

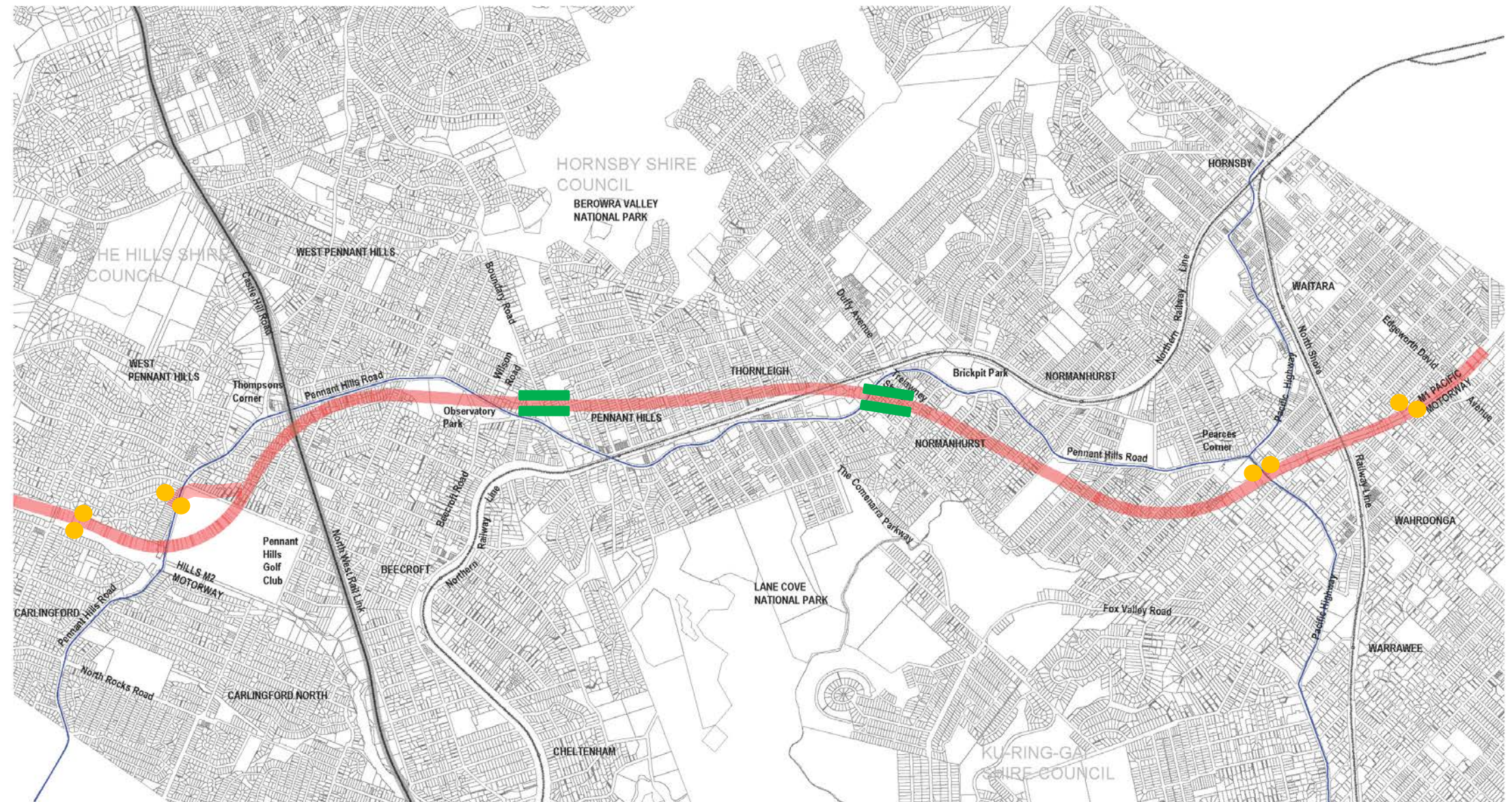
7.0 Lighting Concept

7.1 Introduction

The lighting concept has been developed to support objectives of the overall project narrative. These include:

- Enhancing the opportunity to create identity;
- Providing potential to supporting orientation along the route; and
- Establishing a positive image for the project as an asset for the community.

The NorthConnex would be illuminated to appropriate standards to ensure driver safety and wayfinding. Additional lighting would be provided that addresses the intangible objectives of the project.



LEGEND

- NorthConnex
- Existing Major Roads - Pennant Hills Road / Pacific Highway
- North West Rail Link Proposed Railway
- Existing Northern Railway Line & North Shore Railway Line

0 250 500 750 1000 1250m
SCALE 1:25000@A3

Tunnel Narrative – Lighting Concept

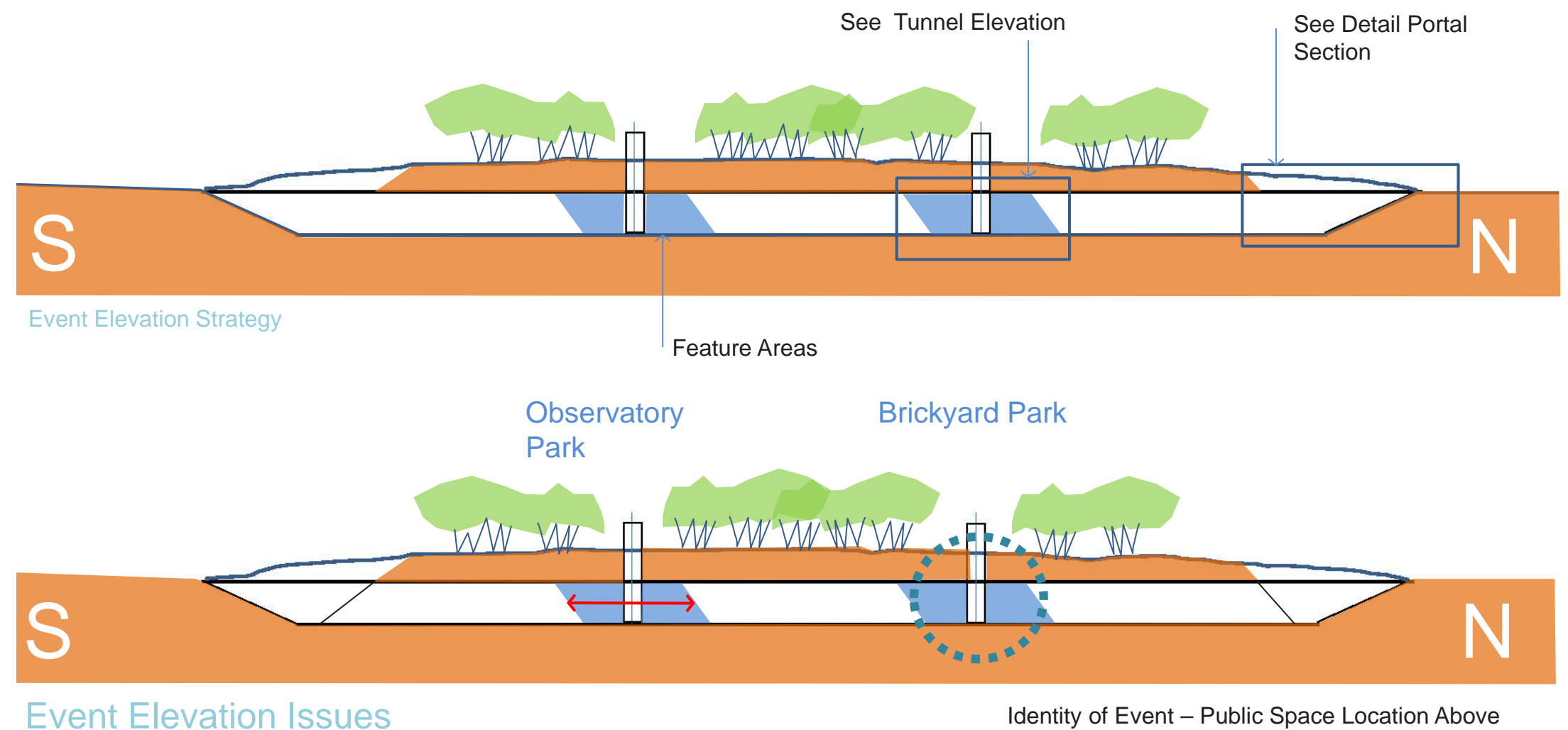
- Standard Lighting – Full Length of Tunnel
- Feature Lighting – Underside of Portal Cowl– 8 Locations
- Feature Lighting – Duration of Event Panels on Tunnel Interior – 4 Locations - 2 Sides Each

M1-M2-5000-DR-UD-0601
TUNNEL NARRATIVE – LIGHTING CONCEPT

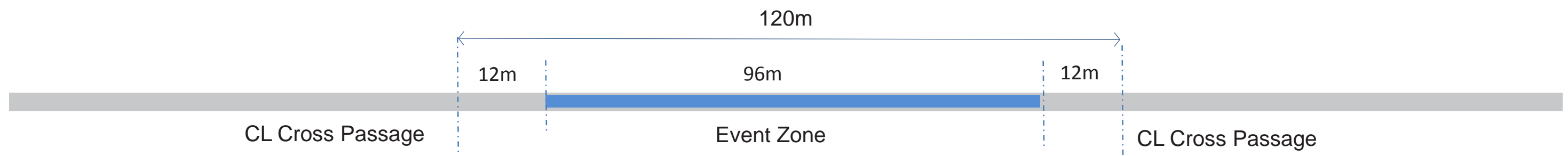
7.0 Lighting Concept

7.2 Tunnel Concept

The Tunnel would have standard lighting along its full length. Special lighting would be provided for the 'Event Panels' at Observatory Park and Brickpit Park. This would provide a relief to standard lighting adding visual appeal to these points and supporting the overall narrative of creating a sense of orientation and progress along the journey. The duration of this lighting effect would be approximately 4 seconds at 80kph travel speed. This would occur at four locations in the tunnel interior.



7.0 Lighting Concept

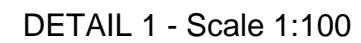


Tunnel Longitudinal Diagram

Tunnel Narrative – Event Concept

- Colour to be Selected to Meet Reflective Criteria
- Standard Panels to 3500 Above Roadway
- Black painted Area Above Panels
- 96M Long Special Panel Zone Special Panel Zone aligned on Both Sides of Roadway
- Specialised Tunnel Panels to be Coordinated with Cross Passages at 120m OC

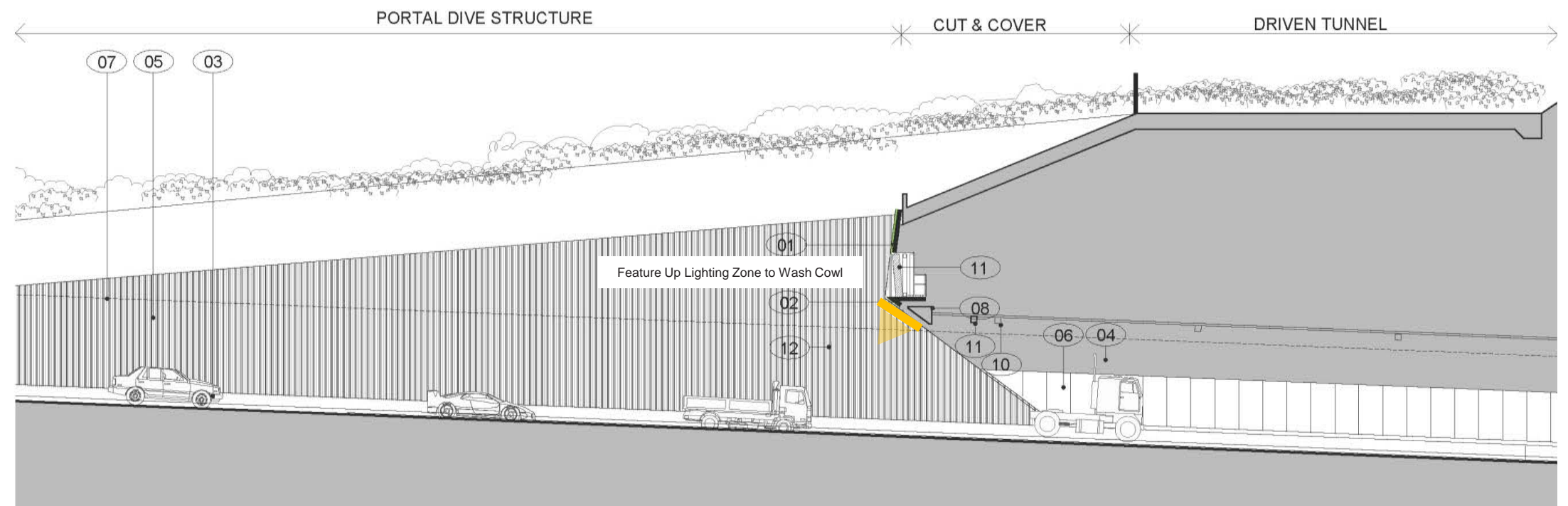
M1-M2-5000-DR-UD-0603
LIGHTING EVENT



7.0 Lighting Concept

7.3 Portal Concept

Each portal would have special lighting illuminating the portal face wall. This would be provided on the underside of the cowl, visible only to drivers to highlight entry and exit points. This would occur at eight locations in the project.



M1-M2-5000-DR-UD-0605
PORTAL LIGHTING CONCEPT

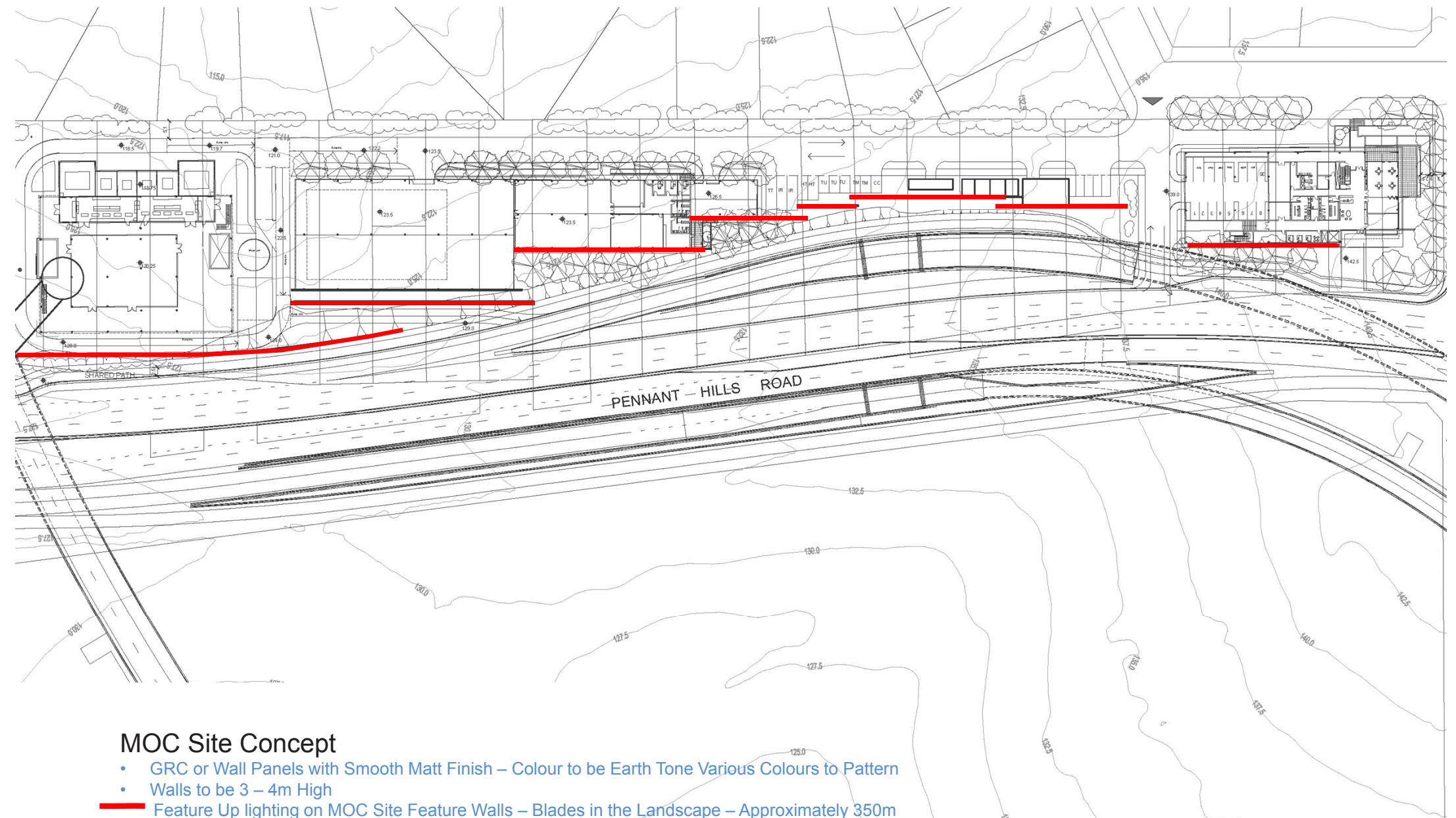
7.0 Lighting Concept

7.4 Motorway Operations Complex Lighting Concept

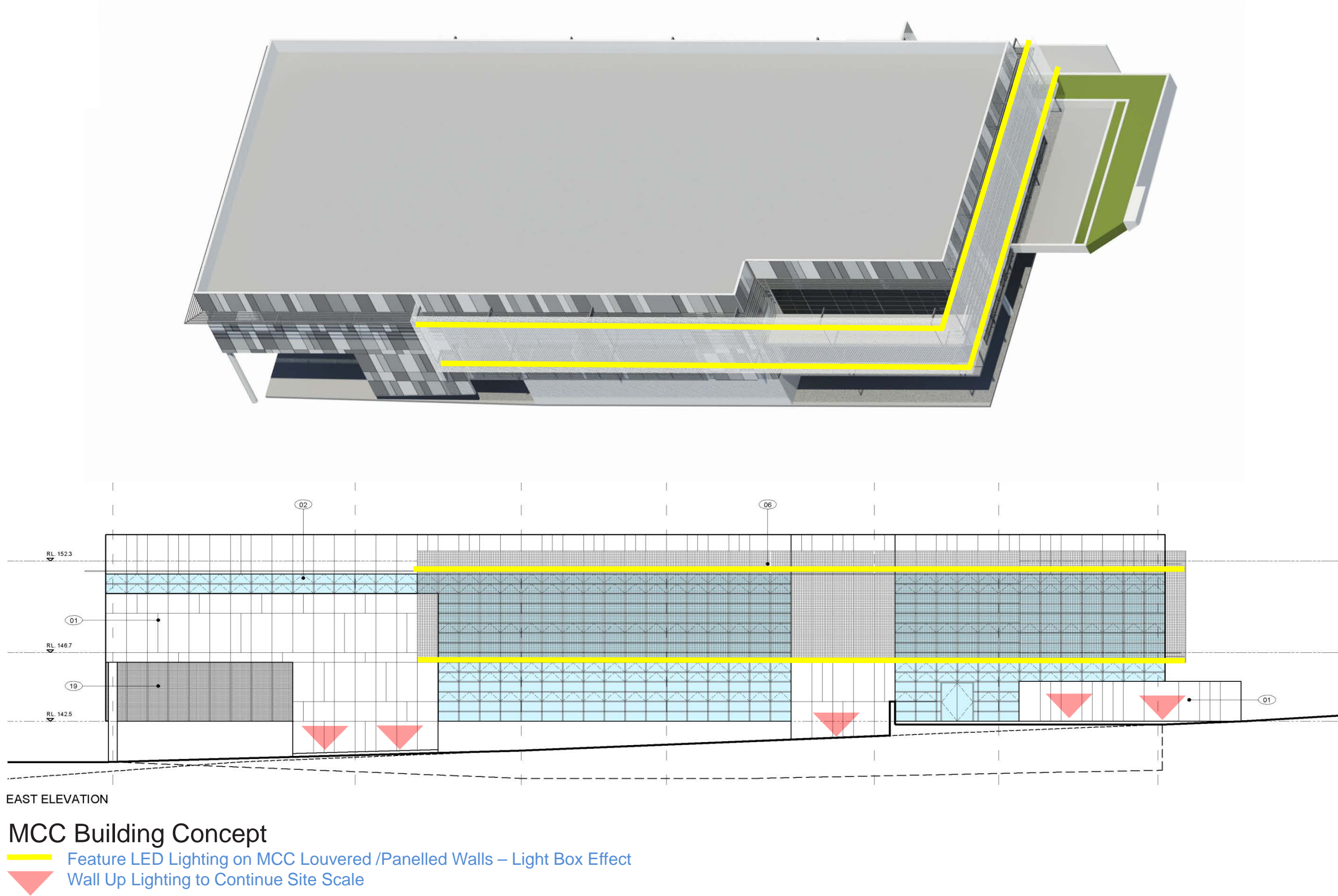
The motorway operations complex site is highly visible to drivers and adjacent neighbourhood. Key view points are from the north along Pennant Hills Road and from the south crossing the Hills M2 Motorway travelling northbound. At each of these corners there is a major structure; the MCC itself in the north and the vent building assembly in the south. Between these two structures there is a series of lower structures that make up the remainder of the required facilities on the motorway operations complex site. Due to the shape of the site and position of the facilities there is fairly continuous built form edge to Pennant Hills Road.

This built form edge has been expressed as a series of blades in the landscape that traverse the falling landform providing a variously scaled pattern of light and dark panels. The lighting concept capitalises on these elements to highlight the patterning and landform expression of the facilities. The intention is to create an expression that can be appreciated both at the scale of the motorway and at the speed of passing drivers.

The major facilities at each end provide punctuation with further illumination to wash the solar screens. At the highly visible corners these elements become markers for the NorthConnex in the metropolitan area.



M1-M2-5000-DR-UD-0606
MOTORWAY OPERATIONS COMPLEX - LIGHTING CONCEPT



8.0 Landscape Design

8.1 Introduction

The landscape experience along the Pennant Hills Road corridor is characterised by an undulating high canopy of indigenous Blue Gum High Forest and Sydney Turpentine Ironbark Forest. High canopies provide a backdrop to the setting of the suburban gardens.

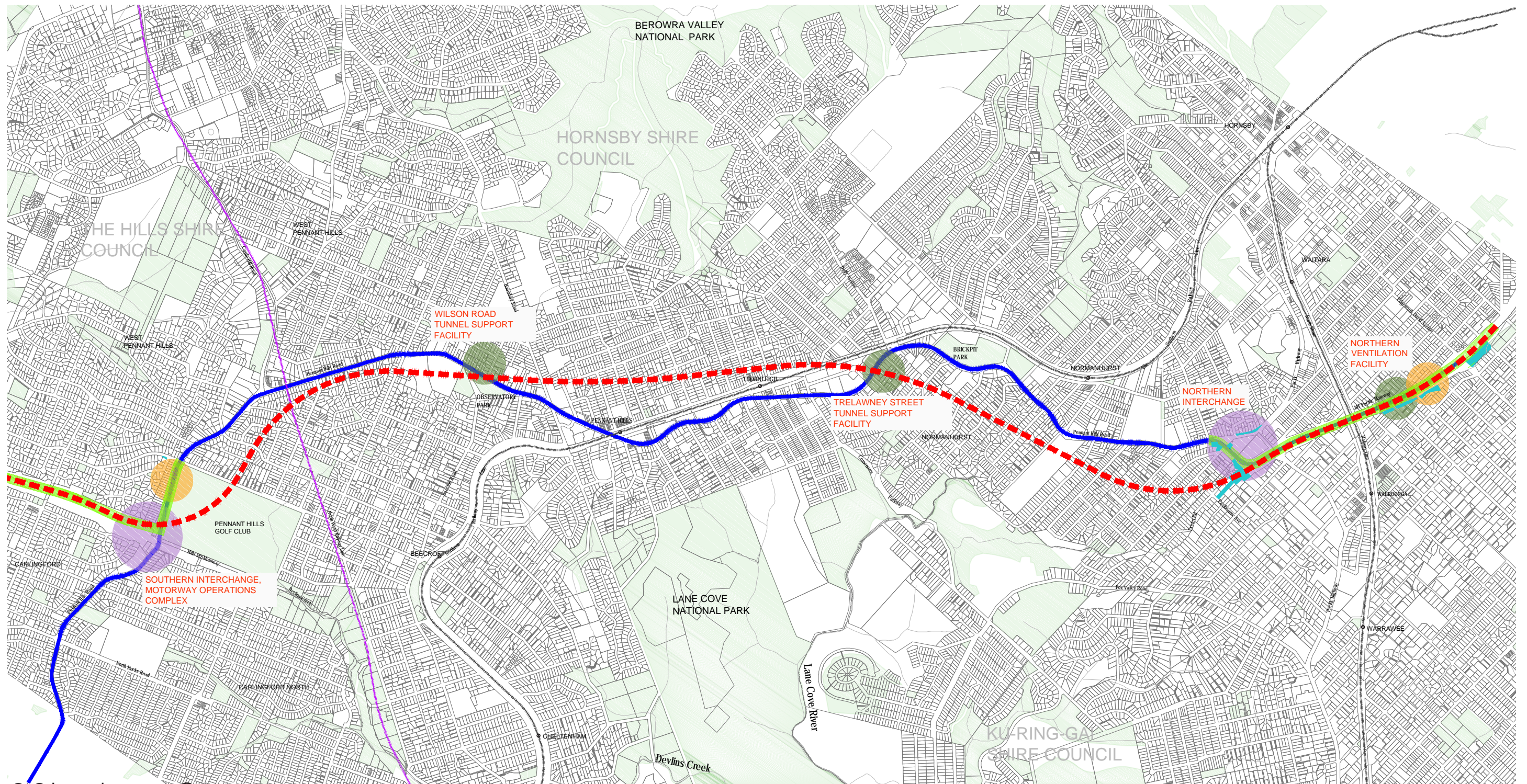
The landscape design for the project would seek to replicate and maintain the existing parkway character of the corridor with an emphasis on revegetating the Blue Gum High Forest and Sydney Turpentine Ironbark Forest communities, endemic to the area.

Vision

‘The landscape setting of Pennant Hills Road has a suburban parkway character, with native and deciduous street trees, remnant stands of Indigenous Blackbutts and landscaped front gardens.’

The landscape proposal would replicate and enhance the verdant character of the suburb’

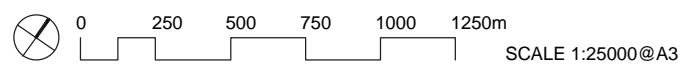




8.2 Landscape Context

LEGEND

- NorthConnex
- Existing Major Roads - Pennant Hills Road / Pacific Highway
- North West Rail Link Proposed Railway
- Existing Northern Railway Line and North Shore Railway Line



LANDSCAPE STRATEGY

- Existing Open Space
- Portal Landscape
- Interchange Landscape
- Ancillary Facilities Landscape
- Corridor Landscape
- Replacement Landscape

M1-M2-5000-DR-UD-0701
LANDSCAPE STRATEGY

8.0 Landscape Design

8.3 Landscape Principles

Landscape interventions would occur at interchanges, ventilation and smoke extraction sites, disturbed areas to be reinstated following construction works and portals.

The following landscape principles would be applied to landscape works:

Endemic Forest

- Reinstatement of indigenous vegetation (Blue Gum High Forest and Sydney Turpentine - Ironbark Forest communities);
- Maximise the extent of retained vegetation wherever possible.



Existing Sydney Blue Gum High Forest at Observatory Park

Habitat

- Extend habitats and wildlife corridors where possible.



Existing wildlife

Community

- Integrate associated built structures into the surrounding setting;
- Provide vegetative screening of residences, structures and built elements.



Suburban parkway setting of the existing Pennant Hills Road corridor.

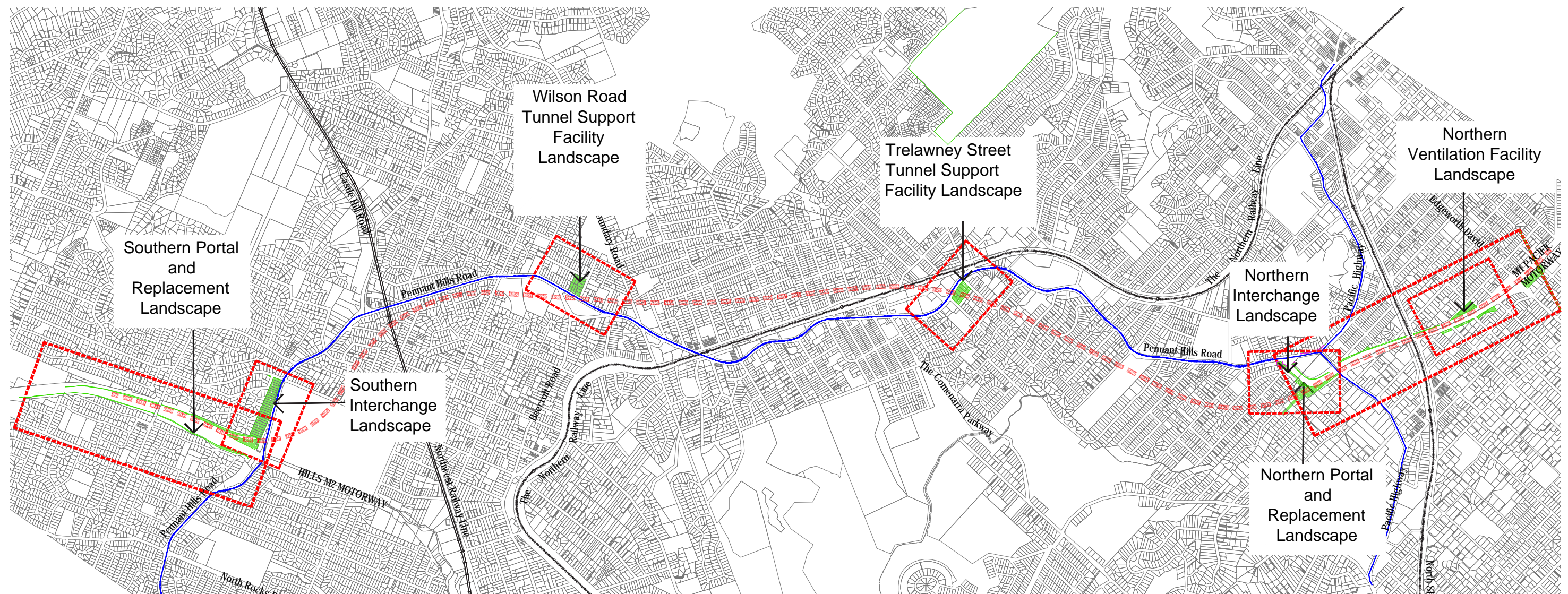
Sustainability

- Create a low maintenance, robust landscape that incorporates ecological best practice wherever possible;
- Ensure the landscape is responsive to sight lines and safety.



Use of drought tolerant, low maintenance plant species.

8.0 Landscape Design



Interchange Landscape Typical Treatment:

- Formalised landscape;
- Signature planting of native and exotics;
- Integrate buildings into suburban context with street tree planting;
- Screen planting to adjacent properties;
- Robust low maintenance; and
- Incorporate the use of WSUD principles within the landscape design.

Ventilation Landscape Typical Treatment:

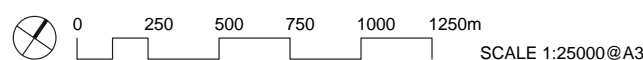
- Naturalistic revegetated landscape;
- Screening to adjacent properties;
- Robust, low maintenance;
- Frangible planting at vent access areas; and
- Retention of existing trees where possible

Replacement Landscape Typical Treatment:

- Site specific treatments to integrate with existing streetscapes and settings;
- Planting to include street tree planting; or
- Re-vegetation depending on site.

Portal Landscape Typical Treatment:

- Continuation of naturalistic planting using native species;
- Blend earthworks with surrounding topography;
- Screen drains and benches;
- Frangible planting of low shrubs and grasses; and
- Adhere to safety and sight line requirements.



8.0 Landscape Design

8.4 Planting Design Principles

Plants may be established using either:

- Hydromulching;
- Planting of viro-tube plant stock;
- Planting of forestry-tube plant stock;
- Planting of mature plant stock (5 litre to 75 litre plants); and
- Mature specimens.

Setbacks and Planting Zones

Hydromulch - uses a standard seed mix of cover crop and frangible and non-frangible mixes and is applied to all disturbed areas including, but not limited to, the road edge, median, cut batters, fill batters and basins.

The seed mix is designed to provide speedy plant establishment to control topsoil runoff (the cover crop) and long term plant cover.

Road edge mowing strip – the road edge mowing strip is a two metre wide strip of frangible grass mix applied using hydromulch. This occurs at the outer road edge and at the median road edge at certain points along the alignment. The width of the strip requires only one pass of a standard tractor mounted slashing/mowing device.

Safety setback zone (SSZ) – that area at the road edge where only frangible plants may occur. Where no safety barrier is provided at the road edges the SSZ is 11 metres back from the road edge. If a safety barrier is provided, the SSZ is nine metres back from the road edge.

Primary Planting Zone (PPZ) – that area beyond the SSZ where frangible and non-frangible plants occur.

Canopy trees are scattered within this area to better visually integrate the road edge landscape with the surrounding landscape, as required.

Typical planting zones – no major batter

No major batter (typically where cut/fill is less than five metres)
Hydromulch all disturbed areas (road edge, batter and four metres construction access).

Seed and/or plant frangible plant species in the frangible and non-frangible areas. Seed and/or plant non-frangible plant species beyond the SSZ.

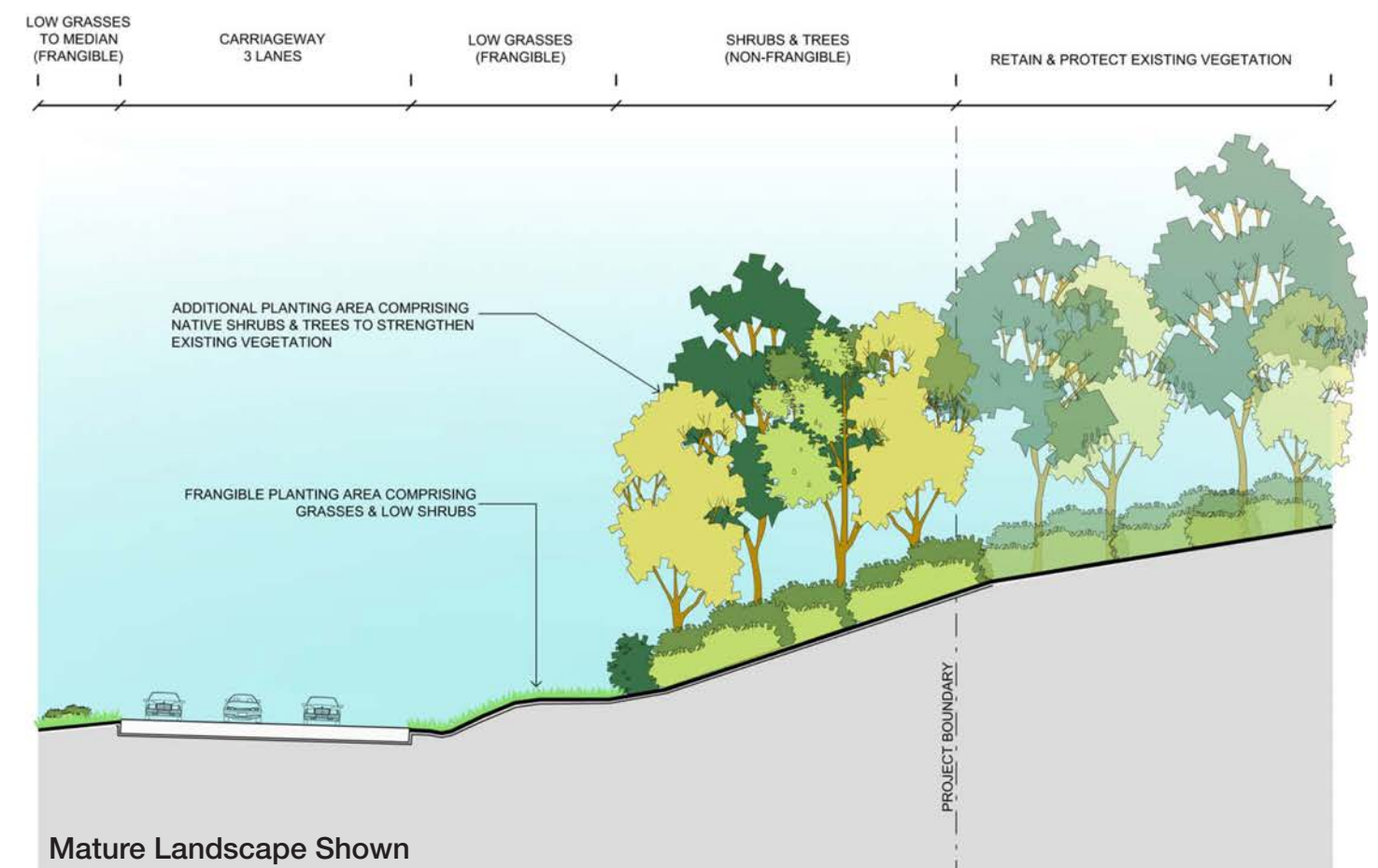
Typical planting zones major fill batter and typical planting zones major cut batter

Major fill batter (typically greater than five metres) Hydromulch all disturbed areas (road edge, batter and four metres construction access way). Seed and/or plant frangible plant species in the frangible and non-frangible areas.

Seed and/or plant non-frangible plant species beyond the SSZ including the base of the fill batter.

Major cut batters (typically greater than five metres) Hydromulch all disturbed areas (road edge, batter and four metres construction access way).

Seed and/or plant frangible plant species in the frangible and non-frangible areas. Seed and/or plant non-frangible plant species beyond the top of the cut batter, which can be further back from the road edge than the SSZ.



0 2.5 5 7.5 10 12.5m
SCALE 1:250@A3

M1-M2-5000-DR-UD-0703
TYPICAL PLANTING SECTION

8.0 Landscape Design

8.5 Existing Vegetation Protection

Preservation of existing vegetation incorporating threatened species, strategy and principles

By minimising the clearing of existing vegetation as a result of the road upgrade, the overall environmental impact of the proposed works would be reduced by:

- Ensuring the survival and enhancement of flora communities,in particular the existing Sydney Blue Gum and Sydney Turpentine Ironbark forest communities;
- Maintaining the biodiversity, habitat potential and protecting and enhancing the riparian ecosystem’
- Maintaining and improving soil stability and salinity levels;
- Contributing to water quality;
- Decreasing dissemination of weed species, while increasing the dissemination of native species;
- Enhancing the visual quality and landscape character; and
- Maintaining established landscape views for road users.

8.6 Threatened Species Strategy

Design Philosophy

To minimise the impact of the alignment on threatened and other significant plant species/communities and ensure successful rehabilitation.

Principles

Where possible, mulch, seeds and plant material, including threatened plant species, shall be collected prior to clearings from within and adjacent to the alignment.

Strategy	Implementation
Conduct pre-clearing survey of native vegetation.	Undertake a survey, prior to final route design, to locate the positions of threatened flora species within, or close to, the road footprint.
Where possible and practicable, translocate threatened species to areas not affected by the road-works prior to the commencement of clearing.	Monitor and maintain threatened species following translocation.
Protect threatened species retained within the road corridor during the construction period.	<div>Manage construction activities to prevent the loss of existing vegetation.</div> <div>Install approved tree protection fencing around individual plants, as well as larger areas of vegetation.</div> <div>Include a ‘buffer’ zone of sufficient distance to mitigate loss.</div> <div>Avoid any stockpiling of materials, parking of vehicles, or other unnecessary disturbance beneath vegetation and trees to be retained.</div> <div>Manage construction activities to prevent discharge of waste or contaminants into existing vegetation.</div>
Educate contractors on tree protection during construction.	No machinery or personnel is permitted outside the construction buffer without the approval of the Transurban Project Manager.
Rehabilitation and regeneration programs for threatened vegetation communities in the vicinity of the route alignment to enhance the quality and quantity of these communities in the locality.	Provide rehabilitation and regeneration programs as appropriate.