
SCALE 1:100



2 ELEVATION - TYPICAL CROSS PASSAGE  
SCALE 1:100

0 1 2 3 4 5m  
SCALE 1:100@A3

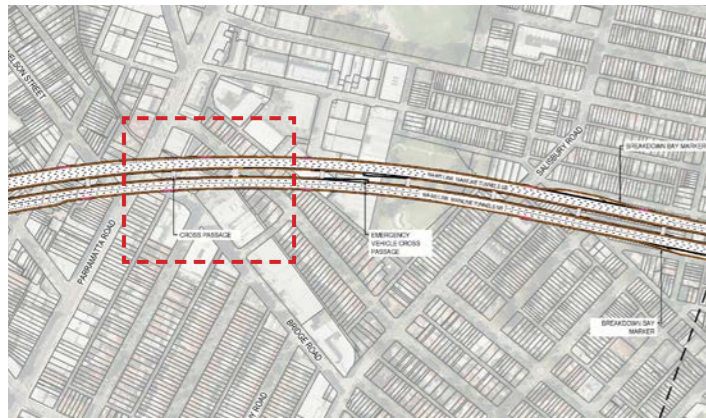


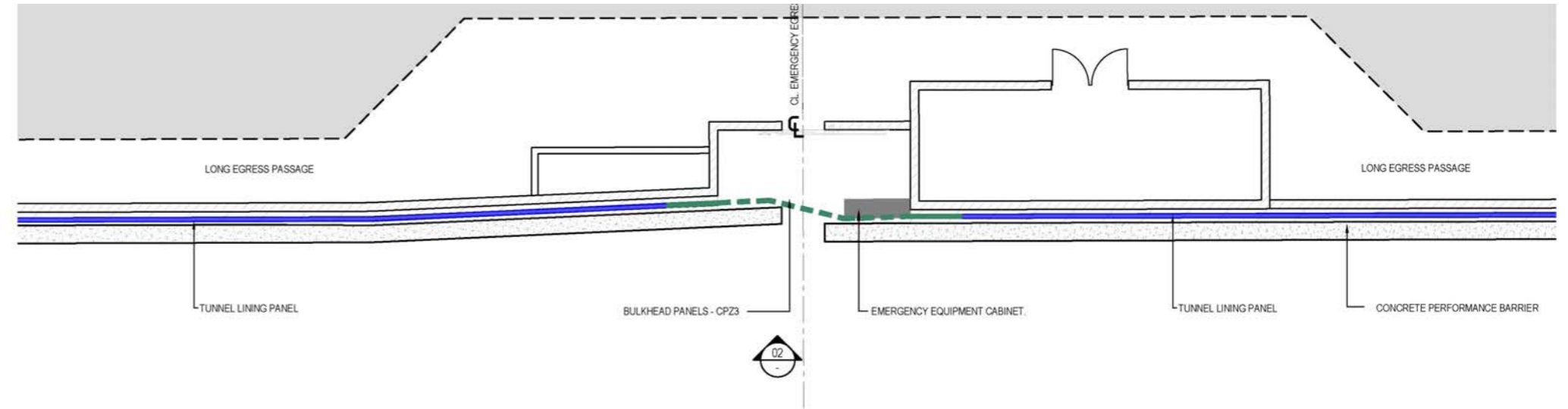
Figure 6-16: Tunnel – typical cross passage - key plan

Figure 6-17: Tunnel – typical cross passage



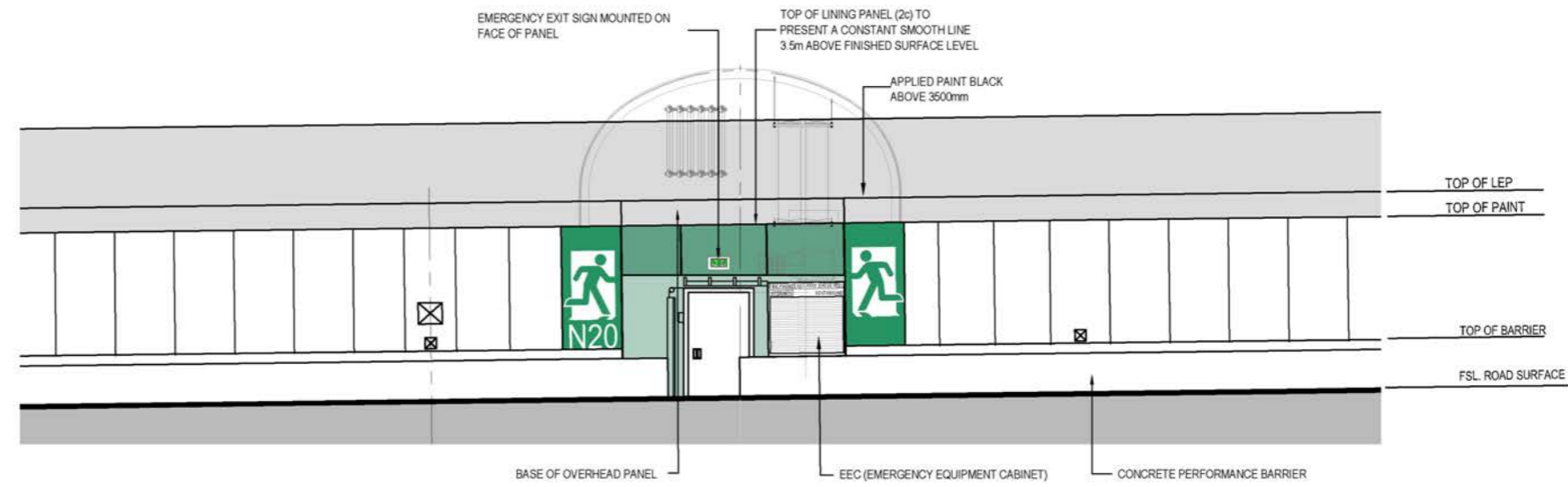
### Long egress passages

Long egress passages are typically located at tunnel entry and exit ramps and are spaced at 120 metre centres on the tunnel near side. They adopt a similar design as the cross passages to provide a uniform and consistent aesthetic, refer to Figure 6-18.



1 LONG EGRESS PASSAGE WITH EMERGENCY EGRESS POINT - PLAN  
SCALE 1:100

- LEGEND**
- TUNNEL LINING PANEL - STANDARD PANEL
  - TUNNEL LINING PANEL - TYPE CP21 & CP22
  - TUNNEL LINING PANEL (BULKHEAD) - TYPE CP23



2 LONG EGRESS PASSAGE WITH EMERGENCY EGRESS POINT - ELEVATION  
SCALE 1:100

Figure 6-18: Tunnel – typical long egress passage



### Emergency vehicular passage

Emergency vehicular passages have been designed as recessive elements to maintain a consistent and uniform tunnel interior aesthetic, refer to Figure 6-19.

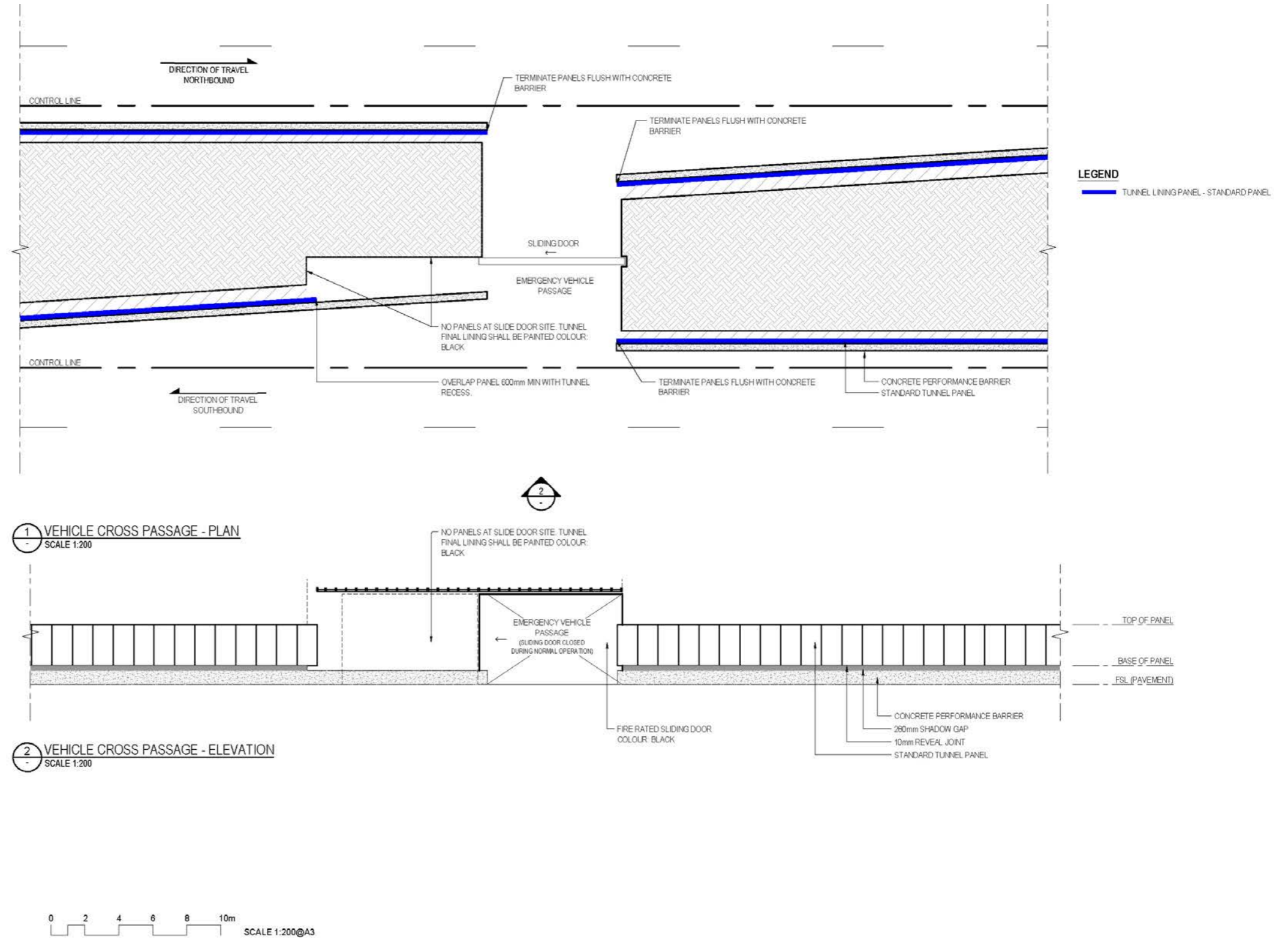


Figure 6-20: Tunnel – typical emergency vehicular cross passage - key plan

Figure 6-19: Tunnel – typical emergency vehicular cross passage



## Tunnel equipment

Tunnel lining panels have been designed to integrate with M&E equipment cabinets on both near side and far side tunnel walls. Tunnel lining panels and mechanical and electrical installations will provide a consistent and clutter-free tunnel visual experience, refer to Figure 6-21.

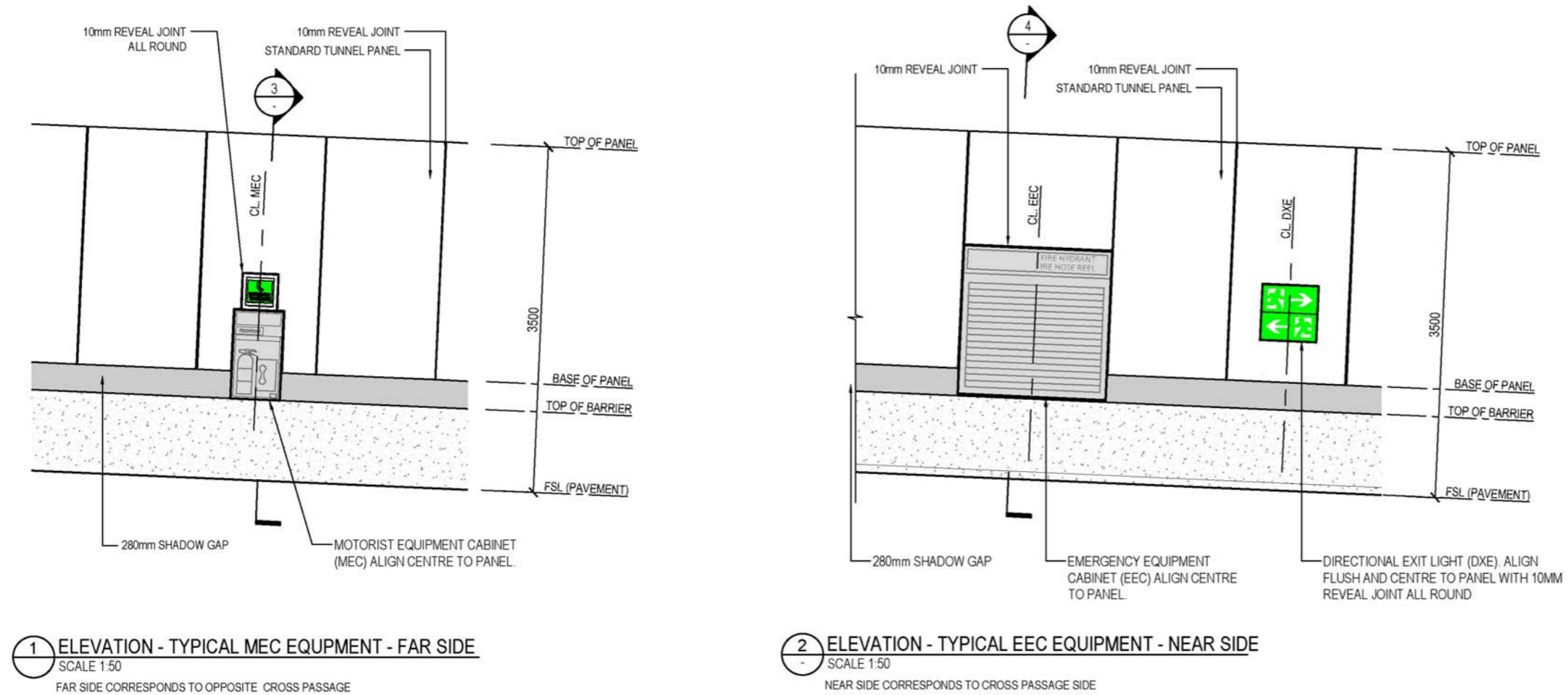


Figure 6-21: Tunnel – typical tunnel equipment details



## 6.6 Materials, finishes and colours

The material of the tunnel lining panels will be folded steel sheets with Vitreous enamel finish, 2400 millimetre x 1200 millimetre mounted on steel framing. These panels will be used throughout the length of the tunnel in different colours as described below.

### General areas

This refers to the mainline, entry ramps, and other emergency locations (except for breakdown bays), refer to Figure 6-23.

- Standard panels in Dulux 'Lexicon' to maximise the light reflectance values and with a satin finish to reduce glare within the tunnel environment.

### Location markers

Refer to Figure 6-24.

- Feature panels in Dulux 'Blue Shutters', with 1900 millimetre high supergraphic text in Dulux 'Lexicon', on near side
- Tunnel lining panels will be arranged in a sequence of standard and feature colours to provide visual interest whilst maximising the light reflectance of the tunnel environment
- Standard panels in Dulux 'Lexicon' on the far side.

### Exit markers

Refer to Figure 6-25.

- Feature panels in Dulux 'Blue Shutters'. Where the blue colours make reference to project tunnel colour theme on the near side, refer to Figure 6-19
- The tunnel lining panels will be arranged in a stepped sequential pattern to highlight the exits and provide visual interest and pattern within the tunnel
- Standard panels in Dulux 'Lexicon' on the far side.

### Breakdown bays

Refer to Figure 6-26.

- Feature panels with mosaic dots in Dulux 'Jubilation'.

### Cross passages

The cross passages are highlighted in a Dulux 'Jade' (AS 2700) green colour to demarcate these emergency zones, refer to Figure 6-27.

- Cross passage panels in Dulux 'Jade' with 1400 millimetre high running man supergraphics in Dulux 'Lexicon'
- Bulkhead panels in Dulux 'Jade'.

Code	Description
C01	Dulux - Lexicon - SW1E3
C02	Dulux - Blue Shutters - S39H2
C03	Dulux - Jubilation - S17H9

Figure 6-22: Colours



Figure 6-23: General areas



Figure 6-24: Location marker



Figure 6-25: Exit marker



Figure 6-26: Breakdown bay



Figure 6-27: AS 2700 Jade



## 7.0 Wattle Street interchange

### 7.1 Overview

WSI has four dive walls (entry / exit ramps) and portal façades, which provide access to and from the project and M4 East tunnels and connect with the Wattle Street surface roads.

They comprise the following:

- Entry ramp from Wattle Street to M4-M5 Link Mainline Tunnels
- Exit ramp to Wattle Street from M4-M5 Link Mainline Tunnels
- Entry ramp from Wattle Street to M4 East (delivered by M4 East project)
- Exit ramp to Wattle Street from M4 East (delivered by M4 East project).

The cut and cover structures for the dive walls and portal façades at WSI have been built by M4 East. The project scope is limited to providing mechanical and electrical fitout as well as finishes for portal dive walls and portal façades, located between Parramatta Road and Ramsay Street with little opportunity to make changes or additions.

The primary design objective for the portal dive walls and façades are to provide an integrated and aesthetically cohesive outcome for the WSI. In order to achieve this, the architectural finishes proposed for the portal façades and dive walls replicate the design rationale used for the M4 East portal dive walls and façades, adjacently located north of Ramsay Street. This supports the objectives of linear identity along the route.

The dive walls and portal façades will not be a prominent visual element seen from surface roads, as they are positioned in the median zones of a busy road and built form environment. Therefore, the design has been kept deliberately simple. Feature elements are located in the dive walls only as wayfinding elements, remaining discrete, for motorists only.

The dive wall cladding elements can broadly be categorised into four zones

- A bottom concrete barrier zone – Type F barrier
- A middle architectural panel zone – dive walls
- A top-middle barrier zone – retaining walls / barriers of the surface roadways
- A top throwscreen zone – throwscreens, refer to Figure 7-1.

Dive wall cladding comprises architectural panels. They extend up to the portal façade and transition into the lin-tunnel panels. The design is developed using a family of forms, tying all elements together.

Dive walls and portal façade are designed to provide a legible transition element and create a sense of visual order to the assembly of complex, functional elements, including road barriers, road furniture, signposting, lighting and tunnel claddings.

Dive wall and portal façades provide the main visual elements experienced by users.

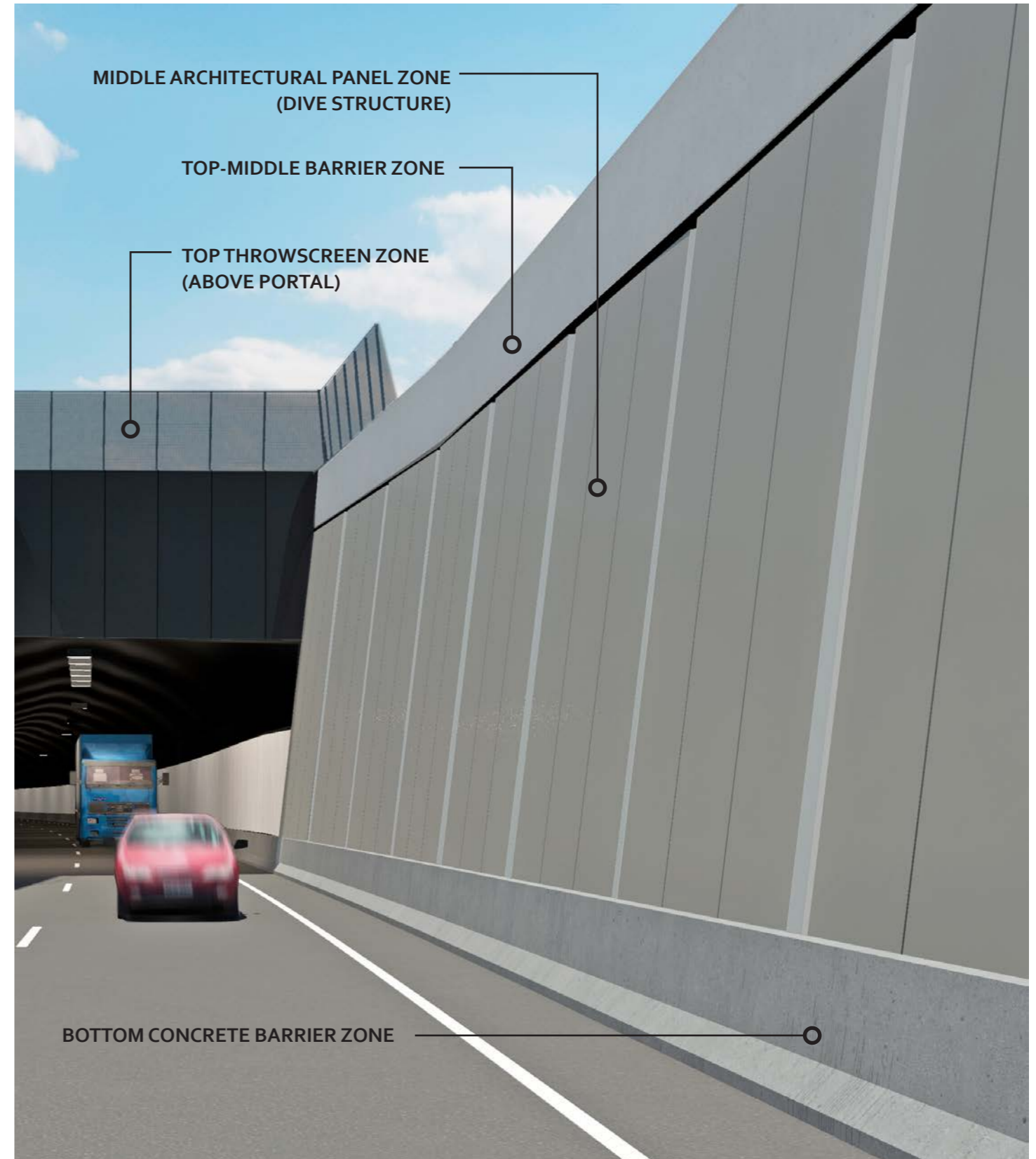


Figure 7-1: WSI portals – northbound exit



### Tree replacement strategy

There have been 11 trees removed as a result of the project, refer to Table 7-1. These trees were removed during the clearing phase at temporary construction sites on either side of Parramatta Road, refer to Figure 7-2.

The project is currently in consultation with local Council to plant a net increase number of replacement trees of Council's preferred species within or in close proximity to the project boundary (if space permits), or at other location(s) within the Haberfield area.

In consultation with Council, the replacement trees will be no smaller than a 75-litre pot size and will preferentially be species which provides foraging habitat for the Grey-headed flying fox.

The replacement trees will be species determined as being:

- Appropriate to the area
- Appropriate to the context of the planting location (e.g. frangible vs non-frangible, space availability, land use)
- Consistent with adjacent planting arrangements or relevant authority's plans / programs / strategies for vegetation management, street planting, or open space landscaping.

Table 7-1: Tree clearing

Species removed	Additional details
Cocos palm	Near Alt Street Entrance to Parramatta Road East
Cocos palm	Near Parramatta Road Entrance at Parramatta Road East
Magnolia tree	Adjacent Parramatta Road East showroom
Magnolia tree	Adjacent Parramatta Road East showroom
Camphor laurel	Garden bed Parramatta Road West at Alt Street
Box elder	Garden bed Parramatta Road West at Alt Street
Cocos palm	Garden bed Parramatta Road West at Alt Street
Camphor laurel	Behind retaining wall middle of lot 3
Camphor laurel	Behind retaining wall middle of lot 4
Leightons green pine	Garden bed adjacent ramp to split level
Camphor laurel	Garden bed adjacent ramp to split level

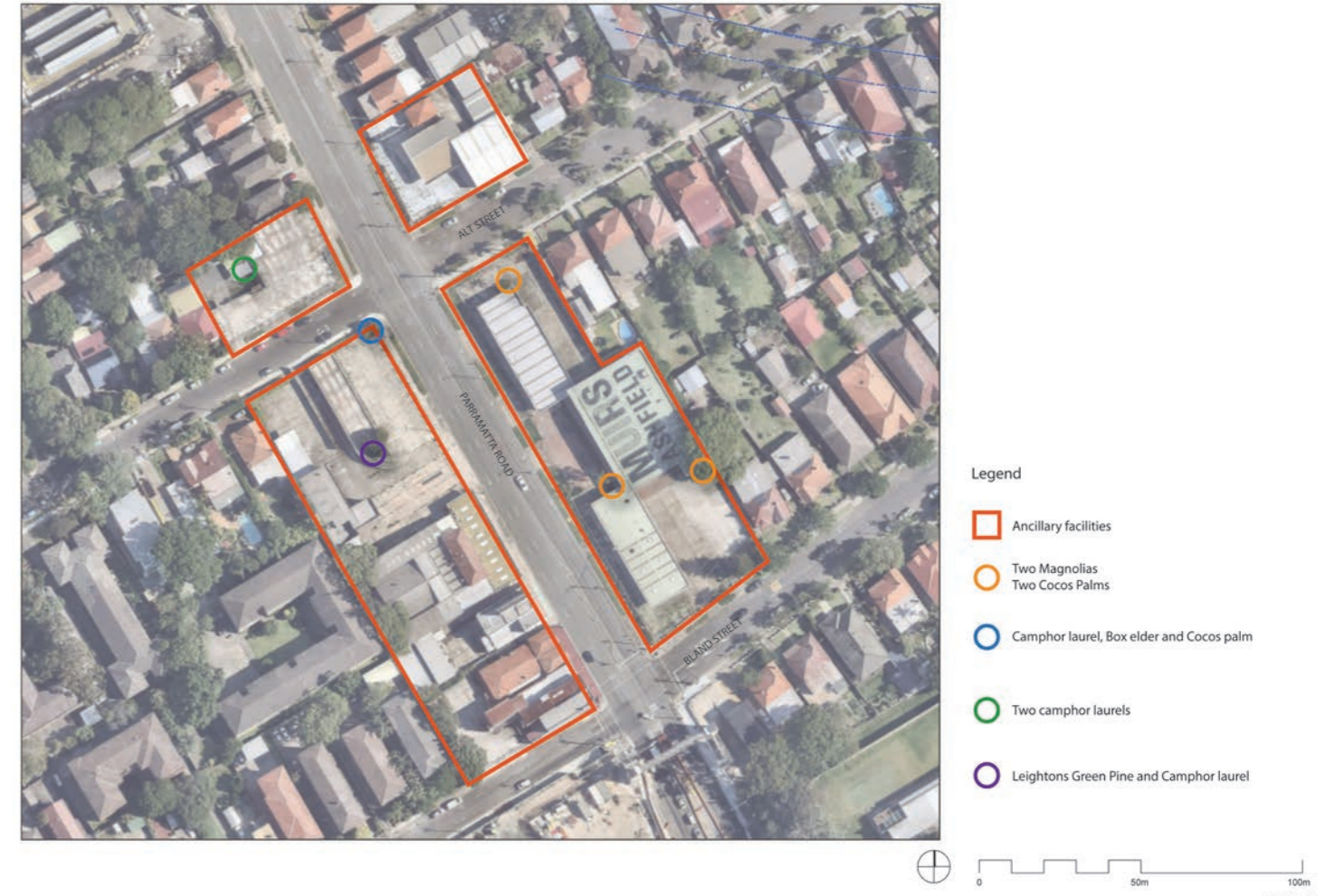
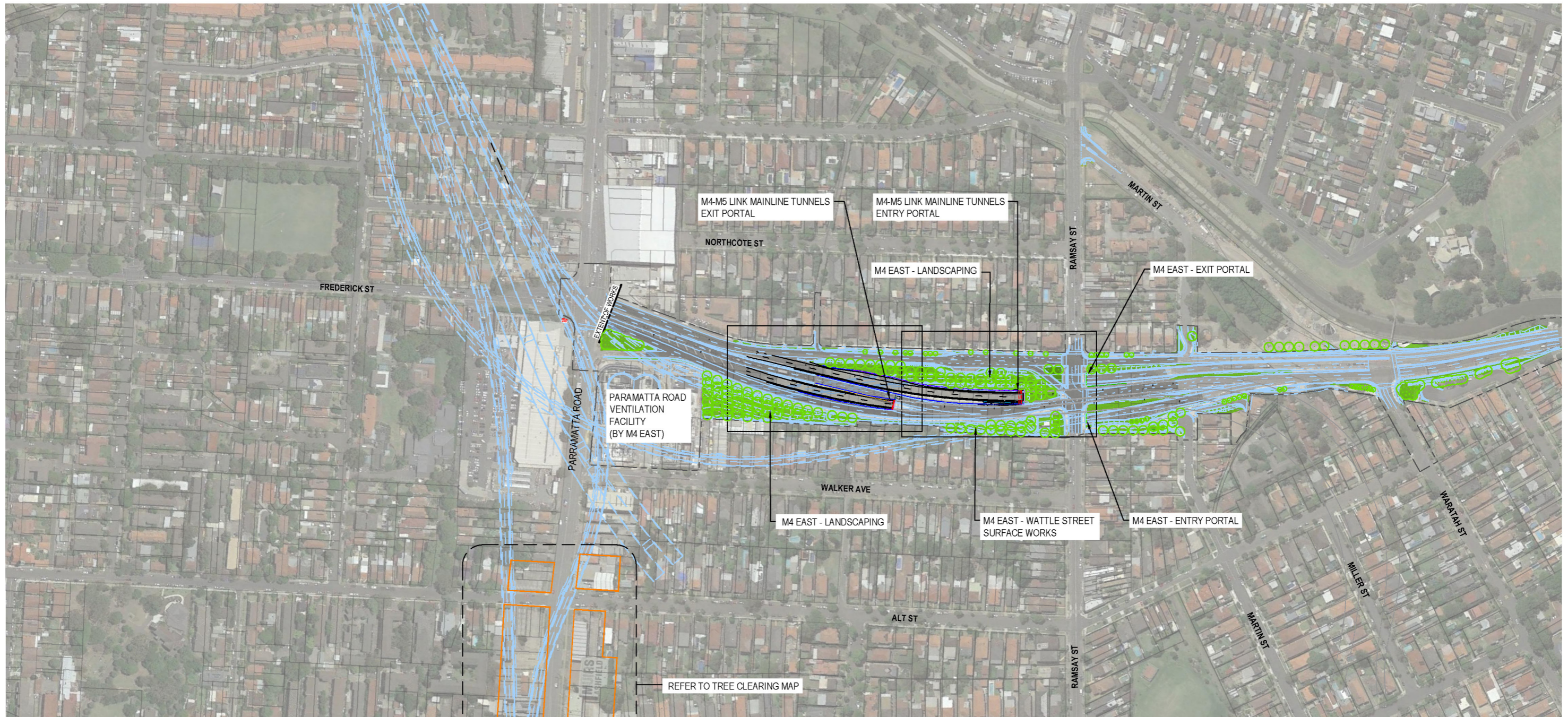


Figure 7-2: Tree clearing map



Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context.



**LEGEND**

- WATTLE ST SITE BOUNDARIES
- BY M4 EAST
- DIVE WALL CLADDING ALIGNMENT (1 IN 10 SLOPE)
- DIVE WALL CLADDING ALIGNMENT (VERTICAL)
- PORTAL FACADE CLADDING
- THROWSCREEN ALIGNMENT

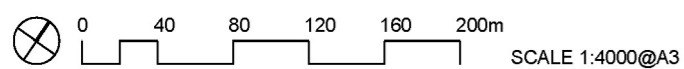


Figure 7-3: WSI portals – site plan





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## 7.2 Portal elements

### Dive walls

The dive walls and the portal façades serve as the main visual elements as experienced by the road users. The portal dive walls feature aluminium cladding panels with feature lighting rebates that highlight the entries and exits of the tunnel. The dive wall cladding for both the entry and exit portals adopt a consistent aesthetic with sloped wall cross sectional profiles along the main lengths of the dive structures. The sloped wall profile complements the sloped profile of the barrier elements above and below the cladding. The panels are arranged vertically to the road surface and have smooth transitions where they meet the in-tunnel architectural panels, refer to Figure 7-4.

Other key design outcomes in the dive include:

- The dive wall cladding is supported through a framing system that is fixed to the main structure, provided by M4 East
- The dive wall cladding colour and aesthetics are designed to complement the M4 East entry and exit ramps
- The dive wall cladding is arranged in a modular system, comprising of two tones of colour; 'silver grey' as the primary colour and a lighter 'silver' colour in the rebates, to provide contrast and enhance feature lighting
- The dive wall cladding is coordinated with the electrical equipment room (EER), cross passage located at the entry portal façade
- A boom gate is located in the entry ramp for tunnel closure and is a recessive element, when in the open position.



Figure 7-4: WSI portals – east



### Portal façade

The portal façade features aluminium cladding panels mounted on a structural frame. The frame is supported off the parapet similar to M4 East. VMS and other ITS signage has been integrated into the design of the portal façade with service and maintenance access via a gantry behind the throw screens. There is no feature lighting on the portal façade so that the dive walls provide the wayfinding experience. The portal façade composition is created by using a layered approach, integrating all elements, and reducing clutter to provide an unobtrusive design, refer to Figures 7-5 and 7-6.

This is achieved by:

- Using the parapet wall as the base element
- Adding a structural frame to the parapet element
- Adding a service access platform to the structural frame (for entry ramps only)
- Adding the portal façade cladding
- Adding the throwscreen wire netting to the base element
- Incorporating the VMS and the other ITS signage.

The entry portal façade has a symmetrical arrangement, whilst the exit portal façade has an asymmetric visual aesthetic as it interfaces with the viaduct which crosses over the western edge of the dive structure.

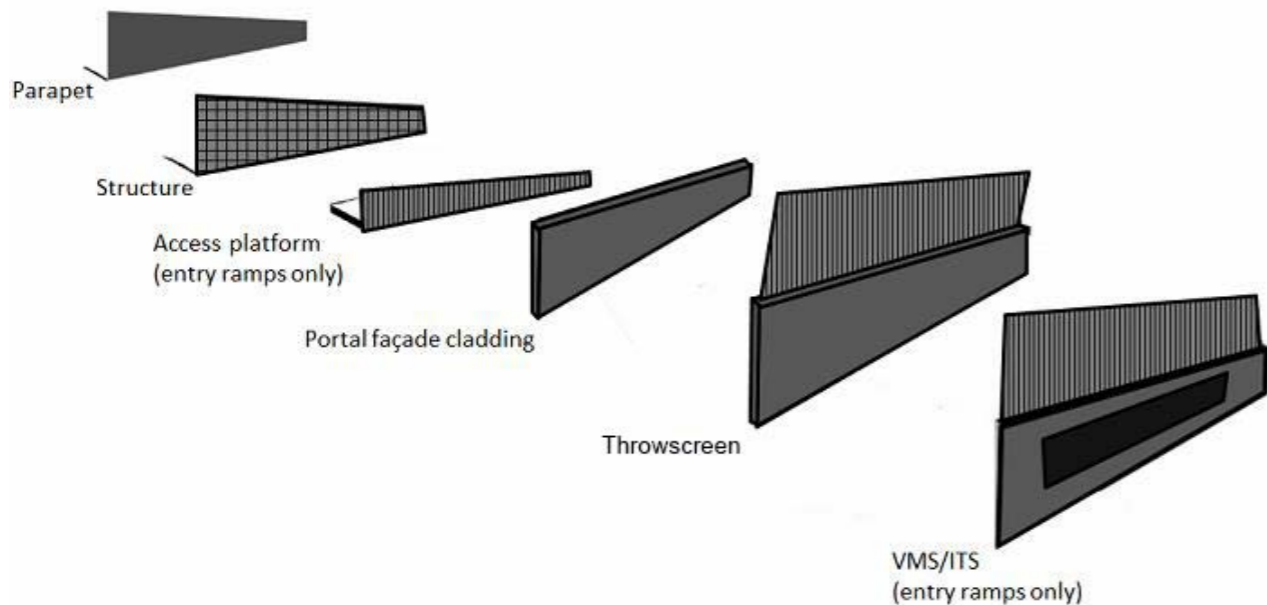


Figure 7-5: WSI portal façade design composition

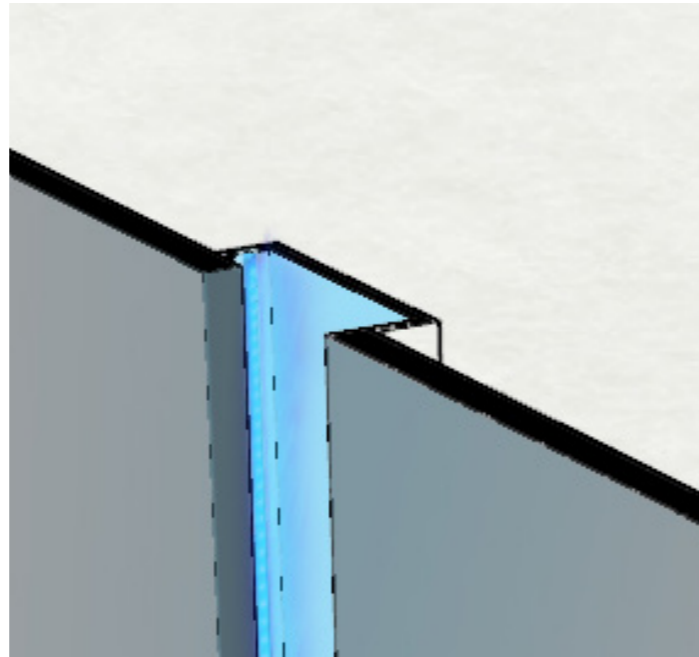


Figure 7-6: WSI - portal panel detail

### Throwscreens

Throwscreens are provided above the entry and exit portal façades to reduce the risk of a projectile being thrown or dropped from above the roadway. These are fabricated using a welded wire netting supported by a frame. The extents are based on providing effective protection for the full width of the carriageway. They return in equal lengths on the edges adjacent to the main portal face, except on the northern dive wall, where they extend along the length of the dive structure to maintain a two metre safe height difference between the road surface and top of parapet. The throwscreens have an end transition panel as it meets the barrier. They have a black powder coated finish, to match the M4 throwscreen colour and supported by fabricated steel posts to the barriers, refer to Figure 7-7.



Figure 7-7: Throwscreens

### Lighting

Lighting is limited to street lights along the roadway and vertical LEDs strip lighting in the recesses of the panel dive walls.

The lighting design is consistent with the M4 East mainline tunnel portals, with LEDs used to guide road users safely into the tunnel, avoiding light spill above. This also enables the tunnel operator to designate colours for the portal structure to celebrate particular public events or days to raise awareness, for example, pink for Breast Cancer awareness or green for St Patricks Day.

Additional mitigation measures to manage residual night lighting impacts to properties adjoining or adjacent to the project are not considered necessary, refer to Figure 7-8.

### LIGHTING LIMITED TO DIVE WALLS

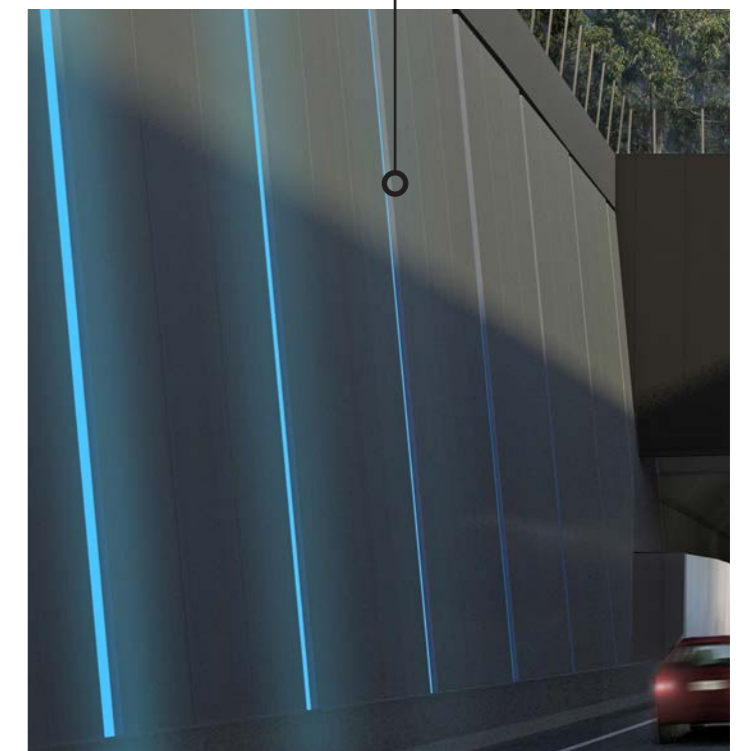
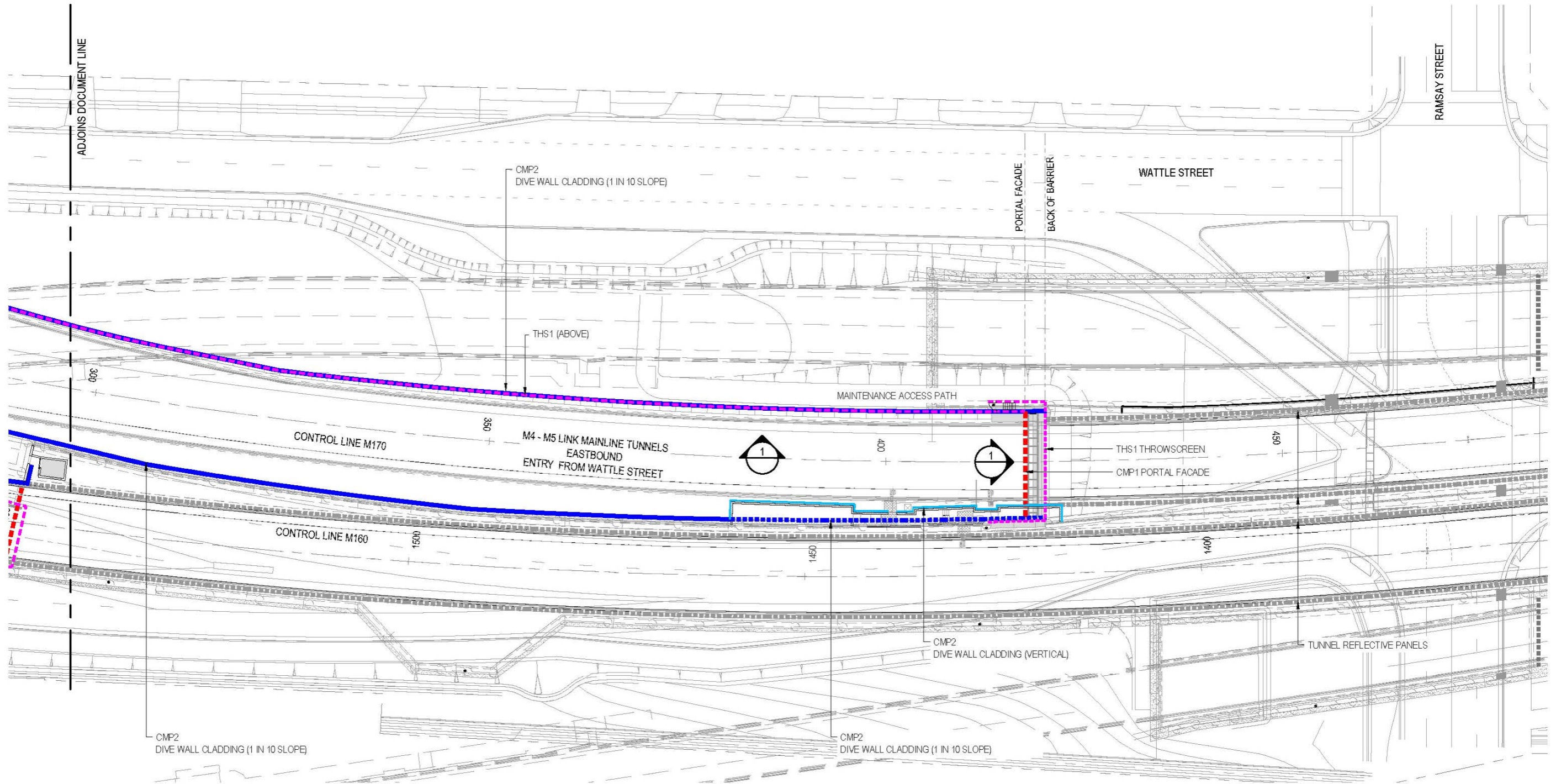


Figure 7-8: WSI lighting





1 PLAN - WATTLE STREET INTERCHANGE  
SCALE 1:500

LEGEND

- WATTLE ST SITE BOUNDARIES
- BY M4 EAST
- CMP2 DIVE WALL CLADDING ALIGNMENT (1 IN 10 SLOPE)
- CMP2 DIVE WALL CLADDING ALIGNMENT (VERTICAL)
- CMP1 PORTAL FACADE CLADDING
- THS1 THROWSCREEN ALIGNMENT

MATERIAL LEGEND

- CMP1 PORTAL FACADE - ALUMINIUM CLADDING
- CMP2 DIVE WALL - ALUMINIUM CLADDING
- CMP3 PARAPET - ALUMINIUM CLADDING
- COF2 FORMED CONCRETE - CLASS 2
- THS1 THROWSCREEN WITH MESH INFILL PANELS
- LT FEATURE LIGHTING RECESSED TROUGH

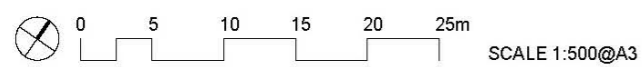


Figure 7-9: WSI portals – plan 2 of 2



Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.



Figure 7-10: WSI portals – entry portal

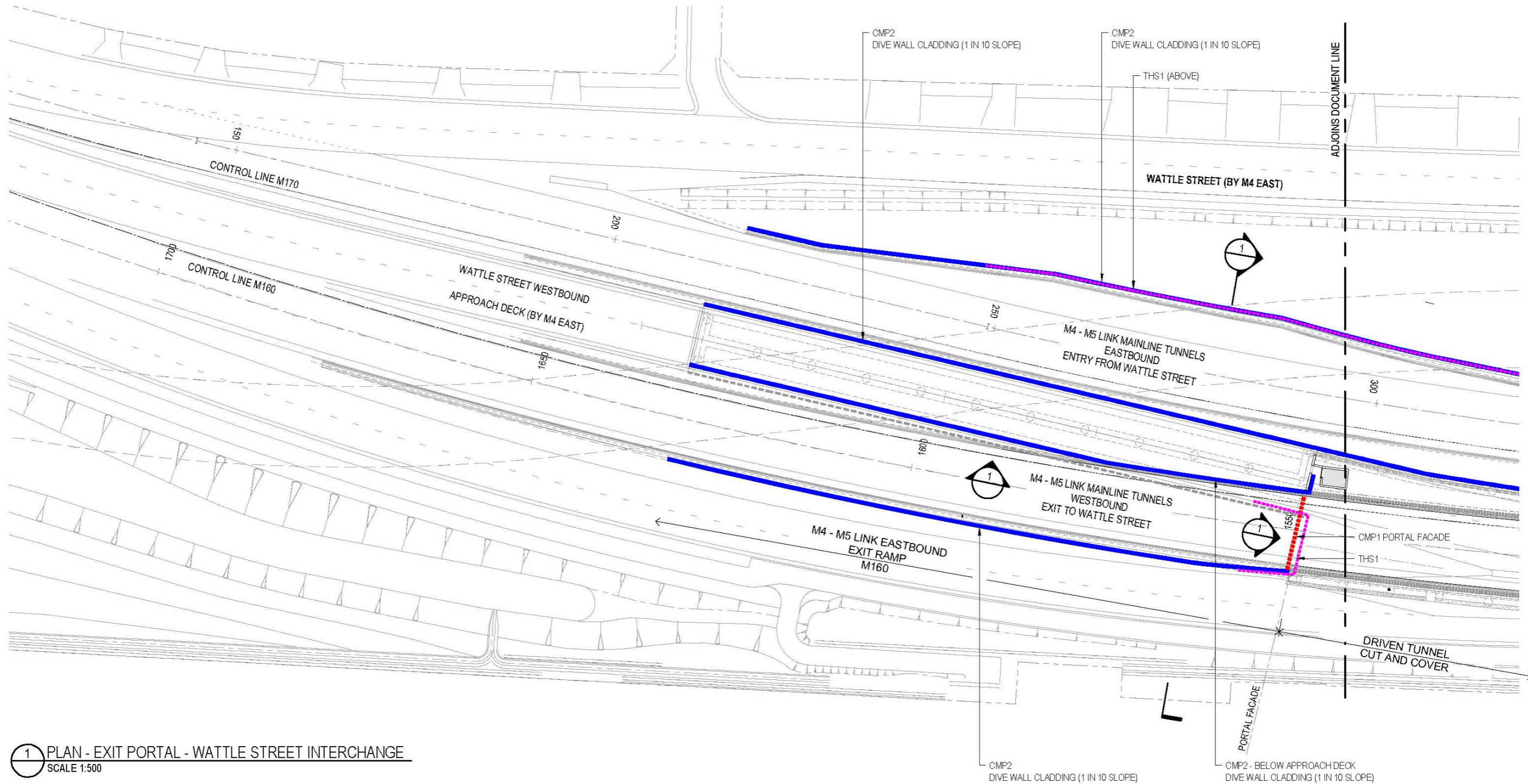


Artist's impression  
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context. Street lighting and other road furniture not shown.



Figure 7-11: WSI portal – entry portal – night time





1 PLAN - EXIT PORTAL - WATTLE STREET INTERCHANGE  
SCALE 1:500

- LEGEND**
- WATTLE ST SITE BOUNDARIES
  - BY M4 EAST
  - CMP2 DIVE WALL CLADDING ALIGNMENT (1 IN 10 SLOPE)
  - CMP2 DIVE WALL CLADDING ALIGNMENT (VERTICAL)
  - CMP1 PORTAL FACADE CLADDING
  - THS1 THROWSCREEN ALIGNMENT

- MATERIAL LEGEND**
- CMP1 PORTAL FACADE - ALUMINIUM CLADDING
  - CMP2 DIVE WALL - ALUMINIUM CLADDING
  - CMP3 PARAPET - ALUMINIUM CLADDING
  - COF2 FORMED CONCRETE - CLASS 2
  - THS1 THROWSCREEN WITH MESH INFILL PANELS
  - LT FEATURE LIGHTING RECESSED TROUGH

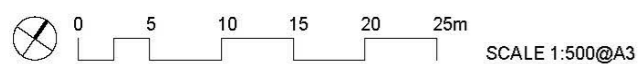


Figure 7-12: WSI portals – plan 1 of 2



Artist's impression  
Includes other WestConnex stages to illustrate context.  
Street lighting and other road furniture not shown.

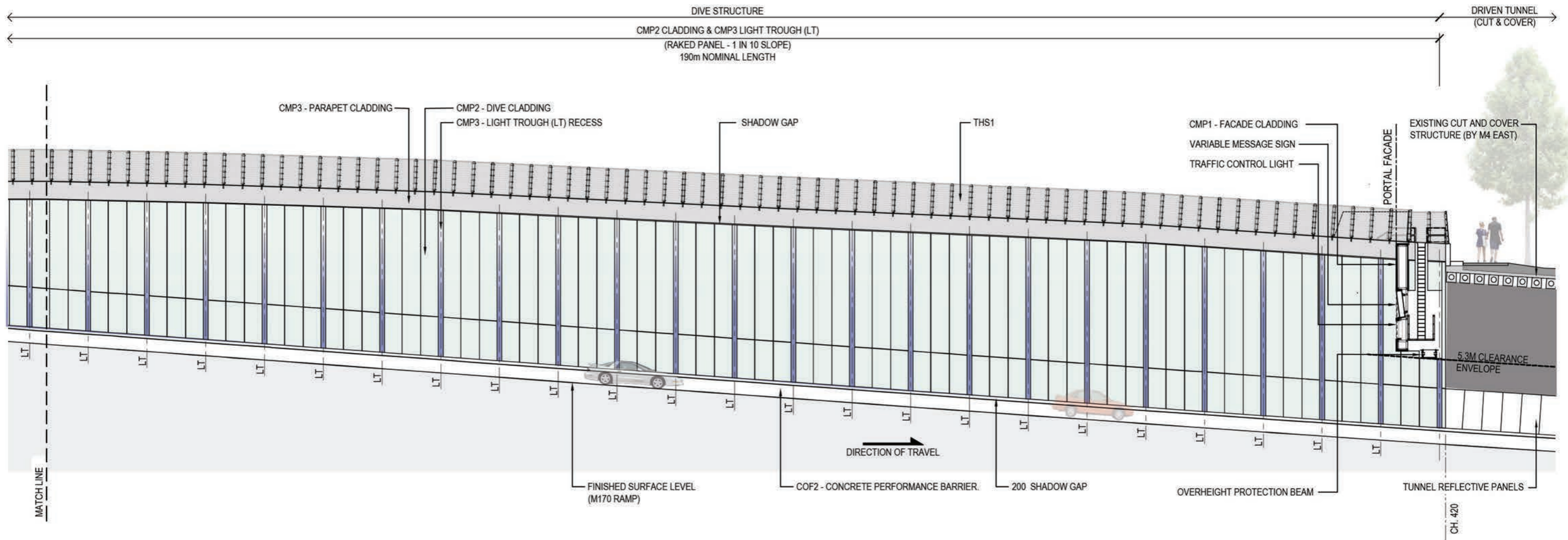


Figure 7-13: WSI portals – exit portal









1 ELEVATION - WATTLE STREET - TUNNEL ENTRY  
SCALE 1:250

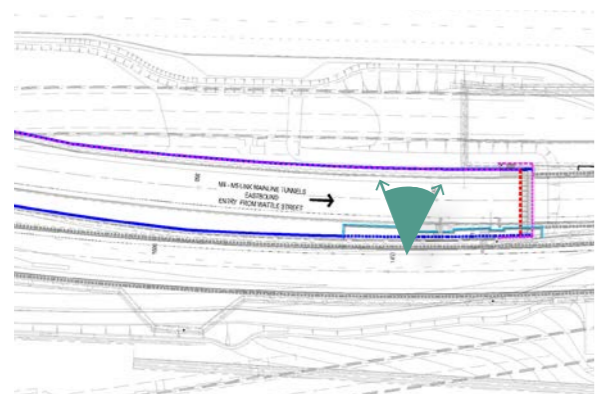
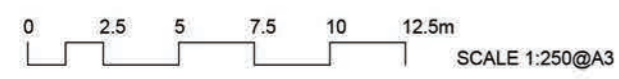


Figure 7-16: WSI entry ramp – key plan



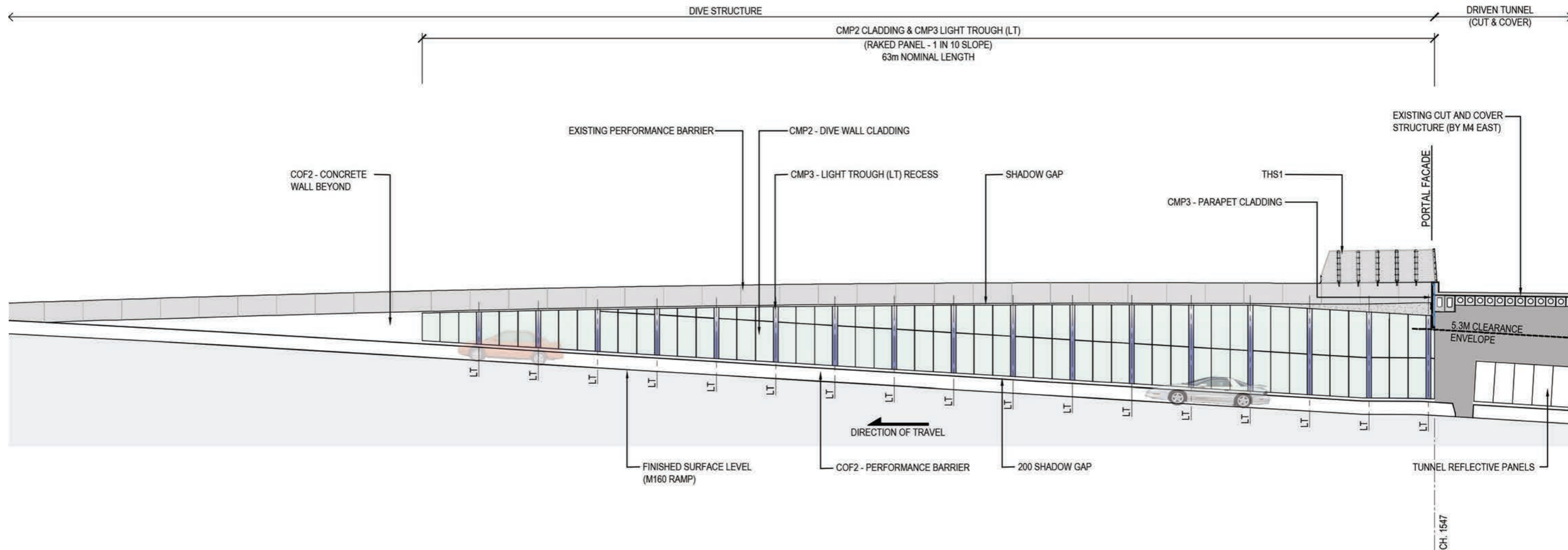
**MATERIAL LEGEND**

CMP1	PORTAL FACADE - ALUMINIUM CLADDING
CMP2	DIVE WALL - ALUMINIUM CLADDING
CMP3	PARAPET - ALUMINIUM CLADDING
COF2	FORMED CONCRETE - CLASS 2
THS1	THROWSCREEN WITH MESH INFILL PANELS
LT	FEATURE LIGHTING RECESSED TROUGH

Landscape shown is indicative only and includes other WestConnex stages to illustrate context

Figure 7-17: WSI entry ramp – typical elevation 2 of 2





1 ELEVATION - WATTLE STREET - TUNNEL EXIT  
SCALE 1:250

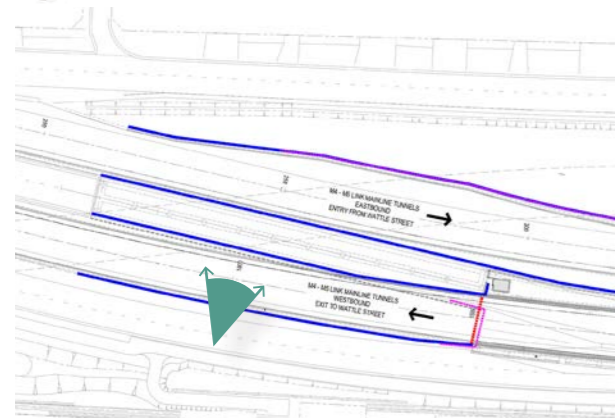
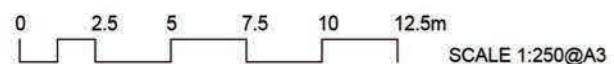


Figure 7-18: WSI exit ramp – key plan

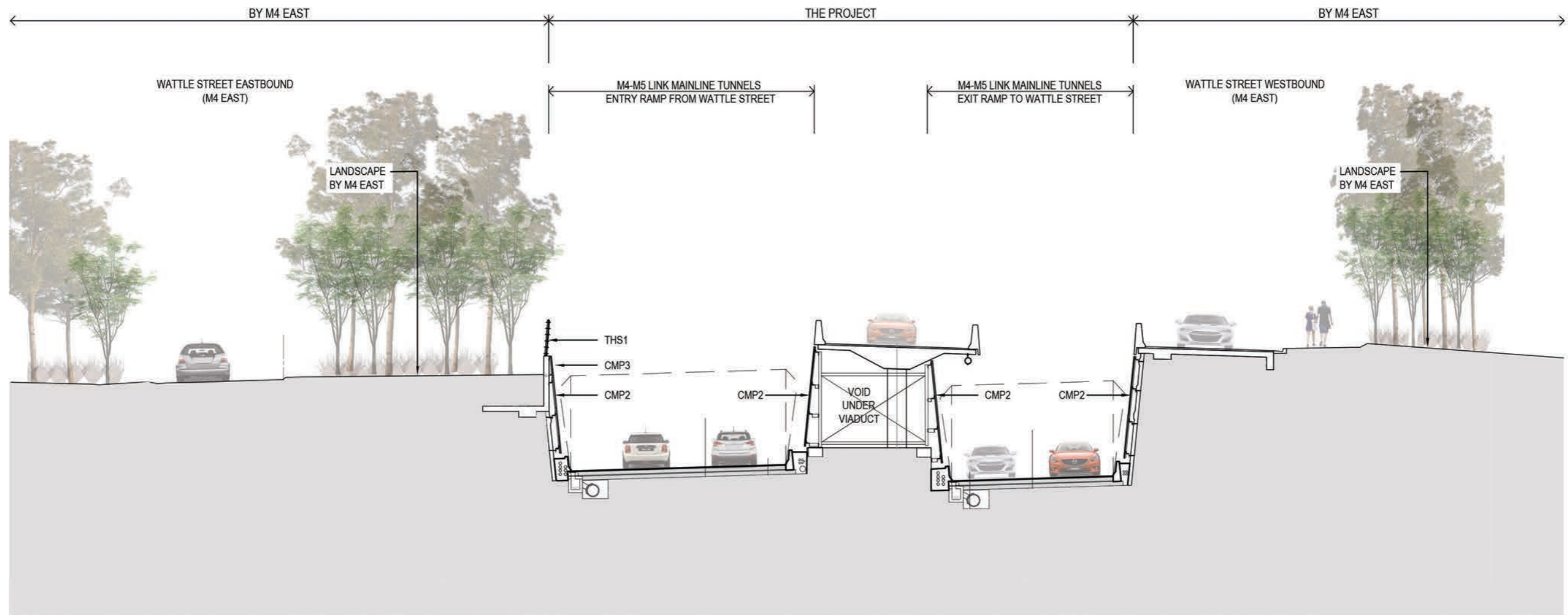


**MATERIAL LEGEND**

- CMP1 PORTAL FACADE - ALUMINIUM CLADDING
- CMP2 DIVE WALL - ALUMINIUM CLADDING
- CMP3 PARAPET - ALUMINIUM CLADDING
- COF2 FORMED CONCRETE - CLASS 2
- THS1 THROWSCREEN WITH MESH INFILL PANELS
- LT FEATURE LIGHTING RECESSED TROUGH

Figure 7-19: WSI exit ramp – typical elevation





1 SECTION - DIVE WALL PANEL  
SCALE 1:250

MATERIAL LEGEND

CMP1	PORTAL FACADE - ALUMINIUM CLADDING
CMP2	DIVE WALL - ALUMINIUM CLADDING
CMP3	PARAPET - ALUMINIUM CLADDING
COF2	FORMED CONCRETE - CLASS 2
THS1	THROWSCREEN WITH MESH INFILL PANELS
LT	FEATURE LIGHTING RECESSED TROUGH

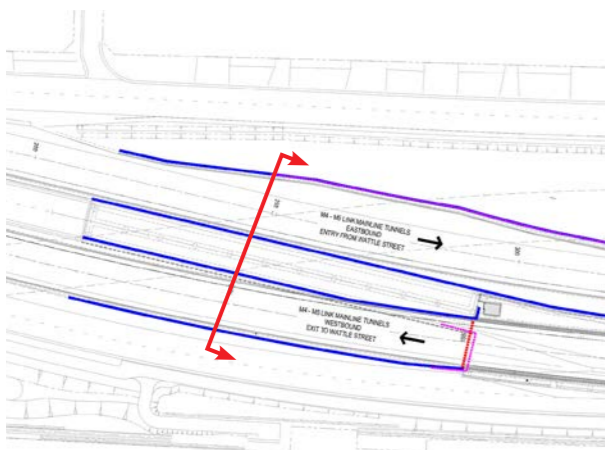


Figure 7-20: WSI – key plan

Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context

Figure 7-21: WSI – section





1 ELEVATION - ENTRY PORTAL FACADE  
SCALE 1:250

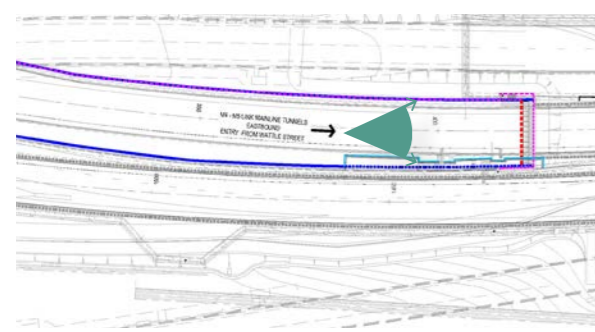


Figure 7-22: WSI - key plan



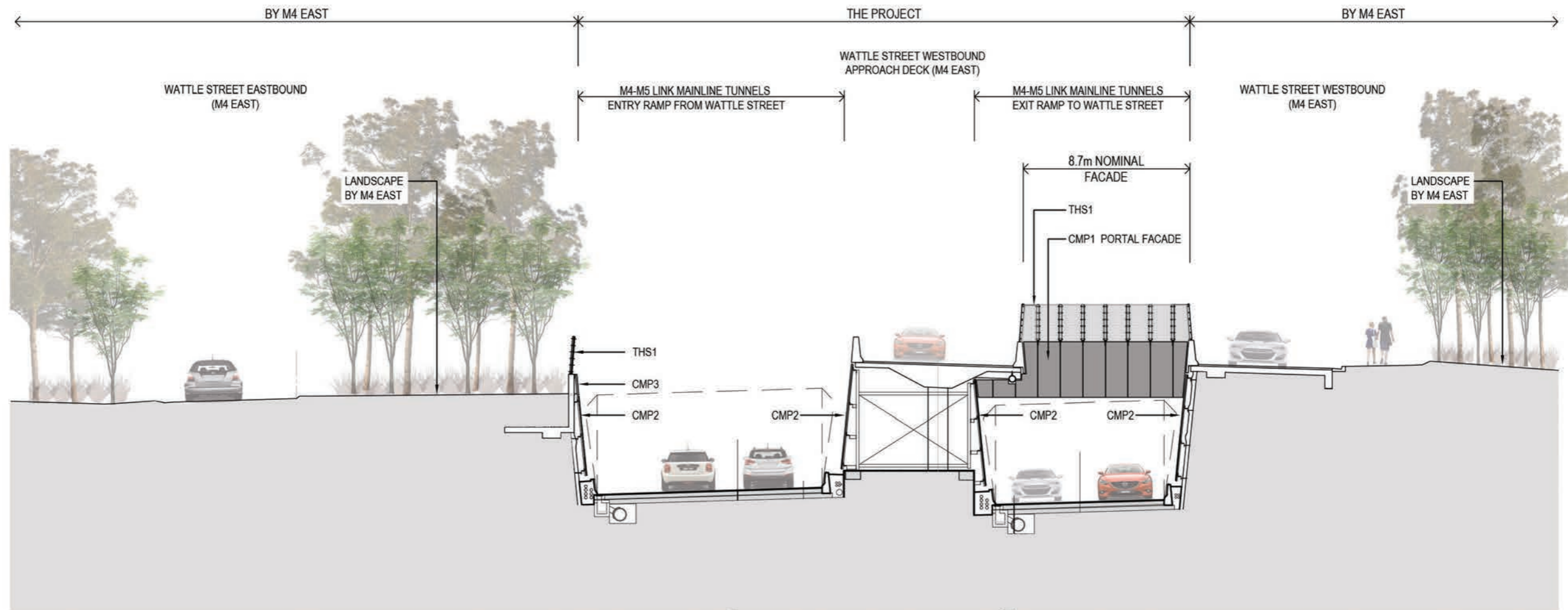
Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context

**MATERIAL LEGEND**

CMP1	PORTAL FACADE - ALUMINIUM CLADDING
CMP2	DIVE WALL - ALUMINIUM CLADDING
CMP3	PARAPET - ALUMINIUM CLADDING
COF2	FORMED CONCRETE - CLASS 2
THS1	THROWSCREEN WITH MESH INFILL PANELS
LT	FEATURE LIGHTING RECESSED TROUGH

Figure 7-23: WSI - entry portal





Landscape shown at full maturity and is indicative only, and also includes other WestConnex stages to illustrate context

1 ELEVATION - EXIT PORTAL FACADE  
SCALE 1:250

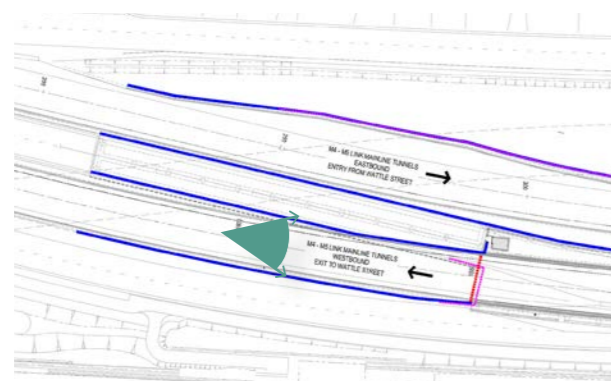
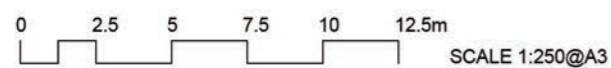


Figure 7-24: WSI - key plan



**MATERIAL LEGEND**

CMP1	PORTAL FACADE - ALUMINIUM CLADDING
CMP2	DIVE WALL - ALUMINIUM CLADDING
CMP3	PARAPET - ALUMINIUM CLADDING
COF2	FORMED CONCRETE - CLASS 2
THS1	THROWSCREEN WITH MESH INFILL PANELS
LT	FEATURE LIGHTING RECESSED TROUGH

Figure 7-25: WSI - exit portal



### 7.3 Materials, finishes and colours

The materials, finishes and colours used are robust and durable and feature the following:

#### Dive walls

- Feature aluminium cladding panels on dive walls – colours similar to MondoClad ‘mouse grey’ and MondoClad ‘silver metallic’, refer to Figure 7-26.



Figure 7-26: Dive wall



Figure 7-29: Lighting

#### Portal façade

- Feature aluminium cladding panels on portal façade – colour similar to MondoClad ‘anthracite grey’, refer to Figure 7-27.



Figure 7-27: Portal façade

#### Throwscreen

- Wire netting painted black throwscreen, refer to Figure 7-28.

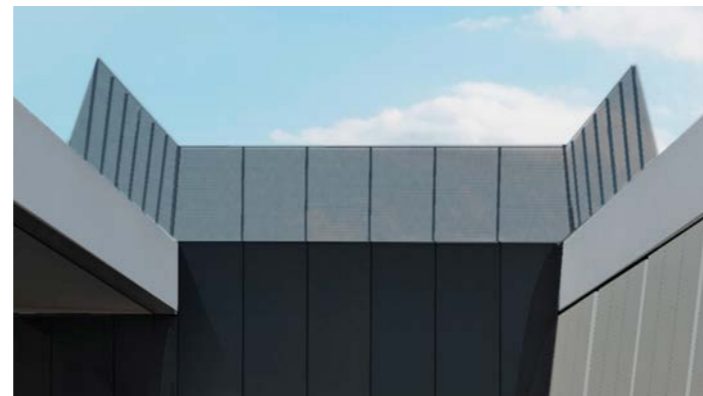


Figure 7-28: Throwscreen

#### Lighting

- Feature LED colour grazing with intelligent colour techniques such as Philips colour kinetics or equivalent, refer to Figure 7-29.



Figure 7-30: VMS signage

#### VMS signage

- Black VMS signage illuminated with orange text when active, integrated with the portal façade, refer to Figure 7-30.

#### Boom gate

- Standard boom gates, integrated with the portal façade, refer to Figure 7-31.



Figure 7-31: Example of boom gate at WSI



## 8.0 Conclusion

### 8.1 Relationship with other sections of WestConnex

WestConnex will be a major connector across Sydney. Journeys will take place on it at varying entry and exit points. It is important for this stage of WestConnex to be understood as part of the larger project, refer to Figure 8-1.

Tunnel experiences should be consistent as the linear identity of the motorway. Surface experiences can have more distinction as buildings relate to both WestConnex and their surrounding context which varies from each site.

The footprint of the Campbell Road MOC is very small, in comparison to the adjacent New M5. However, a holistic approach is adopted for the interchange and as a result, the urban design and architectural treatments of the Campbell Road ventilation facility, associated amenities and the tunnel takes inspiration from buildings, portals and tunnels from other sections of WestConnex to maintain the built form continuity of the area, refer to Figure 8-2.

Construction of the Campbell Road ventilation facility on a bridge structure, above the roadways minimises the footprint in accordance with E134(a)(vii) and provides the opportunity to use the building as a landmark, the potential for it to become a 'gateway' to the city for road users travelling from the airport and through the M4-M5 Link Mainline Tunnels.

The relationship for public art at SPI is a continuous theme across the precinct, with standalone artworks of varying scales by New M5 (refer to The New M5 Public Art Strategy available on westconnex.com.au) to the building artwork, all of which enhance the public domain, enjoyment and education.

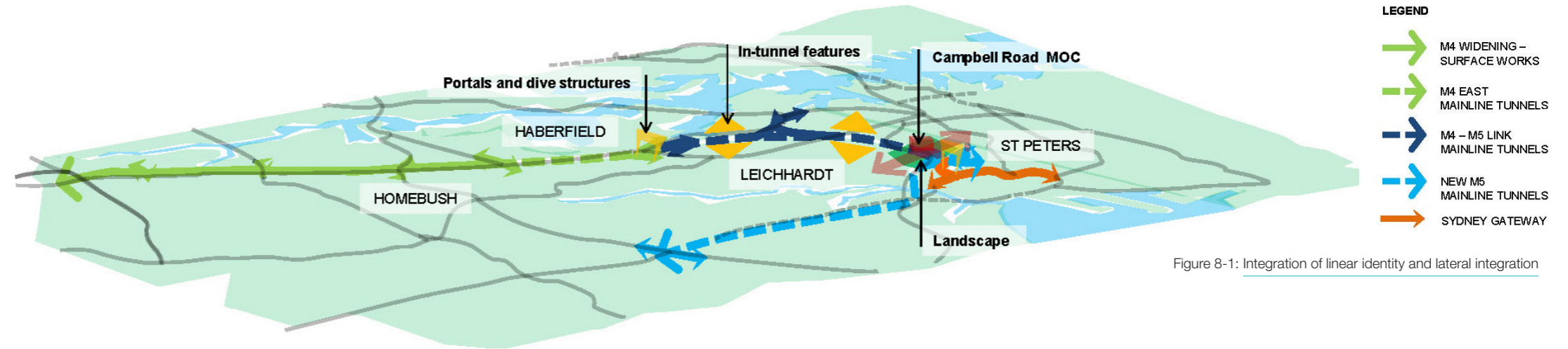


Figure 8-1: Integration of linear identity and lateral integration

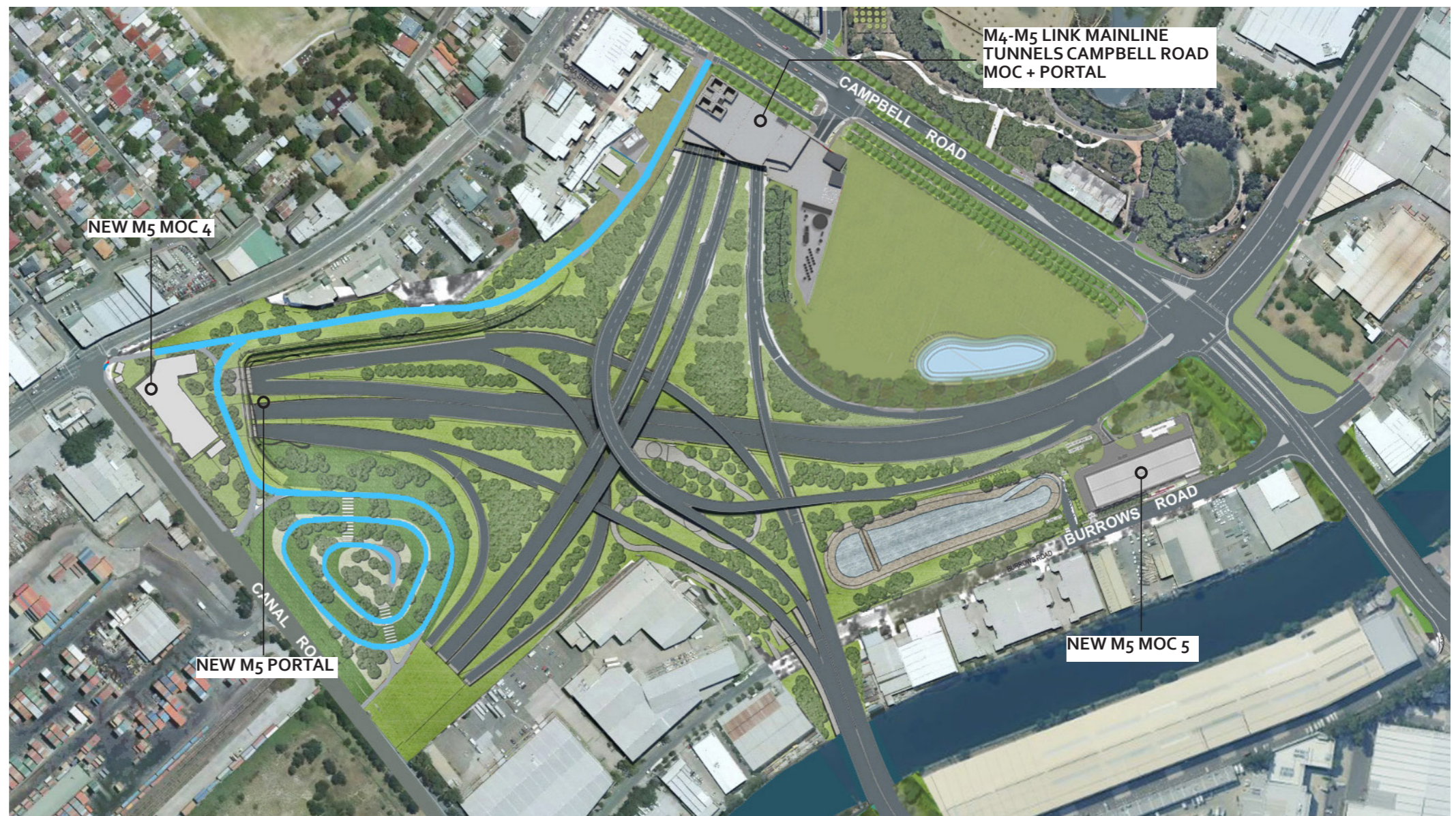


Figure 8-2: Campbell Road MOC – site context



## 8.2 Expression of surface buildings and portals

Resolution of built forms in WestConnex follows the principle of ‘form following function’.

### The Campbell Road ventilation facility

The Campbell Road ventilation facility has a simple, rectilinear volume enclosing its programmatic function, allowing articulation of an artistic expression on the façade, refer to Figure 8-3.

Materials, finish and shape have been derived through careful consideration and interrogation of the buildings elsewhere within the SPI. The Campbell Road ventilation building is the final missing piece of the jigsaw at SPI, therefore the shapes and colour adopted for the building are purposely intended to be more striking. However, throughout this new zone of complex roadways are buildings with similar themes:

- Rectilinear structural arrangements
- Aluminium, angular metal façade cladding is reminiscent of the shapes of shipping containers stored nearby
- A single gold colour runs throughout the building palettes. A subtle reminder of the building relationship and continuity of the built form situated on Campbell Road (M4-M5 Link Mainline Tunnels), Burrows Road and Canal Road (New M5). The gold is used in a variety of locations, from the gradation of gold colour for the ventilation outlet cladding on the New M5 MOC5 to a light gold around the entire perforated façade of the MCC
- Smaller buildings, almost shed like in their appearance with a functional, utilitarian finish are recessive
- The brick datum line which runs around the Campbell Road ventilation facility pays homage to the industrial brick making nature of the past and mimics the use of bricks on the New M5, throughout and around SPI and the local terrace houses.



New M5 - St Peters MOC 4 (view from Canal Road)



New M5 - St Peters MOC 5 (view from Burrows Road)



M4 - M5 Link Mainline Tunnels - Campbell Road MOC

### Similarity

- Sculptural approach to building design – the shape of the buildings and angular nature of the façade treatment, echoes the corrugated profile of a shipping container
- Landscape design
- Building materiality and form – aluminium battens and folded aluminium panels
- Architectural expression of solid and screen element
- Colour selection – a gold / sand colour remains constant throughout all surface buildings at SPI
- Built form finishes – the WTP is recessive in its built form against the façade of the Campbell Road ventilation facility, similar to other stages of WestConnex.

### Distinction

- Vibrant colour of building
- Artwork on building
- Low level lighting.

Figure 8-3: Expression of surface buildings



**Portal**

The SPI portal is almost immediately below the Campbell Road ventilation facility, which is adorned in the pattern and colour of highly respected Indigenous artists. Therefore, it was considered more appropriate to make the portal element a recessive, functional screen only, allowing the eye to be drawn to the building above.

The New M5 ventilation facility is setback from the cut and cover tunnel portal, therefore the portal itself is utilised as a design feature, with a ‘sculptural veil’ designed to present a unique and memorable experience for drivers, refer to Figure 8-4.

The portals share similarities in:

- The use of vertical aluminium battens on the portal screen allow the portals to share a similar aesthetic language
- The gold colour used on the New M5 portal façade and across other buildings within the SPI context is translated onto the Campbell Road ventilation facility façade artwork
- The overall scale of the portals, relative to the height from the motorway.



New M5 - St Peters MOC 5 (view from motorway)



M4 - M5 Link Mainline Tunnels - Campbell Road MOC (view from motorway)

**Similarity**

- Use of battens
- Batten material – aluminium
- Landscape design.

**Distinction**

- Colour of battens
- Orthogonal batten configuration
- Battens attached to building.

Figure 8-4: Expression of portals



### 8.3 Tunnel visual events and dive structure

The project's in-tunnel and portal design is developed to acknowledge its relationship within the overall WestConnex network.

**Tunnel**

The tunnel visual events provided are complementary to the M4 East and New M5 in-tunnel and portal design (refer to Figure 8-5), and enhance the linear identity of the project.

All road safety elements within the tunnel, such as the placement of road signage and motorist equipment cabinets, as well as the colour and panel arrangement of the breakdown bays are consistent across the three stages of WestConnex.

Harmonising the road safety features provide tunnel users with a sense of familiarity in their surroundings, potentially reducing anxious driver behaviour, particularly for new users.

**Dive structure**

The finishes on the dive structure are complementary to those of the M4 East. They feature the same materials, finishes and colours. Geometry varies to suit the structure provided by the M4 East, refer to Figure 8-5.



New M5 - Location marker

M4 - M5 Link Mainline Tunnels - Location marker

- Similarity**
- Wall materials – vitreous enamel
  - Wall configuration and base colour – white
  - Cross passage running man escape graphic
  - Suburb location markers concept
  - Suburb name text size and font, read in forward direction
  - Roadway lighting
  - Provided on the near side to avoid conflict with cross passage signage
- Distinction**
- Location markers reversed white on colour
  - Exit markers concept
  - Breakdown bays not highlighted with colour
  - No lighting in feature areas.



M4 East - Location marker

M4 - M5 Link Mainline Tunnels - Location marker

- Similarity**
- Wall materials – vitreous enamel
  - Wall configuration and base colour – white
  - Cross passage running man escape graphic
  - Suburb location markers concept
  - Suburb name text size and font
  - Roadway lighting
  - Exit markers concept
  - Provided on the near side.
- Distinction**
- Location markers reversed white on colour
  - Breakdown bays not highlighted with colour.



M4 East - Portal dive structure at WSI

M4 - M5 Link Mainline Tunnels - Portal dive structure at WSI

- Similarity**
- Wall materials – aluminium
  - Wall configuration and colour – silver / dark grey
  - Lighting design
  - Railing design
  - Throwscreen design.
- Distinction**
- Inclined panels consistent with engineering constraints.

Figure 8-5: Expression of tunnels and portals



## 8.4 Project summary

The design of the project has been developed to be an integrated experience with other stages of WestConnex yet provide, through its own interpretation of common themes, some variety and additional interest to the overall experience.

The design builds upon the Roads and Maritime's achievement of design excellence for contemporary road infrastructure, and establishes new benchmarks for the urban and landscape design of motorways.

The project provides an opportunity to fully integrate art into the motorway design to transform the experience of movement. An Indigenous voice has informed the design of the ventilation building resulting in a powerful statement of continuity and connection with the site. The legacy of this unprecedented work of art, scaled to the city, as 'connection to country' and welcome to Australia will strengthen the legibility of this infrastructure and deliver strong placemaking outcomes for both road users and the community.

Project design outcomes exemplify the integrated approach taken to resolving the challenges presented by urban design, landscape and engineering. The use of modular components and similar detailing adapted across WestConnex ensures a smooth and on-time implementation to deliver an improved operating environment as soon as possible.

The design outcome supports a positive driver experience, allowing drivers to comprehend the route, easily navigate, and 'enjoy the ride' provided by WestConnex as a whole. The key aspect of the driving experience is in establishing reference points, which evokes a sense of progress towards a destination, whilst having an interesting visual environment will mean that the new motorway is embraced by the public and will provide enduring value, refer to Figure 8-6.

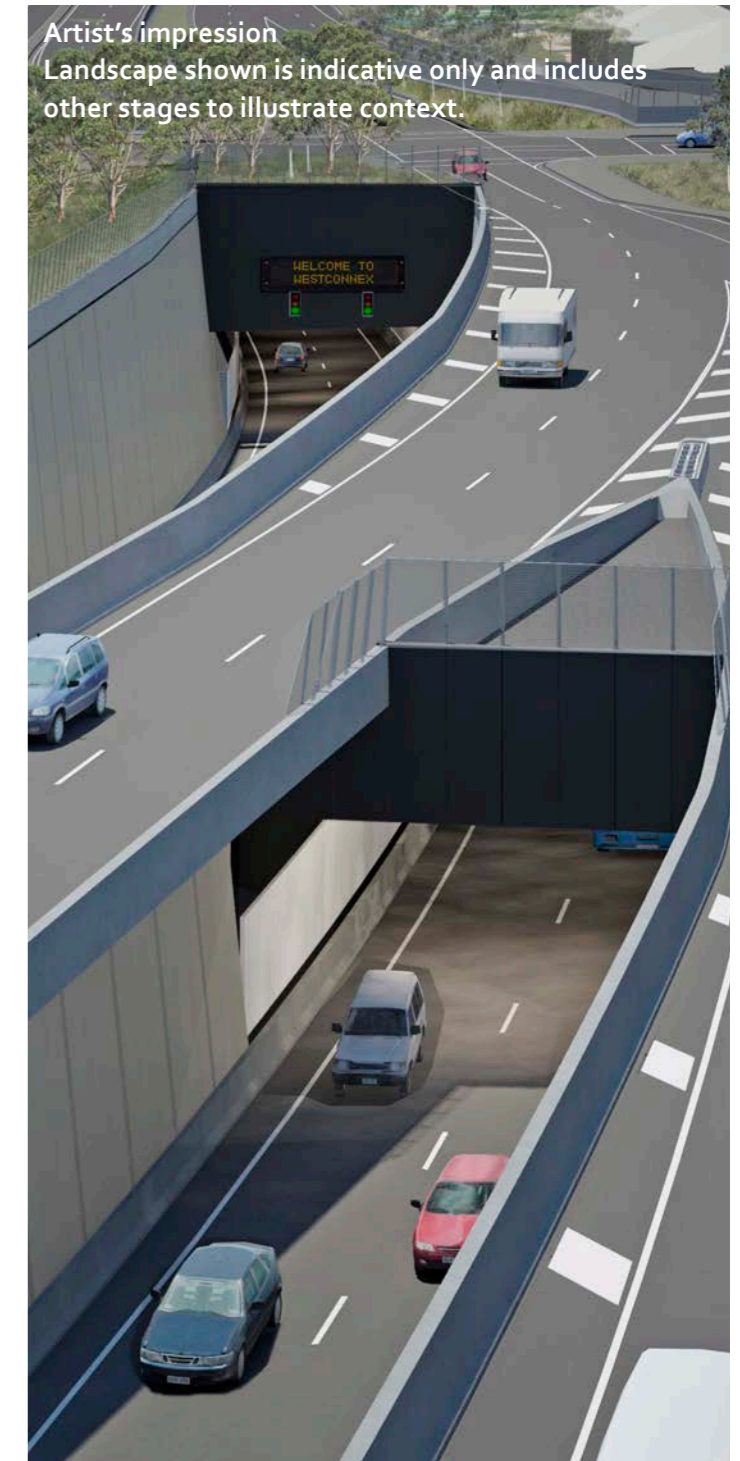


Figure 8-6: SPI, tunnel and WSI (left to right)



# WestConnex M4-M5 Link Tunnels

