

08. Tunnel Portals

The tunnel portals along the alignment provide access to the Western Harbour Tunnel for traffic. Portals are a place of transition, signifying not only entry into the tunnels, but the commencement of the journey beneath the Harbour and across the Country.



Figure 120: Artist's impression of main tunnel portal (trees and landscape shown at 5 years maturity)

8.0 Tunnel Portals

Deliver portals and trough structures that are visually appealing, sensitive to their context, reflect the above ground environment and provide a legible, self-explaining journey which enables awareness of location.

-Tunnel portals and trough structures principles, EIS Appendix V

8.1 Overview

8.1.1 Scope

At the southern end of WHT, three portals exit at City West Link and The Crescent from Rozelle Interchange. The portal structures are vertical faces, to be clad as part of the Rozelle Interchange works and do not form a part of this project scope.

At Cammeray, there are three tunnel portals:

- The main WHT portal (structure to be constructed by WFU contractor)
- Falcon Street off ramp (cut and cover structure)
- Berry Street on ramp (cut structure with braced retaining wall)

The tunnel portals include urban design elements including retaining and flood walls, safety screening, road furniture and signage, and elements of interface between the tunnel lining and various surface elements. Each portal differs in structural configuration.

8.1.2 Setting

The physical scope of works is divided between the three portals. Berry Street on ramp is geographically bounded by the intersection of Berry and Arthur Streets at the south, the existing alignment of WF and the Berry Street on ramp to the east, the east-west line defined by McLaren Street to the north, and the rear of the residential properties along Walker Street to the west. Falcon Street off ramp is geographically bounded by Ridge Street to the south, the existing alignment of WF and the Falcon Street off ramp to the east, Falcon Street to the north and St Leonards Park and Bon Andrews Oval to the west. The main tunnel portal is geographically bounded by Ernest Street Bridge to the south and the realigned carriageway of WF, following the completion of WFU works to the east, north and west. The structure of the main tunnel portal is delivered by the WFU contractor.



Figure 121: Tunnel portals locations

8.1.3 Tunnel portal design principles

The WHT tunnel portals have been designed to achieve a sensitive fit with their context, including the motorway, surrounding landscape, local road networks, and nearby built form. As WHT is adjacent to WFU, it necessarily takes design cues from that project in order to deliver a consistent driver experience. These cues include the landscape palette, materials selection, and palette, and design expression. Additional considerations include the reduced speed at which motorists approach the portals – which has implications for the scale of design elements – and the opportunities to strengthen the landscape where it can help integrate WHT into its setting.



Simple and elegant design

- Maintain a clean and uncluttered appearance with a minimal material palette
- Ensure the portals have a modest and simple design to complement the road infrastructure
- Design retaining walls, tunnel lining panels, noise walls and safety screens as a unified and high-quality family of elements
- Integrate service elements to conceal them as far as possible and to allow for drainage away from the face of walls

Integration

- Design all three portals to provide seamless integration between the project and the existing context, including WFU, through material expression relating to both the tunnel and the ground works
- Ensure a smooth transition from tunnel to the surface road network, by designing the walls surrounding the portals to appear as an extension of the tunnel as it emerges from below ground

Optimise planting

- Integrate landscape wherever feasible to soften and screen the portal structures
- Replace any vegetation removed during construction wherever possible

8.2 Key design elements

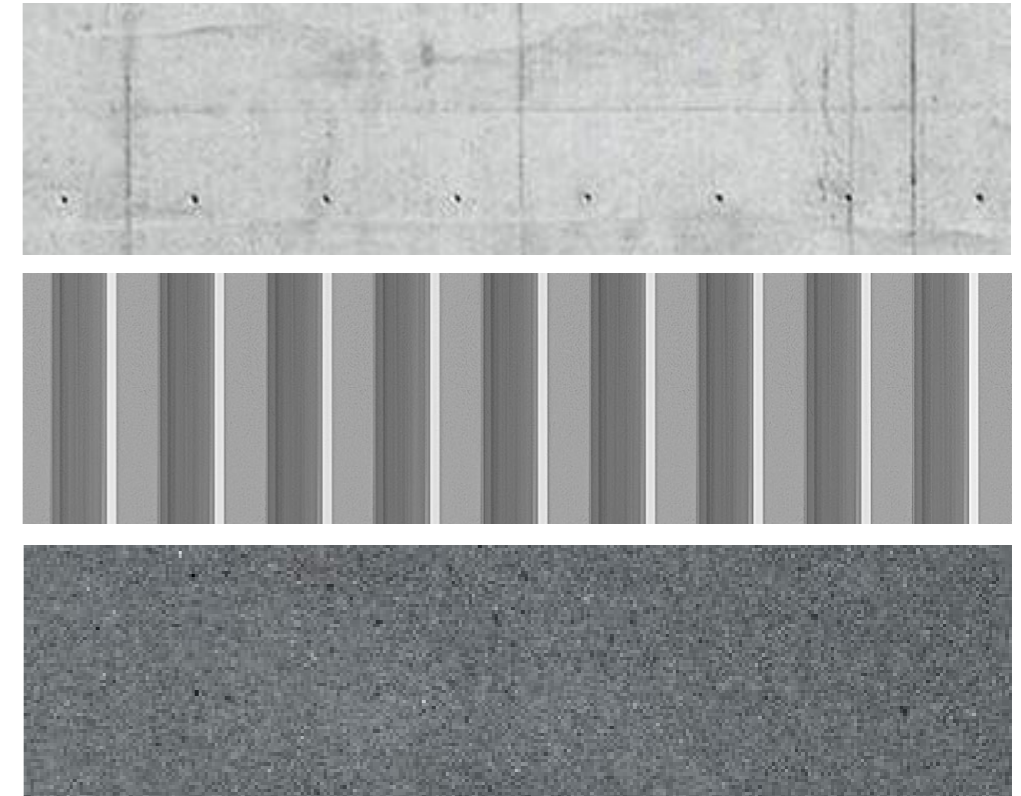
8.2.1 Portal lining panels

The design for the northern portals is refined and minimalist. The strategy is to create continuity across all three portals and highlight them as key events along the journey, while not dominating their setting. The treatment is clean and simple, with strong horizontal lines over the tunnel entry, dark-coloured recessive panels on approach, and discreet fixing details. The portal panels will extend to a maximum height 3.5m above the carriageway, the same as the tunnel panels, contributing to a continuous road user experience into and through the tunnel.

8.2.2 Walls

There are various wall types across the portals aim for a clean, minimal design outcome while also aligning with WFU design elements.

- The exposed concrete face to the Warringah Freeway at Falcon Street will feature a vertical rebate up to 50mm deep, with the rebate spaced at regular intervals to line up with the adjacent retaining structures. The texture will be achieved through the use of formwork liners.
- The noise wall at Berry Street is a vertically ribbed concrete wall as per the WFU noise walls.
- The flood wall at Falcon Street has been designed to meet structural and flood requirements. The smooth concrete finish also ties in to the palette established for WFU.



8.2.3 Anti-throw screens

Anti-throw screens are required at Berry Street and Falcon Street, and will be of stainless steel welded mesh, which both fits in with the WFU screens and minimises the visual bulk of the structures.

8.2.4 Landscape

The landscape strategy around and above the portals is to soften the harsh concrete surfaces while regenerating parkland areas lost during construction. The planting palette comprises a mix of exotic and native species, which include grasses and groundcovers, small and larger shrubs, and small and larger trees. Their arrangement mimics the planting patterns of the surrounding areas, with the aim of complementing existing vegetation.

Refer to [Section 5.0](#) for more details on landscape strategies and [Section 5.0 8.4.2](#) for the proposed plant schedule.



8.3 Main WHT portal

The main WHT portal will be located in the centre of Warringah Freeway in North Sydney, just north of the Ernest Street Bridge. The single portal dive will accommodate six lanes – three in each direction – with concrete retaining structures on either side. The structure of the portal will be constructed by the Warringah Freeway Upgrade contractor, while the cladding treatment is part of this project.

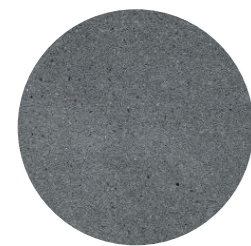
The retaining walls on either side of the dive, as well as the headwall, will be concrete with a smooth finish, with all visible surfaces painted dark grey to match the interior of the tunnel to ensure a clean, streamlined composition. Above the crash barriers, the tunnel lining panel will continue as the wall height decreases toward the end of the ramp.

New vegetation behind the portal as part of WFU will provide an enhanced landscape setting over time as planting matures..

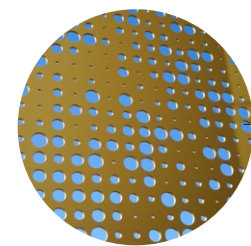
Main Portal feature

On the tunnel headwall, a tessellated semi-transparent 'crown' will be affixed to the top of the portal to add visual interest. The crown comprises anodised aluminium panels supported by a steel substructure connected to the concrete headwall. Its design matches the façade treatment of the Cammeray ventilation facilities to create a cohesive component with the project's architectural expression. The crown will be lit at night, also echoing the lighting of the Cammeray facilities. The cladding strategy for the Cammeray facilities is further described in [Section 6.3](#)

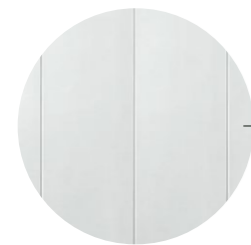
- 1 Landscaping above cut and cover portion of the main portal (WFU scope)
- 2 Tunnel lining panels (Type A)
- 3 Aluminum curved panels finish to match tunnel lining
- 4 Dark portal lining panels (Type B)
- 5 Feature 'crown' anodised perforated aluminium cladding aligning with CVB and CVS cladding
- 6 Dark stained concrete flood wall constructed by WFU contractors



Grey colour stained concrete



Perforated aluminium panels



Tunnel lining panels

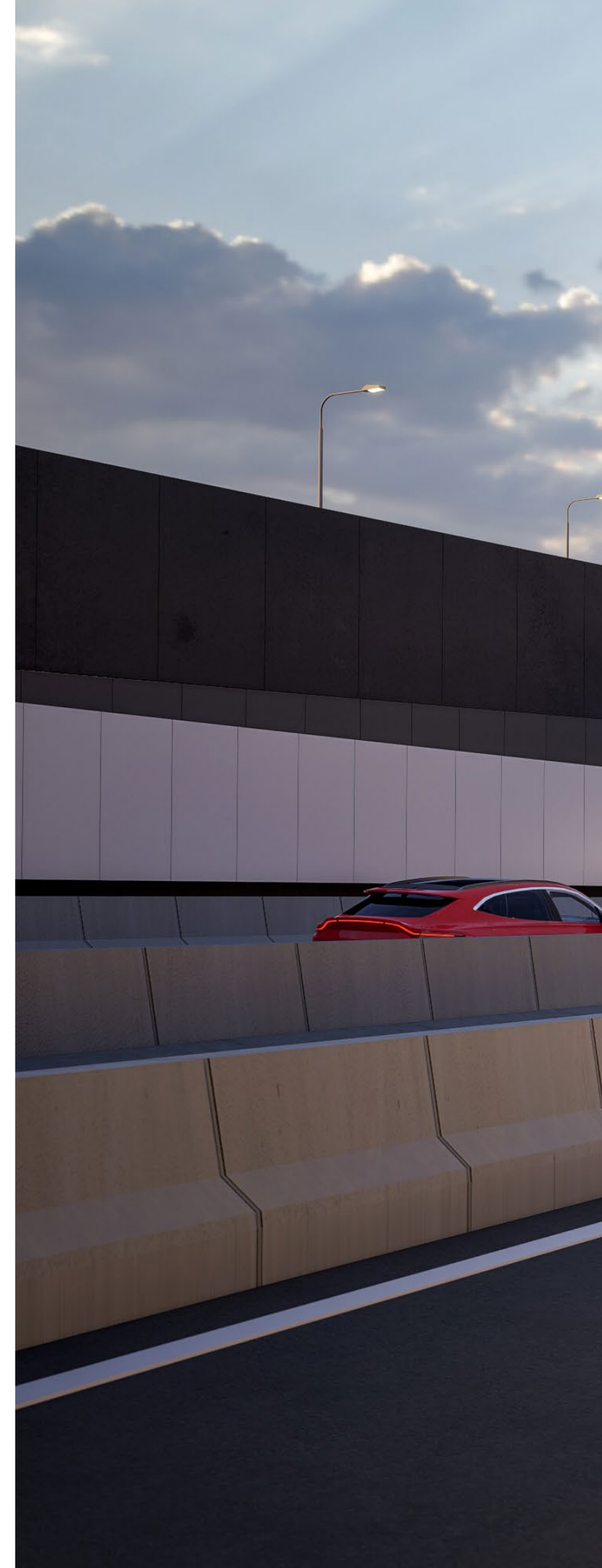
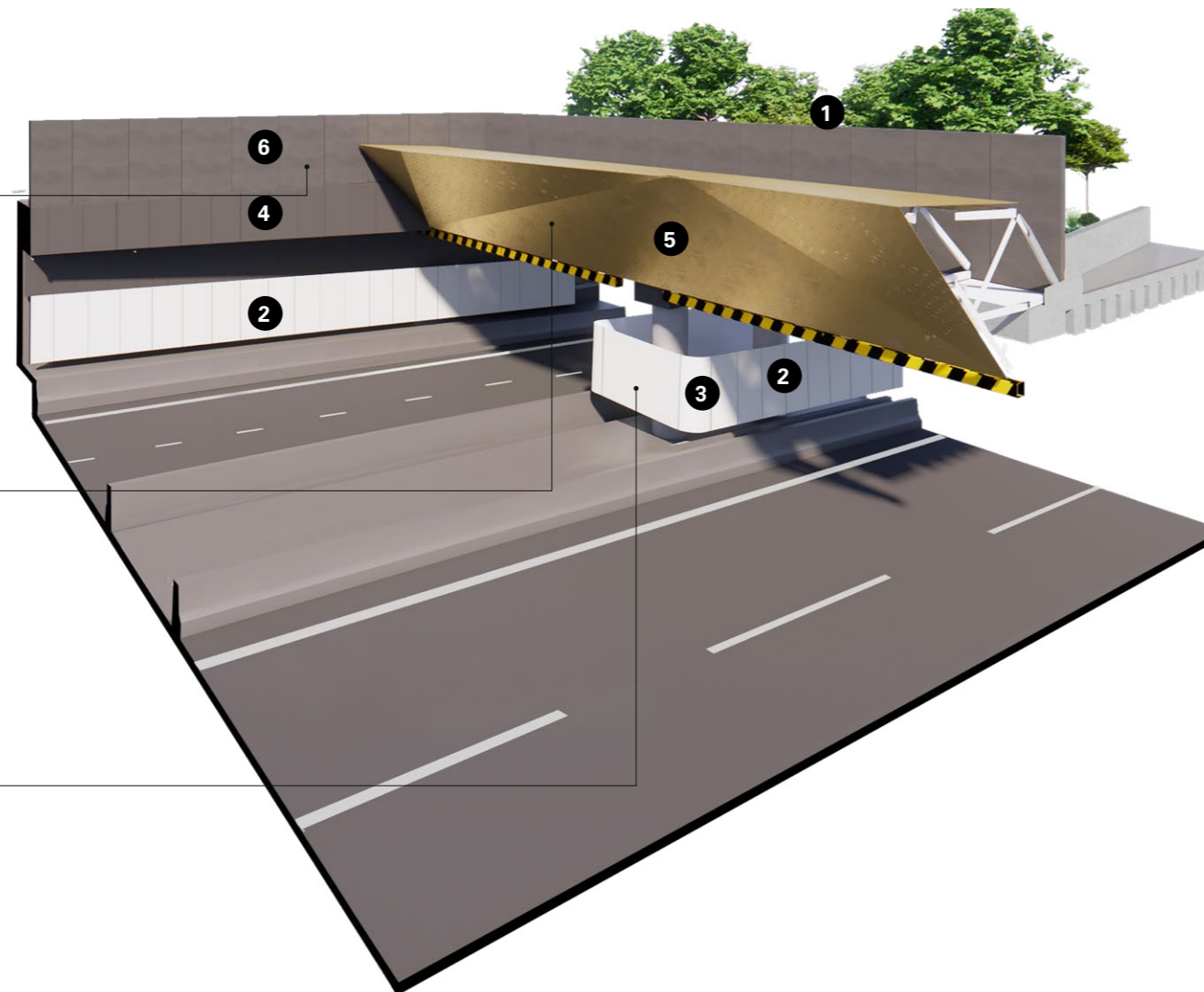




Figure 122: Artist's impression of main tunnel portal (trees and landscape shown at 5 years maturity)

8.4 Falcon Street off ramp

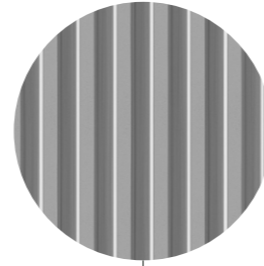
The Falcon Street off ramp is in a cutting emerging just north of Ridge Street along St Leonards Park. The southernmost portion of the cutting will be covered with a concrete structure and replanted to extend the parklands over the construction zone, with a retaining wall along the western edge. This treatment complements the existing topography and permits revegetation of the park.

The retaining walls within the cutting will be concrete with a smooth finish, with any exposed shotcrete also finished smooth. All visible surfaces will be painted dark grey to match the interior of the tunnel.

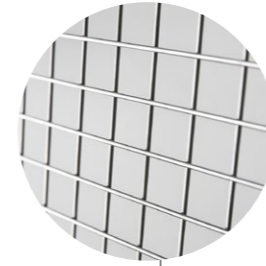
Where required, the wall will be extended vertically to create a noise wall. The form of the structure has been developed to meet both the retaining wall and noise mitigation requirements while providing a visually consistent, smooth line from top to bottom. Above the crash barriers, the tunnel lining panel will continue, dying away as the wall height decreases toward the end of the ramp.

A safety screen is required to prevent incursion into the motorway below from the public park that sits atop the structure. The screen will be stainless-steel welded mesh to align between galvanized steel posts.

Concrete face with vertical recesses



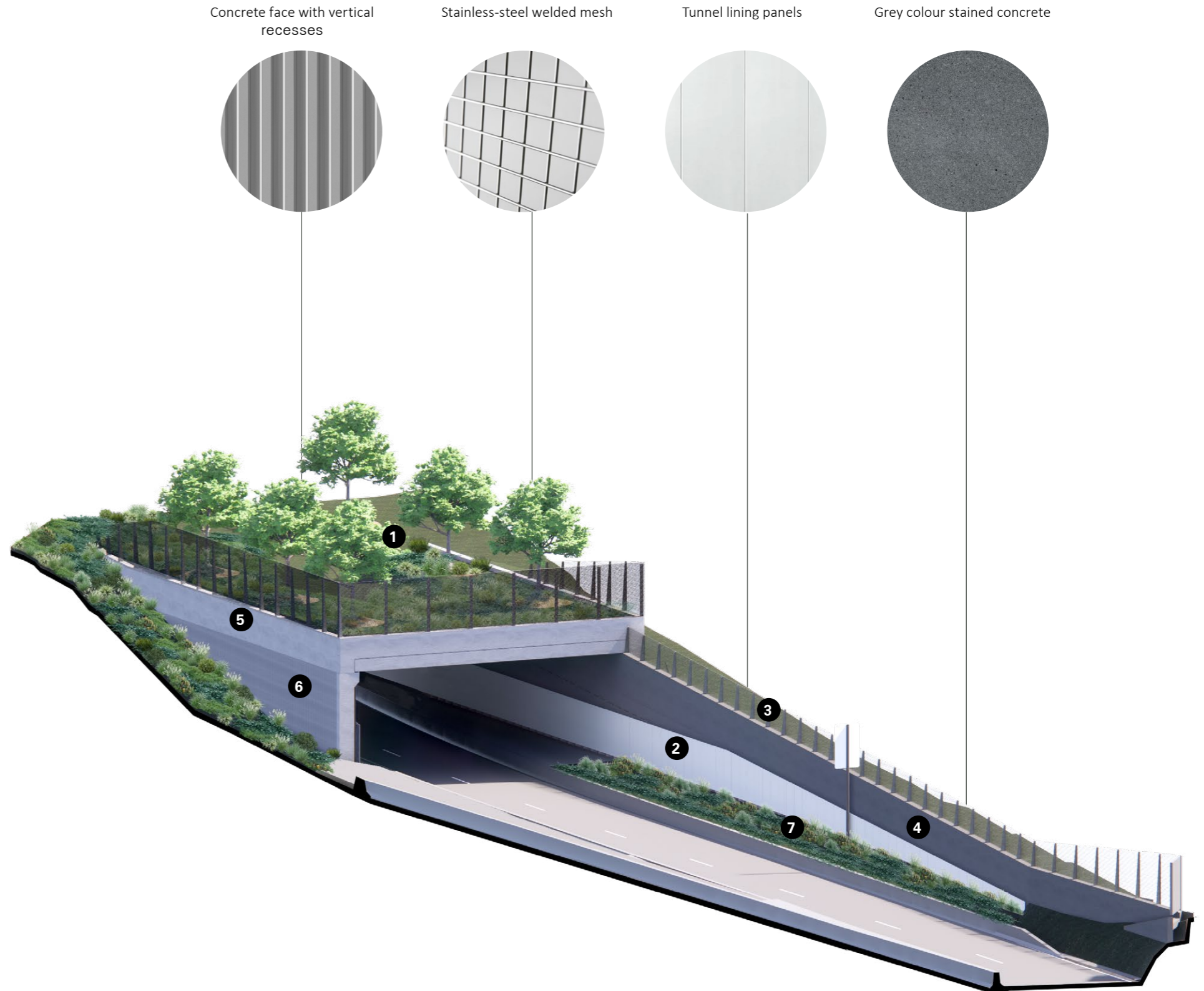
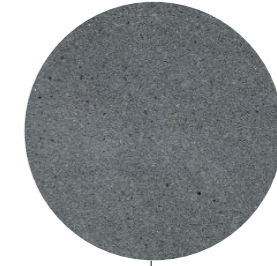
Stainless-steel welded mesh



Tunnel lining panels



Grey colour stained concrete



- 1 Landscaping above cut and cover portal
- 2 Tunnel lining panels (Type A)
- 3 Anti-throw screen stainless steel welded mesh fixed to t-post
- 4 Dark stained concrete flood wall
- 5 Smooth concrete finish
- 6 Concrete feature wall
- 7 Landscaping adjacent to carriageway

Figure 123: Axonometric diagram of Falcon Street off-ramp

8.4.1 Landscape

The landscape treatments adjacent the Falcon Street off ramp will make good the areas disturbed by construction and tie in with existing lawn and garden areas within St. Leonards Park. Vegetation proposed for removal and replacement, including trees, will be of similar native species, arranged informally to replicate the adjacent landscape.

Small tree plantings are proposed to the roof of the cut and cover structure. Trees are to be mounded locally to allow for a maximum of 1m of soil, within the eastern and western edge of the portal. These restrictions work within the structural limitations of the daylight portal. Native understorey planting consisting of large shrubs with grasses and groundcovers is proposed to mitigate views of the Warringah Freeway from St. Leonards Park.

Small retaining walls and batters will tie into the existing topography, enabling tree planting within 4m of the eastern and western edge of the daylight portal. West of the portal, earthworks will level out the ground level to give the community more usable passive park than is currently available. East of the portal, the ground will slope gently down to tie in with the proposed road level adjacent the Warringah Freeway. Erosion control products will be used to stabilise the batters to allow for soft landscaping. Concrete v-channels will drain surface run-off from the daylight portal down towards Warringah Freeway.

- 1 Proposed turf to complement existing open space use
- 2 Small tree planting with native understorey to the roof of the portal
- 3 Native trees with native understorey consisting of large screening shrubs, grasses and groundcovers
- 4 Proposed soft landscaping behind carriageway barriers to soften appearance of retaining walls
- 5 Native shrubs and groundcovers proposed on slope, to soften the appearance of the portal structure

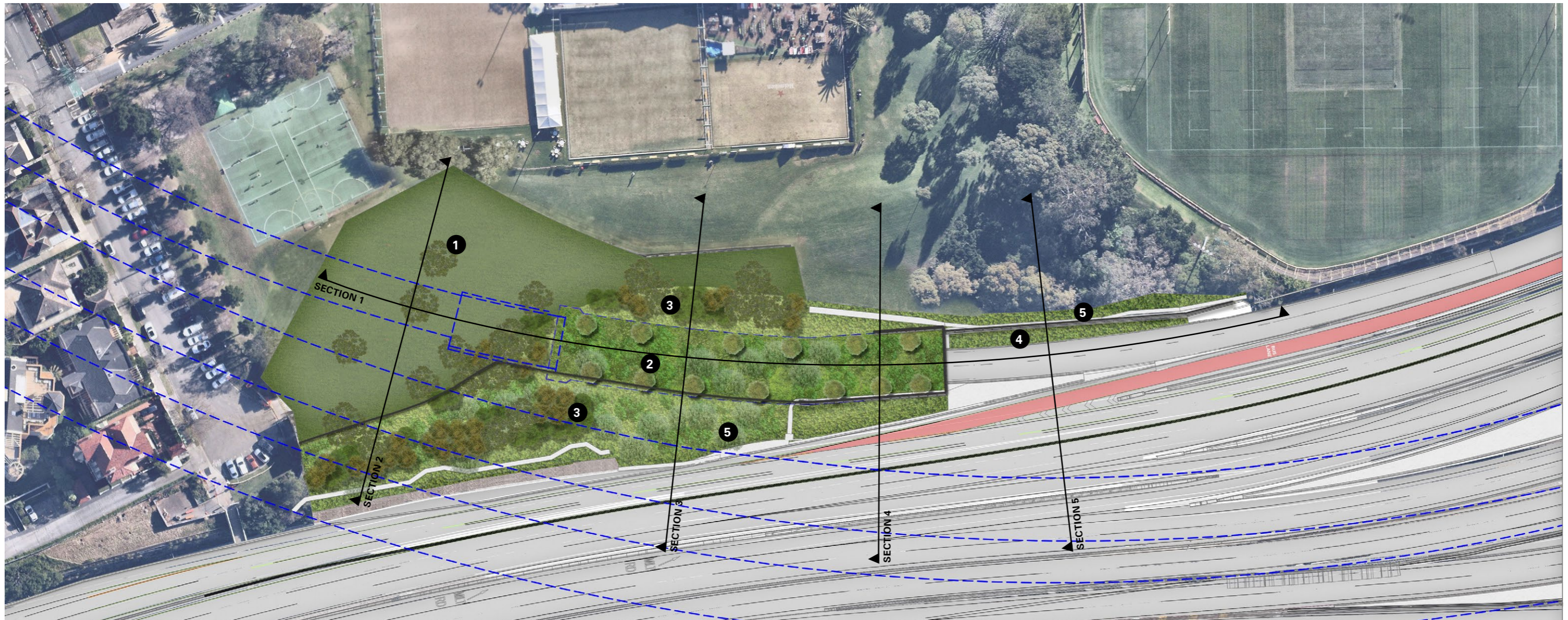


Figure 124: Falcon Street off ramp: landscape plan



Figure 125: Artist's impression of Falcon Street off ramp, view from the exit (trees and landscape shown at 5 years maturity)



- 1 Landscaping above cut and cover portal
- 2 Type A tunnel lining panels
- 3 Anti-throw screen stainless steel welded mesh fixed to t-post
- 4 Dark stained concrete flood wall

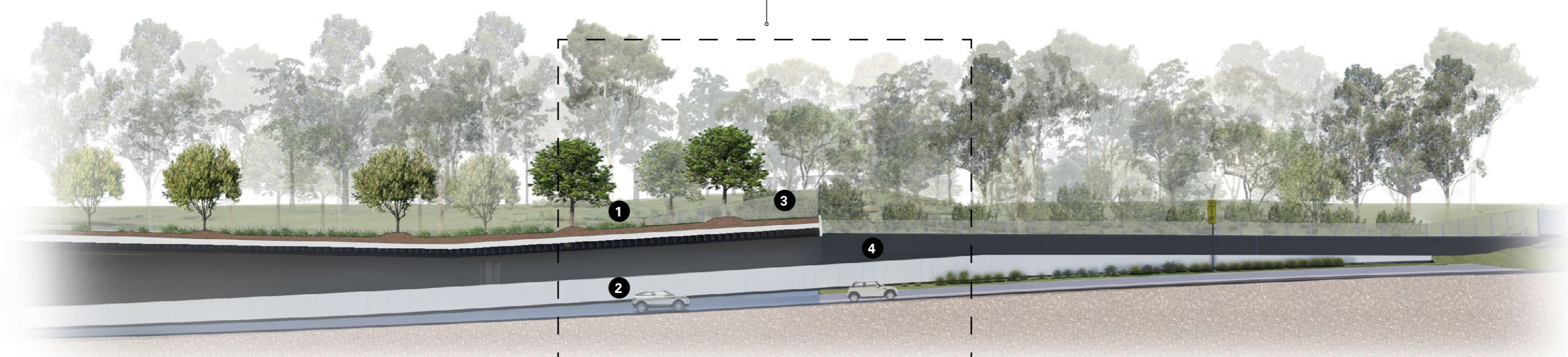
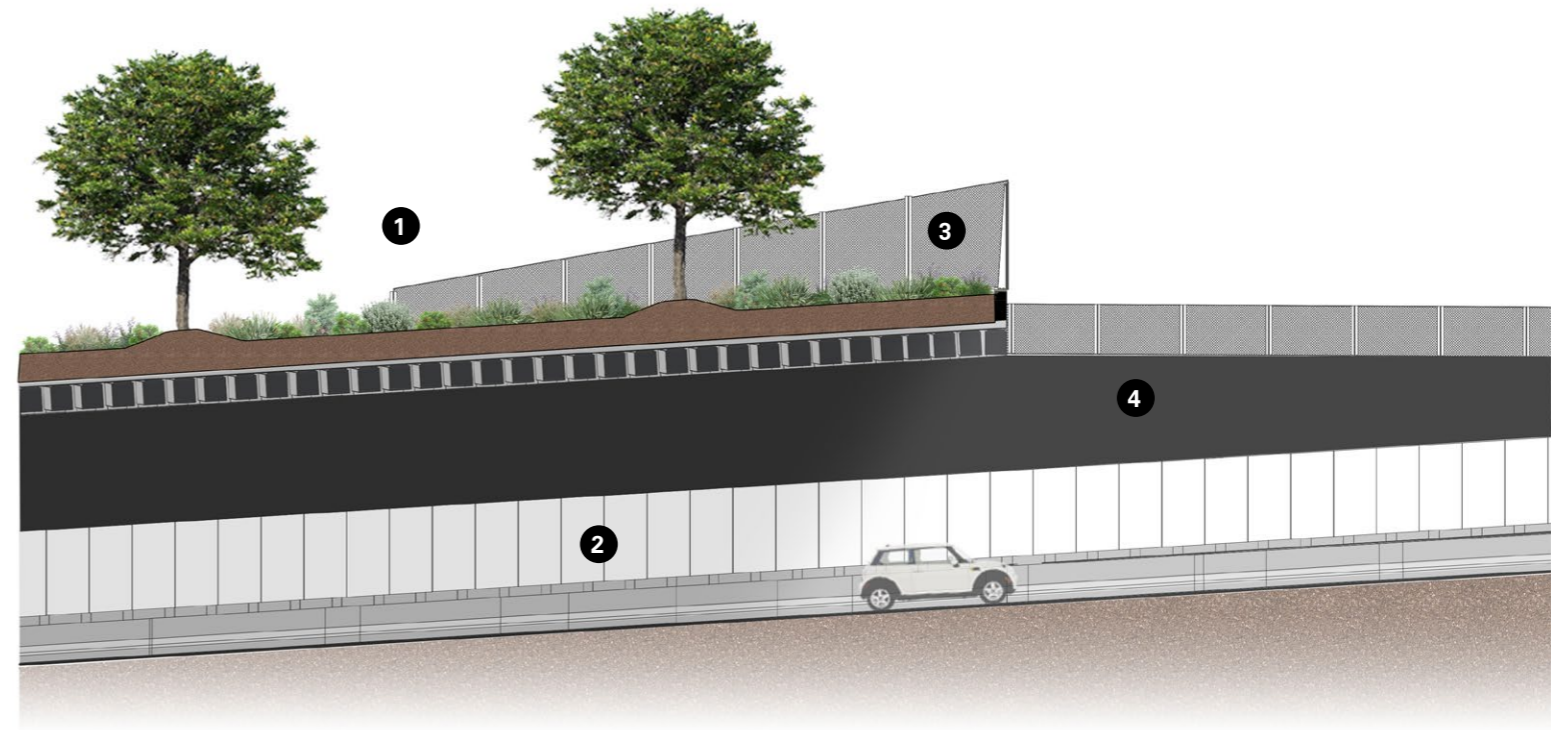


Figure 126: Falcon Street on ramp: section 1

8.4.2 Plant schedule

Botanical Name	Common Name
TREES/FEATURE PLANTING	
<i>Acmena smithii</i>	Lilly Pilly
<i>Angophora costata</i>	Sydney Red Gum
<i>Angophora costata</i>	Sydney Red Gum
<i>Backhousia citriodora</i>	Lemon Myrtle
<i>Cupaniopsis anacardiodes</i>	Tuckeroo
<i>Cupaniopsis anacardiodes</i>	Tuckeroo
<i>Eucalyptus haemastoma</i>	Scribbly Gum
<i>Eucalyptus salinga</i>	Sydney Blue Gum
<i>Lophoestemon confertus</i>	Brushbox
<i>Leptospermum petersonii</i>	Tea Tree
<i>Melaleuca armillaris</i>	Bracelet Honey Myrtle
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark
GRASS TURF	
<i>Zoysia japonica</i>	Zoysia 'Empire'
MIX A: PORTAL STRUCTURES MIX	
Shrubs	
<i>Callistemon linearis</i>	Narrow-leaved Bottlebrush
<i>Callistemon viminalis</i>	Weeping Bottlebrush
<i>Correa reflexa</i>	Native Fuchsia
<i>Westringia fruticosa</i>	Coastal Rosemary
Grasses	
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Themeda australis</i>	Kangaroos Grass
MIX B: NATIVE UNDERSTOREY MIX	
Shrubs	
<i>Correa reflexa</i>	Native Fuchsia
<i>Grevillia lineriaefolia</i>	White Spider Flower
<i>Kunzea pomifera</i>	Muntries
<i>Westringia fruticosa</i>	Coastal Rosemary

Botanical Name	Common Name
Grasses and Groundcovers	
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Goodenia ovata</i>	Hop goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Westringia fruticosa 'Mundi'</i>	Coastal Rosemary
MIX C: NATIVE SHRUB & GROUNDCOVER MIX	
Shrubs	
<i>Banksia ericifolia</i>	Heath Banksia
<i>Grevillia liner iaefolia</i>	White Spider Flower
<i>Hakea dactyloides</i>	Broad-leaved hakea
<i>Kunzea pomifera</i>	Muntries
Grasses and Groundcovers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Goodenia ovata</i>	Hop goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Themeda australis</i>	Kangaroos Grass
MIX D: NATIVE GRASSES & GROUNDCOVER MIX	
Grasses and Groundcovers	
<i>Callistemon viminalis 'Green John'</i>	Weeping Bottlebrush
<i>Carpobrotus glaucescens</i>	Pigface
<i>Dianella revoluta</i>	Blue Flax Lily
<i>Goodenia ovata</i>	Hop goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass



Sydney Red Gum



Tuckeroo



Sydney Blue Gum



Zoysia 'Empire'



Narrow-leaved Bottlebrush



Coastal Rosemary



Hop Goodenia



Knobby Club Rush



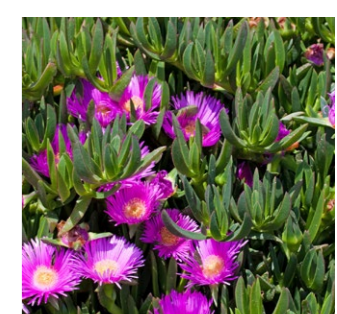
Kangaroos Grass



Tea Tree



Creek Mat Rush



Pigface

Table 7: Falcon Street off-ramp plant schedule

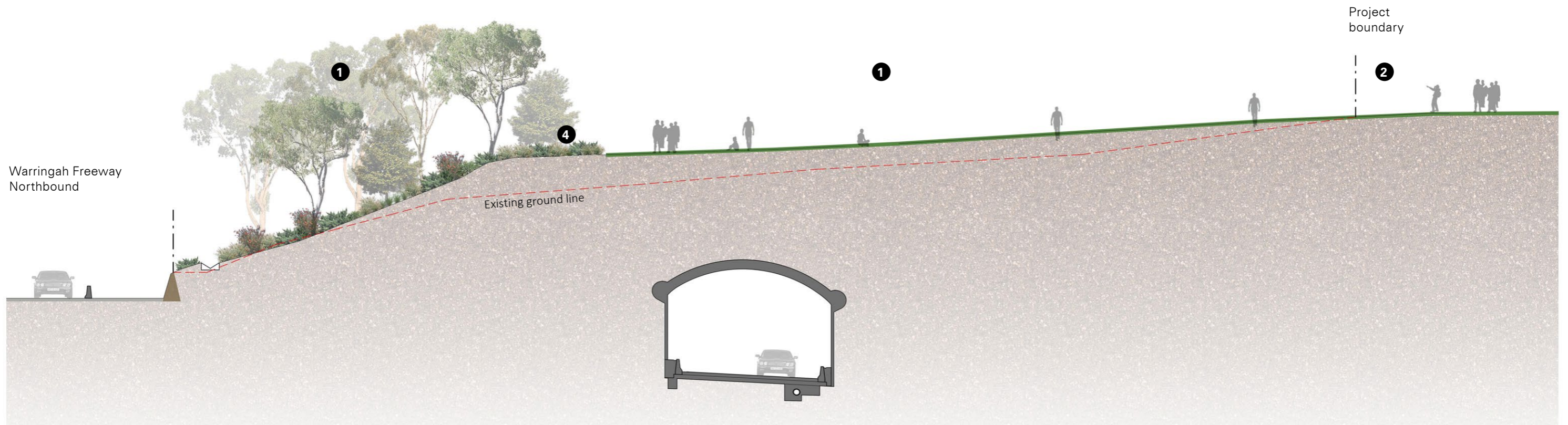


Figure 127: Falcon Street on ramp: section 2

- 1 Proposed planting
- 2 Area bordering extent of works to be made good
- 3 Tunnel lining panel
- 4 Safety fence
- 5 Existing planting retained
- 6 Imported soils to allow for tree planting

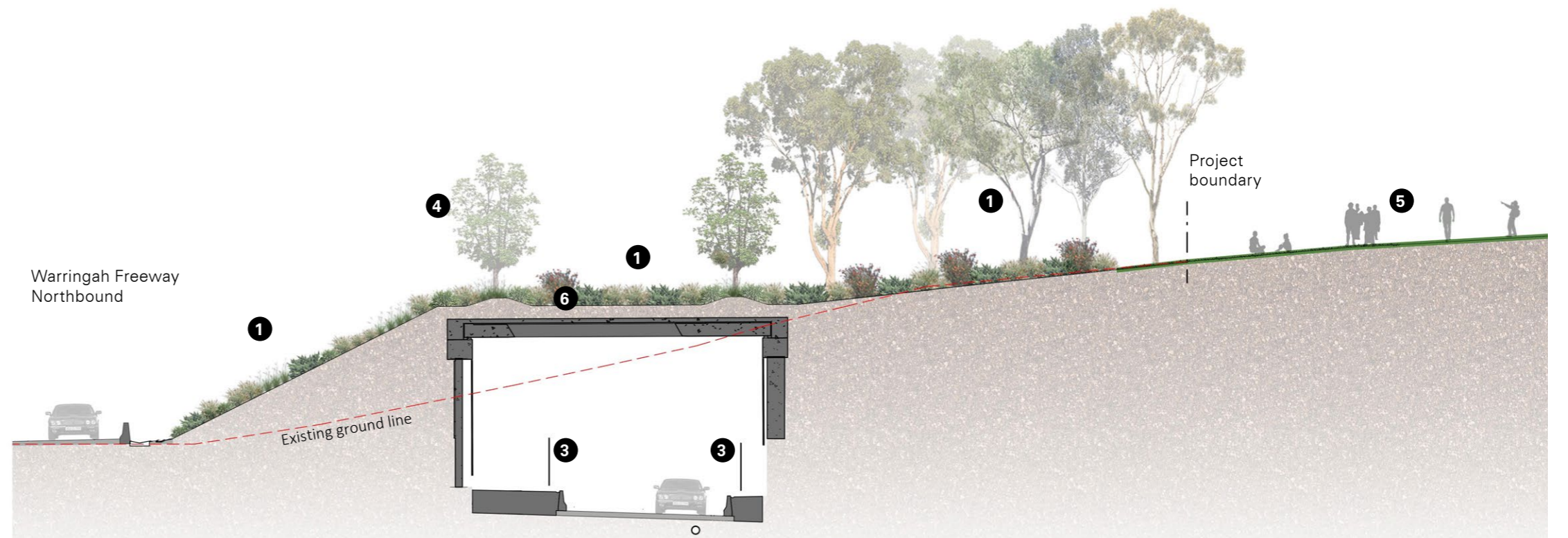


Figure 128: Falcon Street on ramp: section 3

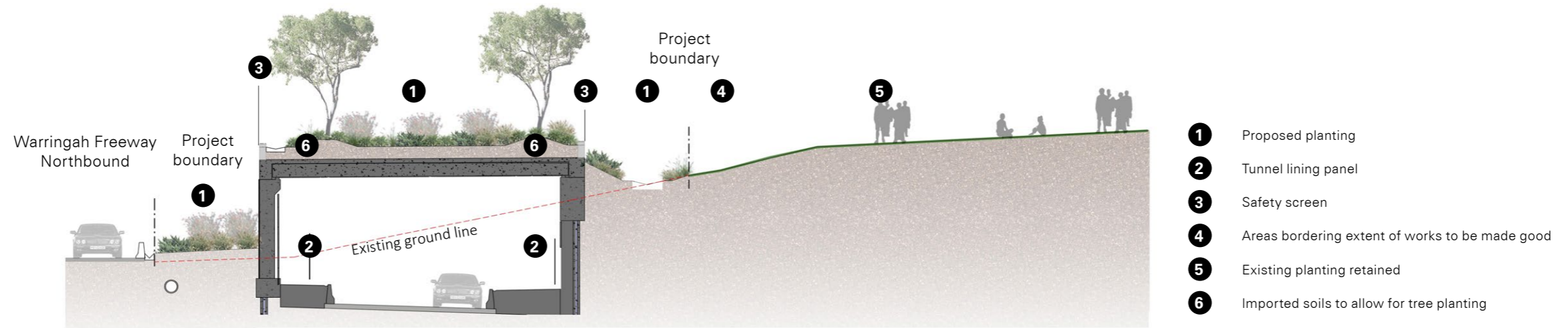


Figure 129: Falcon Street on ramp: section 4

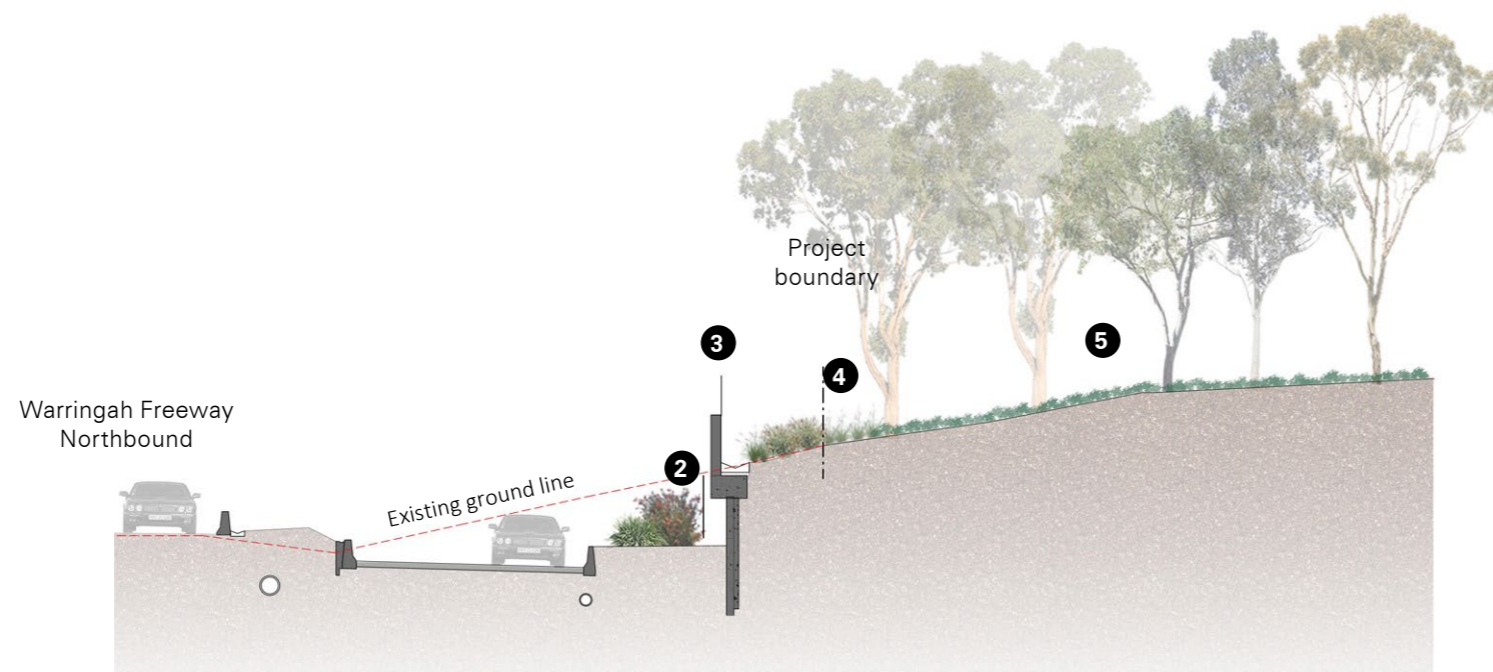


Figure 130: Falcon Street on ramp: section 5





Figure 131: Artist's impression of Falcon Street off ramp as seen from Warringah Freeway (trees and landscape shown at 5 years maturity)

8.4.3 Berry Street on ramp

The Berry Street on ramp is in a cutting running northward from Berry Street along the edge of the Warringah Freeway. A retaining wall is required on the western side of the cutting, which will be braced with horizontal structural members to a wall on the eastern side of the ramp.

The retaining walls within the cutting will be concrete with a smooth finish, with all visible surfaces of the walls and beams painted dark grey to match the interior of the tunnel. Any exposed shotcrete will be finished smooth and painted. Where required, the wall will be extended vertically to create a noise wall. It has been carefully designed as both a structural retaining wall and to meet noise mitigation requirements while maintaining a visually uniform, seamless appearance from top to bottom. Where exposed to the Warringah Freeway corridor, the concrete will be treated as described in [Section 8.2.2](#).

Above the crash barriers, the tunnel lining panel will continue, terminating at the end of the combined retaining and noise structure. On the western side of the ramp, at the termination of the combined retaining and noise wall, an additional, horizontal noise wall will be required. This wall will be finished to match the standard defined in the Warringah Freeway Upgrade.

- 1 Landscaping adjacent portal
- 2 Tunnel lining panels (Type A)
- 3 Dark portal lining panels (Type B)
- 4 Anti-throw screen stainless steel welded mesh fixed to t-post
- 5 Dark stained concrete flood wall
- 6 Variable Message Signs (VMS)
- 7 Concrete noise wall and galvanised steel posts

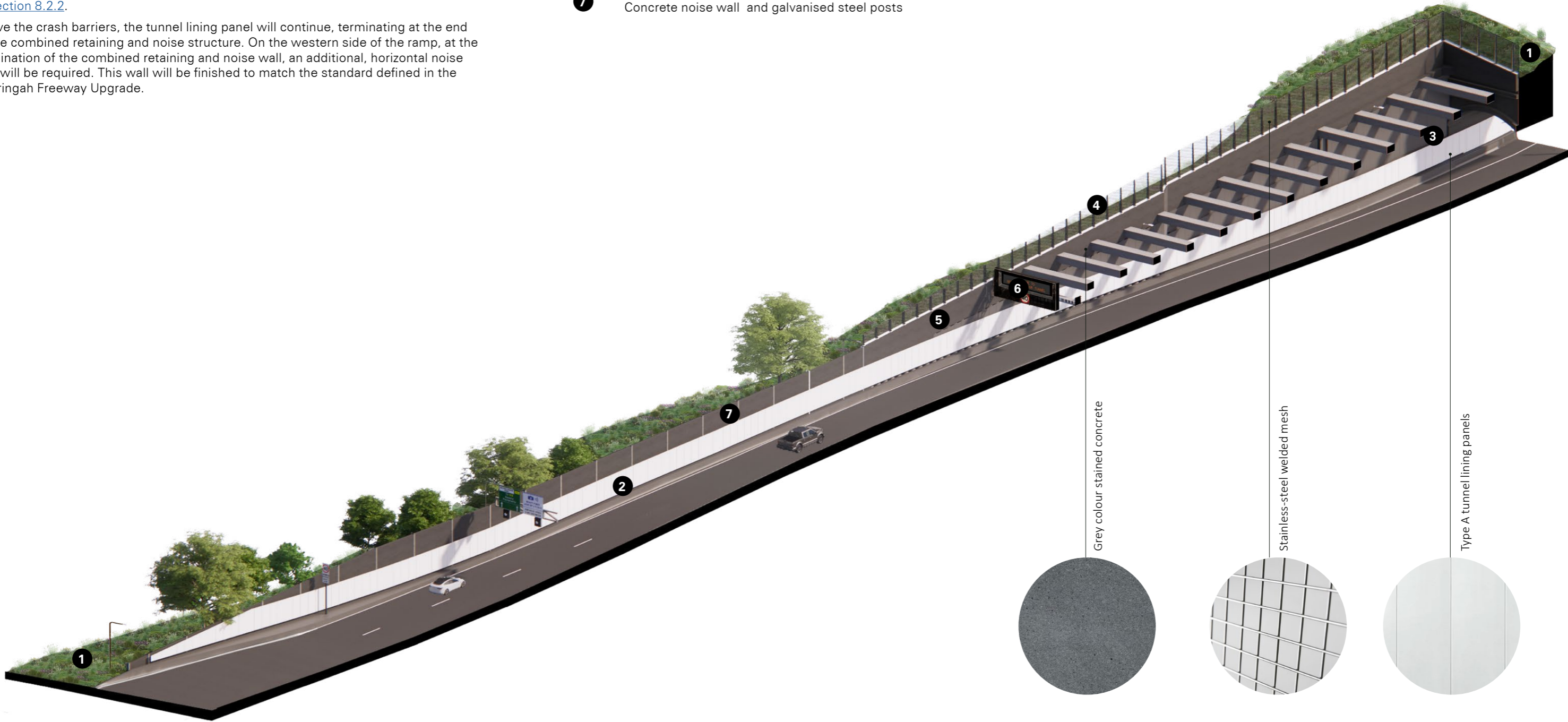
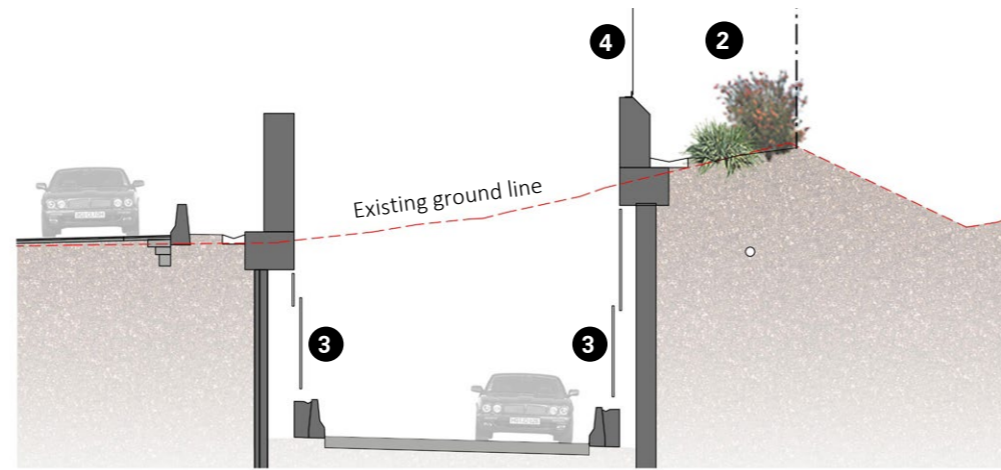


Figure 132: Berry Street on-ramp- axonometric diagram

8.4.4 Landscape

Landscaping at the Berry Street on ramp dive provides consistent tree coverage to help screen WFU from the adjacent residential areas to the east. Trees being retained at the handover from WFU works are intended to be retained by WHT where feasible and complemented with additional trees, shrubs and understorey plantings. Landscaping adjacent to the portal will screen it and thereby discourage pedestrians from reaching the portal edge. Dense planting is proposed for this small area to help replace trees lost.



- 1 Large trees with native understorey consisting of large screening shrubs, grasses and groundcovers to make good areas affected by proposed works and mitigate visibility of on ramp
- 2 Native shrubs and groundcovers proposed to tie into existing soft landscaping make good areas affected by proposed works
- 3 Tunnel lining panel
- 4 Safety screen
- 5 Drainage channels and culverts

Figure 134: Berry Street on ramp: cross section



Figure 133: Berry Street on ramp: landscape plan



Figure 135: Artist's impression of Berry Street on ramp (existing context shown indicatively)



WELCOME TO
WESTERN HARBOUR TUNNEL

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8.4.5 Plant schedule

Botanical Name	Common Name
TREES/FEATURE PLANTING	
<i>Acmena smithii</i>	Lilly Pilly
<i>Angophora costata</i>	Sydney Red Gum
<i>Backhousia citriodora</i>	Lemon Myrtle
<i>Cupaniopsis anacardioides</i>	Tuckeroo
<i>Eucalyptus haemastoma</i>	Scribbly Gum
<i>Eucalyptus salinga</i>	Sydney Blue Gum
<i>Lophoestemon confertus</i>	Brushbox
<i>Melaleuca armillaris</i>	Bracelet Honey Myrtle
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark
MIX B: NATIVE UNDERSTOREY MIX	
Shrubs	
<i>Correa reflexa</i>	Native Fuscia
<i>Grevillia lineriaefolia</i>	White Spider Flower
<i>Kunzea pomifera</i>	Muntries
<i>Westringia fruticosa</i>	Coastal Rosemary
Grasses and Groundcovers	
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Goodenia ovata</i>	Hop goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Westringia fruticosa 'Mundi'</i>	Coastal Rosemary
MIX C: NATIVE SHRUB & GROUNDCOVER MIX	
Shrubs	
<i>Banksia ericifolia</i>	Heath Banksia
<i>Grevillia lineriaefolia</i>	White Spider Flower
<i>Hakea dactyloides</i>	Broad-leaved hakea
<i>Kunzea pomifera</i>	Muntries
Grasses and Groundcovers	
<i>Carpobrotus glaucescens</i>	Pigface
<i>Ficinia nodosa</i>	Knobby Club Rush
<i>Goodenia ovata</i>	Hop goodenia
<i>Lomandra hystrix</i>	Creek Mat Rush
<i>Poa affinis</i>	Tussock Grass
<i>Themeda australis</i>	Kangaroos Grass



Table 8: Berry Street on-ramp plant schedule

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8.5 Tunnel portal design response to project principles

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 1 - Designing with Country	
Design built elements to acknowledge and celebrate the deep history and unique culture of the place, and the enduring connection of Aboriginal people to the land	<ul style="list-style-type: none"> – The colours, patterns and the form of the main tunnel portal feature pay homage to the historic character and geology of the area
Communicate to motorway users that they are entering and travelling through the land of the Cammeraygal and Wangal people	<ul style="list-style-type: none"> – The portal leads motorway users into the tunnel, where the stories of both cultures are interpreted as striking art features / tunnel events that acknowledge the journey between Cammeraygal and Wangal Country and how the project also creates a 'meeting place' within Sydney Harbour
Care for Country through reciprocal relationships between landscape, flora and fauna and people	<ul style="list-style-type: none"> – The landscape design supports caring for environment by providing habitat for native fauna
Objective 2 - Identity and user experience	
Adopt a cohesive and simple design language for the motorway elements including tunnel panels, walls, screens, building façades and portals to create consistency and avoid visual clutter.	<ul style="list-style-type: none"> – The portal designs employs simple designs with a minimal and consistent material palette
Ensure awareness of the geographic location while travelling by referencing the specific natural and cultural characteristics of the places the corridor is passing through.	<ul style="list-style-type: none"> – The form, patterns and colours of the main tunnel feature reflects on the geology of the of the area
Story telling - develop design themes around the historic and geographic significance of the place and articulate it through integration of arts and design elements to create interest and provide a distinctive travel experience for the users	<ul style="list-style-type: none"> – The design of the main tunnel feature is built upon the Terrestrial Country Story
Enhance the overall experience by using high-quality, durable and functional materials throughout the corridor	<ul style="list-style-type: none"> – All materials utilized are robust, high-quality, and designed for easy maintenance, ensuring long-lasting durability
Create an intuitive journey with the careful design and positioning of the urban design elements, street furniture and signage.	<ul style="list-style-type: none"> – The portals are designed to signify milestones along the journey, through the strategic integration of landscape features, road furniture, and signage, enhancing navigation
Objective 3 - Integrated design	
Ensure a smooth transition to and from the adjacent road corridors including WestConnex and Warringah Freeway, considering their general visual appearance and material palettes	<ul style="list-style-type: none"> – The tunnel panels continue out beyond the daylight portal to provide a smooth transition into the tunnel environment
Take inspiration from and draw reference to the natural and built features of the surrounding area including the landform, geology, flora and fauna	<ul style="list-style-type: none"> – The form, patterns and colours of the portal reflect the geology of the of the area
Ensure the surface structures at Cammeray are sensitive to the adjacent uses and have a strong visual and spatial relationship with the existing features.	<ul style="list-style-type: none"> – The tunnel portal has been designed as part of a family of structures with the ventilation outlet and buildings, which in turn were designed to respond to the topography and geology, and to the Ernest Street Bridge
Integrate the landscape design seamlessly with the existing vegetation.	<ul style="list-style-type: none"> – The landscape design seamlessly extends the surrounding vegetation

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 4 - Connectivity and legibility	
Enhance the legibility within the tunnel through the sequence of tunnel events that refer to the geographic locations	<ul style="list-style-type: none"> – This objective relates to the tunnel interiors, not the portal. However, the portal announces the entry to the tunnel, is designed as part of the family of structures, and thereby contributes to the overall experience of 'place'
Ensure clear wayfinding through the corridor with the clever use of design elements, viewpoints and signage	<ul style="list-style-type: none"> – As a strong design element, and part of the family of WHT structures, the portal itself contributes to wayfinding and legibility
Provide active transport facilities where feasible and tie them in with existing and future networks and improve links from Cammeray Park	<ul style="list-style-type: none"> – The project increases the legibility and amenity of walking and cycling across the corridor, including on Ernest Street Bridge as an enhanced connection to Cammeray Park. The portal is part of the overall composition
Ensure visual consistency with the cohesive design language and material palette along the corridor	<ul style="list-style-type: none"> – The design of the main tunnel portal and its perforated pattern will be consistent with the panel design for the ventilation building and outlet to provide visual consistency
Objective 5 – Urban renewal and liveability	
Develop open spaces as high-quality urban places accessible for the entire community	<ul style="list-style-type: none"> – The revegetation of the cut and cover structure of the Falcon Street off-ramp creates additional usable space at St. Leonards Park
Utilise public art opportunities and landscape design to enhance the appearance and experience of the place	<ul style="list-style-type: none"> – While the tunnel interior is where the main public art 'events' contribute to the travel experience, the tunnel portals have been designed as part of the overall appearance, for consistency and a sense of place
Ensure the surface structures, including the ventilation buildings and portals, are designed to contribute to the existing character of the surrounding environment and have high visual quality	<ul style="list-style-type: none"> – The tunnel portal design has been developed to work with the design of other project structures, and to respond to and complement the character of the area – Landscape design is utilised to soften the structures and blend it further into the context
Improve street connectivity and provide safe and shaded shared paths tying in with existing routes active transport routes and the broader green network	<ul style="list-style-type: none"> – Ernest Street Bridge is a shaded path that enhances active transport connections
Incorporate Crime Prevention Through Environmental Design (CPTED) principles, particularly passive surveillance and clear, legible connections in the public domain, to increase safety and the perception of safety for people.	<ul style="list-style-type: none"> – Security fence surrounding the perimeter clearly delineate public open space from motorway operational areas

PROJECT PRINCIPLE	KEY DESIGN MOVE
Objective 6 – Living Environments	
Where possible, protect existing vegetation and increase tree cover	<ul style="list-style-type: none"> – Existing trees are protected and additional trees are planted wherever feasible
Promote opportunities for habitat creation	<ul style="list-style-type: none"> – Falcon Street off ramp and Berry Street portal have consolidated areas of new vegetation that will provide habitat
Incorporate Water Sensitive Urban Design (WSUD) principles to reduce reliance on reticulated water supply, for example through re-use of stormwater and plant selection of drought-resistant species	<ul style="list-style-type: none"> – Low water use plants, and shade trees to reduce the urban heat island effect, passive irrigation through manipulation of topography are all integrated into the design
Incorporate appropriate built form and site planning to ensure minimum building footprint.	<ul style="list-style-type: none"> – The portal design has been refined and streamlined, along with all buildings on the project, through extensive design reviews to minimise their footprint for the functions they serve
Replace and restore the affected landscape.	<ul style="list-style-type: none"> – Replacement vegetation utilising native plants has been maximised within the site constraints
Objective 7 – Sustainability	
Maximise planting opportunities adjacent to the corridor and within service compounds	<ul style="list-style-type: none"> – Replacement vegetation utilising native plants has been maximised within the site constraints, including utilities, maintenance and access
Use robust, durable materials that contain recycled content and that are recyclable at the end of life	<ul style="list-style-type: none"> – There are no recycled materials in the portal, however material was selected for long life / durability and low maintenance
Consider the whole life cycle of materials when selecting them, in support of a circular economy	<ul style="list-style-type: none"> – Finish to the portal of anodised rather than powercoated aluminium was selected to reduced the embodied carbon in the structure
Provide active transport links across the corridor	<ul style="list-style-type: none"> – The portal is part of the wider project that enhances walking and cycling across the corridor via the Ernest Street Bridge
Implement strategies and measures aimed at reducing the impact of the urban heat island effect	<ul style="list-style-type: none"> – Maximising tree canopy, use of larger tree stock adjacent to hardstand areas for quicker growth and coverage

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