

# Urban Design and Landscape Plan

North East Link Eastern Freeway Upgrades – Burke Road to Tram Road



## Attachment 5 Southern Interface Zone

# Introduction



## About the Southern Interface Zone

The Eastern Freeway Upgrades will connect to the new 6.5 kilometre North East Link Tunnels (NEL Tunnels) at a new interchange in Bulleen.

The interchange area is called the Southern Interface Zone (SIZ). The SIZ also includes a section of Eastern Freeway Upgrades in Bulleen and Balwyn North, new and upgraded noise walls, walking and cycling paths and improvements to Koonung Creek Reserve. Figure 1 on the next page shows the SIZ area.

To demonstrate how the SIZ will work, the design was exhibited in the NEL Tunnels UDLP in May 2022, updated in response to submissions received and approved by the Minister for Planning in February 2023.

The SIZ will now be built as part of the Eastern Freeway Upgrades – Burke Road to Tram Road.

## About this attachment

Attachment 5 – Southern Interface Zone transfers all existing and approved content and

design detail for the SIZ from the NEL Tunnels UDLP to the Eastern Freeway Upgrades – Burke Road to Tram Road UDLP (this UDLP).

This includes relevant pages from the NEL Tunnels UDLP Report and the Architecture and Urban Design, Landscape Design and Urban Design Overshadowing Assessment attachments.

The transfer brings all approved design and content for the Eastern Freeway Upgrades – Burke Road to Tram Road together into one single UDLP.

Content in Attachment 5 for areas outside the SIZ is not applicable to the Eastern Freeway Upgrades – Burke Road to Tram Road UDLP.

## Updates to the Southern Interface Zone

This UDLP includes five design developments within the SIZ which have evolved through further work since the NEL Tunnels UDLP was approved in February 2023 by the Minister for Planning.

These design developments are detailed in section 4.1.3 of this UDLP. They were exhibited for

comment with the Eastern Freeway Upgrades – Burke Road to Tram Road UDLP in October 2023, and supersede the designs and content for these same five items in this Attachment 5.

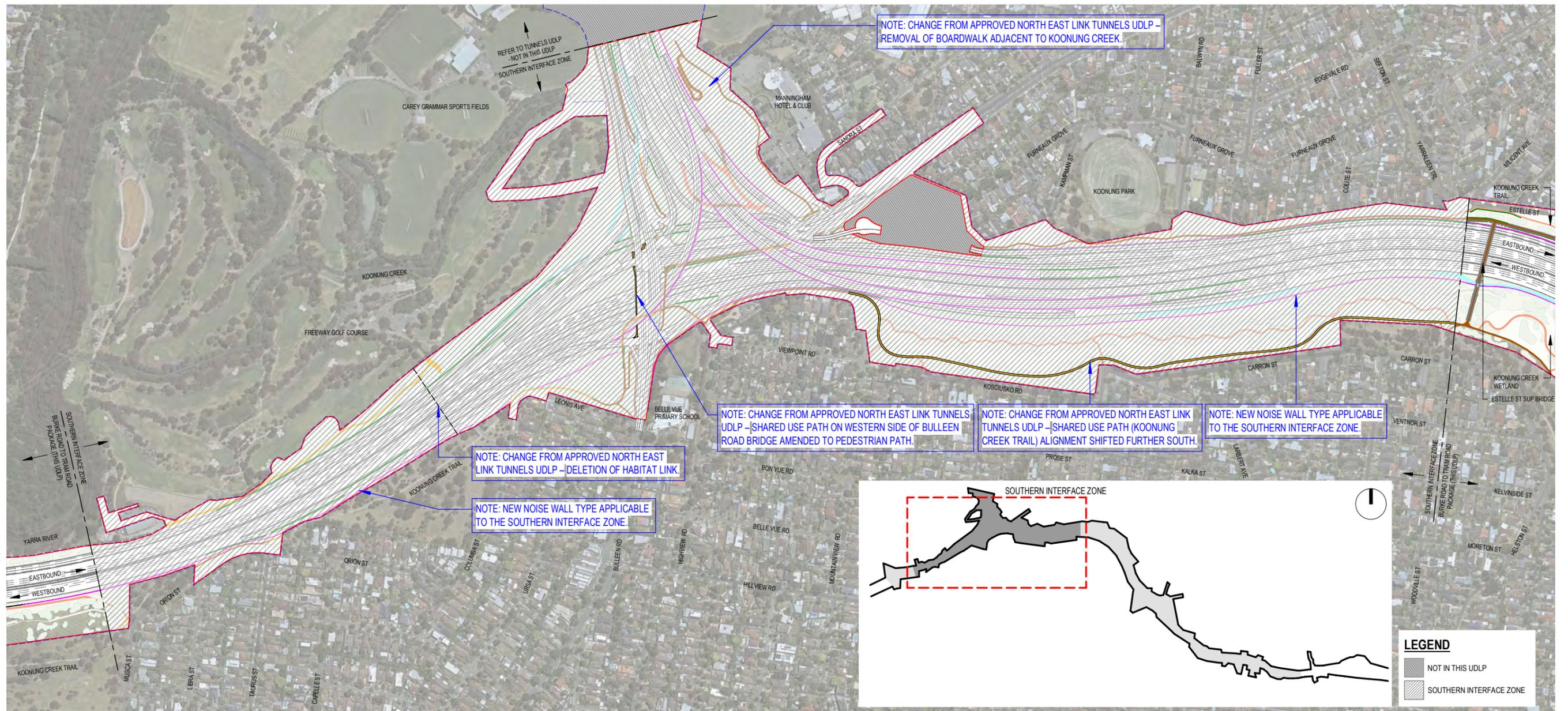
All other details within the SIZ remain as per the content in Attachment 5.

The five updated design items within the SIZ are listed below.

**Table 1 – Design development in the Southern Interface Zone (superseding specific scope formerly approved)**

#	Scope	Design development	Location
1	Delete	Deletion of habitat corridor across the Eastern Freeway	Habitat corridor located across the Eastern Freeway, west of the existing Columba Street bridge providing access into Freeway Golf Course.
2	Delete	Deletion of boardwalk adjacent to Koonung Creek	Wetlands located to the east of Bulleen Road and north of Thompsons Road.
3	Vary or realign	Change of path type on western side of Bulleen Road bridge from shared user path to pedestrian path	Path located on western side of Bulleen Road bridge over the Eastern Freeway.
4	Vary or realign	Reconfiguration of shared user paths within Koonung Creek Reserve	Northern section of the Koonung Creek Reserve, located to the south of the Eastern Freeway.
5	New	Noise wall material type	Southern Interface Zone

# Figure 1 – Southern Interface Zone



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Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

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## UDLP Attachments .....

(separate document)

Attachment 1: Architecture & Urban Design

Attachment 2: Landscape Design

Attachment 3: Urban Design Visualisations  
(Artistic renderings and images as shown are indicative only and do not form part of UDLP endorsement.)

Attachment 4: Urban Design Overshadowing Assessment

## Revision

Issue	Date	Reason for Issue
01	11/05/22	Public Exhibition
02	23/06/22	For Review
03	10/08/22	For Review
04	01/09/22	For Review
05	12/10/22	For Review
06	14/10/22	For Review

Approved SIZ content  
and design detail from  
NEL Tunnels UDLP  
has been TRANSFERRED  
to this UDLP.

## 4.3 Scope of Works and Design Intent

## 4.0 Project Description and Design Response

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

### 4.3.4 Southern Interface Zone (Eastern Freeway)

The Southern Interface Zone is outlined in Figure 79. Key items are labelled in this Figure and a brief description is provided below. Refer to the UDLP Attachments for further details regarding the scope of works.

#### Shared Use Path (SUP)

- New and upgraded SUPs.

#### Landscaping

- General road alignment landscaping
- General adjoining streets interface areas
- Recreational facilities (Koonung Creek Reserve Wetlands, Koonung Creek Reserve Water Sensitive Urban Design Features).

#### Flood Walls

- To the areas around the Southern Portal.

#### Noise Walls

- Road alignments
- Eastern Freeway Overpass Ramps.

#### Gantries and Tolling Systems

- General tolling and gantries systems across the Project.

#### Axicom Tower

- The Axicom Tower has been located west of the Manningham Club in close proximity to Thompsons Road.

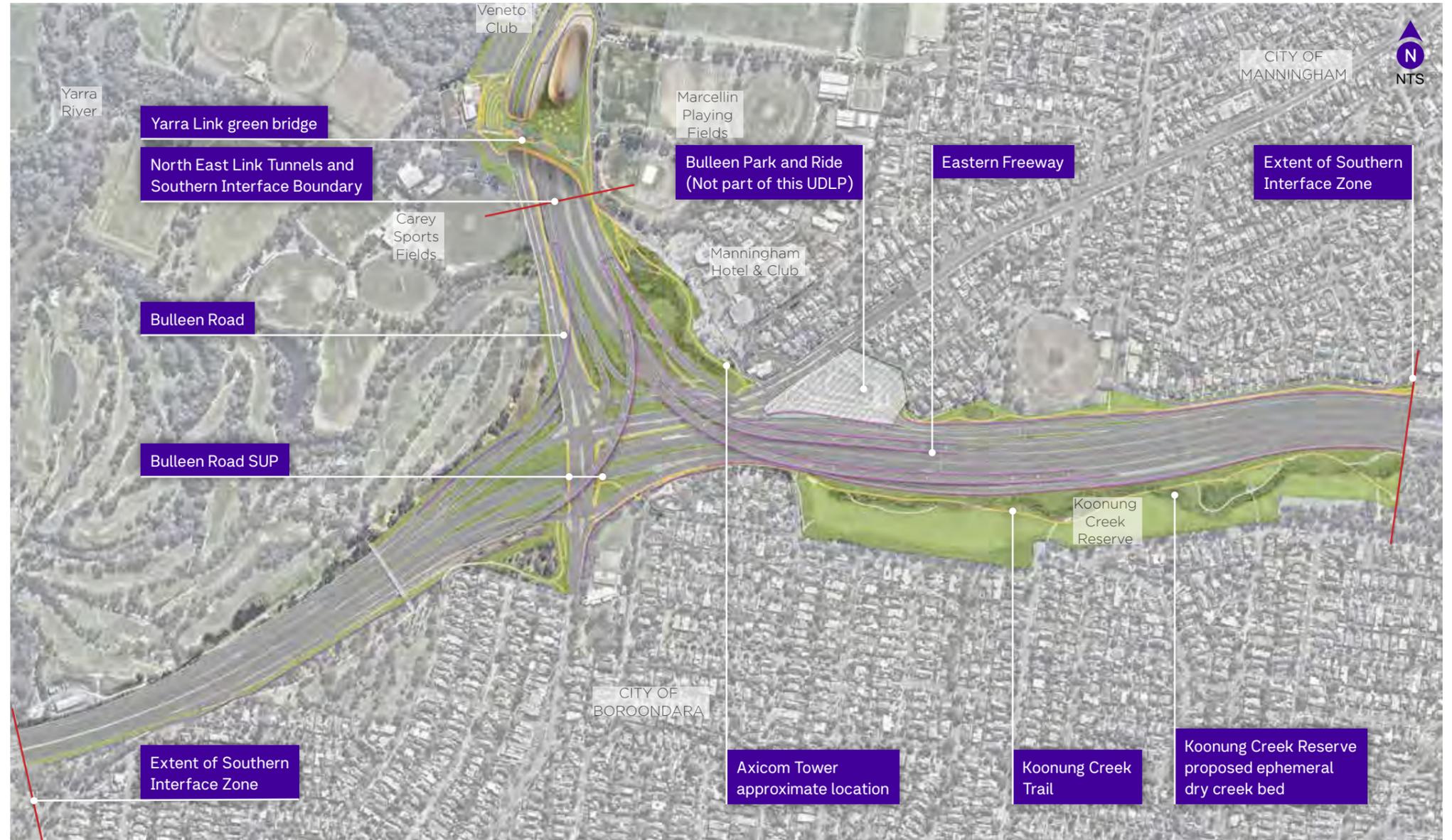


Figure 79: Indicative render: Southern Interface Zone

Note: The map outlines some of the key Project elements as a reference only and the reader should refer to Attachments 1-2 for further Project details.

## 4.0 Project Description and Design Response

Approved SIZ content  
and design detail from  
NEL Tunnels UDLP  
has been TRANSFERRED  
to this UDLP.

### Southern Interface Zone

The Southern Interface Zone has a number of key design moves supported by a considered urban and landscape design approach. The following outlines a series of Project highlights:

#### SUP connections

- The SUP connectivity is provided through to Bulleen Road via the eastern and western SUPs on either side of the Yarra Link green bridge
- The western SUP runs from Bulleen Road under the Yarra Link green bridge and on the Eastern side of Bulleen Road
- The eastern SUP provides a link from the Yarra Link green bridge down to Trinity and Marcellin College and through to the Eastern Freeway
- The new design includes a SUP bridge parallel with the existing Bulleen Road bridge.

#### Landscaping

- The reimagined parkland setting enhances tree canopy cover, while navigating the topography to capture the natural characteristics of the site to manage overland flows
- Flood mitigation strategies have been adopted while supporting improved biodiversity and a clearly defined habitat corridor
- New urban amenity is supported through SUP connections and community benefit through a well-proportioned recreational space enhanced through high level design quality.

#### Underpasses

- New underpasses have been provided south of the Bulleen Road bridge providing direct SUP connectivity.

#### Axicom Tower

The Axicom Tower has been located west of the Manningham Club in close proximity to Thompsons Road and in a location that meets technical requirements resulting in a position deemed to minimise impact on the local community.



Figure 80: Indicative render: South of the Eastern Freeway showing the Koonung Creek Reserve area



**NORTH  
EAST LINK**  
PROGRAM

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and design detail from  
NEL Tunnels UDLP  
has been TRANSFERRED  
to this UDLP.



# 5.0 Consistency with Urban Design Strategy

### Introduction

The UDS for NEL was approved by the Minister for Planning on 23 March 2020. The purpose of the strategy is to establish the expectation of the Victorian Government for the design outcomes to be achieved by the Project, specifically:

- Establish and communicate the urban design requirements for the Project
- Ensure proposals are developed with integrated urban design solutions
- Provide the framework for a performance-based assessment of Urban Design and Landscape Plans.

The UDS drives:

- Urban design excellence to benefit the wider transport network, its users and the communities and places that North East Link passes through
- Positive outcomes that minimise negative impacts of the Project
- Integration of high-quality urban design with effective technical solutions
- Collaborative, multi-disciplinary, integrated design thinking for all elements of the Project with an urban design-led process.

The UDS has a four-tier structure as follows:

1. **Corridor-wide requirements** – set out a corridor-wide design approach across the Project, and includes principles, objectives and key directions
2. **Place-specific requirements** – guide design development within three distinct character areas so that existing landscape and natural features influence design
3. **Detailed requirements and benchmarks** – relate to specific Project elements and inform the minimum standard of the design quality expected for North East Link
4. **Urban Design Framework Plans** – set out design and development priorities relating to five key locations, to guide detailed design and ensure that landscape and visual impacts on these sensitive areas are minimised.

This Section of the UDLP introduces the relevant sections of the UDS consistency of the design and these are the sub-sections in which they are addressed:

- 5.1 Corridor-wide Requirements – Urban Design Principles and Objectives
- 5.2 Corridor-wide Requirements – Key Directions
- 5.3 Corridor-wide Requirements – Character Area Overview
  - 5.3.1 Ridgeline area
  - 5.3.2 Yarra River Valley area
  - 5.3.3 Koonung Creek Valley area.

The design responses should be read in conjunction with the design documents in attachments listed below and the UDS.

**Attachment 1:** Architecture & Urban Design

**Attachment 2:** Landscape Design

**Attachment 3:** Urban Design Visualisations

(Artistic renderings and images as shown are indicative only and do not form part of UDLP endorsement.)

**Attachment 4:** Urban Design Overshadowing Assessment

Approved SIZ content  
and design detail from  
NEL Tunnels UDLP  
has been TRANSFERRED  
to this UDLP.

# 5.1 Corridor-wide Requirements – Urban Design Principles and Objectives

# 5.0 Consistency with Urban Design Strategy

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

## 5.1 Corridor-wide Requirements - Urban Design Principles and Objectives

### Introduction

This section of the UDLP demonstrates compliance against section 3.1 of the UDS—Urban design principles and objectives. The following information in this section outlines the design’s overall compliance to each of the UDS principles which is then followed by compliance against each specific criteria in table form.

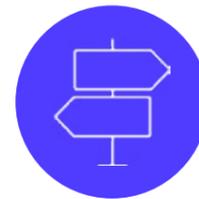
The NEL approvals framework was based on an EES Reference Design that envisaged design changes when contractors were appointed. The key approvals, UDS and EMF, are performance based to ensure design changes are assessed and result in appropriate outcomes. There was not a detailed Urban Design solution at EES stage but rather a ‘performance based’ UDS.

The UDS sets out corridor-wide requirements in the form of eight principles, objectives, and key design directions to inform the design process to ensure good design outcomes. Those principles are:



#### Principle 1 – Identity:

A well-defined identity and sense of place add to people’s experience and understanding of a place.



#### Principle 2 – Connectivity and Wayfinding:

Well-connected and legible networks and places contribute to strong economies and healthy, inclusive communities.



#### Principle 3 – Urban Integration:

Well integrated infrastructure provides a sound framework for successful cities and places.



#### Principle 4 – Resilience and Sustainability:

Infrastructure must be sustainable, enduring and resilient to support current and future generations.



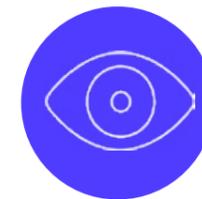
#### Principle 5 – Amenity:

High quality urban amenity afforded by well-designed infrastructure contributes to successful, equitable and prosperous communities.



#### Principle 6 – Vibrancy:

Vibrant communities are places where people want to visit, experience or live.



#### Principle 7 – Safety:

Safe environments are essential for strong, connected and liveable communities.



#### Principle 8 – Accessibility:

Highly accessible and inclusive environments encourage positive activation and are vital to community wellbeing, inclusion and health.

These principles are complemented by objectives and key design directions. Table 3 provides an assessment of the consistency of the UDLP for the North East Tunnels Project with the principles and objectives of the UDS.

Refer to Section 4.4.2 for a high level non exhaustive list of design standards.

## 5.0 Consistency with Urban Design Strategy

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.



Figure 81: Indicative render: Motorway Control Centre (MCC)



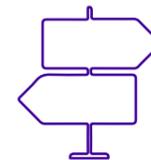
Figure 82: Indicative render: Yarra Link green bridge and Southern Portal



### Principle 1 Identity

The design objective is to amplify a sense of place and Connection to Country through a nuanced urban design response that respects local character, Cares for Country, and recognises the immense cultural and environmental capital of north-east Melbourne. Urban design decisions that enhance identity through NEL examples include:

- Preserving community identity through reducing the extent of physical works and visual impacts of the road infrastructure with landscaping
- Fostering local identity through context responsive, visually appealing design of bridges, buildings, landscaping and signage
- Improving the environmental, social and cultural agency of Melbourne's iconic asset, the Yarra River (Birrarung)
- Acknowledging Wurundjeri Woi-wurrung Country as the land which NEL stretches over and beneath through meaningful engagement and urban design outcomes
- Maximising the potential of the Manningham Road interchange surrounds
- Portals as tunnel entries into Wurundjeri Woi-wurrung Country, expressing physical and cultural contexts through landscape and colour
- Improved pedestrian and cycling connectivity through to the Heide Museum of Modern Art as well as wayfinding and storytelling nodes in the precinct linking into the precinct cultural gateway
- Heidelberg School Artists Trail.



### Principle 2 Connectivity & Wayfinding

At NEL, wayfinding is easy and intuitive for motorists, cyclists and pedestrians. Our coordinated approach to wayfinding will improve Connection to Country, reduces reliance on signage, and supports well connected, legible networks that deliver long lasting benefits.

Examples include:

- Suggested markers for nodes and navigational moments throughout NEL to connect people to Country and one another e.g. Yarra Link green bridge
- An active transport network elevating user experience and connecting into broader networks e.g. Eastern Bicycle Corridor
- Tunnel portals as episodic markers and expressions of threshold through colour, light and texture for a rich motorist experience that will provide a location reference point for users
- Integrated wayfinding that connects adjacent Council and community networks for accessible walking and cycling
- Wayfinding along SUPs and at playgrounds that shares knowledge of Country
- New SUP bridges providing a simpler more direct route for users
- The wayfinding and storytelling design will be developed during the design development phase and will capture design items such as key destinations, trail names, places of interest and cultural storytelling, and adopt suitable local council design and logos where deemed suitable. Consultation with key stakeholders such as the councils, VicRoads and the Heide Museum of Modern Art will be undertaken during the formation of the wayfinding design.

## 5.0 Consistency with Urban Design Strategy

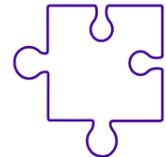
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Figure 83: Indicative render: Yarra Link green bridge view from Marcellin College sports fields



Figure 84: Indicative render: Greensborough Road boulevard



### Principle 3

## Urban Integration

The urban design solution stitches communities together with extensive new and upgraded cross-corridor connections that improve lives and community throughout north-east Melbourne. The urban design responds to transport and land-use integration strategies identified by local government and community.

Examples include:

- Integrated engineering, architectural, landscape and urban design solutions that ensure better outcomes for people and neighbourhoods e.g. a longer tunnel and shorter trench
- A new land bridge that connects communities
- Road infrastructure that touches the earth lightly or is underground to minimise impacts on community e.g. all ancillary buildings and MCC

- Consolidated service buildings and submerging of MCC and Ventilation Structure buildings into the integrated landscape to free up space for parklands, habitat and people (Caring for Country)
- Minimising visual bulk of all new noise walls, buildings and multi-span bridges
- Maximising new land use opportunities at Manningham Road interchange to create ready to develop sites for possible future uses.



### Principle 4

## Resilience & Sustainability

The design provides a resilient and sustainable design outcome. The design includes embedded sustainability initiatives, whole of life analysis, durable materials selection and maintenance considerations.

The site-specific urban design solution creates high-quality built, natural and cultural amenity to create enduring public and environmental benefit.

Examples include:

- Use 100% renewable energy for electricity used to construct the central tunnelling package and at least 50% for other NEL packages of work
- Maximise harvest and reuse of rainwater
- GBCA Green Star 5 Star Design and As Built Rating for the NEL Motorway Control Centre and any occupied permanent buildings (excluding the Alternate Motorway Control Centre)

- Incorporation of solar photovoltaic (PV) panels are incorporated along the alignment, including anti-throw barriers and ventilation outlets, to provide renewable energy to power NEL assets
- Incorporation of wetlands and bio-retention basins to overland flow areas
- Consideration of maintenance and access requirements within the design approach to ensure functionality, design qualities and appearance is able to meet community expectations
- Specification of high quality materials to ensure the materials are long lasting and maintain appearance.

## 5.0 Consistency with Urban Design Strategy

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Figure 86: Indicative render: Recreational amenity in Borlase Reserve



Figure 85: Indicative render: The Southern Ventilation Structure reimagines a typically utilitarian structure with greater sense of place, identity and culture

### Principle 5 Amenity

The site-specific urban design solution creates high-quality built, natural and cultural amenity to create enduring public and environmental benefit.

Examples include:

- New outdoor recreation facilities such as playgrounds, fitness stations and Borlase Adventure Play at Lower Plenty Road
- Minimising impacts of road infrastructure on adjacent communities by comprehensive buffer planting that filters views
- Reimagining existing roadways with more trees, planting and pedestrian and cycling pathways e.g., Greensborough Road boulevard

- Holistic and coherent landscape responses that positively impact communities and landscape across the entire corridor e.g. connecting the Koonung Creek Trail to the Yarra Main Trail, and Banyule Trail and habitat
- Creating engaging journeys by tunnel, trench, roadway, foot or cycle with thoughtful application of urban design principles that prioritise people and place
- Cultural Landscape Precinct to bring people together to engage with Wurundjeri Woi-wurrung culture.

### Principle 6 Vibrancy

The urban design solution fosters community, supports active lifestyles and amplifies a vibrant and evolving north-east Melbourne.

Examples include:

- Improving local neighbourhoods with new pocket parks, fitness stations, playgrounds and pathways to encourage diverse social interaction, vibrant communities and support public transport
- The Southern Ventilation Structure responds to themes of Wurundjeri Woi-wurrung cosmology and modern astronomy with night lights transforming this vibrant place-maker into a starry night sky

- Treatment and lighting through buildings and walls responding to movements of car, cyclist and pedestrian to bring vibrancy to the urban environment
- A site offering future opportunity for a cultural precinct to bring people together to engage with Wurundjeri Woi-wurrung culture
- Various parkland character areas offering a choice for users.

# 5.0 Consistency with Urban Design Strategy

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Figure 87: Indicative render: SUPs are separated from roads along Greensborough Road boulevard to create safe cyclist and pedestrian journeys



Figure 88: Indicative render: SUP connectivity throughout the Project

## Principle 7 Safety

The urban design promotes safe, inclusive and liveable neighbourhoods through north-east Melbourne. Examples in NEL include:

- Separating cyclists wherever possible from roadways e.g. Greensborough Road boulevard
- Preferring four metre wide SUPs to provide generous and safer cycling and pedestrian journeys
- Planning of optimal locations for wayfinding measures, such as colour and noise wall treatments, to avoid distractions and create safer motorist journeys

- Integrating public safety barriers on land bridge to create safe and visually appealing architecture
- Thoughtful design features such as lighting, flaring, colour and barriers to create safe and attractive urban environments
- Carefully considered sightlines and passive surveillance in parks and along SUPs to ensure environments are inviting and accessible to all community members.

## Principle 8 Accessibility

The design has prioritised Universal Access principles, balancing regulatory requirements with the need to create vibrant civic space and architecture accessible to all. Examples in NEL include:

- Prioritising 20-minute neighbourhoods that offer convenient and pleasant access to schools, shops and community services

- Encouraging active transport through an extensive network of new and renewed SUPs connecting seamlessly with surrounding networks such as Eastern Bicycle Corridor, Greensborough Bypass Trail, Yarra Main Trail and Banyule Trail
- Including accessible play equipment through all playgrounds.

# 5.0 Consistency with Urban Design Strategy

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## 5.1.2 This table provides a compliance response to each of the relevant UDS design principles and objectives.

Table 3: Consistency with the Urban Design Principles and Objectives

The following table provides an urban design response to the 8 key principles as listed in Section 3.1 of the UDS.

UDS-Principle Objective	UDS-Urban Design Outcome	Response
<b>Principle 1</b>	<b>IDENTITY</b>	<b>A well-defined identity and sense of place add to people's experience and understanding of a place</b>
<b>Objective 1.1</b>	<b>Sense of place</b>	<p>Protect, maintain and enhance the identity of local places, and respectfully represent Indigenous and non-Indigenous cultural values. This includes appropriate consideration of local community facilities, the natural environment, European and Indigenous history, and cultural places such as the Bolin Bolin Billabong, Yarra Bend Park, and Heide Museum of Modern Art.</p> <p>The design protects, maintains and enhances the identity of local places and respectfully represents Indigenous and non Indigenous cultural values in the following manner:</p> <ul style="list-style-type: none"> <li>The entire design strategy has prioritised the specificity of Country and the characteristics of local places and contexts. Cultural values will be embedded and revealed through cultural interpretation, narrative and wayfinding strategies, thus celebrating the layers of history and memory of place including the established cultural precinct and landscape corridor which runs parallel to the Yarra River (Birrarung)</li> <li>The tunnel portals incorporate an embedded Indigenous narrative that reflects the ground into which they are cut. The colours of the structure and cladding will reflect the geomorphology of the surrounding area representing a connection to the country through which the tunnel travels. At night the proposed feature lighting represents the embers of the campfires of the traditional owner gathering places. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i></li> <li>The organic Ventilation Structure form and cladding reflects an abstracted idea of an eel trap that was significant to the Wurundjeri Woi-wurrung in their hunting and gathering of food. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>The colours of the bridge elements, retaining walls and noise walls will reflect the geomorphology of the surrounding area representing a connection to the country through which the road travels. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i></li> <li>The Yarra Link green bridge provides the physical, visual and habitat connectivity between the Koonung Creek and the Birrarung. Subject to cultural approval and authority from Wurundjeri Woi-wurrung, it provides an interpretative landscape, and open-space pedagogical journey that can highlight the cultural significance of the adjacent Bolin Bolin Billabong. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i></li> <li>The wayfinding design will incorporate both Indigenous and European history storytelling that is relevant to the various project areas as well as nearby cultural places such as Bolin Bolin, Yarra Bend Park and the Heide Museum of Modern Art.</li> </ul> <p>Further work will be undertaken with precinct stakeholders including Heide Museum of Modern Art in developing and refining the design of the project elements to reflect the European and Indigenous (Wurundjeri Woi-wurrung) artistic, cultural and historical narratives.</p>
<b>Objective 1.2</b>	<b>Recognise the Yarra River (Birrarung)</b>	<p>Provide a design that respects and promotes the Yarra River (Birrarung) and its environs which encompass its tributaries, wetlands, billabongs, native vegetation and parklands such as Banyule Flats, and seek opportunities to celebrate this iconic Melbourne asset and ceremonial meeting place for the benefit of Traditional Owners and the general public.</p> <p>The design has focussed heavily on seeking outcomes that showcase, improve, and are inspired by the Birrarung. Strategies include daylighting tributaries, managing overland flows through creation of retarding basins, ensuring hydrological expertise informs decision, while incorporating strategies to improve water quality (WSUD-Water Sensitive Urban Design). Deference to the Yarra River (Birrarung), through liaison with Wurundjeri Woi-wurrung Traditional Owners, Elders &amp; Knowledge Keepers, particularly in seeking their insights and feedback in how the Cultural Landscape Precinct and other significant landscape settings, are embraced within the design thinking.</p> <p>The proposed Cultural Landscape Precinct near the Manningham Road interchange will provide a significant cultural space for gathering, ceremonies as well as WSUD features such as bioretention basins and wetlands.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 1.3	Landscape & visual amenity	<p>Sensitively enhance landscape and visual outcomes and reduce physical and visual impacts associated with the Project.</p> <p>The landscape design draws from the overall design pillars and design principles to create a landscape setting that prioritises indigenous vegetation species in naturalised settings to reflect the context of the surrounding areas and in doing so the landscape strategy is multi-layered. Examples include:</p> <ul style="list-style-type: none"> <li>The daylighting of waterways and tributaries improves the physical settings creating new habitat corridor linkages</li> <li>The multi-layered planting strategy, whilst reflecting the indigenous planting palette, is structured to provide visual screening of infrastructure buildings through positioning of larger shrubs and canopy trees. Lower storey indigenous grasses and groundcovers frame view corridors to and through public open space areas, providing physical and visual access to the habitat corridors</li> <li>Key pathways and SUP alignments provide safe and accessible routes for the public into and through the open space areas</li> <li>Expansive planting of canopy trees will provide shade and amenity to pedestrians and cyclists whilst increasing habitat for avifauna as well as visual screening of roadway infrastructure for surrounding residents</li> <li>The built form has endeavoured to reduce the urban footprint by under grounding building areas where possible such as substations and plant rooms</li> <li>Ventilation Structures have been nested within the landscape</li> <li>Screen planting has been used to soften the visual built form</li> <li>The earth mounding proposed around the Ventilation Structures, tunnel portals and the Motorway Control Centre seek to embed these structures within an indigenous planted landscape setting, reducing both their physical and visual impact</li> <li>The design of the Yarra Link green bridge provides the physical, visual and habitat connectivity between the Koonung Creek and the Birrarung. It provides an expanded landscape and open space area that will reduce the visual impact of the Southern Portal and Ventilation Structure as well as providing a new SUP connection across the Bulleen Road corridor removing that physical barrier.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

# 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 1.4	Existing landscape character	<p>Provide a high quality design outcome that responds sensitively to the distinctive character of this part of Melbourne, takes advantage of existing landmarks and vegetation, views and significant places, protects landscape and vegetation, and seeks to enhance the way in which people experience and interact with the landscape.</p> <p>The overall design outcome responds to the landscape and geomorphological context of the wider area. The 3 key landscape character settings of the Ridgeline, Yarra River Valley and the Koonung Creek Valley precincts are reflected in not only the planting species palette but in the urban design and architectural response.</p> <p>The landscape design and urban design strategy draws from the established design pillars and design principles, formulating a design approach in responding to each of the character areas as outlined below:</p> <ul style="list-style-type: none"> <li>The Ridgeline area of the north is characterised through the indigenous species palette of canopy trees and understorey species. These open space areas provide linkages with other disparate parcels to expand the habitat corridor within the precinct. The naturalised landform design within the open space areas reflects the slopes and gullies of the ridgeline precinct enabling the daylighted Banyule Creek corridor to sit within a naturalised setting allowing for Indigenous cultural references to be realised and interpreted</li> <li>The Yarra River Valley precinct reflects the more riparian nature of the environment through species selection and land forming to reflect the meandering nature of the wider river delta with implementation of a naturalised ox bow wetland or billabong as both a key environmental element, water management element and Indigenous cultural opportunity for representation, interpretation and cultural engagement with the wider community. This area transforms and rehabilitates a previous commercial land use back to a naturalised parkland area providing open space connections, expansion of habitat and Indigenous cultural engagement. The precinct also expands the open space connections and habitat corridor via the Yarra Link green bridge at the Southern interchange to carry the riparian habitat and context over Bulleen Road to link with the Koonung Creek Valley area environment</li> <li>The Koonung Creek Valley area environment is then enhanced through the implementation of indigenous plant species and creation of naturalised water management systems. These elements provide further amenity and cultural connection for the existing open space areas, linking them to the wider landscape context</li> <li>The design takes advantage of the existing Bolin Bolin Billabong landmark area by providing a connection through to the proposed Cultural Landscape Precinct and thus further enhancing the Indigenous aspects of the region. The cultural precinct landscaping will also respond sensitively to the adjoining landscaping spaces by protecting the areas of the interface to Bolin Bolin Billabong as well as the no go zone as shown on the landscaping areas along the Yarra River (Birrarung)</li> <li>The Yarra Link green bridge will provide views to the surrounding and provide an ongoing landmark for the area</li> <li>The landmark Heide Museum of Modern Art will be celebrated by incorporating suitable messaging within the proposed wayfinding solution</li> <li>Existing pedestrian and cycling trails are landmarks for the community and the design enhancing that experience by providing additional connectivity throughout the Project.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p> <p>Refer to: Sections 5.3.1, 5.3.2, 5.3.3 of this UDLP Report.</p>

# 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 1.5	Architectural contribution	<p>Make a positive architectural contribution to infrastructure including bridges, noise walls and other structures.</p> <p>The design will make a positive architectural contribution to infrastructure including land, SUP and road bridges, noise walls and other structures. An integrated design approach has been developed throughout the Project which includes embedded Indigenous themes and the material finishes are sympathetic to the Project’s environment and through scale, texture and finish provides a harmonious urban design outcome.</p> <p>Examples include:</p> <p><b>Bridges</b></p> <p>The design team aligns the heavy engineering elements of bridges with the overarching urban design vision for the Project. Continuous free-flowing structural forms and piers for elevated structures form part of a collective family of chamfered piers within the Project. Curved alignments are achieved through curved steel box girder bridge deck structures or segmented precast concrete bridge deck structures.</p> <p>The development of the bridge elements ensures seamless integration with surrounding landscapes. Barriers have been conceived as linking elements to topography and landscape character at either end of the spans. Bridge barriers serve as connecting elements to the corridor character.</p> <p>While the materiality and finish of spanning elements and piers will remain largely consistent across the Project, bridge barriers, through the use of form, and colour, give visual wayfinding clues for motorists.</p> <p>Bridge barriers are designed as unifying elements connecting Country at landing positions. Tapered forms ensure continuous smooth lines reduce visual clutter. Bridge barriers integrate and unify structural elements of the bridge with other functional requirements including drainage to ensure an overall uncluttered appearance.</p> <p>Pier and column structures are designed using chamfered profiles to promote strongly shadowed forms, recognising that these structures will be viewed at speed. Pier positions and span lengths minimise the overall height and extent of elevated structures in selected locations to minimise visual impacts.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i></p> <p><b>Land Bridge</b></p> <p>The design solution increases the length of the tunnel to reduce severance of landscape and communities and Yarra Link green bridge design improves east-west connectivity over Bulleen Road.</p> <p>At Bulleen, the land bridge extends over the Southern Portal and Bulleen Road to help connect the ecological habitat of the Koonung Creek Valley area corridor over NEL to reconnect with the creek on the other side. This highly vegetated land bridge creates a green landscape link between the Yarra River recreational reserves and the schools and communities to the east.</p> <p>The Land bridge is a visually appealing landmark and careful consideration of lighting and surface treatment ensures a legible, safe and engaging motorist journey under the bridge.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p> <p><b>Noise walls, fencing, barriers and screens</b></p> <p>Noise walls will be experienced at a variety of speeds and scales throughout the Project and proposes a series of designs appropriate for each condition and location. Developed in consultation with Wurundjeri Woi-wurrung, using a variety of forms, patterns, and colours, these road components are designed as identifiable elements responding to their context. They provide sense of place and identity to their locations. The visual language aims to complement Melbourne’s greater freeway network and not detract from or compete with existing and new structures. The design has taken an innovative approach to on-site power generation, integrating photovoltaic cladding on barriers and noise walls where possible, to generate power for some of the tunnel energy demands.</p> <p>Walls, fencing, barriers and screens have been designed to relate to their specific context.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p>The design has reduced visual bulk where possible and allowed for landscaping through into the freeway environment. In some instances, walls are angled and offset away from the road, punctuating the motorist journey with attractive moments of landscape, Connection to Country and the scale and visual bulk of walls, fencing, barriers and screens has been minimised.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
		<p>Barriers on the land bridge are angled outwards to provide a sense of openness and improve user experience for pedestrian and cyclists, tilted towards the landscape to visually reduce their height. Noise walls and retaining walls are embedded in landscape where possible, reducing their perceived bulk.</p> <p>Using acrylic as an alternative clear material allows for solar and visual permeability, resulting in reduced overshadowing on neighbourhoods and parklands. Public safety barriers (PSB), privacy screens and anti-throw screens are designed and detailed to integrate with the landscape to create opportunities to celebrate landscape through curated visual connections.</p> <p><b>SUP bridges</b></p> <p>SUP bridges have the capacity to connect both physical and cultural landscapes. They carve new pathways through neighbourhoods and open up new connections between people.</p> <p>The SUP bridge designs are balanced and materially efficient; it touches the ground lightly and uses only what is needed. The organic tapering form and texture is informed by Indigenous themes and naming conventions will be confirmed in consultation with the relevant stakeholders.</p> <ul style="list-style-type: none"> <li>• An inviting entry affords good visibility to surrounding path networks. Alignment responds to and follows desire lines to support community pathways</li> <li>• Safety is prioritised by maximising clear site lines. Barriers are high transparency to ensure passive surveillance</li> <li>• Overlooking and overshadowing has been minimised by design via incorporation of privacy screens and a light touch approach with respect to structural bulk, landscaping via planting screenings and the SUP bridge alignment to minimise impacts on adjoining sensitive areas such as pier positions minimising impact to the site's ecology</li> <li>• Through efficiency of structural design, a respectful material use considers ongoing maintainability and full life cycle costs</li> <li>• Minimum universal access requirements are exceeded. Through minimising gradients we have designed landings to provide a better experience for cyclists and pedestrians</li> <li>• The SUP bridges alignment makes the most of scenic views with wide SUP bridge decks allowing space for stopping and viewing. The structural identity of the bridge is expressed, recognising that it will also be viewed at speed by motorists</li> <li>• Integrated lighting in the bridge structure expresses form and encourages night time use</li> <li>• Indicative family of SUP bridges reflecting the design intent Corridor Wide Application The design and engineering of new walking and cycling bridges is one of the best illustrations of the CWD approach to the three core pillars – Connection to Country, Caring for Country, and Connecting People</li> <li>• These SUP bridges will also connect people across geographical boundaries. As unique structural identities responding to context, our bridges are episodic markers with shared steel structure and elegant form; self-anchored to touch the earth lightly</li> <li>• Recognising that the walking and cycling bridges of NEL are sited on Aboriginal land, use of unique names in Wurundjeri Woi-wurrung, mindful of the requisite processes of permission and engagement that will be required.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084, 0138 &amp; 0139 (Iuk and Bulleen Road SUP bridge).</i></p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i></p> <p><b>Gantries</b></p> <p>The design has developed a family of gantries that provide visual continuity across the Project while ensuring a visually uncluttered environment. The simple rectangular form of all gantries, finished in mid-grey, ensures these elements remain recessive and do not detract from a visual Connection to Country.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
		<p><b>Materials and finishes</b></p> <p>The design amplifies and celebrates the unique features of the road corridor through landscape experiences expressed in colour, form and rhythm. The material palette provides a diverse, considered and vibrant expression of urban realm at NEL.</p> <p>Functional, durable and sustainable materials are selected to ensure an enduring, high quality finish to the built elements of NEL. Materials and colour palettes are responsive to the variety of scales of perception and well integrated to their location along the freeway corridor.</p> <p>The design's chromatic approach is an orchestrated composition where a combination of textures and colours ties all road components into a coherent, unified language. Elements that are not physically connected, such as bridges and buildings, engage in a dialogue between each other through the anticipated sequence through which they are viewed.</p> <p>The design's choice of colour for NEL is rooted in cultural significance. The colour palette uses the Munsell Chart, a colour system that describes soil pigmentation and measures colours of archaeological artefacts. Hues, value, and chroma for the various design elements at NEL have been inspired by the colour palette of the natural local landscape and the Wurundjeri Woi-wurrung colour identity through paintings, rituals and artefacts.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<b>Principle 2</b>	<b>CONNECTIVITY &amp; WAYFINDING</b>	<b>Well connected and legible networks and places contribute to strong economies and healthy, inclusive communities</b>
<b>Objective 2.1</b>	<b>Connectivity</b>	<p>Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.</p> <p>The design will improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists in the following manner:</p> <ul style="list-style-type: none"> <li>The nature of the road alignments provides for expanded active transport connections along the corridor linking key users nodes and transport interchanges</li> <li>The north-south SUP linkages create an active transport corridor for pedestrians and cyclists to link with bus and rail interchanges</li> <li>The north-south active transport corridor is also served by grade separated bridges over major roadways created safe and accessible paths of travel</li> <li>East-west connectivity across the corridor is improved through the increased number of safe signalised intersections and dedicated signalised pedestrian crossing points. These safe and accessible crossings directly link with the north south SUP and active transport corridor to improve overall connectivity for pedestrians and cyclists</li> <li>The tunnel linking the Eastern Freeway to Greensborough Road which reduces road congestion and vehicle travel times</li> <li>The Yarra Link green bridge providing connectivity over Bulleen Road for pedestrian and cyclists</li> <li>The dedicated bus lane along the Eastern Freeway reduces road congestion and travel times.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<b>Objective 2.2</b>	<b>Transport integration</b>	<p>Maximise the benefits of the Project by facilitating seamless access to a variety of public transport, walking and cycling choices as part of a connected intermodal network.</p> <p>The creation of the north-south SUP active transport corridor facilitates safe and accessible access for pedestrians and cyclists to access rail and train services along the corridor.</p> <p>Examples of where the design has provided choices as part of a connected intermodal network:</p> <ul style="list-style-type: none"> <li>The additional pedestrian and cycling paths provided within the design and their connections to the existing surrounding networks</li> <li>Additional signalised crossing points to roadways</li> <li>Additional parkland</li> <li>Additional playgrounds and active and passive recreational areas</li> <li>Additional places for rest and shelter by including seating, shelters, tree canopy coverage and BBQs</li> <li>Public transport options such as the dedicated bus road on the Eastern Freeway, additional bus stops as well as paths and SUP routes to these facilities such as the Bulleen Park and Ride</li> <li>Additional east-west connectivity via the Yarra Link green bridge</li> <li>A more direct access from the Eastern Freeway to Greensborough Road.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 2.3	<b>Legibility &amp; wayfinding</b> Provide a coordinated design that promotes visual connections and wayfinding, reduces reliance on signage and minimises visual clutter and obstructions to key views.	<p>The landscape design and urban design strategy seeks to create an intuitive wayfinding outcome utilising the significant high quality architectural built form elements to sign post the precincts as people journey along the corridor. These elements such as the Ventilation Structures, the feature pedestrian bridges, the landscape precincts and the Yarra Link green bridge create the moments along the journey that allow travellers to intuitively understand where they are.</p> <p>This intuitive wayfinding strategy is then supported by the integration of Indigenous cultural wayfinding elements and then supported through key wayfinding signage.</p> <p>This will minimise the need to obtrusive signage and allow for an integrated suite of elements that form part of the landscape and cultural interpretation setting.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<b>Principle 3</b>	<b>URBAN INTEGRATION</b>	<b>Well integrated infrastructure provides a sound framework for successful cities and places</b>
Objective 3.1	<b>Integration with context</b> Avoid, minimise and mitigate any severance of communities. Provide a well-integrated corridor environment that enhances the street network and takes advantage of opportunities to connect and integrate with the broader commercial, residential and open space functions and environment.	<p>Drawing from Principles 1 and 2 above, the Design strategy integrates the required engineering outcomes with a corridor design that increases the physical access to north-south and east-west cross corridor connectivity elements. This provides increased safe and accessible connectivity to commercial, residential, and open space functions.</p> <p>Incorporated within this design strategy is the increase in habitat corridor and environmental linkages which further enhances the cultural, visual, physical, and accessible corridor connections.</p> <p>Examples of how the Tunnels Package has avoided, minimised and mitigated any severance of communities:</p> <ul style="list-style-type: none"> <li>• The Yarra Link green bridge has provided the east-west pedestrian and cycling connectivity over Bulleen Road</li> <li>• The additional pedestrian and cycling paths has improved connectivity through to the adjoining networks including the SUP bridge over Lower Plenty Road, the SUP bridge over the Eastern Freeway, the north-south connectivity to Manningham road by providing the SUP connectivity from the south through to the existing underpass under Manningham Road</li> <li>• Additional east-west pedestrian crossings to Greensborough Road boulevard</li> <li>• More direct traffic route from the Eastern Freeway through to Greensborough Road thus reducing traffic volumes in the surrounding neighbourhoods</li> <li>• A new service road to Greensborough road which provides a buffer between the properties to the west and Greensborough Road boulevard</li> <li>• A dedicated access road to Trinity and Marcellin College with a signalised intersection and improved pedestrian and cycling connectivity including the Yarra Link green bridge east-west connectivity and reduced traffic on Bulleen Road results in improved access and safety.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 3.2	<b>Integration of design</b> Ensure an integrated engineering, urban design, architectural and landscape architectural approach that sensitively addresses social, cultural, functional and physical aspects of the Project	<p>The collaborative design approach across all design disciplines has driven a fully integrated engineering, urban design, architectural and landscape architectural outcome that sensitively addresses social, cultural, functional and physical aspects of the Project.</p> <p>Examples being:</p> <p><b>Social</b></p> <ul style="list-style-type: none"> <li>The design has included additional parklands and community spaces and pedestrian/cycling paths throughout the Project thus improving the neighbourhood connectivity and amenity</li> <li>Passive and recreational facilities have been provided throughout the Project contributing to a sense of community and improved amenity.</li> </ul> <p><b>Cultural</b></p> <ul style="list-style-type: none"> <li>The design has identified culturally sensitive areas within the Project and responded with a design solution that has been developed in consultation with the Wurundjeri Woi-wurrung</li> <li>The wayfinding design will include multicultural storytelling of the areas history and significance.</li> </ul> <p><b>Functional</b></p> <ul style="list-style-type: none"> <li>The hydrology solution has included wetland areas throughout the Project that contribute to an improved habitat outcome</li> <li>The Ventilation Structures provide a visual navigation node for the road users</li> <li>The structural design of the Yarra Link green bridge is another example of the full integration of the design to ensure a functional yet environmentally significant outcome for the Project</li> <li>The landscape response and integration of built form i.e. MCC and Northern Ventilation Structure / Yarra Link green bridge.</li> </ul> <p><b>Physical</b></p> <ul style="list-style-type: none"> <li>The land forms have been used to provide a sensitive design outcome that sits well within the site context as well as to adjoining interface areas</li> <li>Substations will be buried underground to reduce the visual massing of above-ground structures</li> <li>Landscape screening to reduce the visual massing of structures.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>            Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
Objective 3.3	<b>Strategic alignment</b> Provide an integrated transport infrastructure and land use solution that responds to strategic transport and land use planning for the broader precinct in consultation with local government and authorities.	<p>Benefitting from consultation with local government and authorities, the design provides an integrated transport infrastructure and land use solution that responds to strategic transport and land use planning for the broader precinct. For example, the design has been positively shaped by the following strategic documents:</p> <ul style="list-style-type: none"> <li><i>Plan Melbourne 2017-2050</i> (and 2019 Addendum), which sets out broad transport and land use moves for a growing Melbourne and identifies the key role that the Project will play in contributing to positive transport and employment outcomes. The Project will help connect people to jobs and services and goods to market (Outcomes 1 and 3) and the design of its infrastructure will ensure Melbourne continues to be a distinctive city with quality design (Objective 4). The design also employs a variety of techniques to ensure the sustainability and resilience of the infrastructure and the corridor around it (Outcome 6) (e.g. tree planting, waterway revitalisation, delivery of SUPs)</li> <li><i>Healthy Waterways Strategy 2018-2028</i> – the design has sought to respond to the goals and values within this strategy by ensuring that the waterways and wetlands are enhanced, stormwater is managed appropriately, and re-naturalisation is undertaken where appropriate</li> <li><i>Victorian Cycling Strategy 2018-28</i> – through the delivery of a range of new cycling paths and SUPs, the design is helping to deliver a safer and better-connected cycling network in Melbourne’s north-east. The use of SUPs and paths will help to make a cycling a more inclusive experience for all bicycle users and help to increase participation of underrepresented groups. The SUP network will benefit both commuter cyclists and recreational cyclists, particularly as new paths along the Project corridor link into popular destinations and existing path networks, such as the Main Yarra Trail</li> <li><i>Yarra Strategic Plan (Burndap Birrarung burndap umarkoo) 2022-32</i> – the design of Project infrastructure in proximity to the Yarra River (Birrarung), particularly the Manningham Road interchange, has responded to the objectives of this strategic plan, by seeking to better connect the Yarra River (Birrarung) with other points of interest (including existing and future cultural facilities) and ensuring that the ongoing health of the river (and waterways generally) is a key focus. The delivery of project infrastructure within the Yarra River corridor has sought to celebrate the Yarra and its network of wetlands, and through strong engagement with Wurundjeri Woi-wurrung representatives, ensure that the story of First Peoples’ knowledge and cultural practices is engagingly told.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>            Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
<b>Objective 3.4</b>	<b>Minimise footprint</b> Minimise negative impacts on the community and the environment by minimising the Project footprint and visual bulk, particularly where it intrudes on sensitive land uses including open space and existing vegetated areas.	<p>The design has minimised impacts on the community and environment by optimisation of the design which has resulted in the reduction of the Project footprint.</p> <p>Examples of these initiatives include:</p> <ul style="list-style-type: none"> <li>• Under grounding of buildings which results in greater parkland and reduced built visual bulk. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (Lower Plenty substation)</i></li> <li>• Keeping Ventilation Structures as low as possible which reduces visual bulk. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>• The longer tunnel solution which reduces above-ground impacts such as less above-ground road structures</li> <li>• Consolidating buildings, such as the MCC and services buildings which reduces visual bulk. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC)</i>.</li> </ul> <p>The subsequent project benefits include:</p> <ul style="list-style-type: none"> <li>• Increased open space areas at Borlase Reserve and the Manningham Road interchange Cultural Landscape Precinct</li> <li>• No disturbance to Banksia Park</li> <li>• Increased areas for future redevelopment in Manningham</li> <li>• Increased offsets to roadways along Freeway Golf Course</li> <li>• Improved environmental outcomes such WSUD and additional habitat areas to Borlase Reserve, the Cultural Landscape Precinct and Koonung Creek Reserve which have been incorporated within an integrated landscaping design approach.</li> <li>• Increased landscaping and parklands by approximately 4 hectares over the EES Reference Design.</li> </ul> <p>Refer to: <i>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
<b>Principle 4</b>	<b>RESILIENCE &amp; SUSTAINABILITY</b>	<b>Infrastructure must be sustainable, enduring and resilient to support current and future generations</b>
<b>Objective 4.1</b>	<b>Enduring &amp; durable</b> Provide a design that is enduring and functional for generations to come, is readily maintainable and will age gracefully in concept and detail, ensuring a positive built form legacy.	<p>The Project's urban design concept utilises functional, high-quality, durable materials and sustainable materials, where possible, that are selected to ensure an enduring, high-quality finish to the built elements of NEL. Accessibility, sustainability, community vulnerability rate, and logistics, and maintenance requirements will guide the material selection throughout the Project.</p> <p>The O&amp;M team will review material and equipment selections during the design development phase to factor in maintenance and replacement costs and procedures for the works. The use of durable and quality materials will not only assist in achieving an enduring and durable built form but also the whole of life aspects for the design.</p> <p>Examples of material selection that will contribute to an enduring urban design outcome with practical maintenance considerations that will age gracefully and contribute to a positive built legacy include:</p> <ul style="list-style-type: none"> <li>• Solid aluminium to the Ventilation Structure cladding</li> <li>• Concrete finishes to various urban design forms</li> <li>• Gantry cladding and finish that will enable graffiti management without having to replace panels such as painted low areas where graffiti is most likely to occur</li> <li>• Generally solid built structures as well as miscellaneous items that are susceptible to public access such as handrails, landscaping, furniture</li> <li>• Wayfinding signage that can be replaced readily if needed</li> <li>• Trench and portal cladding that can be replaced and/or cleaned in a relatively simple manner</li> <li>• Tunnel cladding that can be cleaned or replaced relatively easily.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 4.2	<p><b>Resilience &amp; future proofing</b></p> <p>Ensure the infrastructure is able to survive, adapt and perform when subjected to acute stresses and shocks such as changes in climate, technology, future fleets, road use and extreme events.</p>	<p>Examples of how the design has responded to acute stresses and shocks such as changes in climate, technology, future fleets, road use and extreme events include:</p> <ul style="list-style-type: none"> <li>The robustness of the proposed material palette has been designed to ensure a timeless design outcome that can withstand and adapt to future stresses by avoiding the choice of colours that tend to fade and require less maintenance</li> <li>Drought resistant plantings are chosen to ensure adaptability in the face of changing climatic conditions and integrated with landform design to deal with extreme events</li> <li>Flood modelling has included climate change and the design of the Project's flood walls, retention basins and drainage has taken this into account which has influenced the flood wall extent and heights</li> <li>Road and active transport corridors are designed with future capacity and intermodal integration to ensure adaptation to future technological change which includes road demand to 2036</li> <li>The design has investigated opportunities to accommodate for and support the uptake of Connected and Autonomous Vehicles (CAVs). The design has incorporated the capacity and flexibility to accommodate the needs of future transport technologies in our Concept Design, including: <ul style="list-style-type: none"> <li>Greater conduit infrastructure than is required for current technology needs</li> <li>Greater communications capacity than is required for current technology needs (such as CAVs)</li> <li>Accessible gantry structures upon which additional devices and technologies may be mounted and operated with little or no operational disruption</li> <li>A scalable OMCS solution that can evolve and grow to meet future needs (such as CAVs)</li> </ul> </li> <li>The design considers the climate change risk assessment process, which is outlined in the Sustainability Management Plan, addresses "changes in climate" and "extreme events" as outlined in Section 6 of this report-EPR SCC1 <p>Examples being:</p> <ul style="list-style-type: none"> <li>Sustainability design caters for Climate Change impacts through the consideration of long-term risks impacting the asset in its design lifetime (up to 100 years)</li> <li>These risks are identified by the design team teams in both internal design and external stakeholder workshops.</li> <li>The risks identified are ranked for likelihood and severity, using worst case scenario RCP 8.5 projections.</li> <li>Mitigation methods are identified and implemented in the design and operational stage to reduce the risk of climate change.</li> <li>Through this risk assessment process, the Project creates a long-term resilient asset that can better withstand impacts of Climate Change</li> </ul> </li> <li>Potential future utility upgrades have been considered such the significant Melbourne Water asset which is proposed to cross Greensborough Road through to Borlase Reserve. A spatial allowance has been considered in the design.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 4.3	Environmental sustainability	<p>Optimise environmental performance and embed sustainability initiatives into the design response. This includes integrated water management, biodiversity and habitat enhancement and connections, green infrastructure provision and sustainable use of energy and materials.</p> <p>The design strategy embeds environmental performance and outcomes within the overall design approach which includes:</p> <ul style="list-style-type: none"> <li>The water management strategy is fully integrated with the landscape and urban design approach. The daylighting of waterways and tributaries, creation of wetlands and management of flood, contributes to the creation and enhancement of habitat, biodiversity and reflects the cultural importance of these riparian precincts to traditional owners. Examples being the proposed wetlands at Borlase Reserve, the Cultural Landscape Precinct and Koonung Creek Reserve, the daylighting of Banyule Creek and east-west riparian connective via the Yarra Link green bridge as well as habitat corridors extended which includes connections to adjoining landscaping areas such as Bolin Bolin Billabong and subterranean connections under Lower Plenty Road and the Eastern Freeway</li> <li>The expansion of tree canopy coverage and habitat corridors reduces the heat island effect within the surrounding areas reducing energy requirements and we are committed to 'net gain in canopy cover by 2045</li> <li>The use of recycled materials and low embodied energy materials that are simple and robust reduces the energy consumption during production and procurement</li> </ul> <p>Specific targets:</p> <ul style="list-style-type: none"> <li>30% use of recycled materials (excluding recycled asphalt pavement)</li> <li>12% use of recycled asphalt pavement</li> </ul> <ul style="list-style-type: none"> <li>The photovoltaic panels incorporated into the design providing power to the tunnel infrastructure</li> </ul> <p>Approximate Energy Generation:</p> <ul style="list-style-type: none"> <li>1.4 MW Distributed Renewable Energy Generating 1.7 GWh renewable electricity Annually</li> </ul> <p>The approximate areas for the proposed PV cells:</p> <ul style="list-style-type: none"> <li>Southern Ventilation Structure – 3000m2</li> <li>Northern Ventilation Structure – 1325m2</li> <li>MCC – 1220m2</li> <li>Watsonia trench – 1200m2</li> <li>Southern Interface – 6090m2</li> </ul> <ul style="list-style-type: none"> <li>Incorporation of drought resistant plants into the design</li> <li>Incorporation of wetlands along the overland flow paths</li> <li>Maximise harvest and reuse of rainwater, stormwater, wastewater, groundwater and tunnel inflow water through design and construction.</li> <li>Infrastructure Sustainability Design and As Built Rating (v2.1) (Achieve a minimum 50 points for the Program Rating)</li> <li>GBCA Green Star 5 Star Design and As Built Rating for the NEL Motorway Control Centre and any occupied permanent buildings (excluding the Alternate Motorway Control Centre)</li> <li>Specifying a reduced amount of Portland Cement content in concrete across the Project by a minimum of 30% (against Green Building Council of Australia reference mix design levels).</li> </ul> <p>The sustainability team are utilising a number standards and industry best practice guidelines to drive the use of recycled materials in design including:</p> <ul style="list-style-type: none"> <li>Ecologiq Resources and Reference Guides</li> <li>VicRoads TN 107 Use of Recycled Materials in Road Pavements</li> <li>TfNSW Fact Sheets</li> <li>ISC resources and practice Notes</li> <li>GBCA Resources.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 4.4	<p><b>Whole of life</b></p> <p>Ensure the design is appropriate having regard to ongoing maintenance, operations and upkeep; and effective governance arrangements are established to ensure its functionality, design qualities and appearance is able to meet community expectations.</p>	<p>The proposed design outcomes take into consideration aspects of ongoing maintenance, operations, and upkeep. Examples of these design considerations have been provided in the response to Principle 4 - Objective 4.1 Enduring &amp; durable.</p> <p>As part of the design development process the O&amp;M (operations and maintenance) team will provide an analysis on the design solutions and which can include the following considerations:</p> <ul style="list-style-type: none"> <li>• Drought resistant planting</li> <li>• Landscaping maintenance access</li> <li>• Material warranties.</li> <li>• How often will materials need to be replaced</li> <li>• Material maintenance considerations</li> <li>• Material access</li> <li>• Sustainability objectives</li> <li>• Material availability</li> <li>• If specialist contractors are required</li> <li>• General Cost and program implications.</li> </ul> <p>Stakeholder engagement is being undertaken to resolve governance and operational and maintenance requirements and responsibilities between project stakeholders that will be integrated within the design.</p> <p>Effective Governance approach:</p> <ul style="list-style-type: none"> <li>• The design approach will include liaising with the construction and Operations and Maintenance (O&amp;M) team throughout the design process to ensure what has been shown in the UDLP design reflects the design's whole of life requirements which will include material technical requirements, material replacement and maintenance considerations</li> <li>• The design documents will capture the subsequent whole of life requirements for each relevant item</li> <li>• During the design development process the relevant consultants and Operations and Maintenance (O&amp;M) team will review each relevant design package to ensure these aspects have been addressed</li> <li>• The construction team throughout the procurement and construction process will be required to obtain approval from the design team for any potential departures from the design material selections and as part of this analysis the design team will consider aspects such as those listed in this response and will need to be consistent with the UDLP.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
<b>Principle 5</b>	<b>AMENITY</b>	<b>High quality urban amenity afforded by well-designed infrastructure contributes to successful, equitable and prosperous communities</b>
<b>Objective 5.1</b>	<b>Improved amenity</b>	<p>Enhance urban amenity through a highly considered and site-specific response to realise opportunities and address challenges to create better places for people.</p> <p>The design response considers site specific areas within the Project and creates better places for people by enhancing the urban amenity.</p> <p>The landscape and urban design approach draws from the contextual settings of the 3 major precincts:</p> <ul style="list-style-type: none"> <li>• Ridgeline area</li> <li>• Yarra River Valley area</li> <li>• Koonung Creek Valley area.</li> </ul> <p>Refer to: Sections 5.3.1, 5.3.2, 5.3.3 of this UDLP Report.</p> <p>The design approach is highly considered and addresses the challenges within the Project and reflects the contextual elements within each area with examples being:</p> <ul style="list-style-type: none"> <li>• Rehabilitation of interface areas to the Bulleen Industrial Precinct and future development sites at the Manningham Road interchange with extensive landscaping and the Cultural Landscape Precinct while providing future development spaces that are not fragmented and are suitable for practicable development</li> <li>• The expansion of boulevard plantings along Greensborough Road boulevard which will require above and below-ground utility services coordination with proposed trees as well as consideration for required traffic sight lines</li> <li>• The daylighting of water course, tributaries, and wetlands to create habitat, biodiversity corridors and parkland spaces for people to both recreate and understand the cultural significance of the areas to the Traditional owners</li> <li>• Keeping buildings underground where possible such as substations and plant rooms to reduce the visible built footprint while still achieving the functional and operational aspects for the Project</li> <li>• Providing the east-west riparian and pedestrian/cycling link over Bulleen Road with the Yarra Link green bridge while achieving suitable universal accessibility requirements as well as reducing the visual bulk for the adjoining properties</li> <li>• Incorporating the Iuk (Eel) SUP bridge over Lower Plenty Road while addressing the overshadowing and privacy issues to adjoining properties.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>  Refer to: <i>UDLP Attachment.2-Landscape Design.</i>  Refer to: <i>UDLP Attachment.4-Architecture and Urban Design Overshadowing Assessment (Overshadowing).</i></p>

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 5.2	<p><b>Landscape values</b></p> <p>Create positive outcomes for the community with a coherent landscape response that embraces natural qualities and values.</p>	<p>The design creates a positive outcome for the community with a coherent landscape response that embraces natural qualities and values.</p> <p>This design outcome is achieved via:</p> <ul style="list-style-type: none"> <li>The landscape design strategy being drawn directly from the 3 design pillars being Connection to Country, Caring for Country, and Connecting People</li> </ul> <p>The design creates an overall integrated landscaped corridor through the naturalisation and creation of expanded habitat corridors that reflect the surrounding contextual environments. The daylighting of creeks and tributaries, wetlands, and floodways form the basis of the habitat and biodiversity corridors reflecting Indigenous cultural narratives that allow for ongoing interpretation</p> <ul style="list-style-type: none"> <li>The landscape design responds to the area specific characteristics including the 3 major UDS precincts. The design provides a response to the three major character areas being Ridgeline, Yarra River Valley and Koonung Creek Valley areas.</li> </ul> <p><b>Ridgeline area</b></p> <ul style="list-style-type: none"> <li>Creates a unique driver experience that celebrates the long views to the treed ridgelines via the treed Greensborough Road boulevard</li> <li>Enhances connections to La Trobe National Employment and Innovation Cluster (La Trobe NEIC) via the enhanced pedestrian and cycling connectivity as well as the road geometry connection from the Eastern Freeway via the tunnel solution</li> <li>Minimises impacts on neighbourhoods through increased connectivity thorough enhanced pedestrian and cycling paths as well as additional signalised road crossings</li> <li>Enhances natural habitats via the daylighting of Banyule Creek and proposed wetlands</li> <li>Creates new community hubs such as Lower Plenty Road playground.</li> </ul> <p>Refer to: Section 5.3.1 of this UDLP Report.</p> <p><b>Yarra River Valley area</b></p> <ul style="list-style-type: none"> <li>Utilise this opportunity to celebrate the locally and nationally significant cultural assets of Heide Museum of Modern Art by providing connections to the Cultural Landscape Precinct and to the greater Yarra Urban parklands via pedestrian and cycling connectivity throughout the Project as well as a wayfinding approach that will provide direction to key neighbourhood features as well as Indigenous and European cultural aspects</li> <li>Maximise opportunities around the Manningham Road interchange to enhance existing and create new connections that link the Yarra River corridor with Heide Museum of Modern Art via pedestrian and cycling connectivity</li> <li>Through a Caring for Country framework, maximise habitat and rehabilitate wetlands at the Greater Yarra Urban parklands - particularly the Cultural Landscape Precinct</li> <li>Enhance local and broader cycling routes which includes pedestrian and cycling paths primarily from north to south</li> <li>Create more opportunities for communities to access outdoor recreation and learn about natural habitats.</li> </ul> <p>Refer to: Section 5.3.2 of this UDLP Report.</p> <p><b>Koonung Creek Valley area</b></p> <ul style="list-style-type: none"> <li>Through a Caring for Country framework, maximise habitat and rehabilitate wetlands at the Koonung Creek</li> <li>Enhance local and broader cycling routes and connections through to the North via the Bulleen Road SUP bridge and Bulleen Road SUP underpasses</li> <li>Create more opportunities for communities to access outdoor recreation and learn about natural habitats via the additional pedestrian and cycling paths.</li> </ul> <p>Refer to: Section 5.3.3 of this UDLP Report.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 5.3	High quality	<p>Provide a high quality design outcome that makes a positive contribution to the local built and natural environment and minimises physical and visual impact on the surrounding community.</p> <p>The urban design provides a high-quality design outcome that makes a positive contribution to the local built and natural environment and minimises physical and visual impact on the surrounding community in the following ways:</p> <ul style="list-style-type: none"> <li>The landscape design will re-establish the contextual landscape character which has been eroded over time through urban development. The re-establishment of naturalised habitat corridors, waterways and expanded tree canopy coverage enables the knitting together of the disparate landscape settings into a coherent landscape corridor. This will improve the physical access to landscape areas that have been severed over time and reduce the visual impacts of the road corridor by re-establishing significant tree canopy cover</li> <li>The architectural built form is purposeful, graceful, functional, and respectful of the site context in which it sits which is achieved via the use of cladding materials that mitigate glare, avoiding the use of superfluous materials, where possible services buildings have been placed underground to minimise the visual built bulk to the community and the ventilation cladding hugs the internal functional requirements of the ventilation stacks which also reduces visual bulk</li> <li>Built forms have been integrated into the surrounding landscape such as the Ventilation Structures and MMC compound which reduce the visual built bulk. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i>. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC)</i></li> <li>High quality materials will be used to ensure better whole of life outcomes thus reducing maintenance costs and subsequent maintenance operational requirement impacts to the community such as noise, dust and vibration from maintenance vehicles and equipment</li> <li>The incorporation of passive and recreational spaces provides an improved community amenity</li> <li>Buildings have been positioned away from residential areas to reduce the visual bulk impact and overshadowing. Refer to: <i>UDLP Attachment.4-Architecture and Urban Design Overshadowing Assessment (Overshadowing)</i></li> <li>Additional pedestrian and cycling paths have been provided in the community to provide an improved level of connectivity to the neighbourhood which may encourage people to exercise and keep cars off the local road network</li> <li>Additional wetlands and habitat areas have been provided throughout the Project providing an improved ecological and community amenity.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 5.4	Experiential Provide a great journey for motorists, public transport users, pedestrians and cyclists with consideration of the varying speeds and journey types. Prioritise the visual amenity of the community over the road user.	<p>The design provides a great journey for motorists, public transport users, pedestrians and cyclists with consideration of the varying speeds and journey types and prioritises the visual amenity of the community over the road user with examples being:</p> <ul style="list-style-type: none"> <li>The landscape design will create a variety of landscape settings that are able to be experienced at a variety of speeds. The boulevard aspect of Greensborough Road allows motorists to experience a key landscape setting that also forms the backdrop and expansion of the bushland tree canopy of the adjacent Simpson Barracks, Coleen and Borlase Reserves in the north. The naturalised settings of Borlase Reserve, Cultural Landscape Precinct, Yarra Link green bridge and Koonung Creek Reserve allows for a slower speed cycle and pedestrian environment and this forms the basis for pedestrians and cyclists to stop and experience the importance of these naturalised areas in understanding environmental, ecological, and Indigenous cultural narratives</li> <li>The noise wall design colour, texture and articulation have been designed in consideration to the speed of journey by applying different degrees of complexity to the noise wall treatments depending on the anticipated speed of users to each face</li> <li>The Ventilation Structures provide a visual node for various users speed of journey. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>The profile of the elevated structure columns and crossheads are designed to reflect to speed of journey for the Eastern Freeway users. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i></li> <li>The openings for the SUP underpasses consider the speed of journey for users by providing flared openings outward from the entries. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i></li> <li>The SUP alignments consider the speed of journey for cyclists including path widths and turn radius. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084, 0138 &amp; 0139 (Iuk and Bulleen Road SUP bridge)</i></li> <li>The SUP bridges consider user speed with consideration for lead in paths to both ends of the SUP bridges. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084, 0138 &amp; 0139 (Iuk and Bulleen Road SUP bridge)</i>.</li> </ul> <p>The design has prioritised the visual amenity of the community over the road user via the following design approach:</p> <ul style="list-style-type: none"> <li>The Yarra Link green bridge provides riparian and pedestrian connectivity over Bulleen Road and conceals a portion of the road geometry. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i></li> <li>Locating tunnel portals away from adjoining properties particularly residential areas</li> <li>Providing the longer tunnel solution thus increasing open space within the Project</li> <li>Providing additional signalised crossings such as along Greensborough Road boulevard. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>Incorporating 2 additional SUP bridges. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084, 0138 &amp; 0139 (Iuk and Bulleen Road SUP bridge)</i>.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>
<b>Principle 6</b>	<b>VIBRANCY</b>	<b>Vibrant communities are places where people want to visit, experience or live</b>
Objective 6.1	Putting people first Provide places that are comfortable, inclusive and pleasant for the local community, support active and healthy lifestyles, and encourage diverse social interaction within public spaces.	<p>The landscape and urban design through the integration of the north-south active transport corridor, the cross-corridor connectivity of the Yarra Link green bridge creates an interconnected network of accessible open space areas. Within these areas are a variety of open space and landscape settings providing the community with a variety of recreational and cultural experiences. Playgrounds, fitness stations, SUP and walking trails, environmental trails, BBQs and picnic areas, rest stops and respite areas, and viewing areas are located along the landscape corridor. These areas are integrated within a wider Indigenous cultural context with interpretative way points that will provide knowledge of Indigenous cultural narratives and the significance of these areas to the Traditional owners.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscaping-Southern Interface)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 6.2	<p><b>Places for people</b></p> <p>Improve local neighbourhoods where there are opportunities to create inviting, people-friendly streets and public places</p>	<p>Throughout the urban design solution, we have created new civic spaces to foster community, active and passive recreational areas, pedestrian and cycle trails, boardwalks, and footpaths. Every precinct and place respond to local community needs outlined in the Urban Design Strategy for stronger, more connected communities. We have also embraced the enormous opportunity to recognise and celebrate shared history and cultural values, connecting people and place. From the culturally significant Yarra River (Birrarung) for Wurundjeri Woiwurrung, to Heide Museum of Modern Art, places of community are at the heart of our design.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>The proposed Cultural Landscape Precinct will include a feature Indigenous aspect that will provide a space for Indigenous ceremony and celebration for the community</li> <li>The passive and recreational spaces to Borlase Reserve provide a public space with vibrancy</li> <li>The Yarra Link green bridge provides east-west pedestrian and cyclist connectivity as well as communal space for rest and relaxation</li> <li>The proposed wayfinding design will provide areas for storytelling of the areas history and significance</li> <li>A significant amount of traffic is anticipated to be taken off the local streets due to the tunnel connecting the Eastern Freeway to Greensborough Road</li> <li>Additional pedestrian crossings have been provided to improve pedestrian connectivity and safety</li> <li>A service road to Greensborough Road boulevard has been included to provide safer access to the residences along Greensborough Road.</li> </ul> <p>Refer to: UDLP Attachment.1-Architecture and Urban Design.  Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).  Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).  Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

# 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
<b>Principle 7</b>	<b>SAFETY</b>	<b>Safe environments are essential for strong, connected, and liveable communities</b>
<b>Objective 7.1</b>	<b>Safer places</b>	<p>Reduce the opportunity for crime, maximise passive surveillance and support safe, comfortable and enjoyable places that meet Crime Prevention through Environmental Design (CPTED) principles</p> <p><b>CPTED</b></p> <p>The urban design has considered the following core CPTED principles:</p> <ul style="list-style-type: none"> <li>• Activation</li> <li>• Passive surveillance</li> <li>• Personal and community ‘ownership’ of the outcomes</li> <li>• Supportive management</li> <li>• Legibility in the environment</li> <li>• Territorial clarity</li> <li>• Limiting vulnerable places.</li> </ul> <p>Examples have been listed below to demonstrate how the above principals have been incorporated within the urban design.</p> <p><b>Activation</b></p> <p>This principle seeks to/requires/considers public space and surrounding structures that should be designed and managed to encourage people to be in the area.</p> <p>The design has met this principle via the following approach:</p> <ul style="list-style-type: none"> <li>• By the incorporation of passive and active recreational amenity to encourage activation to areas such as to Borlase Reserve, the community gathering area to the Cultural Landscape Precinct</li> <li>• The SUP connectivity and shelters to the Yarra Link green bridge as well as the incorporation of a network of pedestrian and cycling trails and connections to the surrounding neighbourhoods and the general parkland areas throughout the Project.</li> </ul> <p><b>Surveillance</b></p> <p>This principle seeks to/requires/considers buildings adjoining a public space that should maximise the potential for passive surveillance into that public space.</p> <p>The design has met this principle by including views from buildings to public spaces, where possible, via the following design approach:</p> <ul style="list-style-type: none"> <li>• The residential areas along Greensborough Road boulevard sight lines to the Borlase Reserve passive and active recreational areas via the selection of higher-level planting and reduced planting densities</li> <li>• The sight lines from the existing properties on the east side of Bulleen Road down to the cultural landscape precinct via the selection of higher-level planting and reduced planting densities as well as avoidance of visual obstructions</li> <li>• Providing clear sight lines to the underpasses</li> <li>• Artificial lighting to the SUP underpasses and playground areas</li> <li>• The built form design solution avoiding dead corners.</li> </ul> <p><b>Ownership</b></p> <p>This principle seeks to/requires/considers creating a sense of pride and community ownership of the public space and the associated built environment to encourage a level of shared responsibility for its security.</p> <p>The design has met this principle via:</p> <ul style="list-style-type: none"> <li>• The Cultural Landscape Precinct which provides the potential to build upon the significance of the area and provide an amenity for celebration and acknowledgment and hence a place of pride and ownership for the community</li> <li>• Borlase Reserve has included an open space for the community as well as children’s playgrounds and the like which provides an opportunity for the community to take pride and ownership in the amenity particularly from frequent use.</li> </ul>

# 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
		<p><b>Stakeholder management</b></p> <p>This principle seeks to/requires/considers places should be designed, and purpose built to be resilient to damage and the need for undue maintenance, while maintaining the aesthetic and functional qualities that make the places attractive to the community in the first place and a process of regular and reactive maintenance and repair should be implemented to maintain the quality of the places.</p> <p>The design has met this principle via:</p> <ul style="list-style-type: none"> <li>• The operational and maintenance procedures for the Project assets being documented to ensure roles and responsibilities for maintenance are clearly spelt out</li> <li>• The material selection will consider the whole of life aspects of the Project which will include graffiti removal, maintenance and repair, and material access</li> <li>• Selection of high-quality materials that require less maintenance.</li> </ul> <p><b>Legibility</b></p> <p>This principle seeks to/requires/considers built environments that should be designed, detailed, and managed to make them legible for users, especially pedestrians and cyclists, without losing the capacity for variety and interest.</p> <p>Legibility should be promoted in both the overall structure and form of the environments and in appropriate detail within them.</p> <p>The design has met this principle via:</p> <ul style="list-style-type: none"> <li>• The design creates a sense of legibility for users such as pedestrians and cyclists which includes clearly defined trails through wayfinding and sight lines for the paths ahead</li> <li>• Built landmark nodes to provide a sense of location and direction</li> <li>• Clear visibility of playgrounds and other recreational spaces</li> <li>• Well-defined road crossing points.</li> </ul> <p><b>Territory</b></p> <p>This principle seeks to/requires/considers security that should be supported by designing and managing spaces and buildings to define clearly legitimate boundaries between private, semi-private, community-group and public space and delivered while maintaining surveillance of the public space.</p> <p>The design has met this principle via:</p> <ul style="list-style-type: none"> <li>• Public spaces are clearly defined via the use of integrated fencing/barrier treatments to private spaces such as to the Northern Ventilation Structure and the MCC compound</li> <li>• Landscaping treatment will less density to public spaces such as to the playground areas of Borlase Reserve and the cultural landscape precinct</li> <li>• Tunnel portals adopting high throw screen and cladding treatment to discourage public access</li> <li>• Suitable warning signage and wayfinding</li> <li>• Clear distinction of trails and paths and alignment away from private spaces.</li> </ul>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
		<p><b>Vulnerability</b></p> <p>This principle seeks to/requires/considers that the built environment should be designed and managed to reduce or limit the risk or perceived risk to users by incorporating relevant CPTED principles such as minimising areas of concealment or entrapment. Issues in existing space may be addressed with alternative methods of observation for users (mirrors, lighting, maintenance).</p> <p>Pedestrian/cyclist travel routes in the public space should be designed to support the intended purpose of the place.</p> <p>The design and management of places should provide a variety of routes to the destination and ways to avoid potential or actual problems.</p> <p>Consideration should be given to limiting the use of those corridors and paths that would allow an offender to predict the route a person may take.</p> <p>Safety should be delivered in ways that are consistent with the purpose of the place.</p> <p>The design has met this principle via:</p> <ul style="list-style-type: none"> <li>• Fencing of the landscaped area from the public behind the Northern Ventilation Structure</li> <li>• Providing clear sight lines from public spaces to the Borlase Reserve playgrounds</li> <li>• Providing clear sight lines from public spaces to the Lower Plenty Road SUP bridge</li> <li>• Providing clear sight lines from public spaces down to the Cultural Landscape Precinct</li> <li>• Providing clear sight lines to the underpasses</li> <li>• Artificial lighting to the SUP underpasses and playground areas</li> <li>• The built form design solution avoiding dead corners.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 7.2	Road safety Prioritise safety for all users including motorists, cyclists, pedestrians and public transport users, and avoid unnecessary distractions.	<p>Safe environments foster inclusive, strong, cohesive communities. The design has adopted a comprehensive approach to safety and user comfort throughout NEL to inform the design of public spaces, parklands, the interfaces between infrastructure corridors and adjacent land uses, and the interfaces between public spaces and buildings.</p> <p>The design has included the following safety considerations:</p> <ul style="list-style-type: none"> <li>On-roadway signage will minimise clutter and provide clear direction for motorists and the urban design approach is to provide visual cues and reference nodes without having to distract drivers such as noise wall treatment themes, barrier treatments, bridge treatments and the Ventilation Structures</li> <li>Pedestrian and cycling intersections free of clutter with clear sight lines to oncoming traffic</li> <li>CPTED principals being incorporated into the design as outlined in Section 5.1.2 - Objective 7.1</li> <li>The design will incorporate speed signage to roads in accordance with the road safety audits based on Austroads Guide to Road Safety Part 6: Road Safety Audit</li> <li>Cycling paths speed limit signage where there are potential high risk safety issues such as over SUP bridges, underpasses, approaching roadways or road crossings and SUP intersections and turns</li> <li>Additional signalised crossings to provide safer pedestrian movements with clear sight lines to roads</li> <li>Raised pedestrian crossings to reduce traffic speeds and to provide safer pedestrian movements</li> <li>Speed and accident warning signage as part of the ITS (Intelligent Transport Systems)</li> <li>Signage to distinguish what is a pedestrian path and what is a SUP to reduce the risk of user safety incidents.</li> <li>Artificial lighting if deemed necessary</li> <li>Minimising distractions to road users via the use of muted colours throughout the design</li> <li>Provide universal DDA compliant access</li> <li>Undertaking a safety in design process for each design package during the design development phase</li> <li>Fencing of areas that are not meant to be accessible to the public.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
<b>Principle 8</b>	<b>ACCESSIBILITY</b>	<b>Highly accessible and inclusive environments encourage positive activation and are vital to community wellbeing, inclusion and health</b>
<b>Objective 8.1</b>	<b>Universally inclusive</b>	<p>Enhance universal access across the affected and surrounding area for all members of the community.</p> <p>The design has prioritised Universal Access principles, balancing regulatory requirements with the need to create vibrant civic space and architecture accessible to all. By carefully considering the location of pathways, ramps, and entrances through to minimising gradients, we have provided a better experience for cyclists and pedestrians of a huge variety of different abilities or disability.</p> <p><b>Accessibility and the Urban Design Guidelines for Victoria</b></p> <p>The Urban Design Guidelines for Victoria do not detail any prescriptive requirements, nor do they reference recommended guidelines on how satisfactory solutions can be achieved for people with disability accessing the built environment.</p> <p>In Victoria, while buildings must meet the prescriptive requirements of the <i>Building Act 1993</i>, Building Regulations 2018 and the Building Code of Australia: 2019 and referenced standards, there are no prescribed requirements on how access for people with disability in the remainder of the built environment should be provided.</p> <p><b>Seven Principals of Universal Design &amp; Universal Access</b></p> <ol style="list-style-type: none"> <li><b>1. Equal Access</b> For a design to be truly universal, it must be useful to people with all kinds of conditions and abilities, including people with disabilities or activity limitations</li> <li><b>2. Flexibility</b> The design must be flexible enough to apply to all different kinds of people who have a huge variety of diverse abilities or disability</li> <li><b>3. Simplicity</b> The design should be easy to understand so that people with varying education and experience can use it</li> <li><b>4. Effective communication</b> The design must convey the needed information to the user, even if they have limited sensory capabilities or the ability to process it</li> <li><b>5. High tolerance for error</b> If a user accidentally makes a mistake while using the design, they mustn't be harmed, or their situation not made more difficult</li> <li><b>6. Minimal effort required</b> A person should be able to apply the design easily, even if they have limits to their physical or mental capabilities</li> <li><b>7. Suitable space and size for use</b> No matter what size a person is or how mobile they are, they should have enough space and the ability to use the design effectively.</li> </ol> <p>By considering each of these seven principles, we will ensure all areas will attain universal design no matter the types of projects within the proposed works.</p> <p><b>Applying the Principals of Universal Design &amp; Universal Access</b></p> <p>As prescriptive requirements are not detailed within the Urban Design Guidelines for Victoria, we will be applying a best practice approach based on the following recognised legislation:</p> <ul style="list-style-type: none"> <li>• <i>Disability Discrimination Act 1992</i> (DDA)</li> <li>• <i>Australian Standard AS 1428.1 (2009) - Design for access and mobility, Part 1: General requirements for access – New building work</i> (AS 1428.1) <ul style="list-style-type: none"> <li>– Building accessibility</li> <li>– Design of external ramps, walkways and kerb ramps</li> <li>– Design of external stairs</li> </ul> </li> <li>• <i>Australian/New Zealand Standard AS/NZS 1428.4.1 (2009) – Design for access and mobility, Part 4.1: Means to assist the orientation of people with vision impairment - Tactile ground surface indicators</i> (AS/NZS 1428.4.1) <ul style="list-style-type: none"> <li>– Provision of tactile ground surface indicators to the entire built environment</li> </ul> </li> <li>• <i>Australian/New Zealand Standard AS 2890.5 (2020) – Parking facilities, Part 5: On-street parking for people with disabilities</i> (AS/NZS 2890.5)</li> <li>• <i>Australian/New Zealand Standard AS/NZS 2890.6 (2009) – Parking facilities, Part 6: Off-street parking for people with disabilities</i> (AS/NZS 2890.6)</li> <li>• <i>Australian Standard AS 4586 (2013) Slip resistance classification of new pedestrian surface materials</i> (AS 4586).</li> </ul>

# 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 8.2	Twenty-minute neighbourhoods	<p>Support and enhance 20-minute neighbourhoods for convenient and desirable access to everyday services and facilities (within a 20-minute walk from their home, or faster by bicycle or local public transport).</p> <p>The urban design elements that have been designed in compliance with universal access standards by ensuring that the Seven Principals of Universal Design and Universal Access have been achieved include:</p> <ul style="list-style-type: none"> <li>Borlase Reserve playgrounds, paths and boardwalks. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>The SUP network in the Cultural Landscape Precinct. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i></li> <li>The pedestrian and cycling paths over the Yarra Link green bridge. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i></li> <li>Access to the MCC building and alternative MCC building. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC)</i></li> <li>General access to playgrounds. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>.</li> </ul> <p>Pedestrian friendly areas, centred around the '20-minute neighbourhood' concept, have been created throughout NEL. Through an extensive network of new and renewed walking and cycling pathways, safe, inclusive, and inviting new connections between desirable services and amenities enable locals to meet most of their everyday needs within a 20-minute walk or cycle.</p> <p>The following examples contribute to 20-minute neighbourhoods:</p> <ul style="list-style-type: none"> <li>The Lower Plenty Road area has improved local streets and connections to facilitate the continued integration of its diverse community. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>The linkage of the pedestrian and cycling paths from the Eastern Freeway through to the north side of Manningham Road which includes Banksia Park and the Main Yarra Trail. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i></li> <li>Additional pedestrian crossing to Greensborough Road boulevard provided improved east-west connectivity. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>The Yarra Link green bridge providing improved east-west connectivity. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i>.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 3: Consistency with the Urban Design Principles and Objectives continued

UDS-Principle Objective	UDS-Urban Design Outcome	Response
Objective 8.3	Active transport Encourage walking and cycling for transport and recreation with an integrated active transport infrastructure that meets future growth in demand and connects seamlessly with surrounding networks and with proposed infrastructure being delivered by others.	<p>The design aims to promote alternate and more sustainable modes of transport beyond the vehicle experience, through improved cycling and walking networks. SUPs and walking trails that will provide opportunities for multiple users to access the open space network as commuter and recreational cyclists, pedestrians, joggers, walkers, children and passive recreation users.</p> <p>We intend to slow and enrich the movement experience through the linear parklands by providing multiple path options, pause points, stopping locations, lookouts, play spaces and passive recreation opportunities. This is primarily achieved by maximising the canopy trees along pedestrian and cycle routes to provide amenity and minimise urban heat island effects.</p> <p>Active transport along the alignment is prioritised with new SUPs, pedestrian crossings and overpasses. The linkages are extensive, cross-corridor and connect into broader networks like the Eastern Bicycle Corridor, Koonung Creek Trail, Main Yarra Trail and River Gum Walk within the Project corridor.</p> <p>Examples being:</p> <ul style="list-style-type: none"> <li>Active transport along the alignment is prioritised with new SUPs, pedestrian crossings and overpasses. The linkages are extensive, cross-corridor and connect into broader networks like the Eastern Bicycle Corridor, Koonung Creek Trail, Main Yarra Trail and River Gum Walk within the Project corridor</li> <li>The pedestrian and cycling paths have generally been designed so that path widths could increase if future demand increases</li> <li>The designated Manningham/Bulleen Road interchange area is designated for Future Development and the design has incorporated design aspects such as roadways, pedestrian and cycling paths to and around this area. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i></li> <li>Flood modelling has allowed for climate change as part of the analysis</li> <li>Future demand was based on predicted traffic volumes and lane configuration for 2036.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

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# 5.2 Corridor-wide Requirements - Key Directions

# 5.0 Consistency with Urban Design Strategy

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## 5.2.1 Corridor-wide Response

### Responses to Corridor-wide Key Design Directions

The Incorporated Document requires that this UDLP is consistent with the UDS. The UDS outlines the vision and quality expectations for all elements of NEL, including how the final detailed design in this UDLP should look and feel. As per Section 3.2 of the UDS Key design direction 1: Develop an integrated design response, the Project must demonstrate the effective integration of engineering and urban design to deliver an innovative and balanced design solution. This section outlines this UDLP's consistency with the UDS, including key directions, objectives and principles and key places.

### Key Direction 1:

#### Develop an integrated design response

The principles, objectives and key directions in this strategy apply across the entire Project to varying degrees. They form the basis of good urban design outcomes and respond to the different contextual settings within the Project corridor. The principles and objectives regarding an integrated design response, minimisation of the Project footprint and reduction of any physical and visual impacts are of prime importance and must be addressed as a high priority.

Table 4: Key Direction 1 Precincts and Benefits

Solutions include	Benefits
<b>Longer Tunnel</b>	To improve connectivity and develop Greensborough Road boulevard, the urban design team worked with tunnel and road engineers to find the best location for the Northern Portal. This led to the tunnel extension.
<b>Lower Plenty Road interchange</b>	To improve the outcome at Simpson Barracks, the urban design team worked with the tunnel and road engineers to remove two of the four EES Reference Design ramps from the Simpson Barracks area and integrate them within the Northern Portal area near Watsonia.
<b>Manningham Road interchange</b>	To increase open space amenity and create sites for future potential development at Manningham Road interchange, the design solution moved two of the ramps out of this area south into the Southern Interface Zone, compared to the EES Reference Design. This also allowed better outcomes for traffic flows.
<b>Photovoltaic (PV) panels to Barriers</b>	PV installation on this infrastructure Project provides 1.4 MW of power capacity. Panels feature on barriers in select locations and buildings.

Table 5: Key Direction 1 UDS Requirements and Design Response

UDS Requirements	Design Response
Design solutions respect and continue the road and bridge infrastructure along the existing Eastern Freeway	<p>The design solution respects and continues the road and bridge infrastructure along the existing Eastern Freeway via the following design outcomes:</p> <ul style="list-style-type: none"> <li>The civil design provides continuity of the Eastern Freeway and Bulleen Road connectivity</li> <li>The proposed SUP bridge alongside the existing Bulleen Road bridge will provide continuity for users of the SUPs and the design of the SUP bridge is sympathetic to the Eastern Freeway suite of proposed bridges</li> <li>The Bulleen Road bridge over the Eastern Freeway will be retained and widened and the design will be consistent with the existing bridge form</li> <li>The existing Freeway golf course bridge will be retained</li> <li>The proposed Bulleen Road underpasses will provide connectivity to the existing and new SUP trails.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>            Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
Design challenges are addressed holistically	<p>A holistic design approach has been adopted which includes the following design outcomes:</p> <ul style="list-style-type: none"> <li>Colour palette, landscaping treatments and selections, gantries, barriers, and noise walls will be consistent throughout the area but flexible enough to adapt to individual site conditions</li> <li>The wayfinding design will reflect a consistent theme and messaging</li> <li>The landscaping design will expand upon the existing vegetation types and densities in the area and respond to the project wide overland flow requirements</li> <li>The landscaping design will include appropriate screen planting to the road network</li> <li>The proposed pedestrian and cycling paths will expand upon the existing network as well as provide additional connectivity to surrounding areas.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i>            Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i>            Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>Design solutions and opportunities are identified early in the design process</p>	<p>Integrated engineering, architectural, landscape and urban design solutions ensure better outcomes for people and neighbourhoods. In consultation with stakeholders and the design team, issues and opportunities have been identified early in the design process to ensure an integrated approach is achieved and potential conflicts are avoided where possible.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• Consultation has occurred, and is ongoing, with the Wurundjeri Woi-wurrung representatives which has identified key design input opportunities across the Project. These subsequent design outcomes can be complemented by adjoining urban design and landscaping treatments</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0004.</i></p> <ul style="list-style-type: none"> <li>• Future development areas have been identified at Manningham Road interchange and the design has undertaken suitable analysis to ensure that this outcome is woven into the surrounding design solution.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p>The reference design is rigorously challenged to achieve innovative and superior solutions and outcomes</p>	<p>The design solution includes improvements to the EES Reference Design as outlined in Section 4.1 of this report.</p> <p>The key improvements in:</p> <ul style="list-style-type: none"> <li>• A longer tunnel</li> <li>• Portal repositioning. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i></li> <li>• Greensborough Road boulevard tree lined solution. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>• SUP bridge over Lower Plenty Road. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084 (Iuk SUP bridge)</i></li> <li>• Solar panels to the Ventilation Structures and trench walls</li> <li>• Yarra Link green bridge. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i></li> <li>• Eastern and western SUP connectivity from north of Bulleen Road through to the south of the Eastern Freeway interchange. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></li> </ul>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>The design is led by integrated land use and transport thinking</p>	<p>The design is led by an integrated land use and transport approach which includes:</p> <ul style="list-style-type: none"> <li>• Maximising new land use opportunities at the Manningham/Bulleen Road interchange</li> <li>• A longer tunnel solution that connects the existing Eastern Freeway through to the Manningham/Bulleen Road interchange and Greensborough Road boulevard</li> <li>• Provides a portion of the dedicated bus lane from the Bulleen Park and Ride facility to the Eastern Freeway</li> <li>• A road geometry that supports the bus network routes</li> <li>• A pedestrian and cycling design outcome that enhances the existing condition by extending existing networks as well as additional connection to the surrounding communities including via new SUP bridges and underpasses.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p>A meaningful, authentic, and holistic approach to embedding Indigenous values and culture into the Project design</p>	<p>Giving voice and agency to Aboriginal people and embedding Indigenous design expression is core to our ways of working within the Project. This will achieve a culturally responsive first people's engagement strategy of Connection to Country, Connecting People and Caring for Country.</p> <p>Example:</p> <ul style="list-style-type: none"> <li>• Consultation has occurred, and is ongoing, with the Wurundjeri Woi-wurrung representatives which has identified key design input opportunities across the Project.</li> </ul> <p>These subsequent design outcomes can be complemented by adjoining urban design and landscaping treatments.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>Sustainable infrastructure outcomes</p>	<p>The sustainability EPR requirements will be incorporated into the broader Project, not just the urban design aspects.</p> <p>Outlined below are some of the examples of how the relevant sustainability EPR requirements have directly influenced the design.</p> <p><b>SCC1 Implement a Sustainability Management Plan</b></p> <p>The Sustainability Management Plan will identify sustainability performance measures for design, construction and operation, defined roles, and responsibilities to ensure that they measure, monitor and review sustainability performance in line with sustainability targets and IS requirements.</p> <p>Some of these sustainability initiatives that have influenced the design include:</p> <ul style="list-style-type: none"> <li>• Maximise harvest and reuse of rainwater to the Northern and Southern Ventilation Structures as well as the MCC building</li> <li>• Infrastructure Sustainability Design and As Built Rating (v2.1) (Achieve a minimum 50 points for the Program Rating), and GBCA Green Star 5 Star Design and As Built Rating for the NEL Motorway Control Centre and any occupied permanent buildings (excluding the Alternate Motorway Control Centre)</li> <li>• Incorporation of solar photovoltaic (PV) panels along the alignment, including anti-throw barriers and ventilation outlets, to provide renewable energy to power NEL assets.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010,0020,0060 and 0090 sets of drawings.</i></p> <ul style="list-style-type: none"> <li>• Re use of timber from tree removal into the design such as for boardwalks, landscaping furniture and shelters</li> <li>• Reduce the amount of Portland Cement content in concrete across the Project by a minimum of 30% (against Green Building Council of Australia reference mix design levels)</li> <li>• The urban design solution has focused on maximising tree canopy coverage and ensuring the corridor reduces and mitigates climate change impacts. Landscape and planting strategies, and ecology and soil technical inputs have informed our urban design concept.</li> </ul> <p><b>SCC2 Minimise greenhouse gas emissions</b></p> <p>The Sustainability Management Plan will be developed with a goal to limit the Project's contribution to climate change and support the economy-wide transition needed to achieve the State's net zero by 2050 target and objectives to:</p> <ul style="list-style-type: none"> <li>• Deliver a carbon neutral project</li> <li>• Support the growth and transition of the State's renewable energy sector and jobs</li> <li>• Lower the embodied carbon of construction materials.</li> </ul> <p>Some of these sustainability initiatives that have influenced the design include:</p> <ul style="list-style-type: none"> <li>• Average 30% replacement of Portland cement will be through Portland cement with Supplementary Cementitious Materials</li> <li>• Pavement materiality optimisation will be undertaken to reduce the overall quantity of asphalt, resulting in embodied impact savings</li> <li>• Recycled Asphalt Pavement will be implemented in non-surface layers</li> <li>• Recycled glass fines will replace natural sand in wearing and base course layers of asphalt.</li> </ul>

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>The vertical and horizontal road geometry is optimised to sit sensitively in the surroundings</p>	<p><b>SCC3 Apply best practice measures for energy usage for tunnel ventilation and lighting systems</b></p> <p>Best practice measures for energy usage for the tunnel ventilation system design will be included in the relevant design packages which will be submitted to EPA for their approval in accordance with the Development Licence conditions.</p> <p>An example of these sustainability initiatives that have influenced the design include:</p> <ul style="list-style-type: none"> <li>Incidental shading of the tunnel entrances has been estimated to reduce lighting power demand in the tunnel by approximately 5%. This initiative will be assessed as part of the detailed design.</li> </ul> <p>Road geometry has been optimised to reduce the perception of the Project form, including bridges, noise walls and screens, to be diminished as far as practicable. An example of this is the complex interchange at the Eastern Freeway / Bulleen Road as the roads tie into the tunnel, this includes a series of functional linkages both on and off the Eastern Freeway and stitching in with existing local street networks. Forms have been kept consistent and minimal in nature, where the structures are required to be elevated the height has been kept away from residential context as far as practicable. The form of the flyover structures is subtle with barrier treatments consistent.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p>Good engineering design is achieved that is visually pleasing and not literal in its design interpretation</p>	<p>Engineered forms have been treated to sit appropriately within the site context, varying throughout the corridor. Where possible repeated treatments to engineered forms have been adopted to give major Project elements a sense of curation. Examples of this include:</p> <ul style="list-style-type: none"> <li>Barrier treatments to elevated structures including integration of service</li> <li>Consistent tone and pattern of various walled treatments throughout the corridor-integrated landscape where the infrastructure presents opportunities</li> <li>Elevated structural forms such as columns and cross heads have profiled forms.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>The composition of road elements along a corridor is integrated and coordinated</p>	<p>The integrated and coordinated composition of all road components; bridges, noise walls, trench cladding panels, portal face panels, public safety barriers and retaining structures are designed as a series of robust and coherent elements that provide a coordinated, elegant urban design outcome.</p> <p>Consideration has been given to the location and treatment of lighting, barriers, gantries and the like to create a sense of consistent order and form, and avoidance of any superfluous detail as far as practicable. Given the Project is a mix of at grade structures and below grade structures a careful consideration of various wall types exist, creating unifying sequences at transitions.</p> <p>Road elements have been designed to not only provide a functional purpose but also an integrated urban design outcome.</p> <p>Examples include:</p> <ul style="list-style-type: none"> <li>• Gantry structures designed to provide a clean uncluttered look that doesn't distract drivers. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i></li> <li>• Noise walls designed to provide an interesting urban design outcome with colour and texture. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i></li> <li>• Flood walls provided with colour and texture to blend into the urban design theme. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i></li> <li>• Lower Plenty Road tunnel entry – textured walls and profile cladding provides a clear and integrated experiential outcome for road users. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i>.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>.</p>
<p>A sensitive response that avoids superfluous visual statements</p>	<p>The design approach has included avoiding superfluous statements and the design outcome provided is functional yet distinctive without excessive forms.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• The Ventilation Structure cladding has formed around the functional internal use to ensure the urban massing is kept to a minimum. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>• Maintenance yards of the Motorway Control Centre and Northern Ventilation Building will be screened with landscape berms and indigenous plants. This integrated engineering, architecture and landscape solution has reduced visual impact for local communities, concealing and condensing the number of visible buildings and complementing the scale of neighbouring buildings to demonstrate a sensitive approach and Caring for Country. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC)</i>.</li> </ul>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>Challenges associated with the constrained road reservation are appropriately addressed in order to maximise the traveller experience</p>	<p>The spatially constrained road reserve placed extra emphasis on the team to develop an urban design treatment on the road reservations that while robust are also engaging to maximise the traveller's experience.</p> <p>The road reservations design approach has been to include functional and aesthetically pleasing design outcomes such as noise wall treatments, barriers, portal cladding treatments and landscaping treatments where possible.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design-Surface Treatments.</i></p>
<p>The design is appropriate for its ongoing maintenance, operations, and upkeep</p>	<p>Examples of where the design is appropriate for its ongoing maintenance operations and upkeep include:</p> <ul style="list-style-type: none"> <li>• Ventilation cladding selection that is of a high quality and a longer whole of life outcome</li> <li>• Vehicle access path considerations around buildings such as the Northern and Southern Ventilation Structures</li> <li>• Selection of landscaping gradients around Borlase Reserve to enable safe maintenance access</li> <li>• Fixing points for access on the Yarra Link green bridge portal cladding over the tunnel entry</li> <li>• Building access fixing points on the Ventilation Structures</li> <li>• Maintenance access paths to the tunnel</li> <li>• In ground utility future maintenance access zones.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p>Future land use change opportunities are identified and supported, and long-term opportunities for the place and community are considered</p>	<p>The Design imagines a structure for development at the Manningham Road interchange which could accommodate a cultural precinct and future commercial/industrial development.</p> <p>The treatment of this area considers the strategic planning assessments undertaken through the Yarra Strategic Plan and draft Yarra River – Bulleen Precinct Land Use Framework Plan processes, to ensure the area of developable land at surface level is maximised, allowing for future viable land uses such as commercial or industrial.</p> <p>While these developments fall outside the Tunnels Package scope, their consideration was invaluable in shaping a solution which could realise such future aspirations by the State.</p> <p>Our consideration of this future potential has influenced the repositioning of the interchange entry and exit ramps and public transport infrastructure is structured to service the future development area. Long-term thinking also factored in the creation of the right scale of floor plates for future development.</p> <p>The future use considerations are consistent with the EPRs, LP3 Minimise inconsistency with strategic land use plans, and the relevant strategic planning policies and the parcels of land allocated for future use are of a suitable size to cater for greater flexibility in development solutions.</p> <p>Enjoying strong connectivity to the Yarra River parklands and cultural amenities, it provides the public with upgraded open space until its future use is decided.</p> <p>Any future use would be subject to additional planning approvals and is not covered by this UDLP.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>Project outcomes are aligned with the plans and strategies being developed and delivered by others</p>	<p>Throughout the Project the team has ensured the plans are developed in coordination with the north and southern interface areas, cross-corridor connections and neighbourhood improvements to provide a cohesive community asset. Notable guiding policy/strategy documents that will also play a key part in the strategies implemented in the Project are Yarra River - Bulleen Precinct Land Use Framework, Yarra River Strategic Plan, Banyule Open Space Plan 2016-2031, Plan Melbourne 2017-2050 Metropolitan Planning Strategy, Victorian Cycling Strategy 2018-2028, and stakeholder guideline documents.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p>Negative impacts to the neighbouring community are avoided and minimised</p>	<p>The design's core aim has been to minimise the impacts to the surrounding community. The design solution stitches communities together with extensive new and upgraded cross-corridor connections that improve lives and community throughout north-east Melbourne.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• The Ventilation Structures and tunnel portals have been located away from residential and business areas as much as practical. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>• Greensborough Road boulevard has been moved East away from residential areas. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i></li> <li>• SUP connectivity improved</li> <li>• The Yarra Link green bridge has provided a connection from the east to the west. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 5: Key Direction 1 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p>Infrastructure is sited and designed to minimise visual impacts to sensitive receptors such as residents and open space. Mitigation initiatives must address location, scale, form then materials, in order of priority, to maximise effectiveness.</p>	<p>Visual impact is minimised as far as practical throughout the Project with a landscape and cultural lead response. Many at grade structures exist in proximity to sensitive contexts (cultural, residential and schools) and their design form has developed in response to these settings.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• The Ventilation Structures are being minimised in their vertical expression as far as practical with fluid shapes and muted colours</li> <li>• The MCC building compound area has been inset into the landscape to reduce the building heights and as such minimise impacts on sensitive receptors such as nearby properties</li> <li>• Materials selected to appear naturalistic and calm whilst referencing cultural themes of the Project</li> <li>• The Ventilation Structures and tunnel portals have been located away from residential and business areas as much as practical</li> <li>• The Eastern Freeway interchange elevated structures have been designed to reduce visual bulk and sited away from sensitive receptors as far as practical</li> <li>• Road side barriers and throw screens have been designed to the minimum scale and form to comply with the relevant technical requirements</li> <li>• Throw screens have been designed with a level of transparency to enable views to the surrounding areas</li> <li>• Materials have been chosen with muted colours and avoidance of bright colours to minimise impacts on sensitive receptors.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p>Public benefits and long-term returns are maximised.</p>	<p>The design solution stitches communities together with extensive new and upgraded cross-corridor connections that improve lives and community throughout north-east Melbourne. Holistic and coherent landscape responses that positively impact communities and landscape across the entire corridor, create engaging journeys by tunnel, trench, roadway, foot, or cycle with thoughtful application of urban design principles that prioritise people and place.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>• The design provides increased open space compared to the EES Reference Design</li> <li>• Passive and active recreational aspects to Borlase Reserve which is an additional benefit compared to the EES Reference Design</li> <li>• Cultural Landscape Precinct to Manningham/Bulleen Road interchange which provides a place of gathering and celebration for the Wurundjeri Woi-wurrung which is an additional benefit compared to the EES Reference Design</li> <li>• Improved connectivity to the Koonung Creek Trail such as the SUP underpasses and the SUP bridge over the Eastern Freeway</li> <li>• General pedestrian and cycling connection from the Eastern Freeway to the Yarra Main Trail to the north of Manningham Road</li> <li>• Improved pedestrian and cycling connectivity along Greensborough Road including the Banyule Trail</li> <li>• Reduced vehicle travel times from the Eastern Freeway through to the M80 Ring Road</li> <li>• Reduced local traffic volumes to local streets by vehicles using the proposed tunnels.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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### 5.2.1 Corridor-wide Response

#### Responses to Corridor-wide Key Design Directions

The Incorporated Document requires that this UDLP is consistent with the UDS. The UDS outlines the vision and quality expectations for all elements of NEL, including how the final detailed design in this UDLP should look and feel. As per Section 3.2 of the UDS Key design direction 2: Support a natural & connected corridor, the Project must demonstrate a design that responds to the natural, movement and open space systems and improve connectivity to 'stitch' communities across the Project corridor. This section outlines this UDLP's consistency with the UDS, including key directions, objectives and principles and key places.

### Key Direction 2:

#### Support a natural and connected corridor

The Project's approach to NEL creates a well-connected built environment that enhances opportunities for community to enjoy, experience, and protect the region's unique natural assets.

The Greater Yarra Urban parkland has been preserved and enhanced to acknowledge its importance to local communities and visitors alike, along with facilitating the extension of the Koonung Creek Valley area linear parklands. Yarra Link green bridge is a major new gateway to north-east Melbourne, connecting community and habitat over NEL.

Beyond the importance of a natural and connected corridor is the opportunity to share its riches. NEL's urban design fosters learning environments that reveal the geography, seasonal cycles, ecology, water and culture of our Country for all.

Table 6: Key Direction 2 Precincts and Benefits

Solutions include	Benefits
More cross-corridor connections	A land bridge for both walking and cycling and extensive new and upgraded SUP, improved walking, cycling and access to public transport, linking communities across NEL.
Greater Yarra Urban parklands	The Greater Yarra Urban parklands will be celebrated and the surrounding area designed to provide additional amenity, habitat, conservation value and experiential opportunity to contribute to the overall recreation offer and ecological value of the area.
Extensive Open Space	More parks and natural systems to enjoy.
Improved biodiversity linkages	Biodiversity and habitat corridors strengthened with indigenous trees and vegetation from local bioregion and ecological vegetation class.
Preservation of Heritage	Retaining the existing River Red Gum tree. Avoidance of disturbance to Banksia Park.

Table 7: Key Direction 2 UDS Requirements and Design Response

UDS Requirements	Design Response
<p><b>Stitching communities together</b></p> <p>The Project design must endeavour to improve current connections and link communities across North East Link and the Eastern Freeway. This includes providing missing links for walking and cycling along the project corridor between the M80 Ring Road and the Eastern Freeway in the north-south direction, and east-west along the Eastern Freeway into Melbourne's inner city areas.</p> <p>Good access across the project corridor and to key facilities and destinations must be provided. The Project design must also avoid or minimise barriers that impact on visual and physical connectivity.</p>	<p>The design improves current connections and links communities across North East Link and the Eastern Freeway in the following manner:</p> <ul style="list-style-type: none"> <li>A free flowing walking and cycling connected network of movement including SUP underpasses and SUP bridges which provides good access across the Project and to adjoining neighbourhoods such as from the Eastern Freeway through to the Cultural Landscape Precinct</li> <li>Additional signalised pedestrian crossings to Greensborough Road boulevard which provides east-west connectivity</li> <li>The Yarra Link green bridge that provides east-west pedestrian and riparian connectivity across Bulleen Road</li> <li>A wayfinding design approach that stitches communities together by providing trail names, key places of interest and storytelling</li> <li>Landscaping passive and active recreational areas that provide places of gathering for the community</li> <li>The landscaping design provides a habitat corridor across the Project</li> <li>The noise walls, road barriers and throw screens have been designed to the minimal functional extent and with transparent materials to noise walls and throw screens.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

# 5.0 Consistency with Urban Design Strategy

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Table 7: Key Direction 2 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p><b>Supporting natural systems</b></p> <p>The Project design should repair and protect local environmental assets and systems to optimise ecology, aesthetics and experiential opportunities.</p>	<p>The Project design repairs and protects local environmental assets and systems to optimise ecology, aesthetics and experiential opportunities in the following manner:</p> <ul style="list-style-type: none"> <li>Indigenous planting with large canopy trees throughout the Project, including on the land bridge at the south portal which aids urban cooling, extends biodiversity and improves habitat links</li> <li>These connections remediate and support natural systems and create new opportunities for community to enjoy nature. Our aim is to respect the landscape with new and renewed parklands and waterways along this corridor, which celebrate and embrace this important community and biodiversity asset</li> <li>The Manningham Road precinct holistic approach which is to support ecological biodiversity, and evidence-based approach to water management/hydrology and improved water quality outcomes and increased canopy cover to respond to changing demand with both climate change and to respond to heat stress and support user experiences</li> <li>A new oxbow basin, a new landscaped view corridor to the river, the removal of gravel from the old drive-in and use of endemic and indigenous species from the bioregion will begin to restore, remediate and repair the degraded landscape evident in this area</li> <li>The daylighting of Banyule Creek along with additional wetlands and bio-retention habitats.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

## 5.0 Consistency with Urban Design Strategy

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Table 7: Key Direction 2 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p><b>Supporting open space systems</b></p> <p>The Project design should maintain, link and extend the important functions of the open spaces that exist along and adjacent to the Project corridor. Visual connections to green spaces for the surrounding community and the traveller should be reinforced. To provide a robust design, the Project must use an integrated systems approach that reflects the interdependency of interactions between transport, environment and the community. By addressing these systems from a holistic perspective, better outcomes can be achieved to ensure transport and community integration is enhanced while preserving the natural systems within the Project corridor.</p>	<p>From engineering, architecture, urban design and landscape through to transport and sustainability, all disciplines throughout the Project have worked in concert to address the complexities of this ambitious Project to ensure better outcomes for the open space connectivity for the community to enjoy, experience and protect the region's unique natural assets.</p> <p>The transport links serve to enhance community connectivity, supported by places of recreation, travel, connection and community cohesion. A myriad of historically unresolved elements are incrementally resolved through considered design.</p> <p>The Project design maintains, links and extends the important functions of the open spaces that exist along and adjacent to the Project corridor in the following manner:</p> <ul style="list-style-type: none"> <li>• The Yarra Link green bridge extends the riparian east-west corridor which provides visual connections of green spaces</li> <li>• The pedestrian and cycling network links the Eastern Freeway network through to the north</li> <li>• The pedestrian and cycling network along Greensborough Road boulevard provides transport and visual connectivity to the south side of Lower Plenty Road via the Iuk (Eel) SUP bridge</li> <li>• The underpasses south of the Eastern Freeway provide east-west SUP connectivity under Bulleen Road</li> <li>• The design provides habitat corridor connectivity from the Eastern Freeway through to Bolin Bolin precinct and through to the Cultural Landscape Precinct</li> <li>• Renewed public open space between Lower Plenty Road and the Lower Plenty Road portal provides the community with playgrounds, half basketball court, BBQ and shelter facilities, resting stops, walking trails, wetlands and fitness stations.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

# 5.0 Consistency with Urban Design Strategy

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## 5.2.1 Corridor-wide Response

### Responses to Corridor-wide Key Design Directions

The Incorporated Document requires that this UDLP is consistent with the UDS. The UDS outlines the vision and quality expectations for all elements of NEL, including how the final detailed design in this UDLP should look and feel. As per Section 3.2 of the UDS Key design direction 3: Recognise cultural and historic values, the Project must demonstrate a design philosophy and approach that recognises, protects and promotes Indigenous cultural heritage values, and celebrates and interprets places and objects of historical heritage importance. This section outlines this UDLP's consistency with the UDS, including key directions, objectives and principles and key places.

### Key Direction 3:

#### Recognise cultural and historic values

The Project's approach celebrates the contribution the Yarra River (Birrarung) has always made to life along its banks. A revegetated site and wetland habitat at Manningham Road interchange offer potential to accommodate a future cultural precinct to acknowledge the enduring importance of the river to Wurundjeri Woi-wurrung. In turn, this will increase knowledge, understanding and foster Connection to Country for all. Extending along the Yarra from Banksia Park to the Koonung Creek Valley area, the Manningham Road interchange centres on Bolin Bolin Billabong and stitches in Heide Museum of Modern Art, the heart of Australian modernism. Simpson Barracks is a precinct of historical and cultural value in the Ridgeline area of NEL and will be further celebrated and highlighted through the Project's design, enabled through the longer tunnel and shorter trench. Throughout NEL, areas of local importance are celebrated through design and wayfinding to Connect People and foster sense of place.

Table 8: Key Direction 3 Precincts and Benefits

Solutions include	Benefits
<b>Site opportunity for future Cultural Precinct</b>	A once-in-a-lifetime opportunity to re-establish a cultural destination for Melbourne, in partnership with the Wurundjeri Woi-wurrung people.
<b>Walking and cycling bridge</b>	Iuk (Eel) SUP bridge acknowledges its location on Aboriginal land through a unique (placeholder) Wurundjeri Woi-wurrung name and with strong formal references to Wurundjeri Woi-wurrung bark canoes.
<b>Heide Museum of Modern Art</b>	Stitched into the Greater Yarra Urban parklands via the pedestrian signalised crossing at the Manningham/Bulleen Road interchange and cycling paths through to Banksia Park via the southern SUP connection to the existing path that leads to Manningham Road existing underpass. The wayfinding design will also capture the cultural history of the area.
<b>Celebrates Borlase Reserve</b>	New feature gateway over Lower Plenty Road joins Greensborough Road boulevard to River Gum Walk, celebrates history and creates more community value through introduction of a new SUP.
<b>Wayfinding</b>	Thoughtful wayfinding design provides opportunities to celebrate shared cultural values and history.

Table 9: Key Direction 3 UDS Requirements and Design Response

UDS Requirements	Design Response
<p>The aim of this key direction is to build on Principle 1 Identity and Principle 5 Amenity to:</p> <ul style="list-style-type: none"> <li>Ensure creative, authentic, meaningful and contemporary interpretations of Indigenous and historical cultural heritage are incorporated into the Project design while avoiding literal interpretations of elements</li> <li>Increase knowledge and understanding of Wurundjeri Woi-wurrung history as well as their past and present cultural heritage values and traditions</li> <li>Ensure the built form for North East Link contributes to the identity of Melbourne</li> <li>Embed Indigenous and local community knowledge and understandings of place into the Project</li> <li>Enhance urban amenity, user experience and contribute to a sense of place and local identity.</li> </ul>	<p>The design will include creative, authentic, meaningful, and contemporary interpretations of Indigenous and historical cultural heritage incorporated into the Project design while avoiding literal interpretations of elements, increase knowledge and understanding of Wurundjeri Woi-wurrung history as well as their past and present cultural heritage values and traditions and in the following manner:</p> <ul style="list-style-type: none"> <li>The design will include cultural interpretation, language, history, and design solutions which accord with the frameworks co-designed with Wurundjeri Woi-wurrung mapped to the 31 key opportunities identified. This will not be a simplistic, clichéd, or badging exercise, but rather an embedded collaboration, led by an Indigenous architect, with Wurundjeri Woi-wurrung in a distributed and meaningful manner, consistent with cultural protocols aligned to the International Indigenous Design Charter – demonstrating best practice in respectful and culturally responsive design. The Bolin Bolin area is recognised as an area of Indigenous significance and the proposed cultural precinct design intends to build further on these cultural aspects. Consultation has occurred, and is ongoing, with the Wurundjeri Woi-wurrung representatives which has identified key design input opportunities across the Project</li> <li>The colour palette used for the Project's urban design is the Munsell colour chart, a colour system that describes soil pigmentation and measures colours of archaeological artefacts. Hues, value, and chroma for the various design elements at NEL have been inspired by the colour palette of the natural local landscape and the Wurundjeri Woi-wurrung colour identity through paintings, rituals, and artefacts</li> <li>After consultation with the Wurundjeri Woi-wurrung, the design has included place markers for embedded Indigenous and local community knowledge and understandings of place into the Project as shown on the landscaping drawings. There is ongoing consultation with both the Wurundjeri Woi-wurrung and local community throughout the design development phase to inform this design outcome which will include wayfinding and storytelling opportunities.</li> </ul> <p>The built form for North East Link contributes to the identity of Melbourne by creating an intuitive wayfinding outcome by utilising the significant high quality architectural built form elements to sign post the precincts as people journey along the corridor. These elements such as the Ventilation Structures, the feature pedestrian bridges, the landscape precincts and the Yarra Link green bridge create the moments along the journey that allow travellers to intuitively understand where they are.</p> <p>By creating these places for community gathering, exercise and cultural significance, the urban amenity and user experience is enhanced which contributes to a sense of place and local identity.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 9: Key Direction 3 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p><b>A shared history</b></p> <p>This Project presents a unique opportunity for a collaborative approach with stakeholders and the Wurundjeri Woi-wurrung to embed local knowledge, understandings and shared values, and to choreograph the journey via infrastructure with sculptural interventions.</p>	<p>This design demonstrates a collaborative approach with stakeholders and the Wurundjeri Woi-wurrung to embed local knowledge, understandings and shared values, and to choreograph the journey via infrastructure with sculptural interventions in the following manner:</p> <ul style="list-style-type: none"> <li>The urban design solution includes an embedded Indigenous design approach which is weaved throughout the design solution. Jefa Greenaway, from Greenaway Architects, is an Indigenous architect who has driven this approach for the Project team</li> <li>Underpinning our design thinking are three core principles which have been used to focus how the design will ensure that the aspirations of the Wurundjeri Woi-wurrung Traditional Owners are given prominence. These pillars give clarity and focus to how the design has provided solutions which maintain a rigorous design sensibility that reinforces our design response and is inspired by 67,000 years of Indigenous ways of being;</li> </ul> <p><b>Connection to Country</b></p> <p>Connection to Country provides a systems thinking approach to how we think about place. It recognises that we are part of Country and that through deep engagement with the Traditional Owners who speak for Country, we can reveal deep histories of place.</p> <p><b>Connecting People</b></p> <p>This principle provides a people centred lens for the design's decision making. It ensures that we integrate into the design decision making the importance of human connection and the role that we play as designers in stitching together communities contemporaneously.</p> <p><b>Caring for Country</b></p> <p>The notion of Caring for Country provides an elegant, yet potent, design strategy that extends and applies the principles spanning thousands of generations of custodianship of this land to the Project. We feel this is core to the design approach.</p> <p>The key design aspects that have incorporated this design approach include:</p> <ul style="list-style-type: none"> <li>The tunnel portals incorporate an embedded Indigenous narrative that reflects the ground into which they are cut. The colours of the structure and cladding will reflect the geomorphology of the surrounding area representing a connection to the country through which the tunnel travels. At night the proposed feature lighting represents the embers of the campfires of the traditional owner gathering places</li> <li>The colours of the bridge elements, retaining walls and noise walls will reflect the geomorphology of the surrounding area representing a connection to the country through which the road travels</li> <li>The organic Ventilation Structure form and cladding reflects an abstracted idea of an eel trap that was significant to the Wurundjeri Woi-wurrung in their hunting and gathering of food</li> <li>The Yarra Link green bridge provides the physical, visual and habitat connectivity between the Koonung Creek and the Birrarung. Subject to cultural approval and authority from Wurundjeri Woi-wurrung, it provides an interpretative landscape, and open-space pedagogical journey that can highlight the cultural significance of the adjacent Bolin Bolin Billabong</li> </ul>

## 5.0 Consistency with Urban Design Strategy

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Table 9: Key Direction 3 UDS Requirements and Design Response continued

UDS Requirements	Design Response
	<ul style="list-style-type: none"> <li>The wayfinding design will incorporate both Indigenous and European history storytelling that is relevant to the various project areas as well as nearby cultural places such as Bolin Bolin, Yarra Bend Park and the Heide Museum of Modern Art.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>Wurundjeri Woi-wurrung and Connection to Country</b></p> <p>The design for NEL must seek opportunities to represent Wurundjeri Woi-wurrung people's knowledge, insights and Connections to Country, via a meaningful, authentic and collaborative process.</p> <p>As part of supporting the protection and enhancement of precious Wurundjeri Woi-wurrung traditional knowledge and values, the WWCHAC has identified a number of Project-specific cultural themes that may be 'brought to life' through the Project design:</p> <ul style="list-style-type: none"> <li>Art and interpretation</li> <li>Artefacts and material culture</li> <li>Ceremony (tanderrum)</li> <li>Country and natural resources</li> <li>Fire</li> <li>Indigenous architecture</li> <li>Indigenous seasonality</li> <li>Language and communication</li> <li>The Manna Gum and Witchetty Grub</li> <li>Past, contemporary and emerging Indigenous identity</li> <li>Resource gathering and harvesting</li> <li>Story telling</li> <li>Transition and beneath the earth</li> <li>Travel and trade</li> <li>Water and totem animal species.</li> </ul>	<p>In collaboration with Wurundjeri Woi-wurrung Traditional Owners, Elders and Knowledge Keepers an extensive cultural mapping process has been validated and expanded, a series of ongoing conversations commenced, and a co-designed process determined as part of culturally responsive methodology.</p> <p>Thirty-one key design opportunities have been identified across the domains of landscape, architecture, urban design and wayfinding. The translation is tangibly explored across several key design moves, namely the new Iuk (Eel) SUP bridge across Lower Plenty Road, a re-naturalised wetland setting adjacent to the Motorway Control Centre (MCC) and the Yarra River (Birrarung), as a well as continuing resolution towards embedded cultural interpretation along with artistic and (Wurundjeri Woi-wurrung) language inclusion as part of a normalised user experience, to name but three examples.</p> <p>Authentic Indigenous design is integrated within the design solution, translated, and interpreted in close collaboration with Wurundjeri Woi-wurrung, building upon the Cultural Values Report prepared by WWCHAC.</p> <p>The colours of Country, sustainability initiatives, WSUD strategies support the key cultural pillars informing the Project. Further exploration, testing and validation will continue to verify the stories that seek to be told, the motifs that may be expressed and cultural connections that seek to be amplified.</p> <p>Refer to: UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084, 0138 &amp; 0139 (Iuk and Bulleen Road SUP bridge).</p> <p>Refer to: UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC).</p> <p>Refer to: UDLP Attachment.1-Architecture and Urban Design.</p> <p>Refer to: UDLP Attachment.2-Landscape Design.</p>

# 5.0 Consistency with Urban Design Strategy

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Table 9: Key Direction 3 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p><b>Places &amp; influences</b></p> <p>NEL would pass places of importance to Melbourne residents. The Project presents an opportunity to celebrate and interpret pre-settlement and historical heritage values and themes of these places.</p>	<p>The design will capture and celebrate pre-settlement and historical heritage values and themes of these places in the following manner:</p> <ul style="list-style-type: none"> <li>Bespoke signage, cultural interpretation which mark places of significance along the NEL journey, will evolve through the course of the Project. Such adjacencies and histories are understood and will form the key themes that will inform the wayfinding response.</li> </ul> <p>The wayfinding approach is proposed to provide a link across the Project and include key landmark directional signage, general SUP trail information and Indigenous and contemporary storytelling.</p> <p>This will be coordinated with the landscape design to ensure appropriate landscape responses are provided to enhance the wayfinding solution</p> <ul style="list-style-type: none"> <li>The Cultural Landscape Precinct provides a place of Indigenous celebration and gathering.</li> <li>The organic Ventilation Structure form and cladding reflects an abstracted idea of an eel trap that was significant to the Wurundjeri Woi-wurrung in their hunting and gathering of food</li> <li>The colours of the bridge elements, retaining walls and noise walls will reflect the geomorphology of the surrounding area representing a connection to the country through which the road travels.</li> </ul>
<p><b>Interpretation of heritage themes</b></p> <p>The Project also provides an opportunity to develop an approach to the interpretation of heritage themes that reference Wurundjeri Woi-wurrung as well as post-European settlement historical heritage, including the places along the alignment.</p> <p>Interpretation such as signage or traditional Indigenous forms of marking the landscape (such as tree carvings) should be explored along walking and cycling paths, or as part of public open space works associated with the Project. Potential themes that may be considered include but are not limited to:</p> <ul style="list-style-type: none"> <li>The history of the Yarra Bend area (including institutions in Yarra Bend Park)</li> <li>The Yarra River and its environs</li> <li>The Banksia Street pipe bridge (including early bridges)</li> <li>The Eastern Freeway design</li> <li>Orcharding and other agricultural history themes</li> <li>Simpson Barracks.</li> </ul>	<p>A series of storylines are developing to support an integrated interpretation and signage strategy – to echo the layers of heritage across the Project corridor. Key moments are planned, as a series of episodic markers within the landscape adjacent to the SUPs, capturing the rich histories with a particular intensity evident adjacent to the Yarra River catchment, as well as in proximity to the Simpson Barracks which will be highlighted within Borlase Reserve as an important gathering place for community.</p> <p>There is an established appreciation of the celebration of artistic heritage in and around Heide Museum of Modern Art, which will be further explored in conversation with key stakeholders to capture the cultural precinct of the area. The interpretation of themes underpinned by a deep layering, connected Country, create a series of defined spaces for pause and respite to orientate users to places of significance near walking and cycling paths and larger open spaces.</p> <p>The wayfinding approach is proposed to provide a link across the Project and include key landmark directional signage, general SUP trail information and Indigenous and contemporary storytelling.</p> <p>This will be coordinated with the landscape design to ensure appropriate landscape responses are provided to enhance the wayfinding solution.</p> <p>Further work will be undertaken with precinct stakeholders including Heide Museum of Modern Art in developing and refining the design of the Project elements to reflect the European and Indigenous (Wurundjeri Woi-wurrung) artistic and historical narratives of the area.</p>

# 5.0 Consistency with Urban Design Strategy

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## 5.2.1 Corridor-wide Response

### Responses to Corridor-wide Key Design Directions

The Incorporated Document requires that this UDLP is consistent with the UDS. The UDS outlines the vision and quality expectations for all elements of NEL, including how the final detailed design in this UDLP should look and feel. As per Section 3.2 of the UDS Key design direction 4: Provide a great experience for road users, the Project must demonstrate a design that creates a great journey for road users, with a consistent experience that coherently links to adjacent freeways and provides a design hierarchy that allows for intuitive navigation. This section outlines this UDLP's consistency with the UDS, including key directions, objectives and principles and key places.

### Key Direction 4: Provide a great experience for road users

NEL builds upon the design reputation of its city, Melbourne.

NEL's urban design solution preferences nuance over monument to create an expressive and engaging motorist experience. NEL is a journey over, under and through communities and Country of north-east Melbourne, sensitively amplified through form, texture and colour.

The wayfinding journey is measured by portals, ventilation buildings, glimpses of landscape, and wayfinding markers providing legibility and sense of place.

A spatially constrained road reserve placed extra emphasis on the need to develop noise walls and interchanges that while robust and engaging, also minimise impact on communities.

Table 10: Key Direction 4 Solutions and Benefits

Solutions include	Benefits
<b>Intuitive navigation</b>	Consistent, legible design language through roads, bridges, noise walls and wayfinding to create a seamless and engaging motorist experience.
<b>Wayfinding</b>	Wayfinding devices at primary and secondary nodes create sense of place and assist motorists to safely navigate their journey.
<b>Simplified interchanges</b>	Simplified interchanges reduce impacts on local communities and make navigation and driving easier.
<b>Feature portals</b>	Portals are evocative journeys into Country fostering motorist engagement with place.

Table 11: Key Direction 4 UDS Requirements and Design Response

UDS Requirements	Design Response
<p>The North East Link journey must create a high quality traveller experience that harmoniously links to the M80 Ring Road, EastLink and the Eastern Freeway. Along the Project corridor, the travel experience is to be carefully choreographed to provide a memorable journey for drivers and their passengers, including bus users. Navigational nodes are to be created along the journey to form part of the sequential higher speed travel experience.</p>	<p>Colour, form, and architectural resolution supports a quality experience for travellers and a sense of identity across the corridor, assisting in navigation which will be enhanced by legible wayfinding at speed. Regardless of the location, a series of cues both nuanced and overt will be embedded to give both a distinct personality of place, yet within a unified design language.</p> <p>All visible components of the Project have been considered holistically – walls, barriers, gantries, bridges and tunnels. The road user experience is consistent across its length as the Project links transition in the south to the broader freeway network.</p> <p>Examples:</p> <ul style="list-style-type: none"> <li>North – cladding treatments within the trench are articulated to be clearly recognisable to road users. The quality of the noise walls and treatments of fly over structures is consistent with linking Projects. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i></li> <li>Tunnel – tunnel treatments including the integration of feature lighting have been developed to mark clear at grade moments. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Tunnels)</i></li> <li>South – the tunnel portal is a clearly recognisable form that ties various roadways into a unifying design solution. The quality of the noise walls and treatments of fly over structures is consistent with linking Projects. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i>.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>.</p>
<p><b>Minimise negative impacts on communities</b></p> <p><b>Primary nodes</b></p> <p>Manningham Road interchange area is also designated a primary node due to the cultural and heritage significance of the surrounds to broader Melbourne, including the Heide Museum of Modern Art, the Greater Yarra Urban parklands and its location on the Yarra Scenic Drive. This area provides opportunity to create a highly considered design that sensitively responds to the surrounding context and place, marking the transition of the road journey into the tunnel and integrating artful infrastructure to contribute to the cultural narrative of Melbourne. The design should also recognise the role of existing landmarks and features such as the 'Helmet' sculpture near the Heide Museum of Modern Art.</p>	<p>The design provides a highly considered approach that sensitively responds to the surrounding context and place, marking the transition of the road journey into the tunnel and integrating artful infrastructure to contribute to the cultural narrative of Melbourne in the following manner in the Manningham Road interchange area:</p> <ul style="list-style-type: none"> <li>The Manningham Road interchange is acknowledged as a key node within the Project and the existing River Red Gum tree will be used as a key reference marker for the transition of the road journey into the tunnel along with the subtle use of portal cladding to the tunnel entry and exit points. The portal cladding approach is low scale and simplistic in form as to not dominate, in order to sit comfortably within the site context</li> <li>The wayfinding approach is proposed to provide a visual linkage across the Project and include key landmark directional signage, general SUP trail information and Indigenous and contemporary storytelling which will include Heide Museum of Modern Art. Further work will be undertaken with precinct stakeholders including the Heide Museum of Modern Art in developing and refining the design of the project wayfinding elements to reflect the European and Indigenous (Wurundjeri Woi-wurrung) artistic and historical narratives of the area and the existing Helmet Sculpture will be tied into this design approach.</li> </ul>

## 5.0 Consistency with Urban Design Strategy

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Table 11: Key Direction 4 UDS Requirements and Design Response continued

UDS Requirements	Design Response
<p><b>Secondary nodes</b></p> <p>Secondary nodes are places where distinctive elements, navigational features or high-quality civic landmarks will assist with awareness and recognition of places.</p> <p>The Lower Plenty Road interchange marks the transition from the North East Link tunnels. This location presents an opportunity for an integrated architectural and landscape response that balances freeway infrastructure (such as Ventilation Structures and buildings) with local amenity and environmental outcomes.</p> <p>The Eastern Freeway interchange is an important node for bus users and includes a busway and the Park and Ride facility in Bulleen. The Project is not seeking additional large-scale, feature vertical elements at this location due to the sensitivity of the surrounding context. Nodes at this location should be created by well-designed elegant structures and the use of landform and landscaping rather than with additional superfluous built elements. The Ventilation Structures and associated buildings are significant elements in the landscape that should be sensitively sited, and designed to respond to their surrounding parkland landscape (through architectural form, topography and vegetation), and to integrate with other Project elements such as flood walls.</p>	<p>The design is committed to quality across the diversity of elements of the Project. Ventilation Structure architecture demonstrates an integration with landscape and are conceived to be distinctive orientation features within their settings. Coupled with the use of PV cells, they serve to demonstrate the sustainability agenda of the Project.</p> <p>The Lower Plenty Road experience is mediated through adjacent landscape of Borlase Reserve, a new bridge as a civic marker, while acknowledging a cultural story in collaboration with Wurundjeri Woi-wurrung.</p> <p>Topography, landform, vegetation fold-up to create the signature interface with the Eastern Freeway. A vast land bridge pulls the riparian landscape up and over, while concealing services and elements within.</p> <p>Both Ventilation Structures are screened with landscape to support a recessive approach throughout.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i> Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>
<p><b>Tunnels</b></p> <p>The transition from above county to beneath the earth and the journey through the subterranean environment, must enhance the traveller journey and create a comfortable and inviting experience for drivers. The tunnels provide an opportunity to create a highly considered design that may reflect the above-ground characteristics, interpret identified Indigenous cultural heritage themes and define the transition between the design character areas described in Key Direction 5.</p> <p>There are places along the road journey that will include visual events and design elements that must be considered appropriately in the Project design.</p>	<p>A sophisticated lighting strategy has been conceived to echo Country while taking inspiration from the geology of Country supporting a unique user experience. Visual clutter is concealed or made recessive to ensure legibility for the road user. The threshold into tunnels are key moments amplified by design details to mark the movement into and out of the tunnel.</p> <p>Consistent material expression occurs throughout the length of the tunnel journey through use of light reflective materials and dark ceiling treatments. Key moments utilise vertical LED strip lighting that defines a strong relationship to various surface features.</p>

# 5.0 Consistency with Urban Design Strategy

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## 5.2.1 Corridor-wide Response

### Responses to Corridor-wide Key Design Directions

The Incorporated Document requires that this UDLP is consistent with the UDS. The UDS outlines the vision and quality expectations for all elements of NEL, including how the final detailed design in this UDLP should look and feel. As per Section 3.2 of the UDS Key design direction 5: Create a context sensitive design, the Project must demonstrate a design that protects, maintains and enhances the local context through which the Project passes. This section outlines this UDLP’s consistency with the UDS, including key directions, objectives and principles and key places.

### Key Direction 5: Create a context sensitive design

The distinct design character areas – particularly Ridgeline and Yarra River Valley and Koonung Creek Valley areas – have undeniably shaped the NEL approach to the North East Link Tunnels and Freeway Package Interface Zones. The Project has carefully listened to community needs outlined in the UDS to ensure The Project’s response is respectful to the areas, values and uses cherished by communities.

The Project’s urban design for Ridgeline reduces fragmentation to improve access to education and employment. Reinforcing the green canopy of these hilly suburbs and bolstering treasured neighbourhoods has been achieved.

At Yarra River Valley, the Project protects and promotes significant areas to Wurundjeri Woi-wurrung, Heide Museum of Modern Art and the Greater Yarra Urban parklands. Opportunities to link communities via the Yarra Link green bridge are maximised, providing more habitat and biodiversity corridors, places for recreation, and amenity for community.

The Project’s design approach to Koonung Creek Valley area is through a Caring for Country framework, maximising habitat and rehabilitating wetlands at the Koonung Creek Valley area, enhancing local and broader cycling routes and connections and creating more opportunities for communities to access outdoor recreation and learn about natural habitats.

Table 12: Key Direction 5 Solutions and Benefits

Solutions include	Benefits
Better cross-connections	A graceful new walking and cycling bridge and new walking and cycling pathways make travel easy, safe and intuitive around the NEL corridor.
Greensborough Road boulevard	Transformed from road to boulevard featuring extensive tree plantings, with walking and cycling pathways.
Yarra Link green bridge	This generous new land bridge connects communities and habitat over Bulleen Road at this important Yarra River Valley juncture.
Banyule Creek Wetlands and Habitat	Over 3ha of improved Banyule Creek wetlands and habitat planting between Lower Plenty Road and the Lower Plenty Road NEL interchange.
Koonung Creek Valley area wetlands and habitat	Improved landscape habitats, surface water overflow over Koonung Creek Valley area and SUP connections including a new SUP bridge connection over the Eastern Freeway.

Table 13: Key Direction 5 UDS Requirements and Design Response

UDS Requirements	Design Response
<p>The differing values of each of these places were identified in stories and conversations with the community. This has led to an urban design approach that has divided the Project into three distinct ‘design character areas’:</p> <ul style="list-style-type: none"> <li>Ridgeline</li> <li>Yarra River Valley</li> <li>Koonung Creek Valley.</li> </ul> <p>The design for North East Link must be sensitive to the places adjacent and affected by Project, and the features, uses, significant elements and community values within each design character area.</p>	<p>The design solution has sought to balance the various competing demands of the Project, while respecting the three distinct design characters of the areas it traverses.</p> <ul style="list-style-type: none"> <li>The Ridgeline character enjoys a green edge, enhanced by a reimagined Borlase Reserve, a key activated community asset and a revitalised Greensborough Road into a treelined boulevard</li> <li>The Yarra River Valley context is a linear green corridor adjacent to Melbourne’s iconic river. The use of indigenous species, a signature land bridge, a new wetland basin and simplified road geometry which limits intrusion within this area is consistent with the characteristics of this area</li> <li>The Koonung Creek Valley while a little further east of the central package is respected and forms the basis of the design thinking for the Southern Interface Zone. Including the re-naturalised ephemeral dry creek bed parallel the Eastern Freeway demonstrates the alignment to this character.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

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## 5.3 Corridor-wide Requirements - Character Areas Overview

## 5.0 Consistency with Urban Design Strategy

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### 5.3.0 Introduction - Place-specific Responses

#### Place-specific Requirements

The Sections 3, 4, 5 & 6 of the UDS sets out place specific requirements to guide response to the local context of the Project.

The UDS recognises three distinct design character areas:

- Ridgeline
- Yarra River Valley
- Koonung Creek Valley.

The UDS recognises several strategic places within each distinct design character area. The following are relevant to the North East Link Tunnels and Southern Interface Zone:

- Urban Design Strategic place-Ridgeline area-Map R5 south of Watsonia Station
- Urban Design Strategic place-Ridgeline area-Map R6 Simpson Barracks
- Urban Design Strategic place-Ridgeline area-Map R7 Lower Plenty Road
- Urban Design Strategic place-Yarra River Valley area-Map Y1 Manningham Road interchange
- Urban Design Strategic place-Yarra River Valley area-Map Y2 Bulleen Road
- Urban Design Strategic place-Yarra River Valley area-Map Y3 Eastern Freeway interchange
- Urban Design Strategic place-Yarra River Valley area-Map Y4 Bulleen Road to Belford Road
- Urban Design Strategic place- Koonung Creek Valley area-Map K1 Bulleen Road to Doncaster Road.

The following sections of this report demonstrate compliance to the UDS for the character areas:

- 5.3.1 Ridgeline area
- 5.3.2 Yarra River Valley area
- 5.3.3 Koonung Creek Valley area.



Underground tunnel alignment indicative only. Does not form part of this approval.

Figure 89: Landscape character and UDS map areas

#### Location Legend

- Ridgeline area
- Yarra River Valley area
- Koonung Creek Valley area
- Tunnel

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## 5.3.2 Yarra River Valley Area

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### Yarra River Valley Area

The North East Link UDS outlines the following key design requirements that are a particular focus for the Yarra River Valley area on page 25 of the Urban Design Strategy, and outlined below is a high level design response:

**1. Protect and promote cultural values for places of significance including the Yarra River (Birrarung), Bolin Bolin Billabong, and the Heide Museum of Modern Art.**

The design promotes cultural values and places of significance through the incorporation of the Cultural Landscape Precinct which through consultation with the Wurundjeri Woi-wurrung provides a unique space to celebrate Indigenous culture to an area which has been identified as an important Indigenous cultural location. The proposed landscape design will stitch into the surrounding interface landscaping areas such as near the Yarra River (Birrarung) and Bolin Bolin Billabong. The additional parkland along with wayfinding and enhanced pedestrian and cycling connectivity will provide clear connections between the south and Banksia Park and Heide Museum of Modern Art to the north.

**2. Maximise opportunities for land use integration at the Manningham Road interchange.**

The design provides for 3 areas of future development land near the Bulleen/Manningham Road interchange as well as open parkland and the Cultural Landscape Precinct to the west of Bulleen Road. The proposed improved road geometry and enhanced public amenities such as pedestrian and cycling paths will contribute to maximising opportunities for land use integration for the future development area.

**3. Be sympathetic to the landscape setting of the Greater Yarra Urban parklands.**

The design is sympathetic to the Greater Yarra Urban parkland using planting selection, landscaping density and habitat improvement that responds to the site-specific character of the area.

**4. Improve the ability for the community to access open space in Bulleen.**

The design provides increased parkland areas as well as pedestrian and cycling paths which enhances connectivity through to the surrounding neighbourhoods.

**5. Provide enhanced and more convenient cycling routes to Melbourne's inner-city areas.**

The design provides an extensive network of new pedestrian and cycling paths throughout the area that connect through to existing trails and key destinations points.

Further details on the design compliance response to the UDS are contained within this section of the UDLP.

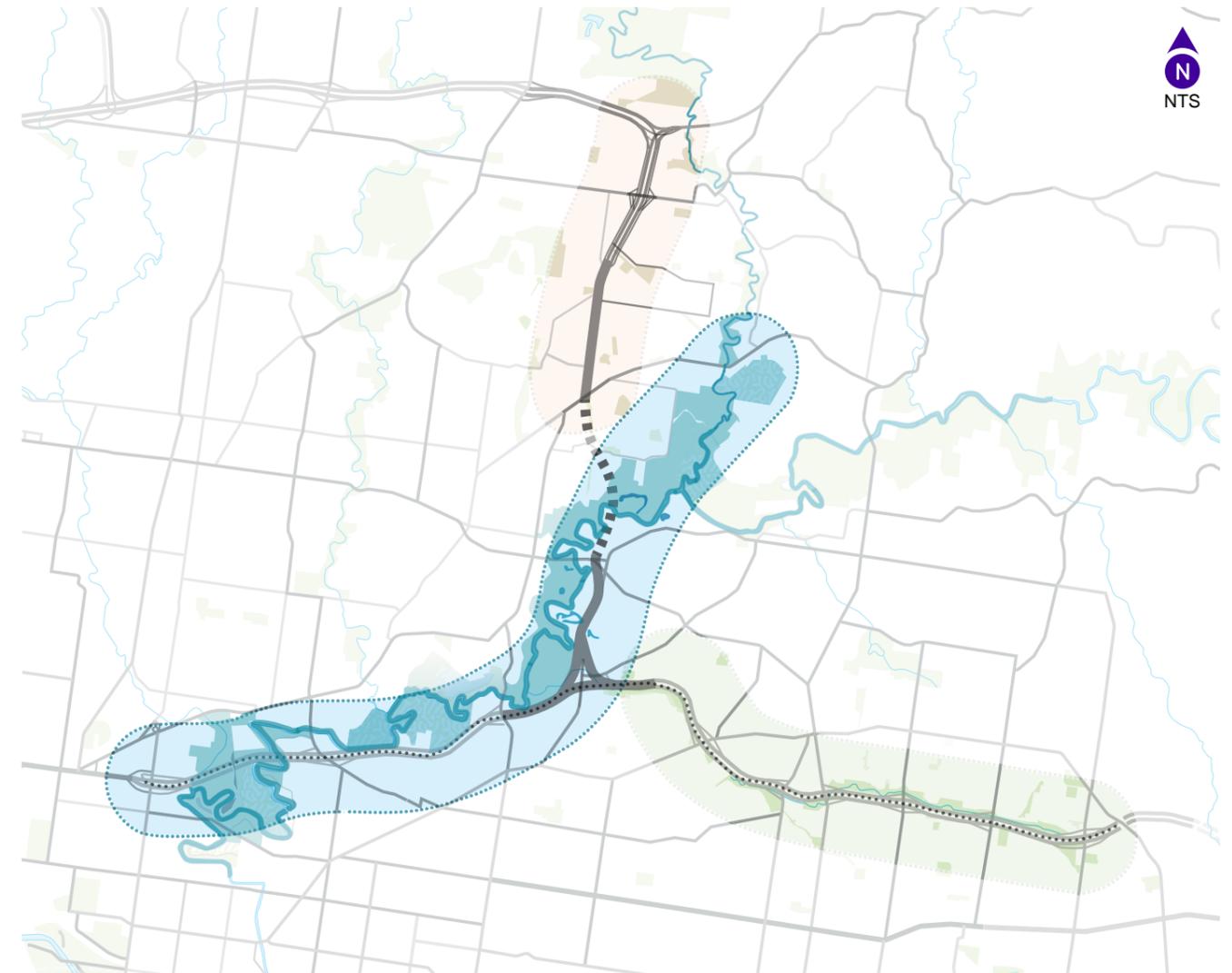
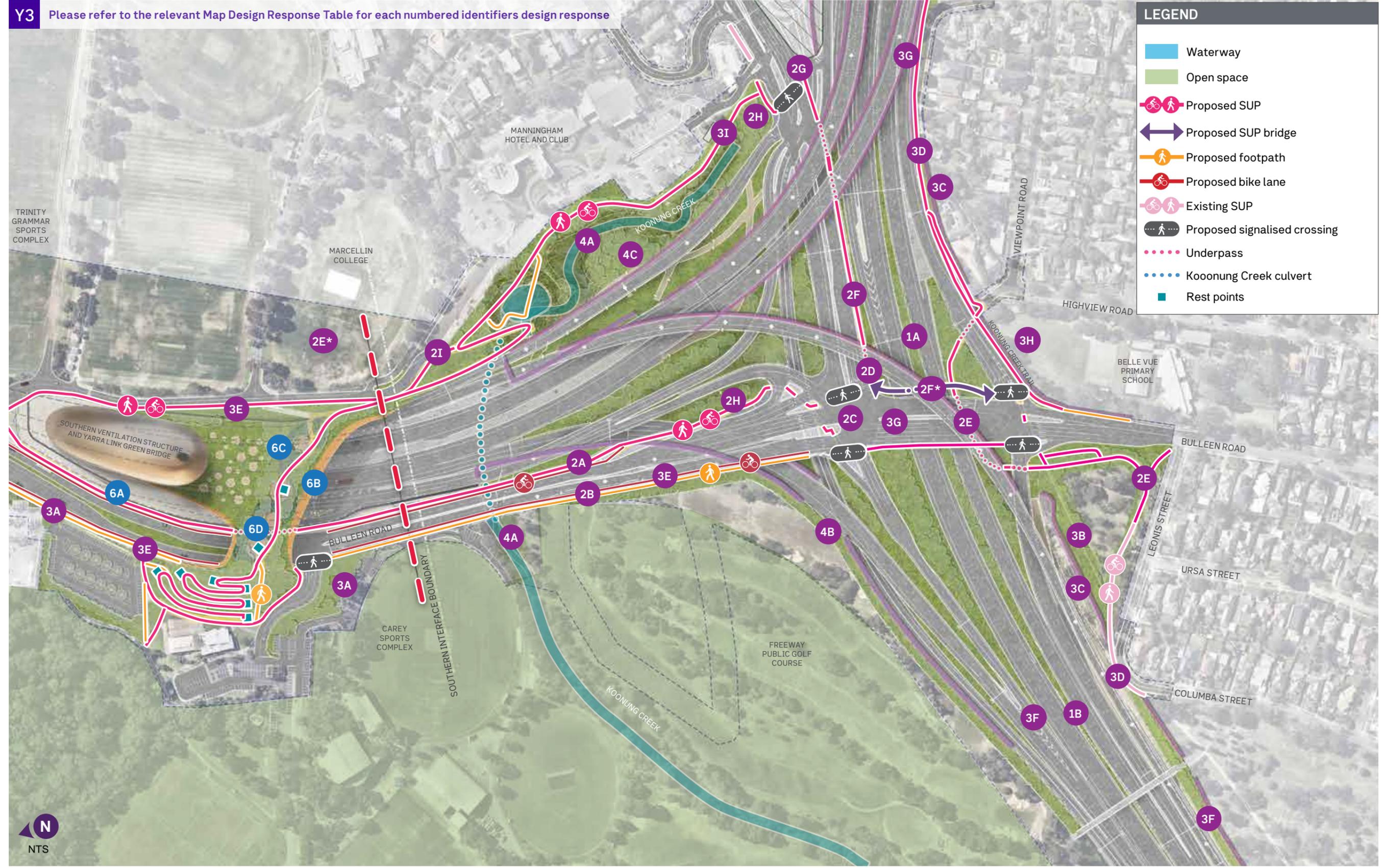


Figure 94: Yarra River Valley area

# 5.0 Consistency with Urban Design Strategy

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Figure 97: Consistency with Urban Design Strategic Place – Yarra River Valley area - Map Y3 Eastern Freeway interchange



## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

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Table 19: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange

Key Design Requirements		Response
<b>Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange</b>		
<b>Identity</b>	<b>1A</b>	Design the Eastern Freeway interchange to be a navigational node by using distinctive elements to provide features and landmarks for navigation for all modes of transports. Landscaping is to take inspiration from surrounding natural assets such as the Yarra River and will maximise indigenous planting to support biodiversity and habitat.
	<b>1B</b>	Where the existing mast lights along the Eastern Freeway cannot be retained, consider relocation. Where the existing mast lights cannot be relocated provide a design strategy for reuse
<b>Connectivity, Wayfinding &amp; Accessibility</b>	<b>2A</b>	Provide an off-road walking and cycling path along the eastern side of Bulleen Road to encourage active transport to local educational, cultural, and recreational places
	<b>2B</b>	Provide a footpath along the western side of Bulleen Road to support pedestrian access north-south between Ilma Court and the Eastern Freeway. The footpath should seek to minimise impact to sensitive areas
	<b>2C</b>	Provide signalised crossings across Bulleen Road to improve pedestrian safety, encourage active transport to the recreational and community facilities, and improve access to public open space from residential areas to the east.
	<b>2D</b>	Provide a walking and cycling crossing of the Eastern Freeway linking the new walking and cycling path to the Koonung Creek Trail

## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

Table 19: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange continued

Key Design Requirements	Response
<p><b>2E</b> Provide an alternative grade-separated crossing of Bulleen Road for pedestrians and cyclists travelling along the Koonung Creek Trail.</p>	<p>A grade separated SUP bridge has been included in the design to link east and west sides of the Koonung Creek Trail to ensure connectivity to the surrounding residents for pedestrians and cyclists.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>2F</b> Provide a high-quality walking and cycling path to connect from Bulleen Road and alongside Thompsons Road (located further east) to the Koonung Creek Trail on the northern side of the Eastern Freeway.</p>	<p>A new pedestrian bridge adjacent Bulleen Road bridge will connect to Thompsons Road SUP providing connectivity to the Bulleen Park and Ride, the Koonung Creek Trail, nearby schools, and Yarra Link green bridge. The path will be a minimum of 3m wide and suitable safety barriers provided where required from a safety perspective.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>2G</b> Provide a pedestrian connection from Bulleen Road into the Bulleen Park and Ride facility.</p>	<p>A proposed pedestrian and cycle path will connect along Thompsons Road to Bulleen Road providing connectivity with the Bulleen Park and Ride, and pathways north.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>2H</b> Improve landscape amenity along Bulleen Road and adjacent to Bulleen Park and Ride facility.</p>	<p>The design has provided canopy tree and garden bed planting adjacent to Bulleen Road where practicable. The Bulleen Park and Ride facility has been moved to the corner of Thompsons Road and Kampman Street and has its own separate UDLP which is not part of this project. Surrounding the new location of the Bulleen Park and Ride, appropriate amenity landscaping has been provided.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>2I</b> Through the design process, consider improvement to connectivity to nearby schools by creating a crossing over the Koonung Creek north of the new Bulleen Park and Ride facility.</p>	<p>A new crossing over Koonung Creek Valley area facilitates access to schools and encourages active transport.</p> <p>The path from Bulleen Park and Ride to the schools will include the eastern SUP leading up to the Yarra Link green bridge.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>2E*</b> Ensure that the design has regard to the setting and operational requirements of Marcellin College, Trinity Grammar and Carey Grammar</p>	<p>The design considers the setting and operational requirements of Marcellin College, Trinity Grammar and Carey Grammar with new access roads provided in the civil design along with new SUP linkage. The schools have been consulted on the UDLP design. The Tunnels Project will work with the schools during the preliminary design phase to resolve the next level of detail regarding access.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>2F*</b> Ensure that the design (including of the walking and cycling crossing of the Eastern Freeway) has regard to the setting and operational requirements of Belle Vue Primary.</p>	<p>The design considers the SUP connectivity along Bulleen Road, Bulleen Road westbound and eastbound ramps and considers the users of Belle Vue Primary School by providing a signalised crossing and a dedicated SUP bridge across Bulleen Road.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>Amenity, Vibrancy &amp; Safety</b></p>	<p><b>3A</b> Provide roadside planting with large canopy trees along Bulleen Road to enhance the area's 'green' character and role as a gateway to Melbourne's north-east.</p> <p>Canopy trees will be implemented along Bulleen Road, where appropriate, to enhance the road character, shade and to support the urban forest.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

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## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

Table 19: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange continued

Key Design Requirements	Response
<p><b>3B</b> Reinststate and enhance buffer planting along the Eastern Freeway interface at Leonis Avenue Reserve</p>	<p>The landscape design will prioritise retaining existing trees where possible. Screen planting will be provided up along Leonis Avenue with a suitable level of landscaping height near the pedestrian and cycling paths to enable clear sight lines for users at the junctions. Screen planting will also be provided between the SUP and the noise wall.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>3C</b> Ensure noise walls to the south of the Eastern Freeway:</p> <ul style="list-style-type: none"> <li>• Maximise solar access to the Koonung Creek Trail and to residential properties</li> <li>• Minimise overshadowing to residential properties</li> <li>• Have treatments to both sides of the wall</li> <li>• Use landscaping to filter views towards noise walls</li> <li>• Respond sensitively to existing retained noise walls.</li> </ul>	<p>Noise walls ensure smooth transitions between open landscaped areas and freeway environments, as well as between different types of walls, heights, and proposed and existing structures. This provides a consistent, legible design language creates a seamless and engaging motorist experience whilst respecting the surrounding residents and landscapes.</p> <p>The UDLP Attachment.1 drawings show the extent, heights and finish to the noise walls which respond to preliminary noise modelling assessments and the design has considered adjoining property impacts, site constraints and the urban design language of the overall project.</p> <p>During the design development process additional analysis is undertaken to inform the noise wall extent, heights and treatments, such as further noise modelling, field surveys and additional stakeholder consultation, and the design will be refined accordingly.</p> <p>The noise walls will be designed to meet the criteria as shown in the UDLP Report-Section 6. Compliance with Environmental Performance Requirements - 13. Noise and Vibration.</p> <p>Outlined below is the high level UDLP design approach response to the UDS criteria and during the design development phase each item will be addressed in greater detail.</p> <ul style="list-style-type: none"> <li>• Maximise solar access to the Koonung Creek Trail and to residential properties <ul style="list-style-type: none"> <li>- Noise wall heights will be kept to a minimum to comply with the EPR requirements, 13. Noise and Vibration (NV), and where deemed acceptable transparent acrylic noise wall panels will be used to assist in light transmission to adjoining properties</li> </ul> </li> <li>• Minimise overshadowing to residential properties <ul style="list-style-type: none"> <li>- The height of the noise walls will be kept to the minimum required to comply with the noise modelling outcomes to minimise overshadowing to adjoining properties and where deemed acceptable transparent acrylic noise wall panels will be used to assist in light transmission to adjoining properties</li> </ul> </li> <li>• Have treatments to both sides of the wall <ul style="list-style-type: none"> <li>- Noise walls will have treatments to both sides of the walls as shown in the UDLP design where adjoining properties have views to these walls</li> </ul> </li> <li>• Use landscaping to filter views towards noise walls <ul style="list-style-type: none"> <li>- Landscaping will be used to screen noise walls where possible subject to suitable availability of space such as along Estelle Street and towards the north end of Greensborough Road boulevard on the east side</li> </ul> </li> <li>• Respond sensitively to existing retained noise walls <ul style="list-style-type: none"> <li>- The noise wall design will consider the existing noise walls that are to be retained to ensure a complimentary design outcome is achieved at the relevant interfaces such as near the Bulleen Park and Ride and along the north and south side of the Eastern Freeway.</li> </ul> </li> </ul> <p>Typical anticipated Design Development Outputs for Noise Walls:</p> <ul style="list-style-type: none"> <li>- Additional noise modelling</li> <li>- Heights and extent</li> <li>- Material, texture, and colour</li> <li>- Overshadowing impacts</li> <li>- Whole of life analysis</li> <li>- Acoustic performance of materials.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

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## 5.0 Consistency with Urban Design Strategy

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Table 19: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange continued

Key Design Requirements	Response
<p><b>3D</b> Ensure narrower areas along the Koonung Creek Trail have good lighting, open sightlines and are attractive to users.</p>	<p>Careful lighting placement, type, clear sightlines, and planting ensures public safety and amenity along narrower areas of Koonung Creek Trail. This section of the SUP along Koonung Creek Valley area will be provided with light spill from the Freeway and where the SUP connects to Highview Road and the proposed underpass, additional lighting will be provided. Landscaping will be included where the room allows and noise walls will have doubled faced treatments as previously mentioned in this report. Consideration will be given to safety signs and junctions points for the confined SUP junctions to ensure suitable sight lines are achieved. Good lighting will be determined by a safety assessment with respect to bicycle speeds, CPTED principals, and adjoining street lighting spillage outcomes.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>3E</b> Minimise the visibility of road infrastructure from the open spaces, Carey and Marcellin College. Plant indigenous trees and vegetation to filter views</p>	<p>Screen planting of native trees and vegetation as well as earth mounding will be used to screen the Yarra Link green bridge retaining walls and structure that faces Trinity and Marcellin College. The screen planting will be in various layers and the eastern SUP structure hanging of the Yarra Link green bridge will provide a sense of vertical relief in the urban design and the retaining walls and structure will be provided with a textured finish.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>3F</b> Reinstate and enhance buffer planting along the Eastern Freeway interfaces.</p>	<p>Low maintenance enhanced buffer planting will be reinstated to create a visual buffer and reduce the impact of Eastern Freeway.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>3G</b> Design elevated structures at the Eastern Freeway interchange to minimise the bulky appearance when viewed from surrounding neighbourhoods such as Balwyn North.</p>	<p>The design has minimised the bulky appearance of the Eastern Freeway interchange when viewed from surrounding neighbourhoods via the following approach:</p> <ul style="list-style-type: none"> <li>• An efficient structural design for the elevated structures that avoids superfluous materials</li> <li>• On structure noise walls and barriers design being kept to a minimum extent and avoiding superfluous materials</li> <li>• The gantry designs being kept to a slender yet functional design outcome as well as combining gantries where possible to reduce the gantry numbers</li> <li>• The Bulleen Road SUP being a light touch design approach which avoids bulky structures</li> <li>• The design approach to keeping the supporting structural columns and cross heads to an elegant yet functional outcome</li> <li>• The use of transparent acrylic noise walls panels</li> <li>• Combining signage where possible.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<p><b>3H</b> Minimise overlooking to residential properties and Belle Vue Primary School located south-east of the Eastern Freeway interchange.</p>	<p>Noise walls will be implemented along the Eastern Freeway off ramp heading westbound to minimise overlooking of residential properties and Belle Vue Primary School.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>3I</b> Enhance access and create a pleasant environment for pedestrians and cyclists along the Koonung Creek corridor at the interface with the proposed Bulleen Park and Ride facility.</p>	<p>A proposed pedestrian and cycle path will connect from Thompsons Road and interface with the Bulleen Park and Ride. This trail will weave along Koonung Creek Valley area with indigenous plantings that will improve the biodiversity and habitat of the corridor.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

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## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

Table 19: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y3 Eastern Freeway interchange continued

Key Design Requirements		Response
<b>Resilience &amp; Sustainability</b>	<b>4A</b> Provide planting to enhance visual amenity, biodiversity and habitat links along the Koonung Creek corridor.	The design's approach to Caring for Country prioritises biodiversity and habitat links of the Koonung Creek Valley area corridor across the Yarra Link green bridge. A proposed wetland and integrated design for elevated bridge will also provide opportunities for creating journey lines linking to the Yarra Link green bridge.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>
	<b>4B</b> Reinstatement and enhance buffer planting along the Freeway Public Golf Course interface. Through the design process, consider Water Sensitive Urban Design infrastructure to capture and treat stormwater runoff from the Project.	New indigenous buffer plantings to support biodiversity and habitat will provide opportunities for filtered views along the Public Golf Course.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>
	<b>4C</b> Where Project works directly affect the Koonung Creek interface (between Bulleen Road and Thompsons Road), provide additional vegetation in the area around the creek to enhance the appearance and environmental values.	Water Sensitive Urban Design approach will showcase and improve biodiversity through treating stormwater, enhancing, and protecting habitat of the new wetland and Koonung Creek Valley area corridor.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>
<b>Urban integration</b>	<b>5A</b> Create a new Park and Ride facility in Bulleen that considers: <ul style="list-style-type: none"> <li>Connectivity to surrounding walking and cycling network</li> <li>Provision of convenient bicycle parking facilities</li> <li>Sensitivity of interfaces with new built form and being at a pedestrian scale with the adjoining Koonung Creek corridor</li> <li>Seamless transition and connection to the Eastern Freeway design (within the Yarra River Valley design character area) with the design for the Eastern Freeway interchange and to the east of Bulleen Road (within the Koonung Creek design character area)</li> </ul>	Not applicable to this Project.
<b>Added Value Items by the Project</b>	<b>6A</b> This design requirement was not listed in the UDS and is an added value item by the Project.	Flood walls differentiate local and through traffic, marking the threshold of the tunnel and contributing to a sense of identity. The design of the flood walls act as a visual marker / threshold in the landscape which differentiates the two driving experiences of the local Bulleen Road environment and the entrance into NEL.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i>
	<b>6B</b> This design requirement was not listed in the UDS and is an added value item by the Project.	Sculptural portal located at the Bulleen entrance to the tunnel, referencing languages of pattern and abstraction within. The sculptural metal cladding at the entrance of the Southern Portal reflects the geomorphology of the surrounding area representing a connection to the country.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>
	<b>6C</b> This design requirement was not listed in the UDS and is an added value item by the Project.	Koonung Creek Valley area terrestrial ecological corridor carried up over the Yarra Link green bridge. The Koonung Creek Valley area terrestrial ecological corridor planting is drawn up and over the Yarra Link green bridge and connects to the Yarra River Valley area.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i>
	<b>6D</b> This design requirement was not listed in the UDS and is an added value item by the Project.	Rest points provided at each switch-back on Yarra Link green bridge SUP ramp. Pedestrian and cyclists rest points are provided where the eastern and western SUPs meet the top of the Yarra Link green bridge.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i>

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# 5.0 Consistency with Urban Design Strategy

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Figure 98: Consistency with Urban Design Strategic Place – Yarra River Valley area – Map Y4 Bulleen Road to Belford Road



## 5.0 Consistency with Urban Design Strategy

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Table 20: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y4 Bulleen Road to Belford Road

Key Design Requirements		Response	
<b>Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y4 Bulleen Road to Belford Road</b>			
<b>Connectivity, Wayfinding &amp; Accessibility</b>	<b>1A</b>	Provide a more direct cycling path parallel with the Eastern Freeway from Burke Road, connecting to the existing Koonung Creek Trail east of Burke Road.	This is an existing SUP and as such no works are required.
	<b>1B</b>	Provide a cycling path on the north side of the Eastern Freeway at freeway level to address existing grade issues at Belford Road	This opportunity is outside of this Tunnels UDLP design project boundary and therefore not addressed in the design. However, the design does not preclude these works from being delivered by others as the Tunnels UDLP provides the SUP connection towards this area.
	<b>1C</b>	Consider providing a walking and cycling path on the north side of the Eastern Freeway from Bulleen Road towards Burke Road.	This opportunity is outside of this Tunnels UDLP design project boundary and therefore not addressed in the design. However, the design does not preclude these works from being delivered by others.
	<b>1D</b>	Consider providing a path connection along the east side of the Yarra River in the Freeway Golf Course to improve access on either side of the Eastern freeway.	This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others.
<b>Amenity, Vibrancy &amp; Safety</b>	<b>2A</b>	Reinstate and enhance buffer planting along the Eastern Freeway interface at Columba Street Reserve.  *Consider opportunities to improve neighbourhood/local unstructured and informal recreational facilities in consultation with Boroondara City Council.	Enhanced buffer planting has been included and will improve visual amenity for locals using the Columba Street Reserve and strengthens the green corridor along the southern edge of the Eastern Freeway.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i> .
	<b>2B</b>	Improve lighting and consider other enhancements to wall treatments, sightlines, and wayfinding at the existing underpass beneath the Eastern Freeway connecting Musca Reserve and Yarra Flats Reserve.	This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.
	<b>2C</b>	Provide buffer planting to the edge of Musca Street Reserve to create a vegetated backdrop and filter views towards road infrastructure.	New plantings will be included to reduce height and bulk of the road infrastructure to better integrate it into the surrounding landscape.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i> .
	<b>2D</b>	Design infrastructure to maximise solar access to properties along Elm Grove / Main Yarra Trail adjoining the Eastern Freeway.	This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.
	<b>2E</b>	Noise walls adjacent to residential properties are to provide visual amenity on both the road and residential interfaces.	Noise walls equally consider both motorist and residential interfaces with high-quality design and finish and will include screen planting where possible.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i> .
	<b>2F</b>	Maximise views towards borrowed landscapes from the Eastern Freeway.	Existing landscaping will be retained where possible in this area and new landscaping will include appropriate heights to enhance views beyond the Freeway.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i> .
<b>Resilience &amp; Sustainability</b>	<b>3A</b>	Consider providing habitat infrastructure beneath Burke Road bridge to support habitat connectivity to and from the Yarra River.	This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.
	<b>3B</b>	Consider providing a habitat link across the Eastern Freeway to the Freeway Public Golf Course.	A habitat link has been included.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i> .
	<b>3C</b>	Consider providing a habitat link across the Eastern Freeway from Hays Paddock to Kew Golf Club.	This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.

## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

Table 20: Consistency with Urban Design Strategic Place - Yarra River Valley area - Map Y4 Bulleen Road to Belford Road continued

Key Design Requirements	Response
<b>Identity</b>	
<b>4A</b> Through the design process, consider the relocation of the existing mast lights where the lights cannot be retained in their current location.	<p>The design will consider this as part of the Project's design development phase which will include an analysis of the suitability of the existing lighting such as lighting performance, urban design finish, suitability of light poles and maintenance considerations when the Freeway lighting is analysed and the design approach is to provide a uniform and coordinated Freeway lighting design outcome.</p> <p>Typical anticipated Design Development Outputs for Freeway Lighting:</p> <ul style="list-style-type: none"> <li>• Survey of existing freeway lighting</li> <li>• Analysis of re use opportunities which includes whole of life, structural considerations, suitability of finishes, pole heights, lighting performance and suitability of integration within the proposed project wide outcome.</li> </ul>
<b>4B</b> Seek to maintain distant scenic views to the north from residential areas on Columba Street at the interface with the Project.	<p>Scenic views enjoyed by residential areas on Columba Street have been maintained through visual permeability of noise wall structures and low level planting.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p>
<b>4C</b> Maintain the existing rock escarpments. Where additional rock cutting or modifications are required, they should complement the existing rock escarpment.	<p>Existing rock escarpments have been maintained as an essential and expressive contributor to the Eastern Freeway's identity and experience.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p>
<b>4D</b> Conserve the quality of existing Belford Road and Burke Road bridges by: <ul style="list-style-type: none"> <li>• Avoiding the retrofitting of elements to the bridges. Should the retrofitting of elements be required, they are to be bespoke to complement the existing bridge designs</li> <li>• Not locating signage on the bridges</li> <li>• Ensuring any new structures and/or elements located near the existing bridges are designed to minimise visual impact and to respond to the design of the existing bridges.</li> </ul>	<p>This area is outside of this UDLP design project boundary and therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.</p>

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## 5.3.3 Koonung Creek Valley Area

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### Koonung Creek Valley Area

The North East Link UDS outlines the following key design requirements that are a particular focus for the Koonung Creek Valley area on page 26 of the Urban Design Strategy, and outlined below is a high level design response:

**1. Optimise the existing open space functions and upgrade the open spaces that run parallel to the Eastern Freeway.**

The design provides an enhancement to the existing open spaces that runs parallel to the Eastern Freeway and includes additional landscaping, screen planting, additional wetlands, pedestrian and cycling paths as well as public amenities such as seating and BBQ areas.

**2. Respect the original architectural and landscape design of the Eastern Freeway.**

The existing landscaping in the area is well established and the design respects the original architectural and landscape design through an integrated design response that enhances the existing condition and provides additional amenity where required.

**3. Maximise opportunities to connect the communities to the north and south of the Eastern Freeway.**

The design includes additional pedestrian and cycling paths as well as a new SUP bridge over Bulleen Road that improves connectivity through to the surrounding neighbourhoods. The tunnel and road geometry design solution provides direct connectivity through to the north thus alleviated traffic pressures to the surrounding areas.

**4. Improve transport and road connections to key activity centres.**

The tunnel design solution provides direct connectivity through to Greensborough Road and

as such through to the north via the Metropolitan Ring Road and the M80 which will result in reduced traffic impact along Bulleen Road.

**5. Create a great bus user experience and upgrade the existing Doncaster Park and Ride into a well-resolved facility.**

The design's Eastern Freeway works scope includes a component of the dedicated bus lane from the Bulleen Park and Ride facility through to the west.

**6. Support active transport along the Koonung Creek Trail.**

The design includes enhancing the pedestrian and cycling connectivity along the Koonung Creek Trail which includes a SUP bridge across the Eastern Freeway as well underpasses under Bulleen Road.

**7. Reinstate and enhance buffer vegetation to filter views to freeway infrastructure and blend interfaces with surrounding treed neighbourhood character.**

The design includes landscaping buffer planting along the Eastern Freeway to filter views from the surrounding areas and blend infrastructure interfaces within the surrounding treed neighbourhood.

**8. Celebrate, maximise and reinstate natural vegetation and wetlands.**

The design includes an enhancement of the existing wetlands and habitat corridor and builds upon the existing condition to provide an improved amenity to the community.

Further details on the design compliance response to the UDS are contained within this section of the UDLP.

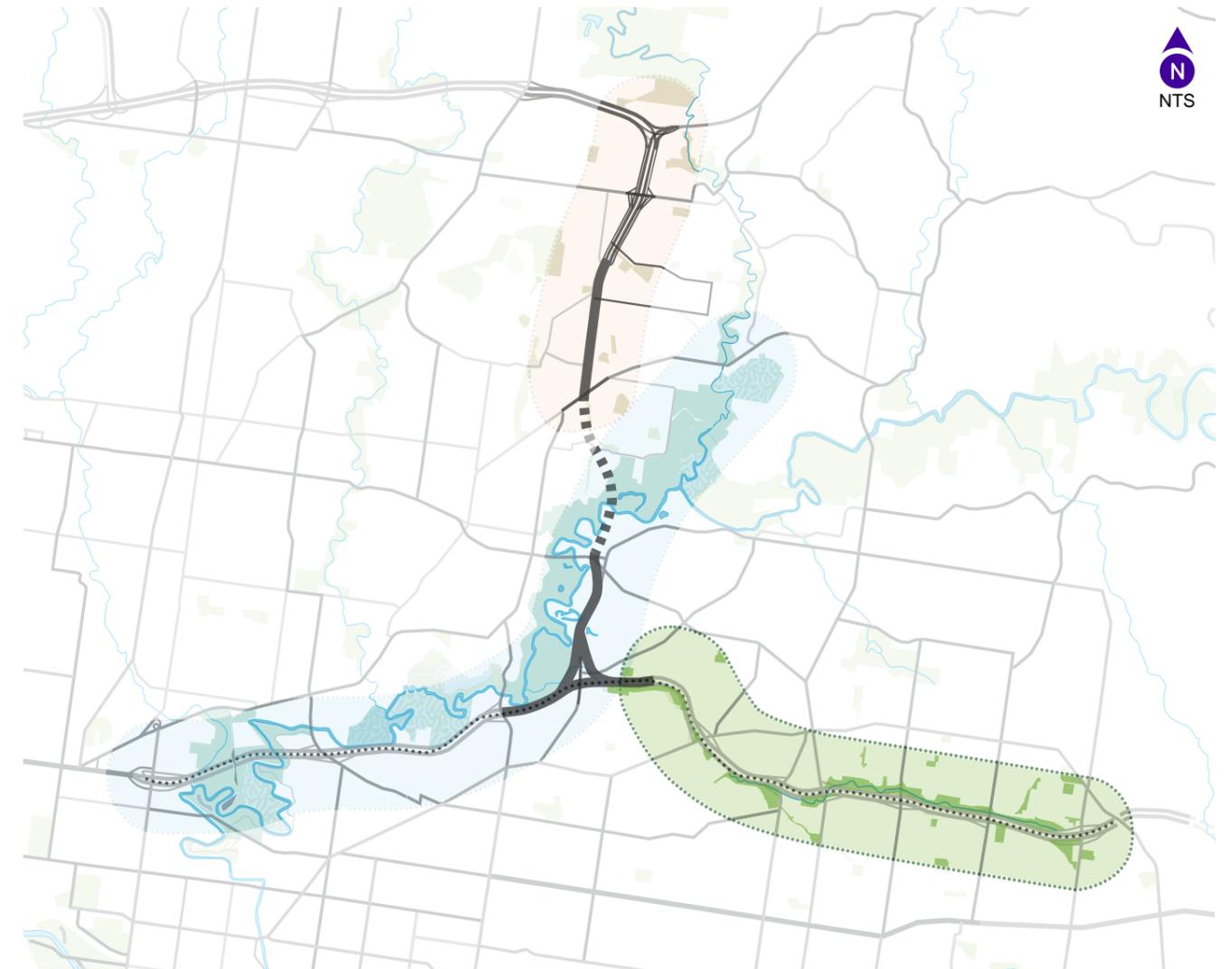


Figure 99: Koonung Creek Valley area



## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

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Table 21: Consistency with Urban Design Strategic place - Koonung Creek Valley area - Map K1 Bulleen Road to Doncaster Road

Key Design Requirements		Response
<b>Consistency with Urban Design Strategic place - Koonung Creek Valley area - Map K1 Bulleen Road to Doncaster Road</b>		
<b>Identity</b>	<b>1A</b> Ensure the Thompsons Road intersection supports a safe pedestrian environment and caters for public transport such as for the Bulleen Park and Ride facility	<p>The design for the intersection at the Eastern Freeway interchange provides connectivity for the Eastern Freeway to Bulleen Road and Thompsons Road.</p> <p>The design includes a new SUP bridge alongside the existing Bulleen Road bridge as well as additional SUP underpasses to separate traffic and pedestrians/cyclists.</p> <p>The proposed road and SUP networks will be tied into the Bulleen Park and Ride Project.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
<b>Connectivity, Wayfinding &amp; Accessibility</b>	<b>2A</b> Reinstate or realign the Koonung Creek Trail where required to a suitably wide and functional standard.	<p>The design includes the realignment and reinstatement of the SUP Koonung Creek Trail as shown on the following design drawings:</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
	<b>2B</b> Replace existing pedestrian bridge at Estelle Street with a walking and cycling bridge over the Eastern Freeway linking Estelle Street with the Koonung Creek Trail (north and south of the freeway) and Koonung Creek Reserve. Bridges within the Koonung Creek design character area must seek to retain existing elegant qualities and should read as a family while being individually identifiable to provide landmarks for navigation.  Provide an enhanced entry and link at Estelle Street to the new walking and cycling bridge which has clear sightlines and wayfinding signage to the Koonung Creek Trail.	<p>The new Estelle Street SUP bridge is outside the Project boundary of this UDLP. The design under this UDLP provides the necessary SUP and footpath connections to enable pedestrian and cyclist connections to the new Estelle Street SUP bridge to be delivered by the Secondary Package Contractor. This new SUP bridge will be designed and constructed in a different location to that shown in the UDS to enable the existing SUP bridge to remain functional while the new SUP bridge is constructed.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
	<b>2C</b> Where Project works directly affect existing secondary paths in Koonung Creek Reserve, provide replacement walking paths in high use areas where safe and practicable to reduce the potential for conflict between walkers and cyclists along the Koonung Creek Trail and provide additional amenity for the community.	<p>A new SUP and pedestrian paths are shown to Koonung Creek Reserve in the design. Replacement paths have been included in the design where works have affected existing secondary paths within Koonung Creek Reserve.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
<b>Urban Integration</b>	<b>3A</b> Seamlessly transition and connect the Eastern Freeway design (within the Koonung Creek Valley design character area) with the design for the Bulleen Road interchange and to the west of Bulleen Road (within the Yarra River Valley design character area).	<p>The design has a corridor wide approach that connects the Eastern Freeway design (within the Koonung Creek Valley design character area) with the design for the Bulleen Road interchange and to the west of Bulleen Road (within the Yarra River Valley design character area). This is achieved by utilising a suite of infrastructure elements that are consistent across the Project's different landscape character areas where the variation in colours and patternation reflect local context and geomorphology. The SUP and footpath network connects the Koonung Creek Valley to the Yarra River Valley areas. Landscape planting between the two character areas include many of the same tree, shrub, grass and groundcover species which provide continuity of landscape treatment when moving from one EVC to the next (e.g. from the Yarra River Valley (EVC 56 Floodplain Riparian Woodland) to the Koonung Creek Valley (EVC68 Creeklane Grassy Woodland).</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>
<b>Resilience &amp; Sustainability</b>	<b>4A</b> Support the biodiversity corridor in Koonung Creek Reserve with indigenous revegetation.	<p>The design includes indigenous planting and a wetland along on the eastern side of the Freeway which will be included to treat stormwater runoff, enhancing, and protecting habitat along Koonung Creek Valley area.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

Please refer to the Map Book Plan relevant to this Map response for the site location references for each design response

Table 21: Consistency with Urban Design Strategic place - Koonung Creek Valley area - Map K1 Bulleen Road to Doncaster Road continued

Key Design Requirements	Response	
<b>Amenity, Vibrancy &amp; Safety</b>	<p><b>5A</b> Support Manningham City Council's planned improvements to Koonung Park which include: Additional planting, improving sightlines and creating a more consistent landscaping theme *Consider upgrades to the playground and providing a shelter and barbecue nearby. *Consider a path link from the Koonung Creek Trail to the playground and exercise area</p>	<p>These opportunities are outside of this UDLP project boundary and outside of this UDLP scope, as noted in the UDS requirements and are therefore not addressed in the design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.</p>
	<p><b>5B</b> Ensure narrow areas along the Koonung Creek Trails have good lighting, open sightlines and are attractive to users.</p>	<p>The design of the SUP trail will ensure users have clear sightlines which will be delivered by adopting suitable low level landscaping treatments, a SUP alignment that allows for maximum sight lines and has artificial lighting where deemed appropriate from a safety perspective. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
	<p><b>5C</b> Maintain wetlands as a focal point for the community in the Koonung Creek Reserve. Retain the natural values of the wetlands. Retain and/or enhance community infrastructure (such as seating, boardwalks, interpretation, informal paths, shade) to support the enjoyment of the wetlands.</p>	<p>These works are located in the adjoining secondary package areas and as such outside of this UDLP design, but the design does not preclude these works from being delivered by others via the design's SUP connectivity towards this area.</p>
	<p><b>5D</b> Provide canopy tree planting to improve shade provision along the Koonung Creek Trail and along connections to key destinations.</p>	<p>The design includes additional trees to improve the shade provisions along the Koonung Creek Trail. The design maximises texturing and variation to discourage graffiti and avoids flat stretches of wall which are prone to graffiti. The noise walls include semi-transparent acrylic panels which represent roughly 20% of the area of the wall and allows for solar and visual permeability. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0064 to 0067.</i></p>
	<p><b>5E</b> Ensure noise walls along the Eastern Freeway deter graffiti at lower levels and maximise solar access.</p>	<p>The noise walls have been designed to deter graffiti as shown on the typical noise walls details on the Architecture and Urban Design drawings. The design maximises texturing and variation to discourage graffiti and avoids flat stretches of wall which are prone to graffiti. The noise walls include semi-transparent acrylic panels which represent roughly 20% of the area of the wall and allows for solar and visual permeability. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0131.</i></p>
	<p><b>5F</b> Reinstate buffer landscape treatments (such as vegetation and mounding) adjacent to the Eastern Freeway road reserve to filter views from parkland and residential areas towards the Eastern Freeway. Landscape planting is to complement the existing open space planting themes and local character.</p>	<p>Increased density buffer landscaping will be installed along the Eastern Freeway to filter views from the parkland and the selection of the planting has been chosen to complement the existing landscape character. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0064 to 0067.</i></p>
	<p><b>5G</b> Where Project works directly affect Koonung Creek Reserve provide appropriate seating and additional planting to enhance amenity for the community</p>	<p>As shown on the landscape drawings, rest areas have been considered and appropriate seating selections will be undertaken during preliminary design. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0064 to 0067.</i></p>
	<p><b>5H</b> Consider planting of the open space at the corner of Kampman Street and Thompsons Road.</p>	<p>These works are part the Bulleen Park and Ride UDLP.</p>
	<p><b>5I</b> Enhance vegetation between the Koonung Creek Trail and proposed noise walls near Balwyn Road to filter views to walls from Kalker Montessori Centre.</p>	<p>The design will include a landscaping buffer where possible between the roads, SUP and noise walls Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0066 and 0067.</i></p>
	<p><b>5J</b> Noise walls adjacent to residential properties are to provide visual amenity on the road and residential interfaces.</p>	<p>Noise walls will have treatments to both sides of the walls adjacent to residential properties where adjoining properties have views to these walls. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0131.</i></p>
	<p><b>5K</b> Minimise overlooking to residential properties located north-east of the Eastern Freeway interchange.</p>	<p>Noise walls have been provided on elevated road structures with suitable treatments to provide acoustic benefit as well as to prevent overlooking. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0131.</i></p>
	<p><b>5L</b> Retain the concrete half-arch structure located along the Koonung Creek Shared Trail. Should relocation or removal be proposed, this is to be undertaken in close consultation with Council and other relevant stakeholders.</p>	<p>The design retains the existing structure which will be relocated in close consultation with Boroondara City Council and other relevant stakeholders. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0067.</i></p>

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## 5.4 Detailed Requirements and Benchmarks

## 5.0 Consistency with Urban Design Strategy

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### 5.4.1 Introduction

The design response to the element-based requirements and qualitative benchmarks is guided through the application of the Project's three core pillars of Connection to Country, Caring for Country and Connecting People.

The design of the individual elements that form the North East Link Tunnels and Southern Interface Zone give identity, visually unifying the road corridor, buildings and landscape, into a choreographed journey (i.e. a structured and purposeful placing on colour and texture) that responds to speed and context.

The integrated design approach is most evident in the Yarra Link green bridge which is an elegant co-location of the Southern Portal, the Southern Ventilation Structure, the ventilation building and substation, a SUP and landscaped park which connects the Koonung Creek Valley area ecology across NEL. The form of the Ventilation Structure takes inspiration from traditional Wurundjeri Woi-wurrung eel traps and incorporates lighting that references Indigenous cosmology.

The road corridor experience is designed as a connected journey unified through landscape, which pays respect to and celebrates existing infrastructure. New elements such as road barriers, piers and safety barriers have been designed as a part of a wider family of urban design elements which are seamlessly related to provide a consistent identity of overlapping and tapering forms. These same forms are evident in a consistent identifiable design language which includes a fineness of structure that minimises material.

### 5.4.2 Detailed Requirements Benchmark

The element-based requirements for the Project as per Section 7 of the UDS, encompasses aspects of the Project including different types of bridges, Ventilation Structures, portals and tunnels, water and road signage.

Those element-based requirements that would apply to the proposed Project are:

#### Element-based requirements & qualitative benchmarks

1. Multi-span bridges
2. Road bridges
3. Land bridge
4. Open cuttings
5. Ventilation Structures, portals & tunnels
6. Project buildings & ancillary structures
7. Public open space
8. Local streets, schools & neighbourhoods
9. Walls, fencing, barriers & screens
10. Bus park & ride, & bus lanes
11. Car parking
12. Lighting
13. Walking & cycling infrastructure
14. Walking & cycling bridges
15. Walking & cycling underpasses
16. Navigational nodes & thresholds
17. Landscape
18. Water
19. Road signage
20. Materials & finishes.

Table 22 demonstrates consistency with Section 7 of the UDS for the NEL Tunnel Project with regard to the detailed requirements and benchmarks.

## 5.0 Consistency with Urban Design Strategy

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### 5.4.3 Summary of Element-Based Requirements & Qualitative Benchmarks Responses

#### 1. Multi Span Bridges

##### Enhancing driver experience & public realm

The design incorporates a number of multi span viaduct and ramp structures at the Eastern Freeway interchange Southern Interface Zone. The Project has delivered an integrated design solution responding to community needs to minimise the visual impact of these structures. Engineering and design strategies minimise impact on local neighbourhoods and ensure an engaging driver experience with views to Country through a changing landscape.

#### 2. Road Bridges

There is one new road bridge being the Bridge Street bridge over the Manningham portal and the road bridge widening to the existing Bulleen Road bridge.

#### 3. Land Bridge

##### Connecting community & Country

The NEL Tunnels Project incorporates a land bridge at the Yarra River Valley to the south. This land bridge provides opportunities to link communities, providing more habitat and biodiversity corridors, places for recreation and amenity for the community and aids urban cooling. The Yarra Link green bridge validates the three pillars to ensure people and communities are better connected, minimising and avoiding severance, and respect the landscape with new and renewed parklands along this corridor, which celebrate and embrace this important community and biodiversity asset. The extended tunnel also provides additional connectivity in place of an additional land bridge.

#### 4. Open Cuttings

##### Transitions through Country

The design celebrates the experience of moving into and through Country with the treatment of elements directly interfacing with geometry and geology of the land. Deep trench walls engage with and support the corridor design narrative to enhance the motorist experience.

#### 5. Ventilation Structures, Portals & Tunnels

##### A journey through landscape

The Ventilation Structures, tunnels and portals represent a unique opportunity for NEL to connect the design of infrastructure with Indigenous knowledge of Country and belief systems. Recognising that the NEL passes beneath one of the most significant sites for Wurundjeri Woi-wurrung at Bolin Bolin, the Project has been guided by an Indigenous world view in the development of a design which Connects to Country, Cares for Country and Connects People.

The context sensitive design of the Yarra Link green bridge which wraps landscape up and over the Southern Portal and also integrates the Ventilation Structure into the landscape embodies this desire of Connection to Country.

#### 6. Project Buildings & Ancillary Structures

##### Minimising impacts on community

The design considers the Project buildings and ancillary structures as essential built elements that will support the functions of NEL and its employees over the lifespan of the Project while minimising long term impacts on local communities. The proposed structures and buildings are designed to provide a positive contribution to the local environment through an integrated design strategy. The design strategy combines optimised footprints and co-location with elegant built forms that integrate sensitively into the landscape and landform of their local context.

#### 7. Public Open Space

##### Connecting People

The design's two core pillars of Connecting People and Caring for Country have framed a multidisciplinary approach to maximise public open space and green amenity throughout NEL. Careful consideration of road alignments and underground substations are examples of solutions that have freed up land for public benefit across the entire Project.

#### 8. Local Streets, Schools & Neighbourhood

##### Thriving neighbourhoods

The Project's urban design ensures seamless integration between the road infrastructure of NEL and the distinctive character of the Ridgeline, Koonung Creek and Yarra River Valley areas. This has been achieved by retaining as much existing vegetation as possible – particularly mature vegetation on local streets – and through a solution that increases connectivity with an extended tunnel. Built elements and landscapes transition from highway environments to local streets through sensitive urban design and planting that is appropriate for site, scale and amenity.

#### 9. Walls, Fencing, Barriers & Screens

##### A sequence of landscapes

Walls, fencing, barriers and screens have been designed to amplify the experience of the surrounding landscape for drivers within the freeway and communities immediately adjacent to the road corridor.

#### 10. Bus Park & Ride Bus Lanes

The design will incorporate the necessary busway linkage to the Project including the connection to the Bulleen Park and Ride project.

## 5.0 Consistency with Urban Design Strategy

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### 11. Carparking

The design has endeavoured to minimise the loss of any carparking and such minimising impact on businesses. New carparks, such as at the MCC building and the Veneto Club, will have tree and garden beds incorporated throughout the carpark to contribute to the tree replacement and canopy cover solution as well as to provide an urban design softening of the hard paving areas and pavement areas will be designed to incorporate passive irrigation where possible as part of the passive irrigation design approach.

### 12. Lighting

#### Enhancing user experience

The Project's lighting strategy for the NEL heightens and accentuates the Project's design elements and principles, fulfils practical requirements and reduces energy use. Feature lighting creates vibrant and safe night-time environments for driving, cycling or walking.

### 13. Walking & Cycling Infrastructure

#### A rich cycling & walking experience

The pedestrian and cycling networks throughout NEL promote alternative and more sustainable modes of transport beyond the vehicle experience. SUPs and walking trails allow for multiple users to access the open space network as commuter and recreational cyclists, pedestrians, joggers, walkers, children and passive recreation users. Several types of movement have been accommodated to respond to landscape, geology and the three scales of speed in the freeway. The design slows and enriches the movement experience through the linear parklands by providing multiple path options, pause points, stopping locations, lookouts, play spaces and passive recreation opportunities.

### 14. Walking & Cycling Bridges

The new walking and cycling bridges at Lower Plenty Road, Bulleen Road and the Eastern Freeway, and the Yarra Link green bridge connects communities, encourages active transport to education, services and employment, and introduces a new expression of identity.

### 15. Walking & Cycling Underpasses

The urban design solution for the Bulleen Road underpasses endeavours to create a sense of enjoyment for the user via the spatial unobstructed SUP entry and exit points, generous heights and widths of the underpasses and also the use of colour and feature lighting within the underpasses.

### 16. Navigational Nodes & Thresholds

#### A choreographed journey

The urban design creates a choreographed motorist journey (i.e. a structured and purposeful placing of colour and texture) on the freeway and through communities above or adjacent to the road corridor. Two guiding design approaches ensure an engaging and intuitive motorist journey;

1. Experiences of the landscape character areas are amplified
2. Structures along the route are conceived of as episodic markers.

### 17. Landscape

#### Caring for Country

Through the core pillars of Caring for Country and Connecting to Country, the Project's landscape design supports the local character and ecology of the landscape character areas. Indigenous and highly diverse local plants shall be used to enhance existing habitat linkages and corridors, bolstering biodiversity, urban forests and microclimates.

### 18. Water

#### Caring for Country

The NEL corridor impacts two of Melbourne's most important waterways; the Yarra River (Birrarung) and Koonung Creek Valley area. The Wurundjeri Woi-wurrung met at the confluence of these two waterways, at Bolin Bolin Billabong and secondary waterway of Banyule Creek to the north, for their annual eel harvest. The Project's design embraces, supports and enrich the biodiversity and habitat of these waterways through the core pillars of Caring for Country and Connecting People to facilities, open spaces and knowledge of natural systems.

### 19. Road Signage

#### Consolidating disparate elements

The signage and wayfinding approach provides a consistent, clean and uncluttered solution to what can often be a messy, heavy component of infrastructure design. Signage, toll points, gantries and associated infrastructure are part of a considered approach to enhance driver safety, legibility and user experience across NEL.

### 20. Materials & Finishes

#### Identity through design

The design amplifies and celebrates the unique features of the road corridor through landscape experiences expressed in colour, form and rhythm. The material palette provides a diverse, considered and vibrant expression of urban realm at NEL.

# 5.0 Consistency with Urban Design Strategy

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## 5.4.4 This table provides a compliance response against each of the relevant UDS items.

Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements

Key Design Requirements		Response
<b>1. Multi span bridges</b>		
<b>1.1 Viaduct Design</b>	<p>Viaducts (continuous multi-span bridges) and ramps are well designed and well proportioned to complement the surrounding area and appropriately address sensitive interfaces. Viaduct profile and design employ a high quality aesthetic when viewed from and to the structure, and are designed to minimise visual bulk.</p> <p>Abrupt changes of size and depth of structures is avoided and transitions are smooth.</p> <p>Structural solutions are durable and avoid the need for cladding.</p>	<p>The design approach has been to align the heavy engineering elements of multi span bridges with the overarching urban design context.</p> <p>Continuous free-flowing structural forms and piers for elevated structures form part of a collective family of chamfered piers within the Project and curved alignments are achieved through curved steel box girder bridge deck structures or segmented precast concrete bridge deck structures with smooth transitions in structural size.</p> <p>The viaduct design avoids the need for superfluous cladding and the columns and cross heads are of a concrete finish without cladding and concrete and steel are durable in nature.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 set of drawings.</i></p> <p>The noise walls are provided to the viaducts only to the extent necessary to provide compliance with the relevant noise modelling requirements and are generally acrylic panels over concrete barriers.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100-0117 (Road infrastructure).</i></p>
<b>1.2 Integration</b>	<p>New elements such as elevated roads and ramps are integrated well with connected structures and/or other built elements, the surrounding land form, local context and road network.</p> <p>Any widening of existing structures are carefully integrated with existing structures to create a cohesive design. Widened structures shall match with existing in size, shape and structural form.</p> <p>Where bridges are duplicated, new soffit lines do not protrude below existing soffit lines and match existing profile.</p> <p>Superstructure, piers, beams, barriers, railings, associated furniture, deck, abutment and feature lighting are carefully integrated together to provide a high quality and durable design solution for all users above and below the structure.</p> <p>Opportunities are maximised to structurally integrate pier cross heads into the bridge and viaduct superstructure.</p>	<p>The elevated road design approach has free flowing forms with minimal bulk which allows the design to sit harmoniously within the surrounding land form and local context. The noise walls and gantries sitting on these structures have clean lines and avoid clutter.</p> <p>Any widening of existing structures will match the existing in size, shape, and structural form where structurally possible.</p> <p>While most of the multi-span bridges (viaducts) are new to the Project, the design will ensure that any bridges which are duplicated will have soffit lines to match the existing condition where structurally possible.</p> <p>The design incorporates a suite of elevated road structural columns, piers, beams and barriers that will be applied across the Project. The finishes selected are of a high quality and durable finish.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 set of drawings.</i></p> <p>The design incorporates a suite of elevated road structural columns, piers and beams that will be applied across the Project. The finishes selected are of a high quality and durable finish.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100-0117 (Road infrastructure).</i></p>
<b>1.3 Minimising impacts</b>	<p>Elevated roads and structures are designed with minimal visual bulk. The design of these structures is to minimise overshadowing of residential properties, impacts on the use of nearby areas (including through generation of noise and disruption of access), and visual impacts from sensitive viewpoints.</p> <p>The visual impact of the elevated roads and structures on road users is also minimised.</p>	<p>Through a combination of refining alignments, integrating crossheads, avoidance of superfluous cladding, care with pier location, and, in some instances, reducing bridge spans, the design for the multi span bridges minimise the overall height and bulk of these structural elements.</p> <p>The noise wall heights and extent will be kept to the minimums required to meet the EPR, as noted in Section 6 of this UDLP Section 13. Noise and Vibration (NV), requirements as well as overshadowing and privacy impacts to adjoining properties.</p> <p>Landscaping screening will be used alongside the elevated structures where possible.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100-0117 (Road infrastructure).</i> Refer to: <i>UDLP Attachment.4-Architecture and Urban Design Overshadowing Assessment (Overshadowing).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>1.4 Visual clutter</b>	<p>Visual clutter is avoided and the number of piers are minimised.</p> <p>Piers and towers are located to avoid the need for additional structures (such as protection barriers). Where pier protection barriers are unavoidable, reduce the scale and carefully integrate with the bridge design.</p> <p>Elements such as the edge of the deck, drainage pipes, services and ducts are concealed from view.</p>	<p>Bridge piers numbers are minimised within the structural constraints of design and the piers have been located to provide a consistent deliberate looking design solution.</p> <p>Bridge barriers are designed as unifying elements Connecting Country at landing positions and their tapered forms ensure continuous smooth lines reduce visual clutter. Bridge barriers integrate and unify structural elements of the bridge with other functional requirements including concealed drainage that contributes to an overall uncluttered appearance.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100-0117 (Road infrastructure)</i>.</p>
<b>1.5 Passive surveillance</b>	<p>Where there is access below structures, passive surveillance is maximised to deter undesirable behaviour.</p> <p>Materials, textures and finishes are used to deter graffiti.</p> <p>Solar access is maximised to spaces beneath the structure.</p>	<p>Retaining structures and abutment treatments have been developed to maximise openness and daylighting to deter unsocial behaviour in publicly accessible spaces. Transparent fencing will be provided where necessary to open spaces under elevated structures to provide a level of security and passive surveillance as well as landscaping screening at a suitable height and density. The use of simplistic uncluttered concrete structures will provide a suitable material finish to manage the impact of graffiti. Where possible, landscaping will be provided under portions of elevated structures or crushed rock to areas where it is determined that landscaping conditions would not be appropriate.</p>
<b>2. Road Bridges</b>		
<b>2.1 Bridge design</b>	<p>All new bridges continue the form of the existing Eastern Freeway bridges. New road bridges and modifications to existing bridges are well designed, complement the surrounding area and appropriately address sensitive interfaces.</p> <p>Bridges are designed to a high quality standard, to minimise visual bulk, and to be visually pleasing when viewed from and to the structure.</p> <p>The overall structure and the various parts of the bridge structure, are geometrically proportioned and have a harmonious relationship.</p> <p>Structural solutions are durable and avoid the need for cladding.</p> <p>New piers match existing pier shape, angle and proportion in both directions.</p> <p>Base of bridge beams match the existing beams in profile.</p>	<p>There is one new road bridge being the Bridge Street bridge over the Manningham portal and the road bridge widening to the existing Bulleen Road bridge.</p> <p><b>Bridge Street bridge</b></p> <p>The treatment of the Bridge Street section of road bridge that spans over the south bound tunnel on ramp will include integrated cladding to align with the portal clad walls below. Barriers and screens will be consistent with the suite of treatments as shown on <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p><b>Existing Bulleen Road bridge widening</b></p> <p>The design scope of works includes the widening of the existing Bulleen Road bridge and as part of these works, will provide new barriers and screens along the bridge new east and west edges which will be with the suite of treatments as shown on <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p> <p>The soffit and superstructure treatment to the Bulleen Road bridge widening will be consistent with the current condition.</p> <p>The design of new and widened road bridges will avoid the use of superfluous materials, minimise bulk and avoid the need for cladding where possible.</p>
<b>2.2 Identity</b>	<p>Sets of bridges within a corridor visually complement one another. There is a clear relationship between bridges, with a consistency of bridge elements demonstrated along the length of the Project.</p>	<p>There is one new road bridge in the Project being the Bridge Street bridge over the Manningham portal and the road bridge widening to the existing Bulleen Road bridge. The Yarra Link green bridge is addressed in 3. Land bridges. The consistency of the treatments for both road bridges lies in the road barrier and throw screen design elements as well as the avoidance of superfluous material to the road bridge soffits.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>2.3 Integration</b></p> <p>New bridges and modifications to existing bridges are well integrated with any connected structures or other built elements, the surrounding land form, local context and road network.</p> <p>Superstructure, piers, beams, barriers, railings, associated furniture, deck, abutment and feature lighting are carefully integrated together to provide a high quality design solution for all users above and below the structure.</p> <p>Opportunities are maximised to structurally integrate pier cross heads into the bridge superstructure.</p>	<p><b>Bridge Street bridge</b></p> <p>The Bridge Street bridge will provide an integrated design solution with the above and below-ground urban design theme and include barriers and throw screens consistent with the greater urban design approach, a soffit treatment free of superfluous cladding and a clean uncluttered tie in to the interfacing trench cladding.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p><b>Existing Bulleen Road bridge widening</b></p> <p>The design includes the widening of the existing Bulleen Road bridge and as part of these works, will provide new barriers and screens along the bridge new east and west edges. The soffit and superstructure treatment to the Bulleen Road bridge widening will be consistent with the current condition.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i></p>
<p><b>2.4 Views</b></p> <p>Scenic views and vistas seen from bridges are maximised for road users and pedestrians.</p>	<p>Lightness and transparency of new barriers maximise views to Country from each bridge for both motorists, cyclists and pedestrians. Screens will be provided over barriers to the sides of bridges to act as not only a safety screen but also to provide visual transparency for users.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<p><b>2.5 Minimising impacts</b></p> <p>Road bridges are designed to minimal height and width to reduce landscape and visual impacts and overshadowing of residential properties and other sensitive land uses.</p> <p>The visual impact of the bridge structure on road users is minimised.</p>	<p><b>Bridge Street bridge</b></p> <p>The design of the bridge has been kept to minimalistic structural form and avoids the use of superfluous materials such as soffit cladding. Throw screens are required for the bridge which will be kept to minimum heights and extent and overshadowing to residential properties of sensitive receptors is not anticipated.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p><b>Existing Bulleen Road bridge widening</b></p> <p>The widening of the Bulleen Road bridge has been kept to a minimum height where possible but is constrained by the existing road bridge structure and structural span conditions. New throw screens are required for the bridge which will be kept to minimum heights and extent and overshadowing to residential properties of sensitive receptors is not anticipated.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i></p>
<p><b>2.6 Visual clutter</b></p> <p>Visual clutter is avoided and the number of piers are minimised.</p> <p>Piers and towers are located to avoid the need for additional structures (such as protection barriers). Where pier protection barriers are unavoidable, reduce the scale and carefully integrate with the bridge design.</p> <p>Elements such as the edge of the deck, drainage pipes, services and ducts are concealed from view.</p>	<p>The Bridge Street bridge design over the south bound tunnel on ramp is clear of clutter and there will be no visible piers. The bridge soffit will be a concrete finish integrated with that of the precast panels and metal cladding to the portal walls. The widening of the Bulleen Road bridge will be sympathetic to the existing condition including superstructure, the blade column profile and services concealment.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<p><b>2.7 Passive surveillance</b></p> <p>Where there is public access below structures, passive surveillance is maximised to deter undesirable behaviour.</p> <p>Materials, textures and finishes are used effectively to deter graffiti.</p> <p>Solar access is maximised to spaces beneath the structure.</p>	<p>There is no accessible public space below the Bridge Street bridge as it sits within the Manningham portal. The public accessible spaces below the existing Bulleen Road bridge will have clear lines of sights from surrounding areas including the Eastern Freeway, the SUP and SUP bridge. The blade columns supporting the existing Bulleen Road bridge will have a concrete finish with anti graffiti treatment. There will be a reasonable level of natural light achieved under these bridges.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>2.8 Retrofitting</b>	New built elements (e.g. throw screens, traffic barriers around piers, structures, fencing, walls etc.) on existing road bridges are bespoke, innovative and designed to complement the original form and aesthetic qualities.	<p>The new built elements on the existing Bulleen Road bridge are designed to complement the existing bridge and the wider family of road infrastructure along the Eastern Freeway.</p> <p>The design scope of works includes the widening of the existing Bulleen Road bridge and as part of these works will remove the existing barriers and provide new barriers and throw screens along the bridge new east and west faces. The soffit and superstructure treatment to the Bulleen Road bridge widening will be consistent with the current condition including the profile of the blade columns. The new barriers and screens will be consistent with the suite of treatments as shown on <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p> <p>In regards to the design, based on the civil geometry and road alignment over the existing Bulleen Road bridge, the bridge requires widening on the eastern side by approximately 11.5m over 2 spans of approx. 43m each span. The Project scope requires new widened parts of an existing structure greater than 2.4m in widened width to be designed to full SM1600 loading [circa. 160 tonnes]. With the widening width proposed, multiple design lanes for loading need to be considered and also higher load factors are used in current standards.</p>
<b>2.9 Signage on bridges</b>	Advertising and road signage are not located on bridges. Intelligent Transport System (ITS) signage on bridges is avoided or well integrated into the bridge design.	<p>The existing Bulleen Road bridge road signage will be rationalised as part of the bridge widening scope of works and while directional and traffic safety signage will be required, there will be no advertising signs. ITS signage will be kept to as minimal as possible. The Bridge Street bridge over the south bound tunnel on ramp will be flanked by the portal walls and any ITS or directional signage will be concealed from most of the surrounding at grade areas.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.</p>
<b>3. Land bridges</b>		
<b>3.1 Community connections</b>	Land bridges (land supported by bridge structures that cross over a road in trench) maintain and/or enhance connections for pedestrians and cyclists across the road corridor.	<p>Land bridges play a vital role in reducing severance across the NEL transport corridors.</p> <p>The Yarra Link green bridge at Bulleen provides landscaping and a community link between the east and west over Bulleen Road including linkages to schools, playing fields and sports clubs, and cyclist and pedestrian pathways along the Koonung Creek and Yarra River (Birrarrung).</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i>.</p>
<b>3.2 Green links</b>	Land bridges act as 'green bridges' to connect adjacent open space and vegetation visually and physically. They enhance and extend biodiversity and habitat links across the Project.	<p>The Yarra Link green bridge continues tree canopy and associated public open spaces of adjacent roads across the transport corridor.</p> <p>At Bulleen, the Yarra Link green bridge extends over the Southern Portal and Bulleen Road to help connect the ecological habitat of the Koonung Creek corridor over NEL to reconnect with the creek on the other side. This highly vegetated land bridge creates a green landscape link between the Yarra River recreational reserves and the schools and communities to the east.</p> <p>The extended tunnel has provided an additional connective experience along Greensborough Road in place of an additional land bridge in this area.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i>.</p>
<b>3.3 Soil depth</b>	Land bridges have sufficient depth of soil and a suitable soil profile to support healthy long-term growth of trees and shrubs.	<p>Yarra Link green bridge will have sufficient soil depth and profile to support sustainable and maintainable growth of small trees, shrubs and ground cover.</p> <p>Consistent with the UDS, minimum soil depths will be 1500mm for trees, and 500mm for ground cover and low shrubs.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>3.4 Land bridge design</b></p> <p>Land bridges are unique and visually appealing design elements for both the roadway and adjacent communities.</p> <p>Land bridges extend surrounding public space and movement patterns and enhance the open space function. Design response should include innovative and integrated solutions.</p> <p>Careful consideration is given to the driver experience including the use of lighting, quality surface materials that age gracefully, and the minimising of the need for structural elements (such as piers) that clutter views.</p>	<p>The Yarra Link green bridge is a unique, visually appealing landmark that connects communities and enhances pedestrian and cycling pathways. Careful consideration of lighting and surface treatment ensures a legible, safe and engaging motorist journey under the bridge.</p> <p>The treatment of noise walls, flood walls, retaining walls and cladding around the tunnel entry provides visual guidance and identity as the land bridge wraps over the tunnel entry and Bulleen Road. The colour palette is muted as not to distract the drivers, the surrounding landscaping forms provide green relief from the urban design and road geometry material hard finishes. Exposed structure has been kept to a minimum as to not dominate the design solution. The appearance of the landscaping over the throw screens on the land bridge facing the tunnel entry will provide identity to the drivers that the parkland area above.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>3.5 Visual considerations</b></p> <p>Barriers on and adjoining land bridges are well integrated, provide good visual connectivity, maximise passive surveillance, and minimise visual obstructions to views and landmarks for the surrounding community.</p> <p>Central piers and visual driver clutter is avoided for land bridges over cutting.</p>	<p>Barriers are well integrated, maximise passive surveillance and ensure good visual connectivity. The Yarra Link green bridge has been kept as level as possible, with long, straight paths maximising passive surveillance.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>4. Open cuttings</b></p>	
<p><b>4.1 Connectivity</b></p> <p>The design of open cuttings is part of a holistic urban design response to improve permeability, legibility and accessibility along and across the corridor, and severance impacts on communities are avoided.</p> <p>The quality and number of path crossings over the Project corridor are maintained to better connect communities, provide access to local facilities and link movement networks.</p>	<p><b>North</b></p> <p>The extent of open cuttings has been reduced in the design compared to what was shown in the EES Reference Design and to the north it is limited to the Northern Portal and Lower Plenty portal. The Northern Portal is flanked by a land bridge to the north (outside of this UDLP approval) and Greensborough Road boulevard to the east, west and south. The Lower Plenty portal has been positioned between Greensborough Road boulevard and Simpson Barracks as to minimise the east and west connectivity across Greensborough Road boulevard and to minimise impact on nearby residential areas.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals).</i></p> <p><b>South</b></p> <p>The extent of open cuttings in the south includes the tunnel portals near the Manningham/Bulleen Road interchange. Pedestrian connectivity has been provided over and around the portals via new Bridge Street bridge footpaths on both sides of the road.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals).</i></p>
<p><b>4.2 Cutting design</b></p> <p>High quality finishes, materials and hard and soft landscapes are used in cuttings.</p> <p>Cuttings are designed to mitigate adverse amenity impacts for adjacent residents and the local community, and to provide spaces that are considered and well resolved as part of the overall design solution.</p>	<p>The Project gives high priority to cuttings as important transitional elements between the public realm and the motorway environment.</p> <p>Variations in colour, texture, and feature lighting reduce the bulk of the road element composition and this design approach makes a visually engaging driving experience in this intensive road environment.</p> <p>The design does not include exposed open cuttings such as exposed earth embankments, but does include tunnel portals and trenches with architectural cladding treatments. The portals locations have been positioned to minimise impacts on residential areas and the local community.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals).</i></p>
<p><b>4.3 Landscaping</b></p> <p>Landscape design and plant species selection within open cut areas are appropriate to local conditions, micro-climate, urban design concepts and local character.</p>	<p>Landscaping has been avoided to open cut areas due to the design constraints, being keeping the built footprint to a minimum, as well as for maintenance considerations. Plant species have been selected to suit local conditions based on the existing landscaping character.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design.</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
4.4 Visual considerations	<p>Barriers on or adjacent to land bridges provide good visual connectivity, maximise passive surveillance, and minimise visual obstructions to views and landmarks for the surrounding community.</p> <p>The barriers on or adjacent to the land bridge provide good visual connectivity, maximise passive surveillance, and minimise visual obstructions to views and landmarks for the surrounding community via the design's approach to keeping the material to the minimum extent required, selection of transparent material being a transparent mesh above the road barrier and adopting a consistent urban design theme across the Project for these materials. The colour palette chosen is consistent with the Connection to Country theme being muted earthy selections.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i>.</p>
<b>5. Ventilation Structures, portals &amp; tunnels</b>	
5.1 Tunnel approach, dive structures and portal design	<p>Tunnel approach, dive structures and portals make a positive contribution to the identity of the local area and user experience through high quality design.</p> <p>The design is well coordinated, neat, attractive and inviting for motorists.</p> <p>The portal design is context sensitive, avoids unnecessary clutter, minimises opportunities for vandalism and does not detract from the remaining tunnel system and components.</p> <p>The portals transition smoothly to create a relaxed and safe feeling for motorists.</p> <p>Signage is well integrated to ensure the tunnel approach and entrance is uncluttered.</p> <p>The transition into the tunnel is welcoming, maximises road safety and provides a positive and memorable experience for the driver.</p> <p>The tunnel entrance is of generous proportions to promote driver comfort.</p> <p>The design's approach has been to provide clean material lines, avoid clutter, provide a sense of interest, feel of Connection to Country and a choreographed journey (a deliberate selection of finish and colour to create a visual reference for users) through the landscape leading to the tunnel entry and into the dive structures.</p> <p>The treatment of the dive structures (trenches) includes textured precast panels with metal cladding and in some areas feature lighting and integrated solar panels. The selection of different materials and profiles has been deliberately kept to minimum to keep the urban design feel simplistic and uncluttered and the smooth lines of finish and material junctions provide a gradual transition outcome and journey for users.</p> <p>The treatments to the tunnel portals provides a sense of visual interest for users and the tones of the metal panels respond to Connection to Country and a sense of relaxation and greeting.</p> <p>Other aspects such as flood walls, portal cladding and gantries have followed the same approach as the dive structure finishes and texture to ensure a consistent urban design theme is achieved and landscaping has been used where possible to reduce the visual impact on cladding.</p> <p>The scale of the tunnel entrance creates a sense of space that will contribute to the drivers level of comfort and tunnel signage will be developed to be integrated within the architectural form and uncluttered to provide clear messaging to users.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i>.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i>.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>.</p>
5.2 Context sensitive	<p>The tunnel and associated structures are well integrated into the local built context to minimise impacts on surrounding land uses, open spaces and connectivity.</p> <p>The tunnel is integrated with the character of the local area, land form and landscape.</p> <p>Opportunities to add value to the community are maximised such as green infrastructure, improved connectivity, interpretation of Indigenous and historical cultural values etc.</p> <p>Our Caring for Country approach has driven the design for the tunnel Ventilation Structures and portals so they are integrated within the landscape. This approach minimises the physical bulk of these elements in the public realm and allows people direct visual and physical connection with the landscape.</p> <p>For the ventilation buildings at Simpson Barracks and the substation building at Manningham Road interchange this is achieved by locating the bulk of the structures below grade and recontouring the landscape up to and around the on-grade access and structures. At the Southern Portal this fusion has been achieved through the amalgamation of the Ventilation Structures within the Yarra Link green bridge, which itself is a continuum of the Koonung Creek Valley area ecological corridor.</p> <p>The colour palette has been informed by Indigenous Connection to Country earthy tones.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i>.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals)</i>.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i>.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>.</p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>7. Public open space</b>	
<p><b>7.1 Integration with surroundings</b></p> <p>The design maximises continuity of public realm, extends surrounding public open space (land primarily used for recreation, nature conservation and passive outdoor enjoyment) and movement patterns, and mitigates any severing of communities and places.</p> <p>Access to public open space within and at the interface of the Project is enhanced.</p> <p>Opportunities to create additional functional and high quality open space within the Project corridor are maximised.</p> <p>The open space function of the open spaces within and along the Project corridor is maintained.</p> <p>Encroachment and impacts on adjacent open space by freeway infrastructure and roadside landscaping (planting within the road reserve) is minimised.</p>	<p>The urban design approach improves access to public open spaces, improves the quality of those environments, and adds more public open space compared to what was shown in the EES Reference Design. We have reduced impacts on local environments wherever possible by the incorporation of more open space and reduced severing of communities and places by locating trenches and portals away from adjoining property areas as much as practicable and increasing the number of signalised pedestrian crossings throughout the Project.</p> <p>The Project solution for road and portal alignments near Lower Plenty Road are derived from better consideration for Borlase Reserve and Simpson Barracks and the integration of Water Sensitive Urban Design, SUPs and a new pedestrian bridge over Lower Plenty Road have maximised continuity of public realm along the Banyule Trail and to connecting communities.</p> <p>The design's two core pillars of Connecting People and Caring for Country have framed a multidisciplinary approach to maximise public open space and green amenity throughout NEL.</p> <p>Compared with the EES Reference Design, the design includes a significant increase in open space that will be available to the public, primarily because of improvements to the tunnel alignment and the lengthening of the tunnel at the northern end of the Project. This optimisation of the design has resulted in the reduction of the Project's footprint creating increased open space areas such as at Borlase Reserve, the Manningham Road interchange, the Cultural Landscape Precinct as well as the Yarra Link green bridge. Careful consideration of road alignments and underground substations are also examples of solutions that have freed up land for public benefit across the Project. This open space has provided the design with opportunities for new parklands, vegetation, a Cultural Landscape Precinct, passive and active recreational areas, wetlands, and biodiversity areas as well as enhanced natural habitat corridors.</p> <p><b>Multi-program spaces:</b></p> <p>The design includes flexible open spaces that can be programmed for multiple uses at different times of the day and year. The focus is on dynamic and active facilities that provide recreational opportunities for multi-generations. This includes passive and active recreational parks along waterways, nature play spaces, fitness stations and seating areas.</p> <p><b>Safety in design:</b></p> <p>CPTED principles are of paramount importance with clear sightlines, activation, and passive observation as key considerations in the design of open spaces throughout the Project. The landscape within the passive and active recreation zones will carefully consider the location and height of planting, walls, and path directions to ensure the natural surveillance is maintained.</p> <p><b>Pause points:</b></p> <p>Improved movement strategies are about creating better experiences for path and open space users by creating connections and allowing points of rest and recreation. Park benches, picnic areas, play spaces, sporting facilities, wetlands, boardwalks, and shelters all allow for passive recreation along the Project network.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>7.2 Open space infrastructure</b>	<p>Opportunities to upgrade the existing open spaces along the Project corridor are maximised to create consistent, high quality, multifunctional and efficient spaces. This includes public open space infrastructure to enhance the function and enjoyment of the open space, such as seating, natural shade, drinking fountains, dog drinking</p>	<p>Across the NEL corridor, the design has upgraded and improved the existing open spaces such as at Borlase Reserve, the proposed Cultural Landscape Precinct, the Yarra Link green bridge which provides the much needed east-west connectivity as well as Koonung Creek Valley area. The design includes public space infrastructure such as bicycle hoops, bins, park benches, sheltered BBQ and picnic tables, drinking fountains, bicycle repair stations, E-bike charging points, fitness stations, half basketball courts and digital bike counters.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>7.3 Positive use of space</b>	<p>The design promotes and enables the positive use of public open space through design, with the resulting spaces being useful, attractive, activated, safe and sustainable. This includes incidental spaces such as those under ramps and viaducts, as well as pocket parks alongside the roadway.</p> <p>Places are well designed to cater for a diversity of uses that promote opportunities for positive social interactions and incidental physical activity.</p>	<p>A diversity of incidental and planned uses create vibrant, safe and inclusive public open spaces throughout the NEL. Nature play spaces, youth recreation facilities such as basketball courts, fitness stations, and shaded park benches all provide varied opportunities to Connect People and encourage positive engagements with the environment.</p> <p>A network of pedestrian paths and SUPs has been provided in the design providing connectivity to these areas of which universal disability access has been incorporated where possible. CPTED principals have been incorporated within the design such as providing lines of site to public spaces from the adjoining areas and including paths and SUPs where artificial light can be used from nearby roadways.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>7.4 Pedestrian realm</b>	<p>Public open spaces are inclusive, pleasant and welcoming.</p> <p>Seating, shade, shelter, 'pause points' and lighting are provided, as appropriate, and at regular intervals in open spaces at transport stops, on key pathways, and in community spaces associated with the Project.</p> <p>Natural daylight is maximised into public spaces below and adjacent structures.</p>	<p>The creation of pedestrian-friendly neighbourhoods has been prioritised with safe, wide, and pleasant paths and SUPs included throughout neighbourhoods and activity centres. Strategically located park furniture, shelters and amenity close to these pathways encourages people to use these facilities, fostering healthy active communities and vibrant urban environments.</p> <p>Pedestrian paths and SUPs have been provided in the design providing connectivity to these areas of which universal disability access has been incorporated where possible and CPTED principals have been incorporated within the design such as providing lines of site to public spaces from the adjoining areas and including paths and SUPs where artificial light can be used from nearby roadways.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>7.5 Safety</b>	<p>New spaces created around the Project feel safe, comfortable and welcoming to users during both day time and night time, maximising passive surveillance, clear sight lines and appropriate lighting.</p>	<p>Improvements to amenity and safety of public open space along the NEL corridor has been a priority. Spaces around the Project have clear sight lines that maximise passive surveillance and includes suitable selections of planting densities, types and locations such as higher canopy trees without lower level planting.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>8. Local streets, schools &amp; neighbourhoods</b>	
<p><b>8.1 Pedestrian friendly local streets</b></p>	<p>Pedestrian-friendly areas and the '20 minute neighbourhood' concept is supported, with streetscapes that are comfortable, safe, inclusive, pleasant and welcoming to the local community</p> <p>Pedestrian friendly areas, centred around the '20 minute neighbourhood' concept, have been created throughout NEL. Through an extensive network of new and renewed walking and cycling pathways, safe, inclusive and inviting new connections between desirable services and amenities will contribute to the objective of the 20 minute neighbourhood concept. In particular, the Lower Plenty Road area has improved local streets and connections to facilitate the continued integration of its diverse community, the Yarra Link green bridge will provide the improved east-west connectivity over Bulleen Road such as including schools and Bulleen Park through to the Bulleen Park and Ride facility and the connectivity provided via the increased open parkland, pedestrian paths, and SUPs from the south of Manningham Road through to the north which provides an improved level of connectivity through to places such as Banksia Park and the Heide Museum of Modern Art.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>8.2 Boulevards and streetscapes</b></p>	<p>Landscape design of local roads and streets as part of the Project contributes positively to the function and character of the area. This includes the introduction of street tree planting, additional greening, pedestrian and cycling infrastructure. The design of local streets is consistent with local authority requirements.</p> <p>Boulevards of canopy trees are prioritised, especially adjacent to shared and pedestrian paths.</p> <p>Seating, shade, shelter and lighting are provided, as appropriate, and at regular intervals, transport stops, on key pathways and in community places associated with the Project.</p> <p>The landscaping design contributes positively to the function and character of the area in the following manner with extensive street tree planting and renewed streetscapes throughout the Tunnels Project. Planting selections have been made in consideration with the existing landscape character areas as well as to align with the UDS character areas requirements.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p> <p>Boulevards of canopy trees have been prioritised such as along Greensborough Road boulevard as well as along the shared user paths adjacent to Greensborough Road boulevard, alongside the SUP near the MCC building, where spatial allowances permit to the new SUP along Bulleen Road and on both sides of the new SUP through Koonung Creek Reserve creating a distinct identity for the area and a pleasant travel experience for all transport modes.</p> <p>Seating, shade, shelters, and lighting have been provided where deemed appropriate on key pathways such as to Borlase Reserve, the Cultural Landscape Precinct, the Yarra Link green bridge and to Koonung Creek Reserve.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>8.3 Transition</b></p>	<p>Built elements and landscape are designed to sensitively transition from a highway environment to local streets and neighbourhoods.</p>	<p>Built elements and landscapes transition from highway environments to local streets through sensitive urban design and planting that is appropriate for site, scale and amenity. Planting selections have been made in consideration with the existing landscape character areas as well as to align with the UDS character areas requirements.</p> <p>Building structures have been located as far away from adjoining properties as possible, particularly from residential areas and have been designed to blend into the adjoining landscape and to have as minimal a footprint as practical, examples being the undergrounding of substations and plantrooms near Lower Plenty Road, Northern and Southern Ventilation Structures, the Watsonia and Lower Plenty portals as well as the Manningham/Bulleen Road interchange tunnel portals.</p> <p>The scale of these elements transition to a lower form closer to sensitive receptors such as residential areas.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>8.4 School interfaces</b></p>	<p>Liaise with schools that interface the Project to identify appropriate interface treatments. The design of road infrastructure around schools carefully considers local identity, sense of arrival, legibility of access points and operational requirements.</p> <p>The landscape design response filters and screens any views of road infrastructure from school grounds where appropriate.</p>	<p>The Project has consulted schools impacted by the Project such as Trinity Grammar School and Carey Grammar as well as Marcellin College to ensure the urban design solution addresses their aesthetic and functional requirements including realigned main entry gates and SUP connectivity.</p> <p>Consultation outcomes in the design have included raised pedestrian crossings, improved addition paths along the new access road to the schools, and increased tree screen planting to Yarra Link green bridge facing Marcellin College and Trinity Grammar School.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i> Consultation with the schools will continue through the design development phase which will include landscaping to screen views from road infrastructure as well as landscaping mounding and density considerations.</p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>9. Walls, fencing, barriers &amp; screens</b>	
<p><b>9.1 Noise and visual mitigation</b></p> <p>Noise attenuation elements are high quality and context sensitive.</p> <p>Innovative methods of noise mitigation are maximised to reflect/refract and/or absorb noise.</p> <p>Landscaping and landscaped embankments enhance and soften the appearance of walls and barriers, reduce height and bulk, and better integrate the structures into the surrounding area.</p>	<p>The design of these elements is not just based on functionality but also an urban design treatment that relates to its context within the Project and along with the selection of high quality finishes and materials these elements will contribute to sustainable long term urban design outcome.</p> <p>The design includes a standard set of urban elements and the design has reduced visual bulk where possible and allowed for landscaping through into the freeway environment. In some instances, walls are angled and offset away from the road, punctuating the motorist journey with attractive moments of landscape, Connecting to Country.</p> <p><b>Noise walls</b></p> <p><i>Movement Through the Landscape</i></p> <p>Urban design/landscape experienced at speed can be understood as a series of frames in a cinematic journey through the freeway corridor.</p> <p>The language developed by the design aims to celebrate this transitional journey through the different landscape and urban design forms experienced throughout the Project. Expansions and contractions of noise walls reveal the landscape and signal moments of transition. The form of the walls creates a sense of rhythm that responds to the winding road geometry and the user experience for pedestrian and cyclists has been equally considered with both sides of noise walls designed with high-quality finish, texture, and colour.</p> <p>Acoustic modelling has been used to determine the appropriate height and extent of noise walls which will achieve the Project EPR - NV1 (Achieve traffic noise objectives). The design and construction activities must comply with the Project's environmental performance requirements (EPR) that need to be achieved which include noise, dust and vibration which are listed in the UDLP Report (Section 6).</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p><b>Flood Walls</b></p> <p><i>Movement Through Landscape</i></p> <p>Flood walls have been designed as one of a number of cohesive road elements along the freeway alignment. Where possible, they have been fully integrated with retaining walls and landforms, reducing visual clutter and providing a seamless experience for drivers. The design of flood walls is consistent throughout the Project with deep texturing on both sides. Hues and colours have been inspired by the Wurundjeri Woi-wurrung artefact colour palette, with exact colours derived from the Munsell Chart standard, a colour system used to categorise types of earth. The choice of colour palettes is context specific and have been used to highlight key features to motorists as they travel along the freeway.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p> <p><b>Barriers</b></p> <p>The road barriers have been designed to be in keeping with the Project's urban design intent and to compliment the adjoining interfaces. Barriers have been designed to provide physical separation but also still provide for transparency where it is deemed suitable.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>9.2 Integrated and coordinated</b></p>	<p>Noise walls, flood walls, fences, screens and traffic barriers are coordinated and integrated to minimise visual and physical clutter. These elements integrate with existing or proposed elements to reduce the need for additional structures and transition seamlessly into the existing elements.</p> <p>Opportunities to incorporate new built form as noise mitigation are maximised to replace the need for noise walls.</p> <p>Transitions in wall and fencing heights are well considered and seamless.</p> <p>Materials and colour palettes are coordinated, and finishes are high quality.</p>	<p>The design approach for noise walls, flood walls, fencing screens and traffic barriers has been a coordinated integrated urban design approach that reduces visual clutter.</p> <p>The design for walls, fencing, barriers and screens are part of an overarching urban design that encompasses all elements within the roadway and surrounding context.</p> <p>Whether above a trench or a roadway, the design intent for all screens and safety barriers aims to achieve seamless integration while maintaining a formal consistency across the Project.</p> <p>Pedestrian safety barriers are fully integrated with concrete barriers on new road bridges to promote a sense of openness for pedestrians and cyclists, and feature lighting is incorporated into select structural elements of the bridge to create visual rhythm for motorists.</p> <p>Safety barriers on edges of the Yarra Link green bridge and the portals maintain a consistent language throughout the corridor. Where practicable, photovoltaic panels have been integrated into Safety Barriers.</p> <p>Flood walls are carefully integrated with land forming and are part of a holistic design which encompasses the retaining walls, landscaped embankments and the Yarra Link green bridge, to seamlessly integrate with surrounding landscapes. Other road structures, such as shading structures, traffic barriers, fencing and anti-throw screens, are also carefully coordinated to reduce visual clutter.</p> <p>Hues and colours have been inspired by the Wurundjeri Woi-wurrung artefact colour palette, with exact colours derived from the Munsell Chart standard, a colour system used to categorise types of earth.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
<p><b>9.3 Local context and scale</b></p>	<p>Walls, fencing and screens are designed in response to the surrounding areas, with careful consideration to form, texture and colour on both sides of the walls.</p> <p>Use of colour is appropriate to location, and minimises the impact on residential and sensitive uses, including negative impacts from coloured light from transparent materials.</p> <p>Both faces are designed to the same standard of quality, with a front and a front, rather than a front and a back.</p> <p>Walls are appropriately designed to address the speed at which they are viewed. Design on public and residential interfaces reflects a pedestrian scale, whereas the roadside interface reflects the scale of a high-speed vehicle environment.</p> <p>Walls and other structures are sensitively sited and proportionate to the surrounding structures, landscape and urban elements.</p>	<p>The design of the noise walls, flood walls, barriers and screens are consistent with the project wide urban design theme as well as to respond to the site specific context to which they are located.</p> <p>The visual mass and bulk have been kept to a minimum but still provides the functional requirements need for the Project.</p> <p>As shown on the Architecture and Urban design drawings, the use of muted tones, texture finishes and articulated relief results in a sympathetic design outcome to the surrounding environment and public facing elements are treated on all faces. The design also reflects the scale of speed on which is appropriate to the environment such as the slower traffic to residential areas compared to the Freeway facing areas and the use of acrylic panels and solid noise wall elements has been considered relevant to the site context to which they sit.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
<p><b>9.4 Interfaces</b></p>	<p>The creation of unsafe narrow areas between noise walls and residential properties are avoided and minimised. Innovative solutions are included to ensure any narrow spaces are pleasant and safe.</p> <p>Walls respond to the adjacent land uses and boundaries and maximise opportunities for dual use.</p>	<p>Narrow areas between noise walls and residential properties have been avoided to most areas across the Project but constraints such as residential areas wanting planting screens between noise walls and their properties and the existing site constraint such as narrow corridors between existing paths, roads and the residential properties does not always make this objective achievable.</p> <p>The effect of this has been minimised by providing landscaping screens to these areas between where noise walls are located and the property boundaries and fencing will be provided to stop the public from accessing these areas. The noise walls have been used not only for acoustic purposes but also privacy screening where deemed appropriate.</p> <p>The avoidance of these narrow spaces is somewhat mitigated where the noise walls are located on the adjoining property boundary and SUPs or landscaping are on the opposite side in the public realm.</p> <p>Example of the design treatment where a narrow space occurs:</p> <ul style="list-style-type: none"> <li>Greensborough Road boulevard on the east side north of Yallambie Road where the noise walls have been located away from the adjoining property boundary and landscaping screening provided in the subsequent narrow space.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
<p><b>9.5 Transitions</b></p>	<p>Transitions in types and materials of walls, barriers and fencing appropriately address adjacent sensitive land use, property boundaries and vegetation.</p> <p>Changes in wall heights and materials types in walls, barriers and fencing are well considered.</p>	<p>The design has endeavoured to avoid continuous stepping of noise walls, flood walls, barriers and the like where possible and the design approach has been to adopt a smooth transition along the element extent and also a smooth transition to interface areas such as residential and landscaping zones. Screen planting has been provided where possible to noise walls to both residential and road infrastructure sides where possible.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>9.6 Visual connectivity and solar access</b></p>	<p>Transparent barriers are used to take advantage of scenic and adjacent views of surrounding landscape, and reduce the bulky appearance of structures.</p> <p>Walls and barriers are designed (for example sited or angled) to avoid or minimise overshadowing of properties, waterways and open space. Transparent barriers are used to optimise solar access, and to maximise visual connectivity across corridor to connect communities.</p> <p>Walls and barriers are responsive to the local environment and allow sunlight to waterways and ecological areas.</p>	<p>Using acrylic as an alternative clear material allows for solar and visual permeability, resulting in reduced overshadowing on neighbourhoods and parklands. Public safety barriers (PSB), privacy screens and anti-throw screens are designed and detailed to integrate with the landscape to create opportunities to celebrate landscape through curated visual connections.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p><b>Example: Noise Walls</b></p> <p>Visual Connectivity &amp; Solar Access</p> <p>Noise walls have been designed to respond to the needs of their immediate context, such as residential areas. Using acrylic as an alternative clear material allows for solar and visual permeability, resulting in less overshadowing and an improved user experience.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p><b>Example: Screens &amp; Safety Barriers</b></p> <p>Visual Connectivity &amp; Solar Access</p> <p>Barriers maintain a high level of visual permeability to maximise passive surveillance. Public safety barriers around the trench top of walls are designed to allow for sunlight to reach the lower trench areas.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p> <p><b>Example: Iuk (Eel) SUP bridge</b></p> <p>The design includes privacy screening to the adjoining residential faces which also allows for light transmission.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084 (Iuk (Eel) SUP bridge)</i>.</p>
<p><b>9.7 Anti-throw screens, public safety barriers (PSB) and privacy screens</b></p>	<p>Anti-throw screens, public safety barriers and privacy screens are well integrated with bridge and road structures and utilise high quality architectural materials while maintaining a high quality aesthetic form. The scale and visual bulk of throw screens are minimised.</p> <p>Screens are designed to avoid the perception of entrapment that may become a barrier to use. Anti-throw screens have good visual permeability when viewed from adjacent areas, to maximise passive surveillance.</p>	<p>Anti-throw screens and public safety barriers are cleanly integrated with all structures. They are designed to match the spacings and dimensions of the structure to maintain a seamless and consistent aesthetic and have been minimised in scale, visual bulk and clutter but still achieve their functional requirements. The treatment of all material faces has considered the surrounding context and responded accordingly such as colour, scale, light permeability as well as permeability for passive surveillance purposes.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084 (Iuk (Eel) SUP bridge)</i>.</p>
<p><b>9.8 Flood walls and retaining walls</b></p>	<p>Walls are carefully integrated with the landform. Opportunities to use earth embankments and screen planting to mitigate the visual height and bulk of walls are maximised.</p> <p>Walls are integrated with traffic barriers, fencing, throw screens and other structures to reduce visual clutter.</p> <p>Walls have a consistent form, design and material palette.</p> <p>Wall design appropriately reflects the surrounding landscape, urban form and the local context.</p> <p>Walls at the entrance to tunnels and along the road corridor use a consistent design and materials, are integrated with the landscape and have appropriate maintenance access.</p>	<p>Flood walls and retaining walls have been carefully integrated into the land form with visual bulk minimised. The walls have been shaped and finished to compliment the Project's urban design theme as well as to respond to the relevant local context.</p> <p>Examples being:</p> <ul style="list-style-type: none"> <li>The proposed MCC compound flood wall which as a textured finish and articulated form as well as bermed concentrated landscaping around the perimeter to reduce the visual bulk.</li> <li>The flood and retaining walls around the Yarra Link green bridge have been formed around the road geometry and land bridge structural and functional requirements but also to sit harmoniously within the context of the broader urban design which includes shaping, texture, and articulation responses.</li> <li>Retaining walls to Borlase Reserve are proposed to have a suitable contextual look such as stone or articulated insitu precast elements that provide a sense of material purpose in which they sit.</li> <li>The choice of colour palettes is context specific and have been used to highlight key features to motorists as they travel along the freeway.</li> <li>Walls at the entrance to tunnels and along the road corridor have used consistent materials and finishes with the greater project treatments.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0040 to 0052 (MCC)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>9.9 Deterring graffiti</b></p> <p>High quality materials and textured surfaces are used on walls, fencing and screening to deter graffiti, particularly at lower levels of the noise wall.</p> <p>Other opportunities for innovative solutions to deter graffiti are maximised.</p>	<p>All barrier types have been designed with deep texturing and patterns, varying in their alignment to the roadway. Extended stretches of blank wall have been avoided to deter graffiti and landscaped embankments and mounding hinder antisocial access to wall surfaces.</p> <p>Examples:</p> <p><b>Noise Walls</b> Deterring Graffiti</p> <p>Walls are designed to maximise texturing and variation to discourage graffiti and are deeply textured on both sides and the forms of noise attenuation barriers avoids flat stretches of wall. Landscape treatments and moundings are designed to hinder direct access to wall surfaces.</p> <p><b>Flood Walls</b> Deterring Graffiti</p> <p>Flood walls are designed to maximise texturing and variation to discourage graffiti and are deeply textured on both sides and landscape treatments and landscaped moundings have been used to hinder direct access to wall surfaces.</p> <p><b>Road Side and Bridge Barriers</b> Deterring Graffiti</p> <p>Road side and bridge barriers will have a paint finish and as part of the graffiti management process these barriers will be painted over where graffiti occurs.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<p><b>9.10 Maintenance</b></p> <p>Walls are designed to minimise maintenance burden through the selection of high quality materials that are durable, not subject to environmental damage and can be accessed to maintain their high quality.</p>	<p>The urban design concept utilises high-quality durable materials that reduce maintenance requirements. Accessibility, sustainability, community vulnerability rate, and logistics, guided the material selection throughout the Project.</p> <p>Barriers, walls and fences have been designed as modular units so that they are easy to replace if required. Noise walls have been developed in conjunction with the existing and proposed road components (retaining structures, the Yarra Link green bridge, screens, fences and traffic barriers) to create a unified and integrated response.</p> <p>Examples:</p> <p><b>Noise Walls</b> Maintenance</p> <p>The selection of wall materials used for noise walls are durable and of high quality and include concrete and acrylic panels in various forms.</p> <p><b>Flood Walls</b> Maintenance</p> <p>Flood walls are constructed from high-quality, durable materials and colours are custom engineered using a variety of oxide cement mixes. This process ensures a long-lasting finish which requires minimal maintenance and custom colours are selected from an off-white cement mix.</p> <p><b>Screens &amp; Safety Barriers</b> Integrated &amp; Coordinated</p> <p>Maintenance</p> <p>All anti-throw screens and public safety barriers are designed with durable materials and detailed to minimise needs for maintenance. Barriers and anti-throw screen meshes are fully encapsulated within channels to all four sides to ensure robust construction.</p> <p><b>Road Side and Bridge Barriers</b> Deterring Graffiti</p> <p>Road side and bridge barriers will have a paint finish and as part of the graffiti management process these barriers will be painted over where graffiti occurs. The screens will include a level of transparency which will contribute to passive surveillance outcomes and reduced graffiti opportunities.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>10. Bus park &amp; ride, &amp; bus lanes</b>	
<p><b>10.1 Bus interchanges</b></p> <p>Bus interchanges provide a high quality experience for commuters that enhances their journey, provides intermodal connections and increases neighbourhood connectivity.</p> <p>Interchanges have demonstrated capacity to support or facilitate future service changes</p>	<p>These works are part the Bulleen Park and Ride UDLP.</p>
<p><b>10.2 Bus station design</b></p> <p>The design of the interchange optimises their dual role as service points for public transport infrastructure and as public landmarks.</p> <p>Architecture of the bus interchange is high quality and provides a positive built-form contribution to the local area. The public realm promotes pedestrian activity, creates vibrant spaces, uplifts connectivity, and integrates the interchange precinct into the surrounding area.</p> <p>Complementary land use and activation opportunities such as commercial, retail and public facilities are maximised. Car parking areas are safe and positive places.</p> <p>Weather protection must be provided such as shelters and passenger lounges. Break rooms and toilets for drivers are conveniently located to minimise disruption to services.</p>	<p>These works are part the Bulleen Park and Ride UDLP.</p>
<p><b>10.3 Innovation</b></p> <p>Innovative design solutions that add value to Project should be incorporated into the design.</p> <p>These are solutions that are not commonly used in the Victoria and are beyond business-as-usual approaches. These solutions include locating of ticketing devices on platforms, creating more attractive 'airport' style waiting spaces, integrating retail and public amenities into station building, initiatives that support intermodal interchange such as shower and change room facilities, integrating future-thinking technologies, and built form sustainability initiatives that contribute to beyond business-as-usual sustainability outcomes.</p>	<p>The items listed in these requirements are not relevant to a project of this nature and therefore not included as part of the Tunnels Project scope of works.</p>
<p><b>10.4 Transport and active travel connections</b></p> <p>Interchanges provide the ability for commuters to undertake effective, safe and comfortable inter-modal connections to public transport, vehicles and active transport.</p> <p>Customers are provided with clear and open movement within the bus precinct/station.</p> <p>Walking and cycling along priority routes into the precinct, along desire lines and at entry points (both existing and future) within the precinct is improved. Walking and cycling connections link into the surrounding network, and are convenient, direct and attractive to use. End of trip and bicycle amenities including bicycle parking are provided.</p> <p>Clear sight lines and well integrated connections are provided to feeder bus services and other modes of transport. The entry and exit to facilities and stops are identifiable and easy to access.</p>	<p>The items listed in these requirements are not relevant to a project of this nature and therefore not included as part of the Tunnels Project scope of works.</p>
<p><b>10.5 Bus lanes and busway</b></p> <p>The design creates a clear corridor that supports the efficient, safe and high speed movement of buses.</p> <p>The corridor infrastructure has a strong visual identity, works to break-up the perceived expanse of freeway, is responsive to the adjacent landscape and urban form, and creates a memorable public transport experience. The busway design is sympathetic to the design of the Eastern Freeway.</p> <p>Busway is designed to achieve high quality urban design and landscape outcomes</p>	<p>The design for the busway provides a clear visual identity along a landscaping form to contribute to a memorable public transport use experience by providing interesting road structure forms such as feature columns, capitals, noise walls, flood wall treatments as well as landscaping buffers and screening.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>11. Car parking</b>	
<p><b>11.1 Car park design</b></p> <p>Car parks will maximise opportunities for vehicle efficiencies such as via other off-peak uses of car park area, and the integration of commuter car parking into any site development.</p> <p>Landscaping is used in car parks to mitigate the visual impact of large expanses of pavement and to create attractive buffers to residential interfaces. Canopy tree planting is used in car parks to enhance amenity and to provide shade.</p> <p>Opportunities to incorporate Water Sensitive Urban Design infrastructure into the car park precinct is maximised to reduce surface water flow impacts and to provide passive irrigation to planted areas.</p>	<p>The design has endeavoured to minimise the loss of any carparking and such minimising impact on businesses. New carparks, such as at the MCC building and the Veneto Club, will have tree and garden beds incorporated throughout the carpark to contribute to the tree replacement and canopy cover solution as well as to provide an urban design softening of the hard paving areas and pavement areas will be designed to incorporate passive irrigation where possible as part of the passive irrigation design approach.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>11.2 Connectivity and safety</b></p> <p>Car parking areas feel safe during the day and night time, passive surveillance is maximised with clear sight lines for pedestrians and cyclists. Car parking areas support the ease of movement for pedestrians and cyclists and avoid or minimise the potential for conflict with vehicles. Access points to walking and cycling paths are clearly defined and are separate from vehicle movements. Entries to car parks are legible and clear for all modes of transport. Entry points and signage are of high quality design.</p>	<p>The design of the car parking areas has considered passive surveillance and providing clear sight lines for pedestrians and cyclists as well as minimising the potential for conflict with shared vehicle and pedestrians areas via the orientation of car parking spaces, lighting, landscaping positioning and dedicated pedestrian paths. The carparks will be provided with suitable artificial lighting to the relevant standards and codes.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>11.3 Signage and entries</b></p> <p>Entries to car parks are legible and clear for all modes of transport. Entry points and signage are of high quality design.</p>	<p>Carpark entries will be clear and visible and, entry and exit points will have clear designated signage and sight lines will be clear from obstructions. Suitable traffic safety analysis will be undertaken to inform the design.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>12. Lighting</b>	
<p><b>12.1 General lighting</b></p> <p>Functional lighting design and light elements for roads and paths integrate with infrastructure and surrounding areas, and are appropriate to surrounding land uses and enhance personal safety.</p> <p>Lighting creates a cohesive identity for the Project and is integrated with built elements and the general lighting approach</p>	<p>Integrated lighting within cycling and walking SUPs, the Yarra Link green bridge, tunnels, portals and Ventilation Structures accentuates and elevates design principles and objectives. General lighting along roads and paths is appropriate to surrounding land uses, enhances personal safety, and creates a cohesive identity throughout the NEL.</p> <p>Whilst technical requirements will be addressed by specialist lighting designers at each specific area of the Project, this urban design concept retains existing functional lighting wherever possible. New fittings are sensitive to the urban design context and overall Project identity to ensure a legible environment.</p> <p><b>Landscaping</b></p> <p>The location of general roadway lighting will be coordinated with the landscape design to ensure that both aspects achieve a harmonious urban design solution which includes positioning trees and light poles to avoid in ground services clashes as well as maximising light coverage as well as tree planting opportunities.</p> <p><b>SUP Lighting</b></p> <p>Lighting to the walking and cycling paths intends to make the paths visible, safe, and navigable, promoting connection of communities across the Project.</p> <p>These instances of lighting aim to avoid being overt or contextually insensitive design elements. Rather, lighting is provided in a visually subtle and contextually relevant manner.</p> <p>Walking and cycling paths typically minimise light pollution by relying on the lighting provided within road and freeway corridors.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>12.2 Feature lighting</b></p>	<p>Feature lighting is integrated with road lighting to enhance navigation and user experience. All lighting appropriately addresses impacts to sensitive adjacent land uses.</p> <p>Feature lighting is incorporated throughout the NEL to enhance navigation and motorist, pedestrian and cyclist experience. Lighting is context sensitive and responds to Country, while also minimising impacts on sensitive environments.</p> <p>Feature lighting is proposed in the following locations:</p> <ul style="list-style-type: none"> <li>Northern and Southern Portals</li> <li>Tunnel lighting</li> <li>Southern Ventilation Structure</li> <li>Iuk (Eel) SUP bridge.</li> </ul> <p>Feature lighting is employed carefully to minimise light pollution, Care for Country, and not distract or detract from functional lighting. Lighting in the tunnel environment in particular has been carefully considered.</p> <p>Feature lighting elements are designed to be easily accessible for maintenance purposes. Long-lasting, low-maintenance fittings and equipment have been specified to be environmentally friendly and feature lights are energy efficient and applied judiciously to reduce ongoing energy consumption.</p> <p><b>Portal Feature Lighting</b></p> <p>The main tunnel entry portals feature lighting designs in keeping with wider Wurundjeri Woi-wurrung cultural themes of the Project. The Southern Portal forms a canopy over the tunnel entry to create a natural lighting transition. User experience and safety is at the forefront of this design approach. At a finer level of detail, the curved ribbon-like form of the portal embeds a number of linear light strips that follow the form of the portal ribbon to create a legible entry for the road users while also heightening the precinct experience for pedestrians and cyclists. The Northern Portal sits within a trench condition at the point of entry. To help elevate this experience and environment, the cladding that extends into the trench embeds an array of lighting referencing Wurundjeri Woi-wurrung cosmology and reminiscent of the starry night skies. This connects people to the cosmos and helps give the wider precinct and portal condition a connection to place, and those who have inhabited and traversed the land.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Portals).</i></p> <p><b>Tunnels</b></p> <p>High quality, easily maintained architectural cladding panels comprised of metal and vitreous enamel finishes line the inside of the Tunnel to ensure a clear, robust and durable finish.</p> <p>Integrated lighting in select locations creates a sequential journey, enhances wayfinding and provides an engaging driving experience. Significant landscape moments occurring above ground are marked with light installations to foster Connection to Country. These include the Northern and Southern Portals, point of crossing under the Yarra River (Birrarung), and at the secondary tunnel portals at Manningham interchange and Lower Plenty Road.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0090 to 0095 (Tunnels).</i></p> <p><b>Southern Ventilation Structure</b></p> <p>Indigenous knowledge systems are represented in the design of the Ventilation Structure at the Yarra Link land bridge. Much as shapes and patterns in the night sky were used by Wurundjeri Woi-wurrung as calendars and tools for navigation, the Ventilation Structure at Bulleen is deeply place specific. An integrated LED lighting display references celestial formations from the night sky connecting to Indigenous cosmology.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i></p> <p><b>Iuk (Eel) SUP bridge</b></p> <p>LED feature lighting is proposed for the Iuk (Eel) SUP bridge over Lower Plenty Road and the design approach is to incorporate the feature lighting along the SUP bridge journey to compliment the screen design. The feature lighting will also respond to any lighting impacts on adjoining properties.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084 (Iuk (Eel) SUP bridge).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>12.3 Light pollution</b>	Lighting employed in the Project is designed sensitively for the surrounding environment and to avoid or minimise light pollution.	<p>Feature lighting is employed carefully to minimise light pollution, Care for Country, and not distract or detract from functional lighting.</p> <p>All relevant standards are to be adhered to in the detailed design, including those regarding lighting used during the operation of permanent structures.</p> <p>Modelling of light spill (lux plots) will be completed on all proposed lighting infrastructure, which will allow the design to assess and mitigate any impacts from light spill and the lighting will be designed to minimise disturbance to significant fauna sites including the Grey-headed Flying fox colony at Yarra Bend, wetlands and waterways immediately adjacent to roadways.</p> <p>Design responses will include:</p> <ul style="list-style-type: none"> <li>Walking and cycling paths typically minimise light pollution by relying on the lighting provided within the road/freeway corridor</li> <li>Low reflectivity materials, such as concrete, weathering steel, and matte coloured acrylic, are used for road corridor structures to minimise light pollution</li> <li>Light fittings and light shields will be provided to concentrate lighting where required.</li> </ul>
<b>12.4 Maintenance</b>	General and feature lighting include designs and elements that maximise road safety, are environmentally friendly and can be safely maintained.	Feature lighting elements are designed to be easily accessible for maintenance purposes and long-lasting, low-maintenance fittings and equipment.
<b>12.5 Energy efficiency</b>	Energy efficient lighting is used to reduce ongoing energy consumption.	Lights will be energy efficient and applied judiciously to reduce ongoing energy consumption. The lighting will be LED's where suitable and luminosity will be minimised where possible. The design includes solar panels to the Ventilation Structures and tunnel trenches which feed into the energy harvesting solution.
<b>13. Walking &amp; cycling infrastructure</b>		
<b>13.1 Pedestrian and cycling network</b>	<p>The Project maintains or enhances the existing pedestrian and cycling network.</p> <p>Walking and cycling connectivity through local neighbourhoods is improved with integrated links and connections across the Project.</p> <p>Clear visual and movement linkages between streets, footpaths, bicycle paths, and public open spaces connect public transport, neighbourhood activity centres, schools and other key community facilities and services.</p>	<p>Walking and cycling connectivity through local neighbourhoods is improved with integrated links and connections across the Project. Clear visual and movement linkages between streets, footpaths, bicycle paths, and public open spaces connect public transport, neighbourhood activity centres and other key community facilities and services.</p> <p>The design interacts heavily with the Principle Bicycle Network (PBN) which outlines a network of proposed and existing bicycle routes that provide access to major destinations in the Melbourne metropolitan area.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>13.2 Encourage cross-community connectivity</b>	<p>Opportunities to remove barriers that discourage walking and cycling, cross-Project corridor connectivity, and the community's ability to reach everyday services and facilities within a 20 minute walk are maximised. These barriers include physical obstructions, and a lack of shade and rest stops.</p> <p>Pedestrian and cycle crossings of the Project corridor are celebrated and emphasised to encourage greater sense of connectivity</p>	<p>Pedestrian friendly areas, centred around the '20 minute neighbourhood' concept, have been created throughout NEL. Through an extensive network of new and renewed walking and cycling pathways, safe, inclusive and inviting new connections between desirable services and amenities will contribute to the objective of the 20 minute neighbourhood concept.</p> <p>Removal of barriers such as limited road crossings, limited shade, rest stops and lack of path and SUP connectivity to existing network have been addressed in the design.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>13.3 Pathways and connections</b></p>	<p>Connectivity and continuity of on-road and off-road walking and cycling routes along and around the corridor are maintained and enhanced.</p> <p>Any existing trails impacted by works are realigned to retain connectivity.</p> <p>Pathways are direct and convenient. Access is maintained or improved with direct, pleasant and safe pedestrian and cycling links.</p> <p>Opportunities for grade separation of walking and cycling paths from roads are maximised.</p> <p>Off-road walking and cycling paths are high quality, suitably wide, functional and aligned appropriately.</p> <p>The transition between cycling paths is continuous and seamless with direct routes and consistent design elements. The riding environment is safe and appealing. Extent of local and strategic cycling corridors is maximised.</p>	<p>Connectivity and continuity of on-road and off-road walking and cycling routes along and around the corridor are maintained and enhanced as shown in the landscaping drawings and access is maintained or improved with direct, pleasant and safe pedestrian and cycling links.</p> <p>Access is maintained or improved with direct, pleasant and safe pedestrian and cycling links.</p> <p>Off-road walking and cycling paths are high quality, suitably wide, functional and aligned appropriately. The transition between cycling paths is continuous and seamless with direct routes and consistent design elements.</p> <p>Opportunities for grade separation of walking and cycling paths from roads have been considered and the design responds in the following manner:</p> <p><b>Greensborough Road boulevard</b></p> <ul style="list-style-type: none"> <li>On-road cycling lane to the west</li> <li>A separate cycling and pedestrian path to the west</li> <li>A SUP to the east.</li> </ul> <p><b>Manningham/Bulleen Road interchange</b></p> <ul style="list-style-type: none"> <li>SUP path connecting the Bolin Bolin precinct to the existing trail that passes under Manningham Road</li> <li>SUP path from the cultural precinct through to Bulleen Road</li> <li>Pedestrian paths that link through to the Manningham/Bulleen Road intersection and the Heide Museum of Modern Art.</li> </ul> <p><b>Yarra Link green bridge</b></p> <ul style="list-style-type: none"> <li>East and west SUPs providing connectivity over the land bridge.</li> </ul> <p><b>Eastern Freeway interchange</b></p> <ul style="list-style-type: none"> <li>SUP underpasses on the southern side of the Eastern Freeway that provide more direction connection to the Koonung Creek Trail.</li> </ul> <p><b>Bulleen Road</b></p> <ul style="list-style-type: none"> <li>Maintain the existing on-road cycling lane to the west side of Bulleen Road</li> <li>A new pedestrian path to the west side of Bulleen Road</li> <li>A new SUP on the east side of Bulleen Road.</li> </ul> <p>The pedestrian and cycling paths are all proposed to be concrete and a minimum of three meters wide or appropriate width to suite specific areas such as landings and switchbacks.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>13.4 Path separation</b></p>	<p>Separated walking and cycling paths are used in high-use areas where appropriate, and avoid and minimise the potential for conflict between intersecting travel paths.</p>	<p>Separated walking and cycling paths are used in high-use areas where appropriate and minimise the potential for conflict between intersecting travel paths. Paths have been widened in strategic locations to allow for adequate passing space and improved separation of conflicting path users.</p> <p>Opportunities for grade separation of walking and cycling paths from roads have been considered and the design response the following:</p> <p><b>Greensborough Road boulevard</b></p> <ul style="list-style-type: none"> <li>On-road cycling lane to the west</li> <li>A separate cycling and pedestrian path to the west</li> <li>A SUP to the east.</li> </ul> <p><b>Bulleen Road</b></p> <ul style="list-style-type: none"> <li>Maintain the existing on-road cycling lane to the west side of Bulleen Road</li> <li>A new pedestrian path to the west side of Bulleen Road</li> <li>A new SUP on the east side of Bulleen Road.</li> </ul> <p>The pedestrian and cycling paths are all proposed to be concrete and a minimum of three meters wide or appropriate width to suite specific areas such as landings and switchbacks.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>13.5 Pedestrian crossings</b></p>	<p>Pedestrian crossings are provided at strategic points to encourage safe travel behaviour and enhanced connectivity. They are regularly spaced. The distances between them minimised.</p>	<p>Pedestrian crossings are provided at strategic points to encourage safe travel behaviour and enhanced connectivity. They are regularly spaced and the distances between them has been minimised. Where SUPs meet road intersections, clearly identifiable pedestrian and cyclist crossings are provided.</p> <p>Signalised crossing are located at busy road junctions to improve safety, whilst local road crossings are identified with road markings, signage and furniture.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>13.6 Perceived safety</b></p>	<p>Perceptions of safety along walking and cycling paths are improved for pedestrians and cyclists, through good design, to remove barriers to participation.</p>	<p>The walking and cycling paths have been designed in accordance with the requirements as listed in Section 4.4.2 of the UDLP, and where possible these paths have been provided without barriers via setting back the paths away from roadways with clear landscaping verges either side of the paths that assist in creating a sense of openness for the users. Where paths directly adjoin roadways, barriers are required from a safety perspective. Speeds of movement and reduction of path conflicts are managed through path design, signage, and surrounding landscape treatments.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>13.7 Shade</b></p>	<p>Canopy trees are maximised along pedestrian and cycle routes, to provide amenity and shade.</p>	<p>Surrounding landscapes have been designed to meet local open space planning policies and to provide green infrastructure along these important active transport corridors. Stopping points with seating and shade structures have been provided at regular intervals along path routes and at key junctions such as on the Yarra Link green bridge, and Borlase Reserve.</p> <p>The UDLP shows the general design intent of the landscaping approach and through the design development phase when additional topographic, arborist and ecology surveys are obtained and coordinated within the design is when individual trees will be shown and tree replacement and canopy coverage maximisation determined.</p> <p>Typical anticipated Design Development Outputs for Landscaping:</p> <ul style="list-style-type: none"> <li>• Arborist and ecology surveys</li> <li>• Planting removal and replacement outcomes</li> <li>• Tree protection zones</li> <li>• Existing and proposed canopy coverage</li> <li>• Environmental responses</li> <li>• Refinement of planting densities</li> <li>• Tree root extents</li> <li>• Screen planting optimisation</li> <li>• Furniture</li> <li>• Refinement of finishes</li> <li>• Handrail finish</li> <li>• Retaining wall locations.</li> </ul> <p>Canopy trees as shown by the indicative future tree canopy symbols on the landscape plans are maximised along pedestrian and cycle routes to provide amenity and minimise urban heat island effects.</p> <p>The design approach will include maximising canopy trees along pedestrian and cycling routes which will also minimise the urban heat island effects.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>13.8 Prioritise pedestrians</b></p>	<p>Pedestrian priority is maximised on key walking routes into and around key community facilities and destinations (including activity centres, Park and Rides and nearby schools and aged care facilities) by providing a high quality walking environment. This includes shade, drinking fountains at appropriate intervals and rest stops with seating.</p> <p>Pedestrian-friendly walkways are free from obstructions and have a smooth surface.</p> <p>Outdoor furniture and fixtures such as bins, bicycle parking and drinking fountains are offset from pedestrian pathways.</p>	<p>Pedestrian priority is maximised on key walking routes into and around key community facilities and destinations such as activity centres, bus stations, nearby schools and aged care facilities. Shade, rest stops with seating and drinking fountains at appropriate intervals have also been included. Pedestrian-friendly walkways are free from obstructions and have a smooth surface. Outdoor furniture and fixtures such as bins, bicycle parking, and drinking fountains are offset from pedestrian pathways.</p> <p>Examples being:</p> <ul style="list-style-type: none"> <li>• The Yarra Link green bridge providing east-west connectivity between the schools and Bulleen Park</li> <li>• The Bulleen Road SUP bridge over the Eastern Freeway providing north/side connectivity to the Eastern Freeway</li> <li>• The pedestrian and SUP trails to the Manningham/Bulleen Road interchange which provided north-south connectivity across Manningham Road.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>13.9 Wayfinding</b></p>	<p>Wayfinding and signage is used to improve the ability for people to find their way to key destinations</p>	<p>The wayfinding signage design will be developed during the design development phase and will improve the ability for people to find their way to key destinations via incorporating the following:</p> <ul style="list-style-type: none"> <li>• Key destination markers such as names and directions for trails, roads, shopping areas, amenities and cultural areas will be included in the design</li> <li>• Standard graphics and naming conventions</li> <li>• Individual relevant place brandings</li> <li>• Integration with existing signage systems</li> <li>• Avoidance of clutter by combining signage</li> <li>• Cultural storytelling.</li> </ul>
<p><b>13.10 Wayfinding signage design</b></p>	<p>Wayfinding signage provides clear and reliable information, as well as being appropriate and sensitive to the environment and users of varying abilities. A balance is struck between sufficient signage and visual clutter. Obstructions to key sightlines are avoided or minimised.</p> <p>Signage is consistent and well integrated with any existing local signage systems. Route hierarchy is coherent.</p> <p>Standard route naming is adopted along entire routes, negotiated with the relevant authority.</p> <p>Individual branding incorporating graphic devices is employed, such as the Koonung Creek Trail branding.</p> <p>A list of 'standard' destinations is developed for each route in consultation with the relevant authority. Names and notation are consistent with those used on other wayfinding signs and maps.</p> <p>Signage is provided where users join the route, at the ends of the route and at any significant intersection with another, route, trail, path or road.</p> <p>Alternative routes are signed where appropriate, such as where the main route may flood.</p> <p>Signage is provided at any point where route continuity is unclear.</p> <p>Signage is high quality, graffiti proof, weatherproof and low maintenance.</p>	<p>The wayfinding signage design will be developed during the design development phase and will include design aspects such as:</p> <ul style="list-style-type: none"> <li>• Indigenous and other relevant cultural storytelling</li> <li>• Key destination markers such as names and directions for trails, roads, shopping areas, amenities and cultural areas will be included in the design</li> <li>• The design location approach to the wayfinding design will be to provide optimal clarity for users</li> <li>• Integrated into the greater landscape and urban design</li> <li>• Maintenance considerations</li> <li>• Standard graphics and naming conventions</li> <li>• Individual relevant place brandings</li> <li>• Integration with existing signage systems</li> <li>• Avoidance of clutter by combining signage.</li> </ul> <p>The Indigenous wayfinding place markers have been indicated on the landscape drawings and further design consultation will be undertaken to inform the specific design outcomes.</p> <p>Consultation will also occur with the relevant councils as part of the design development process which will include the aspects listed above.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<b>14. Walking &amp; cycling bridges</b>	
<p><b>14.1 Walking and cycling bridge design</b></p> <p>Walking and cycling bridges are high quality and suitably wide to allow for passive surveillance and maintenance vehicles.</p> <p>Walking and cycling bridges are well designed and proportioned, and are visually appealing design elements for the roadway and adjacent communities.</p> <p>Bridges are structurally expressive and durable and the need to enhance the appearance of the bridge by use of cladding is avoided.</p> <p>Walking and cycling bridges use structural form, materials, texture and colour to create an identity for the Project.</p> <p>Bridges respond to the surrounding context and are sensitive to the local character of the area.</p>	<p>Bridges have the capacity to connect both physical and cultural landscapes. They carve new pathways through neighbourhoods and open up new connections between people. The design of the walking and cycling bridges has considered the general functional requirements as well as the Project's urban design approach including Indigenous themes.</p> <p>The walking and cycling paths have been designed in accordance with the requirements as listed in Section 4.4.2 of the UDLP.</p> <p>A few examples are listed below:</p> <p><b>Iuk (Eel) SUP bridge</b></p> <p>The design of the Iuk (Eel) SUP bridge includes a suitable clear bridge width, wide SUP entry and exit path widths and gradual angles of approach and clear sight lines that all contribute to a safe design outcome for users. The design of the SUP bridge is suitably proportioned to the context of the area in which it sits and the design of this SUP is very much aligned with an Indigenous cultural appreciation which creates a sense of identity for the Project.</p> <p>Bark canoes made by Wurundjeri Woi-wurrung were used to fish, collect food and connect people across the waterways of Melbourne for thousands of years. These canoes were made from a single piece of bark removed from a tree without damaging the tree itself. Bark canoes have informed our design approach to the bridge infrastructure. The bridge is balanced and materially efficient; it touches the ground lightly and uses only what is needed and the organic tapering form and texture is informed by the materiality of bark.</p> <p>Recognising that the walking and cycling infrastructure is sited on Aboriginal land, we have nominated the bridge at Lower Plenty Road a Wurundjeri Woi-wurrung language name which is a place holder only, with a mindfulness of the requisite processes of permission and engagement that will be required through the Victorian Aboriginal Corporation of Languages and the traditional owner groups and Aboriginal linguists. The name, Iuk meaning 'eel', is a unique identifier and has been informed by the structure of the bridge. In consultation with Wurundjeri Woi-wurrung we are seeking to name the other two SUP bridges on the Project to integrate them into NEL's family of Bridges.</p> <p>The structure of the bridge is elegant and a light touch has been adopted with the structural form being integral to the design outcome.</p> <p>The SUP bridge design also addresses the potential overlooking and overshadowing impacts on adjoining properties and provides a level of transparency that contributes to passive surveillance outcomes.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084 (Iuk (Eel) SUP bridge).</i></p> <p><b>Bulleen Road SUP</b></p> <p>The Bulleen Road SUP bridge design provides a functional and aesthetically pleasing design solution that has been developed not only to fit within the Project's urban design philosophy but also sympathetic to the suite of proposed bridges along the broader Eastern Freeway corridor.</p> <p>The design approach has been to create a light touch which includes minimised structure and transparency in the bridge screens.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge).</i></p> <p><b>Land bridge Eastern SUP</b></p> <p>The Yarra Link green bridge eastern SUP has been designed in keeping with the broader Project's suite of SUP bridges and in particular with the Iuk (Eel) SUP bridge. The design approach will be to include a similar structural form and screening as per the Iuk (Eel) SUP bridge but to cantilever the bridge of the adjoining retaining walls thus providing opportunities for landscaping screening under the bridge.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge).</i></p>
<p><b>14.2 Entries</b></p> <p>Bridges have a sense of openness at the approach, with a clearly identifiable entry and effective wayfinding.</p>	<p>The design of the SUP bridges provides a sense of openness at the approach, with a clearly identifiable entry and effective wayfinding which is achieved through wide and gentle gradients to path entries and exits and along with the level of transparency and outward tapering of the SUP bridge structure. Wayfinding will be designed and positioned to provide clear direction to users and landscaping treatments will be at low level to provide clear sight lines.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>14.3 Safety</b>	Bridges provide a high level of passive surveillance and perception of safety.	Clear sight lines will be provided to the bridges from surrounding areas and lighting will be provided along with transparent barrier treatments to contribute to the passive surveillance outcome. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge)</i> .
<b>14.4 Minimising impacts</b>	Elevated structures are designed to minimise landscape and visual impacts, overlooking and overshadowing of residential and other sensitive areas. The visual impact of the bridge structure on road users is minimised. Planting is used to integrate ramps with their surroundings and reduce their visual impacts.	The SUP bridges design has been developed not only to fit within the Project's urban design philosophy as well as to its functional requirements and context in which it sits. The design approach has been to create a light touch which includes minimised structure and transparency in the bridge screens and also to integrate privacy to nearby adjoining properties where required and endeavours to minimise overshadowing to adjoining properties via siting of the bridges as far away from adjoining properties as practical. Landscaping will be used to reduce the visual impact of the bridges where possible. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge)</i> .
<b>14.5 Access</b>	Walking and cycling bridges meet universal access requirements with ramps and stairs for direct access.	Universal access principles have been adopted in the design of the pedestrian and SUP bridges which will result in a safer and more enjoyable experience for users due to gentler paving gradients, clear sight lines and visibility. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge)</i> .
<b>14.6 Views</b>	The design takes advantage of scenic views and vistas, and space for stopping and viewing does not significantly interrupt pedestrian and cycle movement.	Walking and cycling bridges have suitable path widths and landings as well as transparent throw screens to allow users to stop and view. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge)</i> .
<b>14.7 Lighting</b>	Lighting is integrated into the design to make the crossing attractive and appropriate for night time use.	Lighting is integrated into the design to make the crossing attractive and appropriate for night time which includes integrated handrail lighting to the SUP bridges, functional vertical blade lighting to the SUP bridges within the vertical structural forms and functional surface lighting to the land bridge. The lighting will consider maintenance and potential vandalism risks. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0138 &amp; 0139 (Bulleen Road SUP bridge)</i> .
<b>15. Walking &amp; cycling underpasses</b>		
<b>15.1 Entries</b>	Underpasses have a sense of openness at the approach, with a clearly identifiable entry and effective wayfinding.	The underpass connection provided at the Bulleen Road and Eastern Freeway intersection provides a clear distinctive node solution for users which includes reaching out in an urban form to invite users into the space which will be supported by suitable wayfinding. Spatial unobstructed SUP entry and exit points, generous heights and widths of the underpasses and also the use of colour and feature lighting within the underpasses contributes to a positive journey for users. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .
<b>15.2 Connections</b>	Underpasses are strategically located to improve any gaps in the existing path network. Topography and entry points are integrated with the existing path network to provide a seamless and safe journey with clear sight lines. Paths are generously proportioned with room for pedestrians and cyclists traveling in both directions.	The underpass connections provides the SUP connectivity and are of a width that offers clear sight lines to users in both directions and have been located to provide an improved level of connectivity to the Koonung Creek Trail under Bulleen Road. The paving extent leading in and out of the underpasses have been designed to provide suitable manoeuvrability and clear lines of sight for users. This entry and exit points will be reasonably flat and any vegetation in the vicinity will be generally of low height. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .
<b>15.3 Safety</b>	Underpasses have clear visual connections through to the streetscape and public spaces on either side. Underpasses are wide enough to provide a high level of passive surveillance and perception of safety. The length of underpasses is minimised.	The generous underpass width along with the SUP lead into these spaces and lighting contributes to a safe space for users. The underpasses will have interesting urban design treatments that will contribute to an enjoyable user experience and the location of these underpasses have been position to cater for potential high user volumes which also assists in increased passive surveillance. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .
<b>15.4 Deterring graffiti</b>	Internal and external walls use high quality materials with graffiti-resistant surfaces.	The selection of materials to line the underpasses will be selected with graffiti removal in mind such as profile and material finish. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>15.5 Natural lighting</b>	Opportunities to incorporate openings for natural daylight are maximised to improve lighting and reduce operating costs.	Although the underpasses are located under road structures, that will not allow for light wells, the design of the underpass via the underpasses width, height, finish and clear uncluttered entry and exit areas will contribute to the penetration of a level of natural lighting into these spaces.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .
<b>15.6 Artificial lighting</b>	High quality artificial lighting is used to enhance safety for pedestrians and cyclists. Lighting elements are included as design features integrated into the structure.	The proposed lighting for the walking and cycling underpasses will be a combination of both functional and feature lighting with both forms of lighting integrated into the proposed underpass finishes.  The location of both forms of lighting will be primarily to the underpass soffit in order to minimise vandalism risks and the location of the functional lighting will not be limited to the underpass itself but also provided to the entry and exit points to contribute to a well lit transition.  Both functional and feature lighting will have fittings selected that will not have only a functional requirement but also a suitable design aspect that sits appropriately with the urban design context.  The feature lighting will be a form of LED that provides a touch of colour and interest and be complementary to the adjoining finishes but is of a brightness as not to distract users.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i> .
<b>16. Navigational nodes &amp; thresholds</b>		
<b>16.1 Hierarchy</b>	A hierarchy of identifiable elements are located along the corridor, in accordance with the key design directions set out in this document, to help the community to navigate and identify their location. These elements should incorporate scenic views to the city, mountains, ridgelines and existing natural or built features; or through the design of elements that respond to cultural and historic values, geology, topography, water course, vegetation, above-ground characteristics and places above tunnels, and/or the urban setting.	The design includes a hierarchy of identifiable urban design elements that will help the community navigate and identify their location through a hierarchy of architecture, engineering, and landscape elements.  The hierarchy of elements includes: <ul style="list-style-type: none"> <li>The Northern and Southern Ventilation Structures providing a reference point for users from a longer distance range. Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0010 to 0021, 0060 to 0076 (Northern and Southern Ventilation Structures)</i></li> <li>The portal entries and Yarra Link Green bridge providing a reference point for users from a more intermediate range perspective. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 (Landscaping Yarra Link green bridge)</i></li> <li>The noise walls providing a reference point for motorists along the immediate journey</li> <li>The wayfinding will provide a reference point for pedestrians and cyclists at a low-level scale of use.</li> </ul> These identifiable urban design elements also incorporate the following key urban design aspects: <ul style="list-style-type: none"> <li>Scenic views are provided on the Yarra Link green bridge as well as on the southern side of the Eastern Freeway</li> <li>The overall project design captures Indigenous themes throughout the Project such as the colour and material palettes, the Cultural Landscape Precinct and the Iuk (Eel) SUP bridge</li> <li>Additional cultural and historical aspects will be captured in the wayfinding design storytelling approach</li> <li>Water courses are celebrated and emphasised such as the daylighting of Banyule Creek and incorporation of additional wetlands at Banyule Creek and Koonung Creek Reserve</li> <li>Existing vegetation to the different character areas is further enhanced via the proposed planting mix as well as an extension of the riparian corridor on the Yarra Link green bridge.</li> </ul> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i> . Refer to: <i>UDLP Attachment.2-Landscape Design</i> .

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>16.2 Structures as features</b></p>	<p>Opportunities are maximised for attractive, identifiable and well-designed structures (interchanges, ramps, bridges etc.) that also act as navigational nodes and threshold treatments.</p> <p>Built features and elements are meaningful and are not superfluous visual elements</p> <p>The design provides attractive, identifiable and well-designed structures that also act as navigational nodes and threshold treatments such as:</p> <ul style="list-style-type: none"> <li>• The Northern and Southern Ventilation Structures</li> <li>• The Yarra Link green bridge provides a reference point along the Eastern Freeway to the tunnel entry</li> <li>• Bulleen Road SUP provides a reference point along the Eastern Freeway</li> <li>• Iuk (Eel) SUP bridge provides a reference point along Lower Plenty Road and Greensborough Road boulevard intersection</li> <li>• Manningham portals provides a reference point for the tunnel entry and exits at the Manningham/Bulleen Road interchange</li> <li>• Watsonia and Lower Plenty portal provides a reference point for the tunnel entry and exits along Greensborough Road boulevard.</li> </ul> <p>The Project has designed a family of structures – retaining walls, multi span bridges, road bridges and a pedestrian and cycling bridge – that create a cohesive and consistent motorist experience. Bridges are unique episodic markers, integrated with landforms to foster Connection to Country. Lighting has a cohesive identity that aids navigation – particularly through the tunnels to locate motorists to place along the subterranean journey. Barriers and walls frame views to Country and amplify landscape experiences.</p> <p>The northern and southern ventilation outlets are structures of significant scale in the public realm to serve as navigational nodes for communities such as Bulleen. The design of these structures has been informed by traditional Wurundjeri Woi-wurrung eel traps and an integrated lighting treatment (to the Southern Ventilation Structure) links Indigenous and contemporary cosmology as a means of knowledge exchange.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>
<p><b>16.3 Visual clutter</b></p>	<p>Visual clutter is to be minimised including from road lighting.</p> <p>Visual clutter has been avoided by the design approach for clean urban design line forms, the avoidance of superfluous materials, the selection of muted earthy tones, keeping the selection of materials consistent throughout the Project and combining gantry and tolling structures where possible.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.</p>
<p><b>17. Landscape</b></p>	
<p><b>17.1 Green corridors</b></p>	<p>The Project enhances the quality of the surrounding landscape and strengthens existing green corridors. New landscape work complements the existing soft landscaping and is distributed evenly throughout the Project. Landscaping is undertaken early in the construction process where practicable, prioritising areas that will not be impacted by future construction, in order to maintain the green character of the area.</p> <p>The urban design concept enhances the quality of surrounding landscapes through new wetlands, habitats and recreation facilities such as nature play and BBQ shelters. Green corridors are strengthened by enhancing existing green corridors and creating new green linkages such as Yarra Link green bridge, the environmental rejuvenation of the Cultural Landscape Precinct at the Manningham Road interchange, and habitat corridor enhancements north of Lower Plenty Road.</p> <p>New landscape work complements existing landscape, relates to its contextual character and is informed by local Ecological Vegetation Classes (EVCs). The Project have identified areas for early landscape works, such as the Manningham Road interchange precinct that can accelerate work and environmental benefits for the wider Project.</p> <p>Site specific barrier risk assessment will be undertaken during the development phase to optimise the provision of safety barriers as required both in the median and the outer edges of Greensborough Road to achieve the boulevard treatment.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road)</i>. Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.</p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>17.2 Roadway identity</b></p>	<p>Landscaping unifies the road corridor, contributes to the identity of the roadway and enhances the experience when driving through the area</p>	<p>Landscaping unifies the road corridor, contributes to the identity of the roadway, and enhances the driving experience. Identity and enhancement is achieved through ecotones of 1750 EVCs. Ecotones are the basis upon which we select species that are commercially viable and bolster the biodiversity with plants that will adapt to the micro-climate, support ecology and are adaptive to climate change.</p> <p>This approach, combined with responding to the local character of each area, will create a diverse and unique sequence of landscape experiences that connect to context.</p> <p>An example of the landscaping providing this identity will be the Greensborough Road boulevard proposal which will result in a formal boulevard effect that will become a visual reference for the area.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>17.3 Integration</b></p>	<p>The landscape design integrates the road environment into the existing landscape character and urban fabric.</p> <p>Landscape areas are clearly defined and are not left-over and undesirable spaces.</p>	<p>The landscape design integrates the road environment by designing for the three scales; the road, the pedestrian and the ecology and is considered in cross section by reviewing the data and identifying how the vehicles, pedestrians and flora/fauna will interact within this space. The appropriate species of relevant ecotones will be distributed across this cross sectional approach. The landscaping schedule shows the proposed planting themes for the three character areas which is influenced by the existing and adjoining conditions.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>17.4 Minimising loss</b></p> <p>The removal of mature trees, planted and remnant native trees and remnant vegetation, (particularly large amenity trees, heritage vegetation and vegetation within or connected to open space) is minimised.</p> <p>Opportunities to retain all valuable habitat linkages or corridors are maximised.</p> <p>An approach for the reuse of existing vegetation to be removed is developed.</p>	<p>The design approach is to minimise the removal of mature trees, planted and remnant native trees and remnant vegetation, particularly large amenity trees, heritage vegetation and vegetation within or connected to open space and opportunities to retain all valuable habitat linkages or corridors will be maximised and an approach for the reuse of existing vegetation to be removed has been developed.</p> <p>Examples being:</p> <ul style="list-style-type: none"> <li>• A detailed tree and ecology survey has been undertaken to identify existing tree types, tree numbers, tree heights, tree locations, canopy coverage areas as well as ecological habitat areas</li> <li>• From the site tree and ecology survey information an analysis has been undertaken on the minimum tree removal and habitat disturbance required for construction purposes which is addressed in the approved Tree Removal and Canopy Replacement Plan required as per The UDLP Section 6 EPR requirements 4. Arboriculture (AR) AR1 Develop and implement a Tree Removal Plan, AR2 Implement a Tree Protection Plan(s) to protect trees to be retained and AR3 Implement a Tree Canopy Replacement Plan</li> <li>• Further analysis will be undertaken as part of the design development phase for opportunities to retain existing vegetation such as by refining the design to avoid impact on vegetation where possible</li> </ul> <p>Typical anticipated Design Development Outputs for Landscaping:</p> <ul style="list-style-type: none"> <li>- Arborist and ecology surveys</li> <li>- Planting removal and replacement outcomes</li> <li>- Tree protection zones</li> <li>- Existing and proposed canopy coverage</li> <li>- Environmental responses</li> <li>- Refinement of planting densities</li> <li>- Tree root extents</li> <li>- Screen planting optimisation</li> <li>- Furniture</li> <li>- Refinement of finishes</li> <li>- Handrail finish</li> <li>- Retaining wall locations.</li> </ul> <ul style="list-style-type: none"> <li>• Where possible the design will be adjusted to avoid impacts on existing flora and fauna and as an example structural and civil solutions will consider existing vegetation to determine if the design can avoid conflicts with existing tree roots</li> <li>• Additional site investigations will be undertaken to determine individual root extents where deemed necessary</li> <li>• Construction procedures have considered retaining existing vegetation as part of the CEMP analysis</li> <li>• The landscape design approach is to have minimal disturbance to sensitive areas such as the Bolin Bolin Billabong and Yarra River interface areas</li> <li>• New in and above-ground services have been designed to minimise impact on existing vegetation and habitat areas</li> <li>• Select timber from trees that are to be removed from site are to be re used within and outside of the Project and the suitability of these timbers will need to be confirmed. Potential re use areas include:             <ul style="list-style-type: none"> <li>- Mulch</li> <li>- Boardwalks</li> <li>- Handrails</li> <li>- Façade treatments</li> <li>- Architectural internal feature walls</li> <li>- Feature architectural timber flooring</li> <li>- Shelters</li> <li>- Playground equipment</li> <li>- Landscaping seating</li> <li>- Indigenous artwork.</li> </ul> </li> </ul>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>17.5 Enhance habitat and biodiversity</b></p>	<p>New landscapes corridors are developed to enhance biodiversity and habitat links (both new and existing). Indigenous vegetation is planted in existing habitat linkages and corridors to strengthen biodiversity and provide habitat links for native fauna to move more easily through the urban landscape.</p> <p>Opportunities to create fauna habitat and links are maximised, including the use of hollow logs, nesting boxes and rope ladders as part of any landscape works undertaken within biodiversity zones and natural open spaces.</p>	<p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p> <p>The landscape corridors are designed to enhance both new and existing biodiversity and habitat links. Indigenous vegetation from the local EVCs are planted in existing habitat linkages and corridors to strengthen biodiversity and provide habitat networks for existing native terrestrial fauna to move more easily through the urban landscape such as our new Yarra Link green bridge, designed to connected the ecology of the Koonung Creek Valley area and Yarra parklands. Opportunities to create fauna habitat and links will be maximised, including the use of hollow logs, nesting boxes, and rope ladders as part of any landscape works undertaken within biodiversity zones and natural open spaces such as the Banyule Creek.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>17.6 Visual mitigation</b></p>	<p>Landscaping is used to filter or screen views of road infrastructure and head light glare.</p> <p>The punctuation of built form and structures above treed ridgelines is minimised. Support a canopy of mature trees as the dominant visual element throughout the Project corridor.</p> <p>Roadside landscape is used to mitigate the visual impact of large expanses of asphalt and to enhance the driver experience.</p>	<p>Landscaping has been used to screen road infrastructure and head light glare where possible such as the tree lined boulevard planned for Greensborough Road, planting screens for noise walls, retaining walls and flood walls as well as tree lined medians.</p> <p>The design includes mature trees as the dominant visual element and the built form above tree ridgelines has been minimised where possible by means of large tree planting selection, incorporation of landscaping mounding, keeping built form items to minimal heights and siting built form items with landscaped setbacks from adjoining property boundaries or public space. Roadside landscape is used to mitigate the visual impact of large expanses of asphalt by ensuring planting is maximised to medians and between paths and roadways.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>
<p><b>17.7 Be inspired by local assets</b></p>	<p>The landscape design takes cues and is inspired by nearby local environmental assets including the Yarra Valley parklands, Koonung Creek, Plenty River Gorge, Gresswell Nature Forest, Banyule Creek and Simpson Barracks.</p> <p>Landscapes along river and creek corridors that are impacted by the Project are rehabilitated and naturalised for ecological and experiential benefits.</p>	<p>The landscape design responds to the character areas as defined in the UDS as well as consideration to the adjoining existing landscape interface areas such as Bolin Bolin Billabong and Koonung Creek Valley area parkland. The landscaping palette for each area has been developed to reflect the different landscaping and habitat areas within the Project. Enhancement of existing wetlands, daylighting of existing waterways as well as enhancement of habitat areas are examples of cues taken from nearby environmental assets.</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>17.8 Urban forest</b></p> <p>New tree planting and vegetation is prioritised within the Project corridor, including adjoining streets, medians, buffers and in carparks, to support the urban forest.</p> <p>Opportunities for tree planting within the roadway landscape, local streetscapes, in buffer planting, and on highpoints and ridgelines is maximised.</p> <p>Innovative engineering solutions are used to maximise tree planting.</p> <p>Where there is a conflict between planting canopy trees and maintaining views, canopy tree and buffer planting may take precedence.</p> <p>Services are located to optimise tree planting.</p>	<p>The Project landscape solution objective is to minimise tree removal and also to achieve at least a ratio of 2:1 for replacement of amenity plantings and achieve a net gain in tree canopy cover by 2045 as per EPR AR3 which has been the design driver for tree locations and density of planting across the corridor to contribute to the broader urban forest of greater Melbourne. This has been coupled with the requirement for this urban forest to be biodiverse, to be resilient to climate change, to provide habitat, and make a positive contribution to the broader urban ecology of the Project, adjacent and connecting landscapes, and green corridors.</p> <p>Tree planting has been maximised in within the Project boundary including streets, medians and carparks, and innovative solutions have been included within the design such as the landscaped Yarra Link green bridge and transforming Greensborough Road into a tree lined boulevard.</p> <p>Canopy trees and buffer planting has been prioritised over views.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>17.9 Plant health</b></p> <p>The design provides sufficient set-backs, soil, and conditions for new and existing trees and vegetation to maintain and support plant health and growth.</p>	<p>Part of the purpose of The Project soils strategy is to acknowledge the importance of soils as a foundational element of the biophysical environment. This soil strategy will contribute to a more sustainable and healthy plant community and in turn a stronger, more robust and biodiverse ecology throughout the NEL corridor. The design will seek to use standard practices to utilise surface water runoff to provide irrigation for planting areas.</p> <p>A 1500mm minimum soil depth has been adopted over structure as well as minimum soil conditions specified to ensure large trees have suitable conditions in which to thrive.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>17.10 Plant selection</b></p>	<p>Planting throughout the Project is self-reliant, sustainable and requires minimal maintenance.</p> <p>Native species of local provenance are used in environmentally sensitive areas and/or identified biodiversity sites and corridors.</p> <p>The potential for impacts on identified biodiversity and habitat corridors and sites, and the Yarra River corridor by introduced species, is minimised.</p> <p>Trees and other vegetation are selected, to take into account predicted future changes in climate.</p> <p>Plant species selection is consistent with State and local government guidance.</p> <p>New tree planting, within or adjacent to the road reserve, is appropriate to the scale for the road environment and considers maintenance access</p>	<p>The framework planting has been selected from the most resilient species that reflect the original flora and its local character. It is an impression based on the science described in the EVCs.</p> <p>We have used the EVCs with some augmentation using species occurring nearby in adjoining EVCs. The Project EVCs are able to overlap as many species are the same in adjacent EVCs.</p> <p>The original conditions that supported this original vegetation hardly exists along the length of the Project any longer. Massed planting areas contain interweaving diverse groups of free seeding pioneer species with long-lived species that will colonise by suckering and seeding. Visual strength, design durability and harmony is seen with the indigenous species chosen to thrive in this foreign artificial condition. Species so far are indicative and can be increased during the next stage. This contrasts with other similar Projects that use extensive massed monoculture.</p> <p>There are a range of planting intensities from the simplest to the most complex, highly diverse examples with limited mixes of key species used to supplement existing planting. These may be seen as a restoration ecology and become self sustaining and self repairing.</p> <p>Here is imagined a new habitat - a refuge for many creatures. A significant factor is to create systems that will thrive with minimal care yet be understood by those who maintain them.</p> <p>Consultation with the relevant councils has occurred on the planting selection and will continue to occur and planting selections will be further refined during design development as the design packages are issued for the relevant key stakeholders to review.</p> <p>The tree planting selection within and adjacent to road reserves has considered the appropriate scale and maintenance access.</p> <p>Typical anticipated Design Development Outputs for Landscaping:</p> <ul style="list-style-type: none"> <li>• Arborist and ecology surveys</li> <li>• Planting removal and replacement outcomes</li> <li>• Tree protection zones</li> <li>• Existing and proposed canopy coverage</li> <li>• Environmental responses</li> <li>• Refinement of planting densities</li> <li>• Tree root extents</li> <li>• Screen planting optimisation</li> <li>• Furniture</li> <li>• Refinement of finishes</li> <li>• Handrail finish</li> <li>• Retaining wall locations.</li> </ul> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</p> <p>Refer to: UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<p><b>17.11 Buffer planting and land form</b></p>	<p>Landscape design elements including buffer planting (planted vegetation situated outside the road reserve) and land form are used to create a visual buffer between the roadway and surrounding areas. Existing buffer planting is retained at the edges of any widened road corridors.</p> <p>Land form is used to reduce the apparent height of walls, barriers and road infrastructure.</p> <p>A suitable width of low planting is used to separate pedestrian and roadside traffic.</p>	<p>Buffer planting has been used in various locations throughout the Project with examples being:</p> <ul style="list-style-type: none"> <li>• Along the Greensborough Road boulevard services road to screen the residences on the west from Greensborough Road boulevard</li> <li>• The proposed earth mounding and tree screen planting to the west of the Northern Ventilation Structure</li> <li>• To the east of the Yarra Link green bridge to provide a landscaping buffer between Trinity Grammar School and Marcellin College and the eastern land bridge retaining wall.</li> </ul> <p>Low level planting widths has been selected between pedestrian and roadside traffic to enable suitable sight lines from a safety perspective.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>18. Water</b></p>		
<p><b>18.1 Water sensitive design</b></p>	<p>A 'water-sensitive design' approach is used to integrate water management objectives into the Project's urban design and achieve a broad range of community and environmental benefits. This includes the use of passive irrigation techniques, and the incorporation of Water Sensitive Urban Design infrastructure such as swales, bio-filtration systems (rain gardens) and wetlands.</p> <p>A holistic approach to integrated water management across the entire Project should be adopted.</p>	<p>At all scales of this Project, Water Sensitive Urban Design has been carefully implemented to ensure water is not wasted and is returned to the ocean in the best possible condition.</p> <p>The urban design has incorporated several new publicly accessible wetlands at NEL. These wetlands range in size, upwards of 1,000m<sup>2</sup> and have pathways, board walks and decks for communities to enjoy the aesthetic, amenity and ecological value of these wetland environments. Wetlands treat water, enhance storm-water management outcomes, and include</p> <p>Indigenous planting to enhance habitat and biodiversity. Many of these wetland systems are visible from cycling and walking pathways of the corridor to ensure they are clearly defined, integrated environments that celebrate Caring for Country.</p> <p>Across the Project, new bio-retention zones will be constructed, ranging upwards in size from 100m<sup>2</sup>. These waterways are mostly located in public parklands adjacent to NEL or at intersections.</p> <p>Plantings at these waterways will be robust indigenous species that create habitat and improve storm-water quality. These natural systems will increase biodiversity, contribute to cooler micro-climates, and foster citizen science through pathways, decks and bird hides so that people can engage with nature.</p> <p>These waterways are visible from the Bulleen intersection and the SUPs of the Yarra Link green bridge.</p> <p>One of the most significant wetlands will be at Manningham Road interchange on the site of the former drive-in cinema. This new billabong-like wetland will treat local catchment prior to release into the Yarra River (Birrarung) or the water could flush nearby Bolin Bolin Billabong and improve the health of this ancient and culturally significant water body. Wherever possible, wetlands, rain-gardens and waterways are integrated into parks, open spaces and public land throughout NEL to increase biodiversity, capture and reuse storm-water, improve water quality, and create a richer urban environment. The Project has prepared an Integrated Water Management &amp; WSUD Strategy to improve the water quality of the Koonung Creek, Yarra River (Birrarung) and associated ecologies of NEL.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>18.2 Healthy waterways</b>	The Project maintains or improves the river health of the waterways that it crosses. Drainage infrastructure maximises opportunities to replicate natural processes in the treatment of water, and enhances stormwater management outcomes, as well as broader urban design and ecological values.	<p>The Project urban design concept will improve the river health of the Yarra River (Birrarung) and Koonung Creek Valley area by creating new wetlands and bio-retention rain-gardens to treat storm-water run off. It also improves the habitat and biodiversity of Banyule Creek from Simpson Barracks to Lower Plenty Road.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>18.3 Daylighting waterways</b>	<p>Opportunities are maximised to preserve and restore natural and open waterways, and to 'daylight' (restore to a more natural state above ground) sections of creeks and streams that have previously been diverted into a culvert, pipe or drainage system to improve aesthetics, amenity and ecological values.</p> <p>Roadway crossings of waterways and wetland are minimised.</p>	<p>The design includes the realignment and daylighting of Banyule Creek in Borlase Reserve which includes the meandering realigned creek through Borlase Reserve into a series of retention and bioretention basins and wetlands.</p> <p>Roadside crossings have been minimised where unavoidable the design has endeavoured to mitigate the subsequent ecological outcomes with an example being where Koonung Creek travels under NEL elevated structures are being utilised with open culverts to linking the existing Koonung Creek from us the west to a new wetland area on the east which contributes to improved water quality and habitat creation. Piped section of waterways have been utilised to some areas where waterways pass under existing road structures.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>18.4 Minimise habitat impacts</b>	Road infrastructure is designed, located and constructed to minimise short and long-term impacts on riparian, riverbed, and aquatic habitat.	<p>Road infrastructure is carefully located, designed and constructed to minimise short and long-term impacts on riparian, riverbed and aquatic habitat throughout NEL. Road infrastructure has been design to minimise the impact on riparian, riverbed, and aquatic habitat areas where possible with examples being:</p> <ul style="list-style-type: none"> <li>• The Yarra Link green bridge which provides the east-west riparian connectivity over Bulleen Road</li> <li>• The open culvert to Koonung Creek under the Eastern Freeway interchange.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements	Response
<p><b>18.5 Drainage infrastructure and retarding basin design</b></p> <p>Drainage infrastructure and retarding basins are located and designed to not adversely impact on the function of public open space. Drainage infrastructure within public open space does not inhibit the ability of residents to have access to open space near where they live. New infrastructure enhances recreational values, and contributes positively to the quality and function of the open space.</p> <p>Low points in basins are strategically located to maximise useable open space, and to minimise disruption to the community's enjoyment of open space, particularly following wet periods.</p> <p>Drainage infrastructure is designed too visually blend into the surrounding landscape.</p>	<p>Retarding basin designs have been integrated into adjacent landscapes, with bio-retention and/or wetlands included where possible to gain a dual function from these assets.</p> <p>The location of drainage infrastructure has been strategically incorporated within the design to form an integral part of the landscape and to allow for public usable parkland. The proposed wetlands and retarding basins sit harmoniously alongside each other, and the design has utilised contours and elevated paths connections and retaining walls to achieve this outcome which results in the drainage infrastructure blending into the landscape and not dominating the design outcome.</p> <p>Examples being:</p> <ul style="list-style-type: none"> <li>• Borlase Reserve which utilises board walks and piped drainage paths under active recreational areas</li> <li>• The Cultural Landscape Precinct wetlands which utilises the drainage requirements into a feature cultural landscaping form</li> <li>• Koonung Creek Valley area which incorporates drainage land forms into the landscaping along with pedestrian movement crossings via elevated paths and board walks.</li> </ul> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<p><b>18.6 Maximise community and environmental benefits</b></p> <p>Opportunities for community education and to integrate community recreational infrastructure (e.g., seating, paths, boardwalks) are maximised.</p> <p>Water Sensitive Urban Design infrastructure is prioritised at locations where there are opportunities for water harvesting, treatment and reuse that supports community facilities (such as providing a source of treated water for the irrigation of sporting fields).</p> <p>Water Sensitive Urban Design infrastructure does not limit opportunities to use landscape to mitigate visual impacts of the Project (that is, by reducing available space for planting of trees and vegetation to filter views towards infrastructure).</p> <p>Water Sensitive Urban Design infrastructure is located and designed to support the proposed hierarchy of navigational nodes.</p>	<p>The new wetlands and bio-retention gardens at NEL provides many opportunities for community to access and experience these pedagogical landscape systems. Wayfinding will also reveal stories of Caring for Country by Wurundjeri Woi-wurrung in these environments.</p> <p>The new wetlands and bio-retention gardens at NEL provides opportunities for community to access and experience these pedagogical landscape systems. Wayfinding will also reveal stories of Caring for Country by Wurundjeri Woi-wurrung in these environments to further articulate the story of the areas. Areas of rest and reflection are incorporated within the design around waterways and wetlands which includes widened paths, boardwalks and seating and these areas support the hierarchy of navigational nodes such as the Cultural Landscape Precinct wetlands, the wetlands proposed on the east side of the Yarra Link green bridge and with the active recreational areas within Borlase Reserve.</p> <p>Rainwater harvesting opportunities will be explored for all above-ground buildings.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>18.7 Raingarden and wetland design</b>	<p>Water Sensitive Urban Design infrastructure is integrated with the surrounding context and is designed to enhance the aesthetic appeal and ecological values of the area. Water Sensitive Urban Design maintains existing and planned key walking and cycling movement connections.</p> <p>Wetlands and raingardens located within or near the Yarra River floodplain or along creek and waterway corridors are naturalistic in form and aesthetics. The location of these elements avoids or minimises impact on existing recreational values.</p> <p>New wetland shapes respond to the contours of the land. The design provides a balance between natural areas for animal and bird life, and areas for public amenity, including places for respite, recreation and seclusion.</p>	<p>Water Sensitive Urban Design infrastructure is integrated within the surrounding context and designed to enhance the aesthetic appeal and ecological values of each area. The Project will create engaging, attractive, resilient, and bio-diverse environments throughout the NEL corridor for people and place.</p> <p>WSUD infrastructure has been incorporated within the design along the existing waterway alignment and is integrated into the landscape to ensure impacts on nearby recreational areas is minimised and the design approach is to provide pedestrian activity in and around these WSUD areas to enhance the user experience.</p> <p>Habitat corridors are enhanced along the waterway alignments and the design provides a balance between habitat enhancement areas and recreational areas.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0015 to 0024, 0026 to 0027, 0030 to 0034, 0040 to 0041 &amp; 0099 (Landscaping-Greensborough Road/Lower Plenty Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0060 to 0063, 0070 to 0071, 0080, 0081, 0088 to 0092 (Landscaping-Manningham/Bulleen Road).</i></p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i></p>
<b>19. Road signage</b>		
<b>19.1 Strategic approach</b>	<p>A consistent, coordinated, whole-of-corridor signage and wayfinding approach is developed to enhance driver legibility and safety, and to improve the overall experience.</p>	<p>Our strategic approach to road signage sensitively integrates each element to minimise impacts on local communities. Road signage and structural elements are produced from long-lasting, durable materials that will be easy to maintain, Caring for Country. Safe and accessible gantries allow for easy access to electronic signage fittings for maintenance.</p> <p>General signage and wayfinding will adopt the following design initiatives:</p> <ul style="list-style-type: none"> <li>• Sit appropriately within their context</li> <li>• Have a consistent theme and urban design approach</li> <li>• Combine signage where possible.</li> </ul> <p>Note: Consultation will occur with the relevant councils as part of the development of the pedestrian and SUP wayfinding design.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<b>19.2 General signage</b>	<p>Signage, toll points, gantries, and associated infrastructure is sited and designed to be well integrated along the corridor. The scale and character of the area is not undermined with a dominating skyline, or with significant views blocked by signage infrastructure.</p> <p>Minimise visual impacts from signage and toll points on local communities and on the quality of the adjoining public realm.</p> <p>Signage infrastructure is located sensitively, relative to topography, access, safety, security, visual impact, landform, and vegetation.</p>	<p>Road signage, gantries and the like has been carefully considered to avoid detracting from surrounding built form elements and natural landscape. Impacts on the amenity of local communities has been minimised whilst elevating Project design elements.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<b>19.3 Design</b>	<p>Signage and gantries are consistent, with a simple structure and with consideration to form, shape and colour.</p> <p>Unauthorised access and vandalism is prevented.</p>	<p>Gantries house consolidated signage and associated components to hide visual clutter and present as clear, monochromatic bands that stretch across the freeway environment.</p> <p>Where these elements feature bulky structures, such as the accessible truss gantries and the long span single plane truss gantries, a perforated cladding treatment adds a finer grain of design detail and visual permeability.</p> <p>The cladding and finish will be selected to take into account future maintenance and graffiti removal needs and will general be a metal framed superstructure with a paint finish at lower levels with perforated powder coated aluminium cladding to overhead structures. Lockable access points will be provided to accessible gantries and the design will avoid potential climbing elements.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>19.4 Siting to reduce visual clutter</b>	<p>Signage and gantries are consolidated and rationalised where appropriate to minimise the number of overhead elements.</p> <p>The locating of signage on bridges and structures is minimised. Signage at tunnel entries is avoided.</p> <p>Signage is well integrated with the design of Project elements.</p> <p>The locating of gantries on ramps and elevated structures, or within close proximity to bridges is minimised.</p> <p>Gantries are integrated inside tunnel ceilings to avoid visual clutter at portals.</p> <p>Opportunities are maximised to co-locate features such as signage, toll points, Lane Use Management Signs (LUMS), Closed Circuit Television (CCTV), Variable Speed Limit (VSL) signs and Variable Message Signs (VMS) on shared gantries, light poles and other shared assets. Alternative tolling solutions and the 'designing out' of radio frequency (RF) barriers are considered, to avoid or minimise visual impacts.</p>	<p>Signage and gantries have been consolidated, rationalised, and carefully sited around major design features such as the Northern and Southern Portals or other notable elements to ensure legibility and safety. Concealment of structural framing and other miscellaneous elements help to significantly reduce visual clutter.</p> <p>Gantry locations have been rationalised to reduce the number of overhead structures and the design of the gantries will reflect what is shown the UDLP.</p> <p>Opportunities to co-locate other infrastructure such as road signage, toll points and lane use management systems to minimise visual clutter will be considered during the design development phase and will include road safety audits, maintenance and spatial requirements.</p> <p>Typical anticipated Design Development Outputs for Signage and Gantries:</p> <ul style="list-style-type: none"> <li>• Road safety audits were deemed necessary</li> <li>• Opportunities for combining structures</li> <li>• Whole of life analysis</li> <li>• Cladding and finishes</li> <li>• Opportunities to combined elements to reduce visual clutter.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
<b>20. Materials &amp; finishes</b>		
<b>20.1 High quality</b>	<p>Materials and finishes used in the Project are high quality, durable, robust, easy to maintain, and will weather and age well over time.</p>	<p>Functional, durable and sustainable materials are selected to ensure an enduring, high quality finish to the built elements of NEL.</p> <p>The NEL operations contractor will undertake reviews of the design to provide additional inputs into materials selections from a maintenance perspective.</p> <p>Materials and colour palettes are responsive to the variety of scales of perception and well integrated to their location along the freeway corridor.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i></p>
<b>20.2 Colour palette</b>	<p>The colour palette for the materials and finishes is consistent along the Project's design character areas, sensitive to the local environment and reinforces the broader wayfinding approach for the corridor.</p>	<p>The Project chromatic approach is an orchestrated composition where a combination of textures and colours ties all road components into a coherent, unified language. Elements that are not physically connected, such as bridges and buildings, engage in a dialogue between each other through the anticipated sequence through which they are viewed.</p> <p>The Project choice of colour for NEL is rooted in cultural significance. The colour palette uses the Munsell Chart, a colour system that describes soil pigmentation and measures colours of archaeological artefacts. Hues, value, and chroma for the various design elements at NEL have been inspired by the colour palette of the natural local landscape and the Wurundjeri Woi-wurrung colour identity through paintings, rituals and artefacts.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i></p>
<b>20.3 Reflectivity</b>	<p>New materials and finishes minimise light pollution in the surrounding areas from reflectivity.</p>	<p>Low reflectivity materials, such as concrete, weathering steel, and matte coloured acrylic, are used for road corridor structures, such as the Ventilation Structures, to minimise light pollution. A reflectivity study will be undertaken during the design development phase for the urban design elements and material and finishes selections will be adjusted accordingly.</p> <p>Typical anticipated Design Development Outputs for the Ventilation Structure cladding:</p> <ul style="list-style-type: none"> <li>• Reflectivity studies</li> <li>• Maintenance access</li> <li>• Lighting protection</li> <li>• Ventilation performance requirements</li> <li>• Whole of life analysis.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i></p>

# 5.0 Consistency with Urban Design Strategy

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Table 22: Consistency with Urban Design Framework Plan-Element Based Requirements continued

Key Design Requirements		Response
<b>20.4 Vandalism</b>	Selection and application of materials and finishes discourages and minimises the potential for vandalism including graffiti.	Concrete surfaces are highly textured and/or are finished to discourage graffiti. Modular elements have been used wherever possible for easier maintenance.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>
<b>20.5 Identity through design</b>	The design elements along the freeway corridors are coordinated and designed to promote a cohesive identity through colour, materials, patterns and form. These design features include noise attenuation elements, retaining walls, pedestrian bridges, signage and buildings. This coordinated approach creates a consistent, high quality experience for road users and the local community.	The integrated and coordinated composition of all road components; bridges, noise walls, trench cladding panels, portal face panels, public safety barriers and retaining structures are designed as a series of robust and coherent elements that provide a coordinated, elegant urban design outcome.  Examples being: <ul style="list-style-type: none"> <li>• The buildings and ancillary structures are inspired by the corridor language which includes material, colour selections as well as the incorporation of the built elements into the landscaping form which is consistent to both the Northern and Southern Ventilation Structures</li> <li>• Freeway noise wall patterns address the high-speed velocity at which they are viewed such as design moves being bolder within the freeway realm. Patterns are larger and more visible, colour accentuations are brighter, and the durable materials selected are highly finished. There is a material and finish approach to the noise walls which expands across the Project</li> <li>• Noise walls on neighbourhood sides of the freeway corridor are viewed at close quarters</li> <li>• Materials have a finer grain, textures are more delicate, colours are more integrative, and materials are typically expressed in their natural state</li> <li>• Gantries have a consistent theme across the Project and have been rationalized to avoid clutter and visual bulk where possible</li> <li>• Landscaping is used, where possible, to screen various urban design aspects to soften the visual impact.</li> </ul> Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>
<b>20.6 Use resources efficiently</b>	Opportunities are maximised to use materials that are recycled, recovered, have lower embodied energy and are ethically sourced.	The Project has selected durable and low carbon concrete mixes and embraced opportunities to reuse excavated soil for earth embankments.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design.</i>

## 5.0 Consistency with Urban Design Strategy

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### Detailed Requirements Benchmark

#### 5.4.5 Using Design to Help Manage Construction Impacts

The design approach is to avoid, minimise and mitigate adverse impacts on the community from temporary works and construction activities.

Design requirements for temporary and construction works are to be designed and carried out in accordance with the urban design principles and objectives, and Section 7.2 of the UDS, to meet the Environmental Performance Requirement (EPR LV2).

The following key items are listed in the UDS:

- Maintaining access and connections
- Maintaining community functions
- Protecting viability and amenity
- Protecting features
- Landscaping
- Temporary uses
- Visual impacts and presentation
- Waste generation and reuse
- Innovation.

The Construction Environmental Management Plan (CEMP) and associated supporting management plans have been developed to address in detail the aspects listed in Section 7.2 of the UDS—Using design to help manage construction impacts.

As majority of the construction compound areas are located within the Project boundary the potential impact on the community will be minimised and suitable control measure put in place prior to the commencement of construction activities. The location of the construction compound areas has taken into account the proposed temporary and permanent works and their locations have been chosen to minimise the need to re establish the construction compound in other areas at a later date, which also contributes to reducing impact on the community.

The CEMP responds to the Project's relevant environmental performance requirements and address issues such as:

- Noise, dust and vibration controls
- Site compound layouts including the locations, security, visual appearance from the public, worker parking
- Temporary traffic management including roads, pedestrians and cyclists
- Temporary barriers, signage, fencing
- Communication protocols
- Protection of features such as vegetation, memorials, cultural heritage features
- Staging of the works
- Hours of construction works.

The location of the proposed construction compound areas are shown on the landscape drawings in Attachment 2 - Landscape Design.

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# 5.5

## Urban Design Framework Plans

## 5.0 Consistency with Urban Design Strategy

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### 5.5.0 Introduction

The UDS outlines 5 UDFPs of which 3 are applicable to this UDLP report. Urban Design Framework Plans (UDFPs) are a set of designs and development priorities within the UDS that broadly illustrate the approach to land use, design opportunities, sensitive interfaces and constraints for specific precincts. The following precincts are within this UDLP area:

- Borlase Reserve and Lower Plenty Road interchange
- Manningham/Bulleen Road interchange
- Eastern Freeway interchange.

This section of the report is structured in the following manner to address each of the UDFP's requirements :

- High Level Design Approach and Key Benefits
- Design Response to Key Principles & Objectives
- Design Response to Key Directions
- Design Response to Key Place Specific Requirements
- Design Response to Detailed Requirements & Benchmarking
- Design Response to Illustrative Sections.

For further detailed response to the design changes since the EES refer to Section 4.1 within this report.

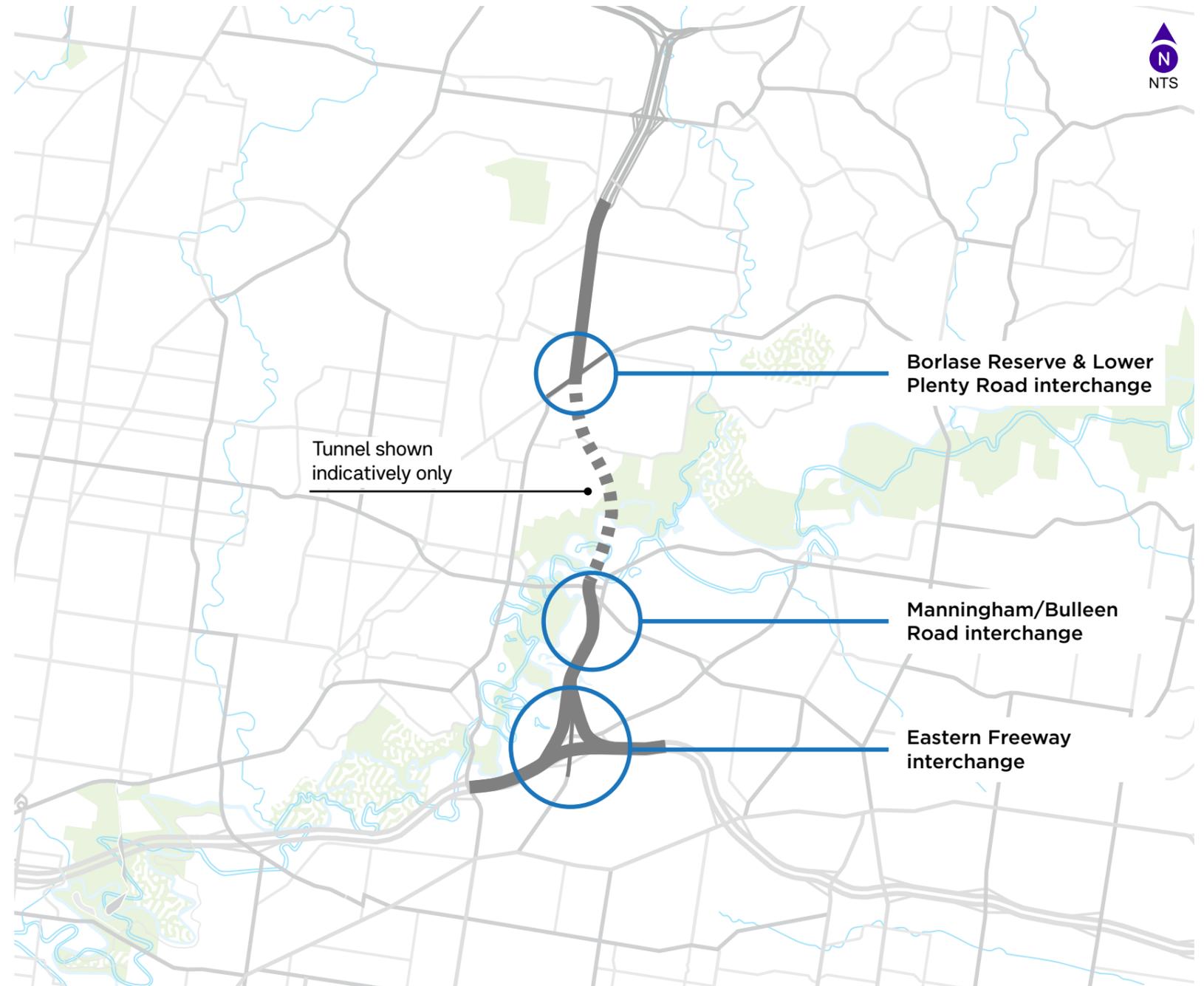


Figure 101: Urban Design Framework Plan site locations

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## 5.5.3 Urban Design Framework Plans - Eastern Freeway Interchange

## 5.0 Consistency with Urban Design Strategy

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### 5.5.3.1 Eastern Freeway Interchange

#### A Pivotal Moment

At this crucial juncture, the urban design proposal unifies a series of engineering and urban design moves into one significant gesture, the Yarra Link green bridge.

The Yarra Link green bridge is the meeting point of the Yarra River (Birrarung) and the Koonung Creek Valleys as they join the Ridgeline heading north away from the Eastern Freeway. This juncture is also the location of a number of schools, sporting clubs and facilities of Bulleen Park, and the Yarra River. Some of the key design consideration for the Eastern Freeway interchange include:

- The UDS design requirements
- Tunnel and road interface
- SUP connectivity
- Koonung Creek Valley area and associated parklands
- Adjoining schools impact
- Providing an east-west pedestrian vegetation and habitat connection
- Vegetation and ecology
- Acoustic and privacy to adjoining neighbourhoods-Site maintenance requirements.

The design response includes:

- A physical land bridge connection between the schools and communities at Bulleen and the western landscape environs and recreational facilities of Bulleen Park and the Yarra River (Birrarung)
- SUP connectivity from the north to the south, along Bulleen Road as well as from east and west via new SUP and bridges across the Yarra Link green bridge
- Minimises infrastructure footprint of the Southern Portal and associated Ventilation Structure by locating them beneath landscaping, reinforcing Caring for Country
- Introduces a series of flyovers that lead motorists from the Eastern Freeway north towards the NEL Tunnel, with screen colours that amplify the experience of the Southern Interface Zone and associated tunnel portal
- Includes acrylic noise wall barriers to the ramps finished in orange and pink hues as reference to the cosmological effect of the southern lights.

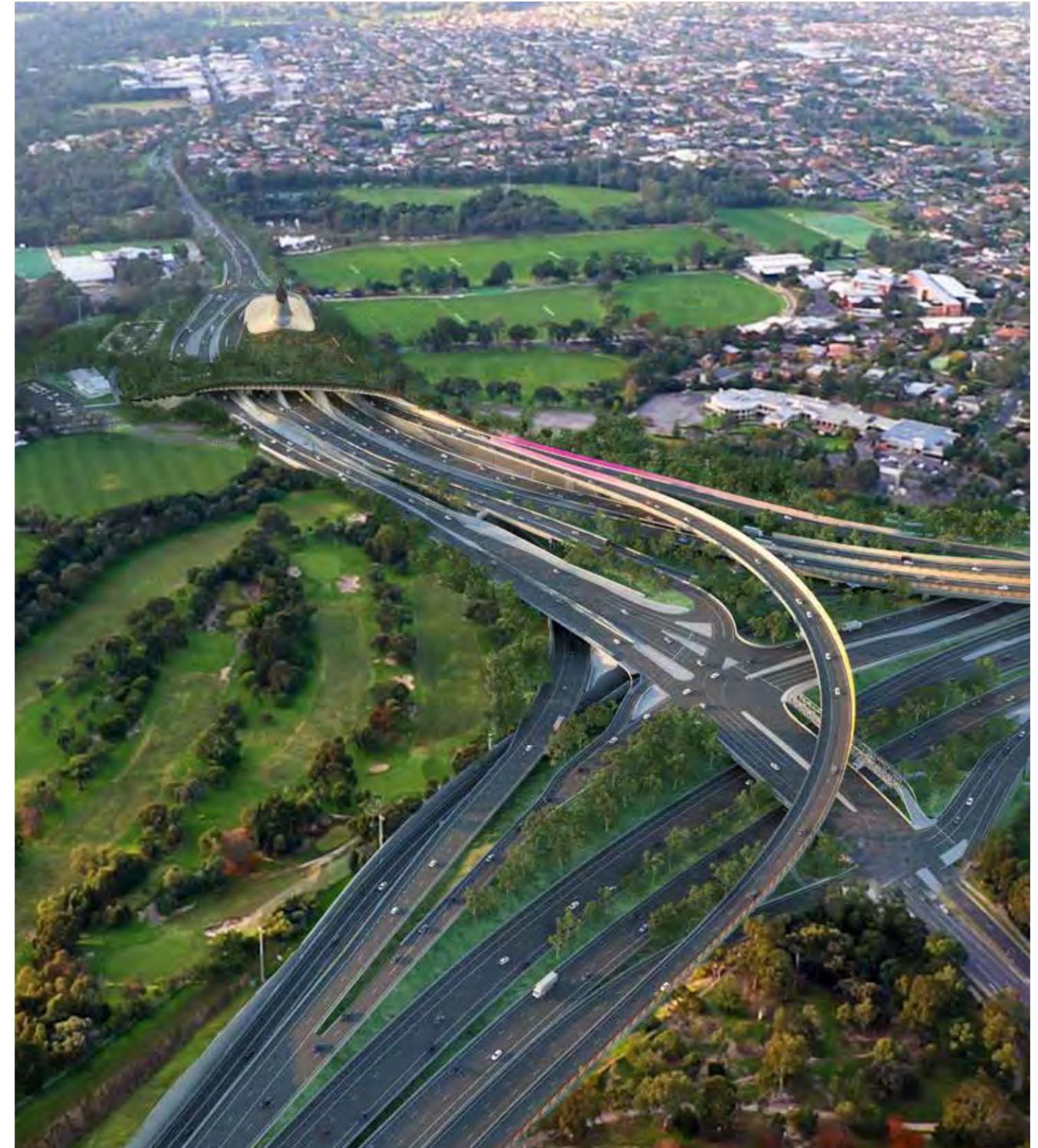


Figure 119: Indicative render: Southern Portal and Ventilation Structures

# 5.0 Consistency with Urban Design Strategy

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Table 33: Design Aspects & Benefits (in relation to the 3 core design pillars and subsequent benefits)

Design Aspects	Benefits	User Experience
<b>Connection to Country</b>		
Provides a Southern Ventilation Structure above the Southern Portal.	Integrated into the Yarra Link green bridge, the Ventilation Structure is a clearly identifiable yet sensitively sited, striking sculptural marker.	The Southern Ventilation Structure has become a landmark when cycling along the Main Yarra Trail defining the turn-off to Heide Museum of Modern Art and the north-east suburbs via Bolin Bolin.
Indigenous Design.	Provides a sense of understanding of the Indigenous history and significance of the area.	Provide an interesting and educational journey for users and a place to rest and reflect.
Treatments to retaining walls and noise walls.	Provides an urban design approach that is sensitive to the environment and cultural significance.	Contributes to an enjoyable user experience without significant distractions.
<b>Caring for Country</b>		
Includes large canopy trees planted along Bulleen Road.	Improves appearance and provides cooling for drivers, cyclists and pedestrians.	Once a fairly bare and non-descript thoroughfare, Bulleen Road is now a shaded and pleasant green gateway to Melbourne's north-east.
Includes photovoltaic (PV) panels on the Southern Ventilation Structure.	Contributes to the energy requirements of the corridor infrastructure as part of the design's corridor-wide renewable energy generation scheme.	Showcases large-scale investment and adoption of sustainable technologies to local communities and visitors to north-east Melbourne.
Interior tunnel artwork.	Lighting/supergraphic designs to create episodic abstract visual references to significant sites above ground.	Creates a heightened sense of arrival and departure as well as revealing the above-ground landscape experience.
Integrated Ventilation Structure in landscape through topography.	The landscape gesture forms the Southern Portal entry, blending the roadway into natural forms. The raised landscape also forms the roof of the ventilation plant room, concealing and mitigating its visual impact.	Provides an elegant and integrated design approach for the required tunnel infrastructure that acts as a landmark for people as they interact with the Southern Portal from multiple directions.
Low maintenance buffer planting has been reinstated to create a visual buffer and reduce the impact of infrastructure.	High quality planting outcome that softens the visual effects of the road infrastructure.	Continuous green arch that enables a beautiful parkland setting over Bulleen Road and acts as a destination in itself for park users.
Koonung Creek Valley area terrestrial ecological corridor carried up over the Yarra Link green bridge.	Provides a continuous habitat link across the tunnel entry, effectively re-connecting the Koonung Creek Valley area with its surroundings.	The creek below the road is revealed through an interpretative landscape that tells the story of the site's Indigenous landscape.



Figure 120: Indicative render: Southern Interchange Zone

## 5.0 Consistency with Urban Design Strategy

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Figure 121: Indicative render: Yarra Link green bridge

## 5.0 Consistency with Urban Design Strategy

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Table 33: Design Aspects & Benefits (in relation to the 3 core design pillars and subsequent benefits) continued

Design Aspects	Benefits	User Experience
<b>Connecting People</b>		
Road access to Trinity Grammar School and Marcellin College from Bulleen Road is incorporated in the design.	Maintains existing access to sports fields and provides safe transport routes across the NEL corridor.	Clear and identifiable wayfinding for people accessing recreation facilities surrounded by pleasant urban landscaped avenues.
Continuous SUP access across Yarra Link green bridge.	Yarra Link green bridge safely links the eastern residential areas to Yarra River parklands and Bolin Bolin, replacing the need for signalised crossings to Bulleen Road. Grade separated SUP.	Diverse SUP experience, from ramping boardwalks to tree-lined paths and an elevated view to the surrounding Yarra Valley landscape.
Continuation of Koonung Creek Trail.	For the first time, the Koonung Creek Trail will connect through Bulleen Park to the Main Yarra Trail.	Connecting Koonung Creek Trail with Bulleen Road walking and cycling path links up local and strategic cycling corridors.

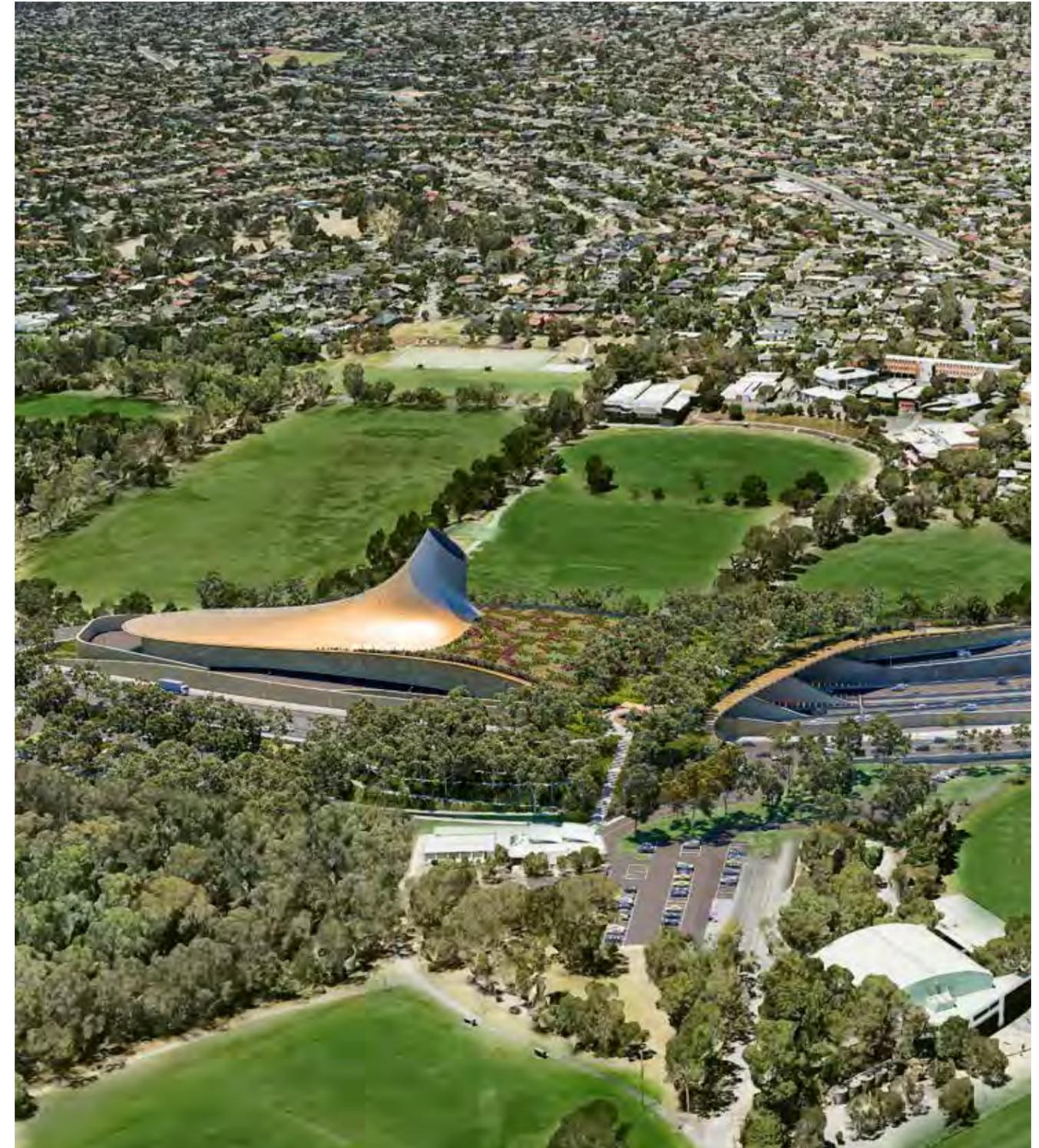
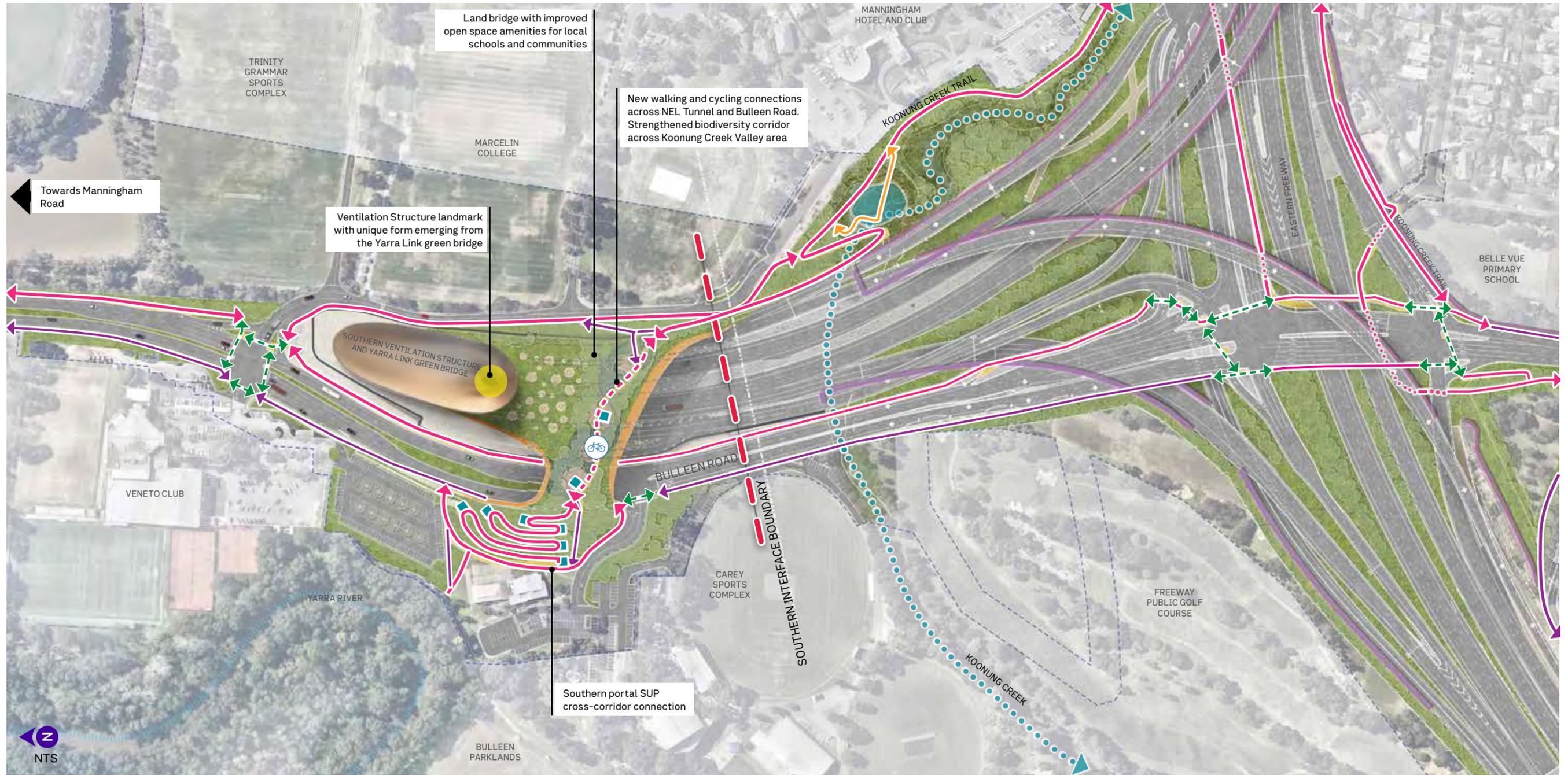


Figure 122: Indicative render: Eastern Freeway interchange

# 5.0 Consistency with Urban Design Strategy

## The Design Solution

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- ↔ Proposed east/west SUP connection
- ↔ Boardwalk connection
- ↔ Park link
- ↔ Proposed green bridge SUP connection
- ⋯ Koonung Creek
- Landmark
- ↔ Proposed pedestrian connection
- Southern interface boundary
- ↔ Proposed pedestrian crossing
- Rest points

Figure 123: The Design Solution

## 5.0 Consistency with Urban Design Strategy

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### A New Landmark

A new landmark for the freeway realm - bold with strong colour saturation to be viewed and appreciated at speed - as well as for the public realm, integrated with landscape and with a form and texture which reflects the pedestrian speed it will be engaged with. This directly responds to the Urban Design Strategy's detailed and specific requirements for Objective 1.5 Architectural Contribution and Objective 2.1 Connectivity. The Southern Ventilation Structure, whilst not dominating the skyline, will be clearly visible on approach to the intersection. Its unique curvaceous form emerges from the Yarra Link green bridge landscape to create a landmark that is clearly identifiable yet sensitively sited and architecturally compelling.

### Connectivity

The Yarra Link green bridge provides walking and cycling connections across the NEL Tunnel and Bulleen Road, linking with new walking and cycling paths to Koonung Creek and Main Yarra Trail. This directly responds to the Urban Design Strategy detailing specific requirements for Objective 2.1 Connectivity and Objective 3.4 Minimise Footprint.

There is a grade-separated crossing of Bulleen Road for pedestrians and cyclists travelling along the Koonung Creek Trail with planting to enhance visual amenity, biodiversity, and habitat link along the Koonung Creek Valley area corridor.

The Yarra Link green bridge creates a landscaped connection between Bulleen parklands and the Yarra River (Birrarung) to the west with Marcellin College sports fields and the Koonung Creek Trail to the east. This provides better connections for walkers and cyclists to the improved walking and cycling network along the Yarra River (Birrarung). A raised boardwalk connection brings people up to the land bridge where a series of landscaped terraces with seating and shelters offers panoramic views in all directions. On the eastern side on the land bridge the Project have designed a SUP bridge and paths with a stair that provides a direct link from Marcellin College to the top of the land bridge.

The Ventilation Structure is dressed in photovoltaic panels and metal cladding which visually enhances its appearance.

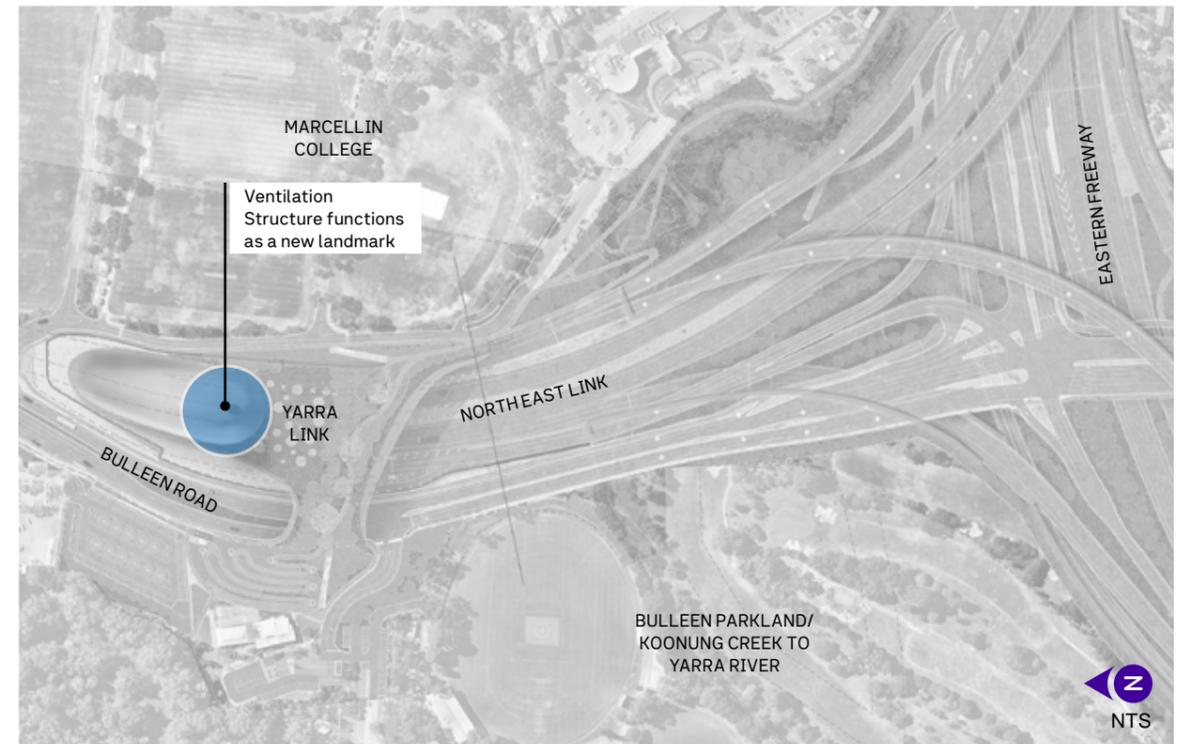


Figure 124: Yarra Link green bridge - A landmark

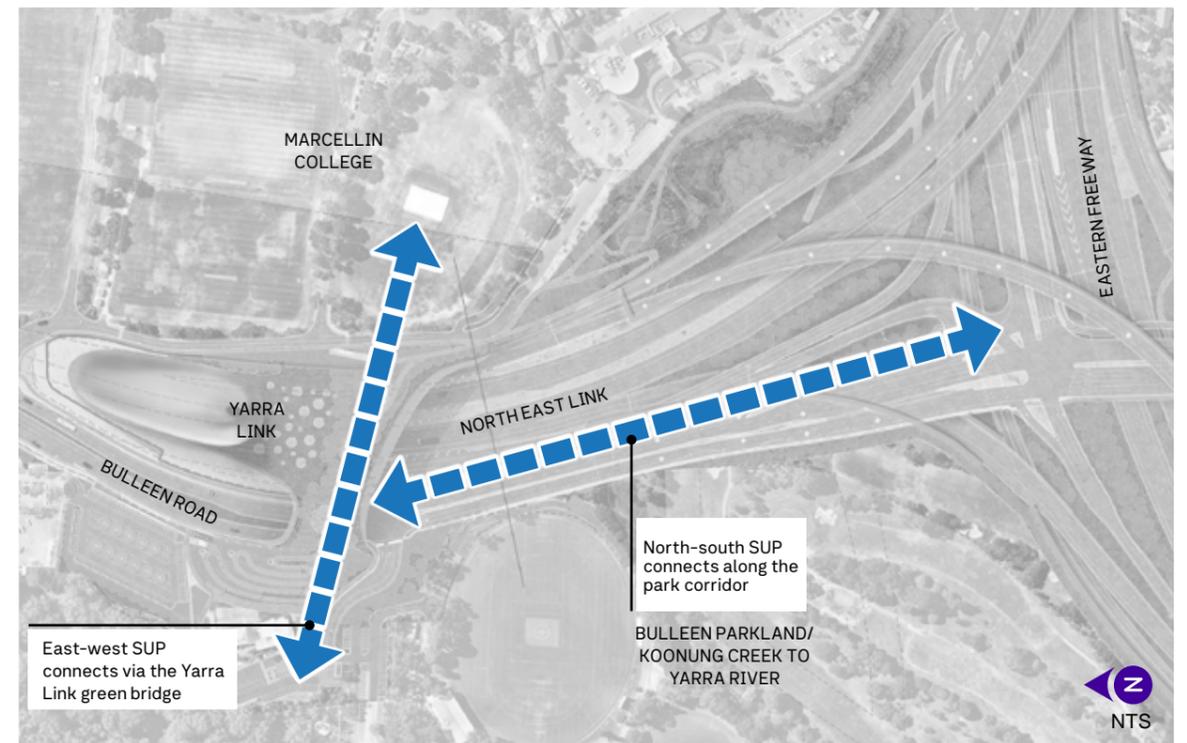


Figure 125: Yarra Link green bridge - Connectivity

## 5.0 Consistency with Urban Design Strategy

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### Strengthened Biodiversity & Habitat Links

Through the Project's core pillar Caring for Country, strengthening the biodiversity corridors has been a priority. A new wetland will treat the flow of water from the Koonung Creek Valley area before it passes under the intersection. The riparian vegetation corridor of the Koonung Creek Valley area continues over the land bridge to be reunited with the creek on the western side. Creating a continuous vegetation corridor will provide a habitat and movement network for wildlife strengthened by the selection of native plant species chosen for their ability to provide habitat and food sources for wildlife.

- a. **Wetland Amenity** - Water from Koonung Creek is treated here before passing underneath the intersection.

### Improved Public Open Space

The design has improved the quality and amenity of existing open space at Bulleen by integrating the ventilation building and substation into the landscape. Creating a large roofscape for public use that supports the Urban Design Strategy's Key Principles & Objectives - Objective 5.1 Improved Amenity - including:

- b. **Open Space Amenity** - With shade trees
- c. **Land Bridge** - Includes shade trees, rest stop, fitness station and drinking fountain
- d. **Neighbourhood Park** - Features shade trees and DDA compliant inbuilt furniture with arm and back rests.

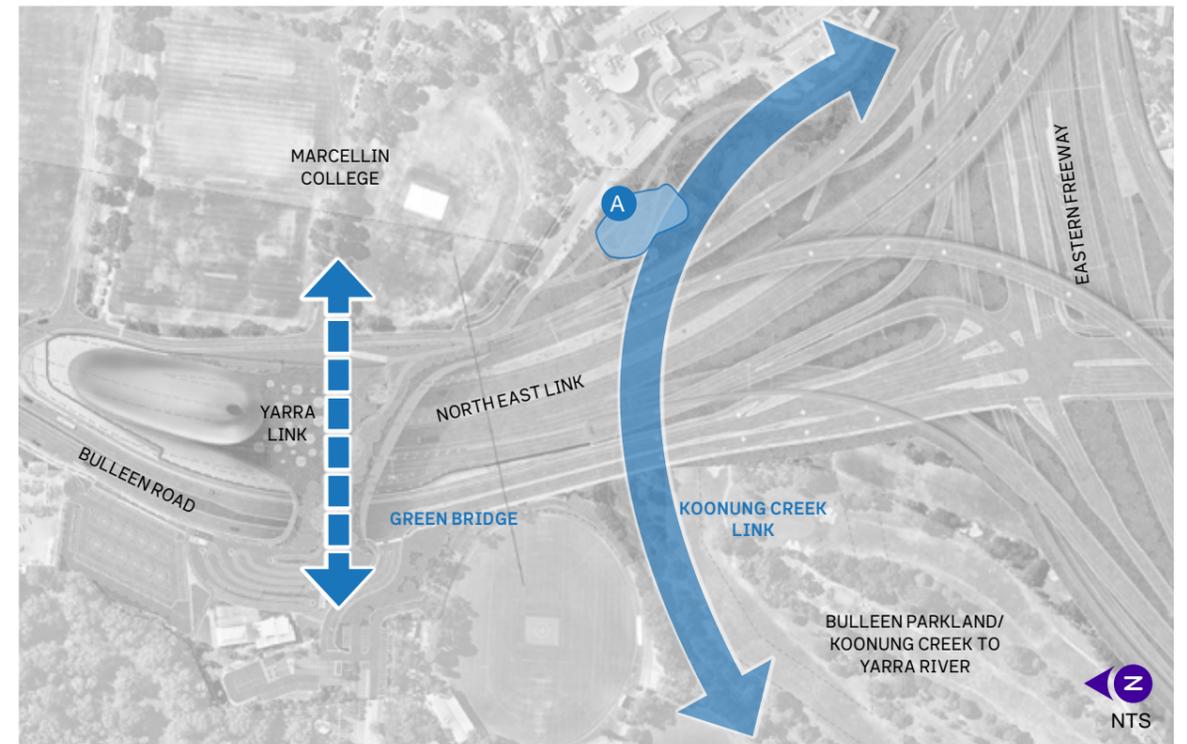


Figure 126: Yarra Link green bridge - Biodiversity and habitat

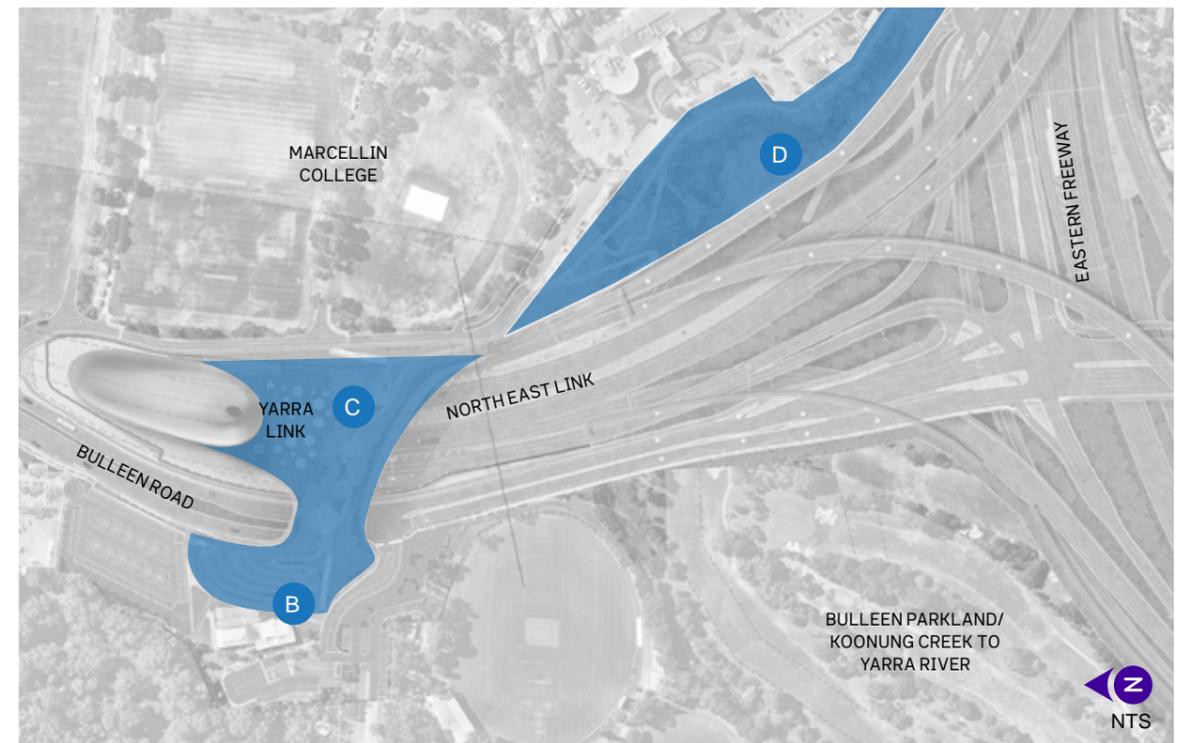


Figure 127: Yarra Link green bridge - Open space

## 5.0 Consistency with Urban Design Strategy

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### Tunnel Alignment

The Southern Portal creates a definable entry moment that is wrapped by the Yarra Link greenscape forming a safe and uncluttered passage into NEL.

This tunnel entry portal configuration forms a green link between east and west, allowing the Koonung Creek to flow underneath the ramp system and uniting the Yarra Valley landscape with the Ridgeline and Koonung Creek Valley area corridors.

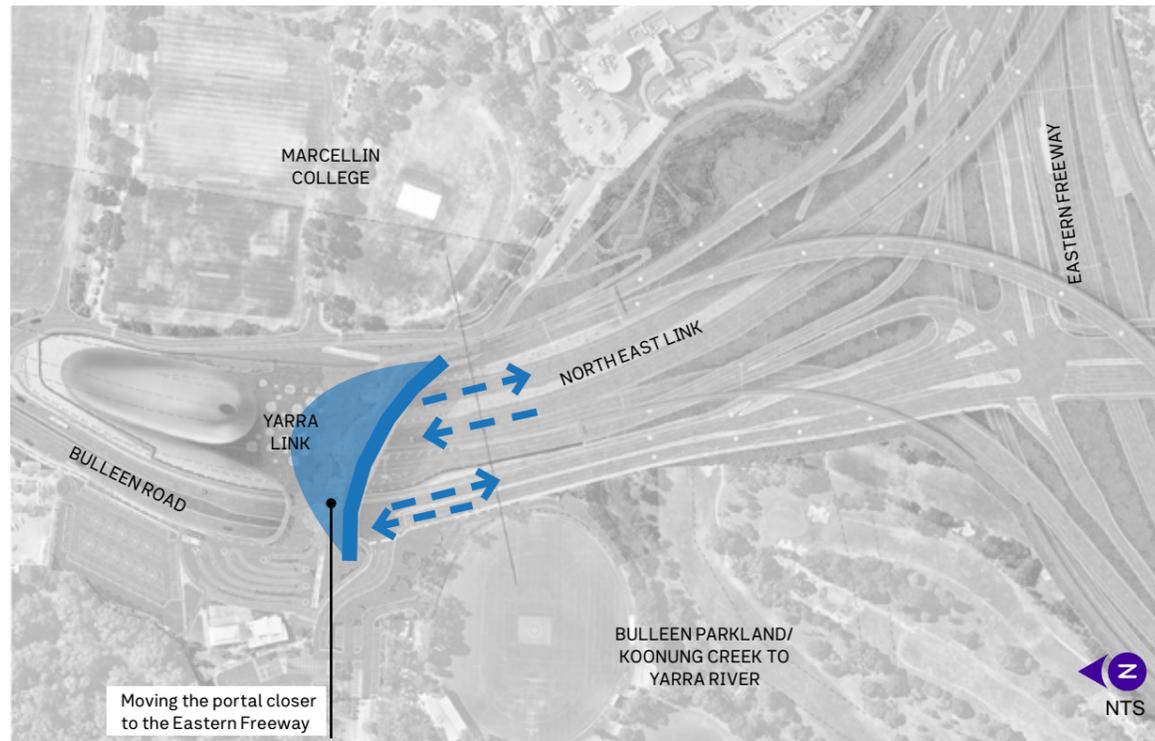


Figure 128: Yarra Link green bridge - Alignment

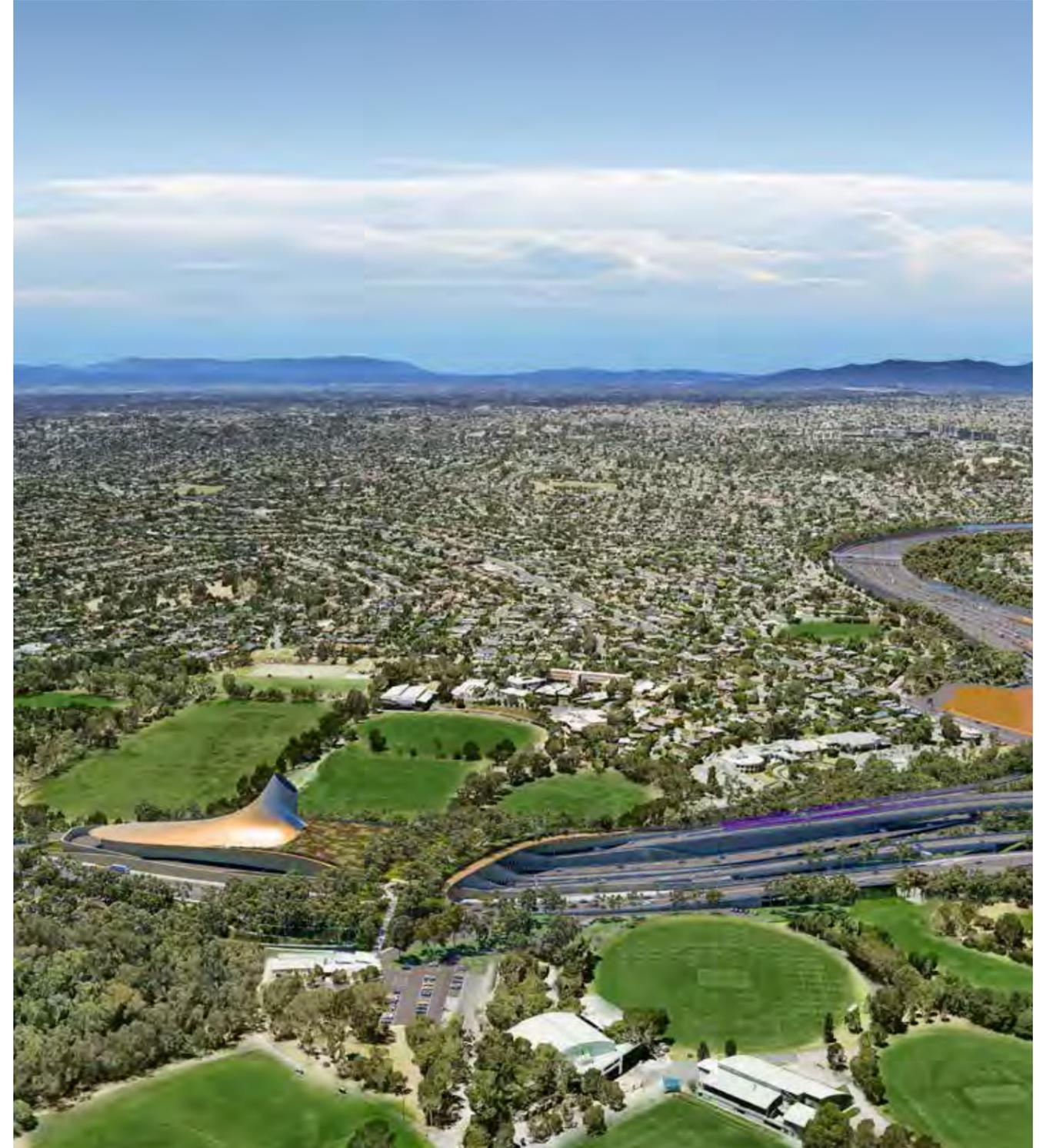


Figure 129: Indicative render: Bulleen Road looking south east towards the Southern Portal and the Yarra Link green bridge

## 5.0 Consistency with Urban Design Strategy

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### 5.5.3.2 Bulleen Road/Eastern Freeway Interchange

#### Design Development Priorities

Table 34: Key Principles and Objectives for Eastern Freeway interchange

Key design requirement number	Requirement	UDLP response
Principle 1 - Identity Objective 1.3 Landscape & Visual Amenity	<p>Sensitively enhance landscape and visual outcomes and reduce physical and visual impacts associated with the Project.</p> <p><b>Strategic context and opportunities</b></p> <p>The elevated structures, ventilation building, and associated elements could have a visual impact on the residential areas, schools and parkland of the flat landscape along Bulleen Road. The design must address these impacts as a high priority, using innovative solutions, appropriate mitigation measures and sensitive siting to reduce any adverse effects.</p>	<p>The overall design outcome responds to the landscape and geomorphological context of the wider area. The three-project key landscape character settings of the Ridgeline, Yarra River (Birrarung) precinct and the Koonung Creek Valley area (Eastern Freeway interchange) precincts are reflected in not only the planting species palette but in the urban design and architectural response.</p> <p>Refer to: <i>Sections 5.3.1, 5.3.2, 5.3.3 of this UDLP Report.</i></p> <p>The design strategy is to draw from the established design pillars and design principles, formulating a design approach in responding to each of the character areas. The Design of the Eastern Freeway interchange has been landscape led and focusing on the following key design objectives:</p> <ul style="list-style-type: none"> <li>• A high-quality design outcome that responds sensitively to the distinctive character of the area</li> <li>• Takes advantage of existing landmarks and vegetation, views, and significant places</li> <li>• Protects landscape and vegetation</li> <li>• Seeks to enhance the way in which people experience and reinforces the status of the interchange as a primary node</li> <li>• Sensitively integrates new elevated road structures</li> <li>• Enhances the significant parkland areas along the Yarra River (Birrarung) and Koonung Creek.</li> </ul> <p>These objectives have met with the following design outcomes:</p> <ul style="list-style-type: none"> <li>• The Ventilation Structure has been built into the landscape form with a significant portion of the structure being below ground which assists in achieving a primary node for the area but also reduces visual bulk of the built form</li> <li>• The Yarra Link green bridge drapes over the tunnel entry and Bulleen Road which also provides a riparian landscaping connection from the east to the west which is a key improvement from the EES Reference Design. The land bridge also provides elevated views to the surrounding areas and the design approach to the land bridge relates to driving directly into and out of country aligning with the Project's key pillar of Connecting to Country</li> <li>• The Eastern Freeway eastbound to NEL northbound ramp shown in the of the EES Reference Design has been relocated underground to reduce the visual bulk of elevated ramp structures which contributes to sensitively integrating elevated road structures</li> <li>• The remaining elevated ramps that reside within the Eastern Freeway interchange have been kept as far away from residential properties as far as possible and designed to integrate engineering requirements, such as drainage and gantries, to provide architecturally simple, elegant forms that will sit well within the landscape</li> <li>• Within the centre of the interchange at Bulleen Road / Thompsons Road the design provides a significant amount of canopy trees and shrub planting that will integrate the interchange-built form into the existing landscape and provide visual screening as required in the UDS</li> <li>• Landscape screening by large canopy tree planting and shrub planting has been used to integrate the built form into the landscape consistent with the local landscape character (e.g., views from Marcellin, Balwyn North and Thompsons Road residential areas, and the Freeway Golf Course)</li> <li>• The predominant views in this area are that of a treelined skyline which the Project seeks to retain and enhance through its canopy tree planting of the interchange and its surrounds as is appropriate for the existing landscape character of the Yarra River Valley area which this interchange resides within</li> <li>• The existing views to the Melbourne CBD and Yarra River Valley from the corner of Columba Street and Leonis Avenue have been retained</li> <li>• Through a combination of refining alignments, integrating crossheads, care with pier location, and, in some instances, reducing bridge spans, the design for the multi span bridges minimises the overall height and bulk of these structural elements</li> <li>• Barriers are well integrated, maximise passive surveillance and ensure good visual connectivity. This approach minimises the physical bulk of these elements in the public realm and allows people direct visual and physical connection with the landscape</li> <li>• Implementation of indigenous plant species and creation of naturalised water management systems. These elements provide further amenity and cultural connection for the existing open space areas, linking them to the wider landscape context.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 34: Key Principles and Objectives for Eastern Freeway interchange continued

Key design requirement number	Requirement	UDLP response
Principle 1 - Identity Objective 1.4 Existing Landscape Character	<p>Provide a high quality design outcome that responds sensitively to the distinctive character of this part of Melbourne, takes advantage of existing landmarks and vegetation, views and significant places, protects landscape and vegetation, and seeks to enhance the way in which people experience and interact with the landscape.</p> <p><b>Strategic context and opportunities</b></p> <p>The largely flat topography and residential interfaces around the Eastern Freeway interchange require a landscape led design approach that reinforces the status of the interchange as a primary node, sensitively integrates new elevated road structures and enhances the significant parkland areas along the Yarra River and Koonung Creek.</p>	<p>The overall design outcome responds to the landscape and geomorphological context of the wider area. The three key landscape character settings of the Ridgeline, Yarra River (Birrarung) precinct and the Koonung Creek Valley area precincts are reflected in not only the planting species palette but in the urban design and architectural response.</p> <p>The design strategy is to draw from the established design pillars and design principles, formulating a design approach in responding to each of the character areas.</p> <p>The Yarra River (Birrarung) precinct reflects the more riparian nature of the environment through species selection and land forming to reflect the meandering nature of the wider river delta with implementation of a naturalised ox bow wetland or billabong as both a key environmental element, water management element and Indigenous cultural opportunity for representation, interpretation, and cultural engagement with the wider community. This area transforms and rehabilitates a previous commercial land use back to a naturalised parkland area providing open space connections, expansion of habitat and Indigenous cultural engagement.</p> <p>The Precinct also expands the open space connections and habitat corridor via the Yarra Link green bridge at the Southern Interchange Zone to carry the riparian habitat and context over Bulleen Road to link with the Koonung Creek Valley area environment.</p> <p>The Koonung Creek Valley area environment is then enhanced through the implementation of indigenous plant species and creation of naturalised water management systems. These elements provide further amenity and cultural connection for the existing open space areas, linking them to the wider landscape context.</p> <p>Within this expansive environment the design of the bridge elements ensures seamless integration with surrounding landscapes. Through a combination of refining alignments, integrating crossheads, care with pier locations, and, in some instances, reducing bridge spans, the design for the multi span bridges minimises the overall height and bulk of these structural elements.</p> <p>Barriers are well integrated, maximise passive surveillance and ensure good visual connectivity. This approach minimises the physical bulk of these elements in the public realm and allows people direct visual and physical connection with the landscape.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0064 to 0067.</i></p>
Principle 1 - Identity Objective 1.5 Architectural Contribution	<p>Make a positive architectural contribution to infrastructure including bridges, noise walls and other structures.</p> <p><b>Strategic context and opportunities</b></p> <p>The environment along Bulleen Road is flat and open with residences on the escarpment to the north. The introduction of a relatively tall element at Bulleen Park such as a Ventilation Structure could have a visual impact for residents, parkland users and school students and staff. To address this, the structure must be sensitively sited and well designed.</p>	<p>An integrated design approach has been developed throughout the Project which includes embedded Indigenous themes. The material finishes are sympathetic to the Project's environment and through scale, texture and finish provides a harmonious urban design outcome.</p> <p>The Ventilation Structure is integrated into the landscape through the mounding of the topography into an organic landform that creates a new east-west connection via the Yarra Link green bridge across Bulleen Road. The landscape gesture forms the Southern Portal entry to the tunnel, blending the roadway with natural forms. The raised landscape also forms the roof of the ventilation plant room, concealing and mitigating its visual impact in the environment. This provides an elegant and integrated design approach for the required tunnel infrastructure that acts as a landmark for people as they interact with the Southern Portal from multiple directions.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 34: Key Principles and Objectives for Eastern Freeway interchange continued

Key design requirement number	Requirement	UDLP response
Principle 2 - Connecting & Wayfinding Objective 2.1 Connectivity	<p>Improve people's ability to move through the immediate and wider area with ample, efficient and quality links across and along the corridor for all transport modes, including pedestrians and cyclists.</p> <p><b>Strategic context and opportunities</b></p> <p>Walking and cycling paths along and across Bulleen Road poorly service the schools (Marcellin College, Trinity Grammar and Carey Grammar) and sporting clubs in the area. The path on the Bulleen Road bridge over the Eastern Freeway is narrow. The Koonung Creek Trail has an at-grade crossing at Bulleen Road. The Project must enhance the pedestrian and cycling network and connectivity in the area, improving facilities for students, sports-people, pedestrians and cyclists.</p>	<p>The design strategy is to increase the extent and amenity of transport connectivity for all modes. The nature of the road alignments provides for expanded active transport connections along the corridor linking key users' nodes and transport interchanges.</p> <p>The north-south SUP linkages create an active transport corridor for pedestrians and cyclists to link with bus and rail interchanges. The north-south active transport corridor is also served by grade separated bridges over major roadways creating safe and accessible paths of travel.</p> <p>East-west connectivity across the corridor is improved through the increased number of safe signalised intersections and dedicated signalised pedestrian crossing points. These safe and accessible crossing directly link with the north south SUP and active transport corridor to improve overall connectivity for pedestrians and cyclists.</p> <p>A separate SUP bridge has been provided adjacent Bulleen Road bridge over the Eastern Freeway, providing better connectivity north along Bulleen Road and west to Thompsons Road and the adjacent schools.</p> <p>SUPs connecting from Thompsons Road and Bulleen Road will connect along the Koonung Creek Trail to the eastern side of NEL. A series of boardwalks, paths and pedestrian bridges will connect through the Koonung Creek Valley area wetland to the Yarra Link the Southern Interface connections.</p> <p>Yarra Link green bridge creates a landscaped connection between Bulleen parklands and the Yarra River (Birrarung) to the west with Marcellin College, Trinity Grammar School and Carey Grammar sports fields and the Koonung Creek Trail to the east.</p> <p>As noted on <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 and 0071</i> the Yarra Link green bridge western SUP is subject to future design development in order to reduce the overall length of the SUP and the number of switchbacks. This further design refinement will occur in consultation with all relevant stakeholders in order to achieve a best for project urban design outcome.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
Principle 2 - Connecting & Wayfinding Objective 2.2 Transport Integration	<p>Maximise the benefits of the Project by facilitating seamless access to a variety of public transport, walking and cycling choices as part of a connected intermodal network.</p> <p><b>Strategic context and opportunities</b></p> <p>A new bus interchange at Bulleen will enhance the public transport options for the area. This facility must be well connected to the pedestrian and cycling network, to maximise access. The Park and Ride must be designed to respond to its context including the Koonung Creek, open space, the adjacent road infrastructure and create a space for use by people (not only vehicles).</p>	<p>The design provides seamless access to a variety of public transport, walking and cycling choices with examples being:</p> <ul style="list-style-type: none"> <li>• The road geometry provides the dedicated bus lane connecting to the Bulleen Park and Ride facility</li> <li>• Pedestrian and cycling lanes along Bulleen Road</li> <li>• Additional SUP links from the north through to the Koonung Creek Trail</li> <li>• A new SUP bridge across the Eastern Freeway.</li> </ul> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 34: Key Principles and Objectives for Eastern Freeway interchange continued

Key design requirement number	Requirement	UDLP response
Principle 3 - Urban Integration Objective 3.2 Integration Of Design	<p>Ensure an integrated engineering, urban design, architectural and landscape architectural approach that sensitively addresses social, cultural, functional and physical aspects of the Project.</p> <p><b>Strategic context and opportunities</b></p> <p>The interchange at the junction of the Eastern Freeway and Bulleen Road would be complex, accommodating numerous traffic movements, elevated ramps and a dedicated busway. This increased complexity requires a multidisciplinary approach that results in well proportioned elevated structures with clear wayfinding for drivers and a design that integrates well with the Eastern Freeway landscape and adjoining uses.</p>	<p>The collaborative design approach across all design disciplines is driving a fully integrated engineering, urban design, architectural and landscape architectural outcome. This approach is driven by the 3 Indigenous design pillars and these 8 design principles to ensure the social, cultural, functional, and physical aspects of the Project are fully integrated and addressed sensitively.</p> <p>The Project incorporates several multi span viaduct and ramp structures, at the Eastern Freeway interchange. The design has delivered an integrated design solution responding to community needs to minimise the visual impact of these structures.</p> <p>The development of the bridge elements ensures seamless integration with surrounding landscapes.</p> <p>Bridge barriers are designed as unifying elements connecting Country at landing positions. Tapered forms ensure continuous smooth lines reduce visual clutter.</p> <p>Our coordinated approach to wayfinding improves Connection to Country, reduces reliance on signage, and supports well connected, legible networks that deliver long lasting benefits. On-roadway signage will minimise clutter and provide visibility for safe motorist navigation.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
Principle 3 - Urban Integration Objective 3.4 Minimise Footprint	<p>Minimise negative impacts on the community and the environment by minimising the design footprint and visual bulk.</p> <p><b>Strategic context and opportunities</b></p> <p>The Eastern Freeway interchange presents a significant opportunity to minimise the footprint of the road infrastructure and protect schools (Marcellin College, Trinity Grammar, Carey Grammar and Belle Vue Primary), sporting clubs and facilities, and businesses (Manningham Hotel).</p>	<p>The optimisation of the design to date has resulted in the reduction of the Project footprint compared to the EES design thus creating increased open space areas at Borlase Reserve and the Manningham Cultural Landscape Precinct, no disturbance to Banksia Park, increased areas for future redevelopment at the Manningham interchange and increased offsets to roadways along Freeway Golf Course.</p> <p>The interchange design has improved the quality and amenity of existing open space at Bulleen by integrating the ventilation building and substation into the landscape and minimising the footprint of the Eastern Freeway interchange to the maximum extent possible.</p> <p>The Yarra Link green bridge creates a grade-separated crossing of Bulleen Road for pedestrians and cyclists travelling along the Koonung Creek Trail. It carries the riparian character of the Yarra River (Birrarrung) and connects it with the Koonung Creek Valley area environment. It expands the open space network in the precinct with planting to enhance visual amenity, biodiversity, and habitat link along the Koonung Creek Valley area corridor provides better connectivity to the surrounding schools, Veneto Club, and Manningham Hotel &amp; Club.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
Principle 4 - Resilience & Sustainability Objective 4.3 Environmental Sustainability	<p>Optimise environmental performance and embed sustainability initiatives into the design response. This includes integrated water management, biodiversity and habitat enhancement and connections, green infrastructure provision and sustainable use of energy and materials.</p> <p><b>Strategic context and opportunities</b></p> <p>Land adjacent and under the new road structures at the interchange presents the opportunity to improve amenity and environmental values through initiatives such as functional water bodies and indigenous planting. This includes connecting and enhancing the Yarra River parkland and Koonung Creek, naturalising waterways and strengthening riparian vegetation.</p>	<p>The design strategy embeds environmental performance and outcomes within the overall design approach. Through the design's core pillar Caring for Country, strengthening the biodiversity corridors has been a priority.</p> <p>The Water Management Strategy is fully integrated with the landscape and urban design approach. The daylighting of waterways and tributaries, creation of wetlands and management of flood, contributes to the creation and enhancement of habitat, biodiversity and reflects the cultural importance of these riparian precincts to traditional owners.</p> <p>The expansion of tree canopy coverage and habitat corridors reduces the heat island effect within the surrounding areas reducing energy requirements. Incorporation of PV panels into architectural elements provides for sustainable energy generation.</p> <p>A new wetland will treat the flow of water from the Koonung Creek before it passes under the intersection. The riparian vegetation corridor continues over the Yarra Link green bridge to be reunited with the creek on the western side.</p> <p>Creating a continuous vegetation corridor will provide a habitat and movement network for wildlife strengthened by the selection of native plant species chosen for their ability to provide habitat and food sources for wildlife.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 35: Key Direction responses for Eastern Freeway interchange

Key design requirement number	Requirement	UDLP response
Key Direction 1 Develop an integrated design response	Sensitively respond to the functional requirements of the local area including the surrounding schools and natural systems.	<p>Plantings at waterways, including the Koonung Creek Valley area environment, will be robust indigenous species that create habitat and improve storm-water quality. These natural systems will increase biodiversity, contribute to cooler micro-climates, and foster citizen science through pathways, decks, and bird hides so that people can engage with nature. These waterways are visible from the Bulleen intersection and the SUPs of the Yarra Link green bridge.</p> <p>The Yarra Link green bridge at Bulleen links schools, playing fields and sports clubs, as well as cyclist and pedestrian pathways along the Koonung Creek and Yarra River (Birrarung).</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
Key Direction 2 Support a natural and connected corridor	Enhance the open spaces and natural systems while improving connectivity along and across the corridor.	<p>The interchange design has taken into consideration the biodiversity of the river and creek corridors as a powerful demonstration of Caring for Country. The design principles create the framework for the landscape design to respect the existing significant riparian corridors and enhance these precincts with new and renewed parklands and waterways, which celebrate and embrace this important open space and biodiversity asset.</p> <p>The Yarra Link green bridge creates a grade-separated crossing of Bulleen Road for pedestrians and cyclists travelling along the Koonung Creek Trail. It carries the riparian character of the Yarra River (Birrarung) and connects it with the Koonung Creek Valley area environment. It expands the open space network in the precinct with planting to enhance visual amenity, biodiversity, and habitat link along the Koonung Creek Valley area corridor and provides better connectivity to the surrounding schools, Veneto Club, and Manningham Hotel &amp; Club.</p> <p>The interchange design has focused on maximising tree canopy coverage and ensuring the corridor reduces and mitigates climate change impacts. Landscape and planting strategies, and ecology and soil technical inputs have informed the urban design.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>
Key Direction 5 1.Y Create a context sensitive design	Protect and promote cultural values for places of significance including the Yarra River, Bolin Bolin Billabong and the Heide Museum of Modern Art.	<p>New pedestrian and cycle paths connect from the Eastern Freeway interchange through to the pedestrian and cycling trails on the north side of the Eastern Freeway through to Bulleen Park trails which link through to the Heide Museum of Modern Art and the Main Yarra Trail. This link completes a significant desire line introducing more people to the Yarra parklands and Heide Museum of Modern Art and connecting in with major regional cycling and walking routes.</p> <p>This strategy provides opportunities to open and connect people to the river and its food plain valley – a journey that links ancient and contemporary narratives through one of Melbourne’s most treasured open space parkland corridors.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>
Key Direction 5 4.Y Create a context sensitive design	Maximise opportunities for land use integration at the Manningham Road interchange.	<p>Refer to 5.5.2 Urban Design Framework Plans – Manningham / Bulleen Road interchange Key Direction 5 1.Y</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>
Key Direction 5 5.Y Create a context sensitive design	Be sympathetic to the landscape setting of the Greater Yarra Urban parklands.	<p>The Greater Yarra Urban parkland has been preserved and enhanced to acknowledge its importance to local communities and visitors alike, along with facilitating the extension of the Koonung Creek Valley area linear parklands. Additional SUPs link communities via the Yarra Link green bridge, are maximised, providing more habitat and biodiversity corridors, places for recreation, and amenity for community. Wider improvements to public realm and open space will contribute to the overall parkland offer, placing further importance on the value of the Greater Yarra Urban parkland and its landscape setting.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 35: Key Direction responses for Eastern Freeway interchange continued

Key design requirement number	Requirement	UDLP response
Key Direction 5 6.Y Create a context sensitive design	Improve the ability for the community to access open space in Bulleen.	<p>The development of the path network around and over the Yarra Link green bridge provides the local communities and surrounding schools several routes of travel to interact with the Bulleen Park and Yarra River setting.</p> <p>The path networks include:</p> <ul style="list-style-type: none"> <li>• Rest and interaction nodes at key points</li> <li>• A green connection over the Bulleen Road and NEL road corridor.</li> </ul> <p>The Carey entrance and car park area shown on <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0063 and 0071</i> is subject to future design development in order to improve access to open space in Bulleen. This further design refinement will occur in consultation with all relevant stakeholders in order to achieve a suitable design outcome that will facilitate an improved functional layout and connectivity.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>
Key Direction 5 7.Y Create a context sensitive design	Provide enhanced and more convenient cycling routes to Melbourne's inner city areas.	<p>To provide convenient routes of travel for cyclists, three key factors have been developed within the design of the SUP Eastern Freeway interchange.</p> <p>Cyclists have three options to travel on a north-south axis from Bulleen Road;</p> <ul style="list-style-type: none"> <li>• Option A along Bulleen Road on a dedicated on-road cyclist lane</li> <li>• Option B along the off-road SUP located to the east of Bulleen Road (travelling north)</li> <li>• Option C along the off-road Thompsons Road SUP, before adjoining the SUP connection in-between Manningham Club/Koonung Creek Valley area before it wraps around the Southern Portal and meets the Bulleen Road SUP.</li> </ul> <p>Grades of SUPs are kept subtle and consistent with clear sightlines and changes in direction minimised to allow cyclists to maintain consistent speeds of travel.</p> <p>The network provides connections to the surrounding local residential areas, that often include more than one path of travel option to interface with the Bulleen Park and the Yarra River setting.</p> <p>The network and path options will be further enhanced with a clear and distinct Wayfinding strategy to provide direction to visitors and infrequent users the best path for their journey.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design</i>. Refer to: <i>UDLP Attachment.2-Landscape Design</i>.</p>

### Additional Project benefits

- The Yarra Link green bridge will offer north-bound motorists a distinctive landscape threshold to pass beneath; a memorable navigational marker that celebrates the transition through to Melbourne's north
- South-bound motorists on Bulleen Road will experience a spectacular solar panel clad dynamic roof that draws up to the Ventilation Structure to provide a striking vertical marker indicating the Eastern Freeway beyond
- A dynamic digital lighting display on the Southern Ventilation Structure that recalls the celestial lights will provide all travellers, whether road or path, with a delightful wayfinding marker during night-time. Please see Figure 58 on page 63
- The land bridge will extend the indigenous vegetation of the Birrarung valley corridor up and over the tunnel entry, supporting habitat and biodiversity and providing continuous open space amenity for the community
- The Yarra Link green bridge allows for uninterrupted connection from the west side of Bulleen Road to the Koonung Creek Trail immediately east of the Bulleen intersection
- Clear open sightlines along SUPs and through open space corridors will ensure that users feel safe in the newly created environment
- Local communities will benefit from the renewed Connection to Country, healthier waterways, and habitat and biodiversity corridors.

## 5.0 Consistency with Urban Design Strategy

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

Table 36: Place specific requirements responses for Eastern Freeway interchange

Key design requirement number	Requirement	UDLP response
Key place-specific Requirement 1A	<p>Design the Eastern Freeway interchange to be a navigational node by using distinctive elements to provide features and landmarks for navigation for all modes of transports. Landscaping is to take inspiration from surrounding natural assets such as the Yarra River and will maximise indigenous planting to support biodiversity and habitat.</p> <p><b>Place-specific context and opportunities</b></p> <p>The Eastern Freeway interchange would mark the transition between the Eastern Freeway and North East Link. It would also mark a meeting point of waterways (Yarra River and Koonung Creek) and a threshold between the City of Manningham and the City of Boroondara. With these attributes, the design must act as a navigational feature, using a well-considered multi-disciplinary response that sensitively integrates road infrastructure with the surrounding parkland and residential areas.</p>	<p>The Yarra Link green bridge is the meeting point of the Yarra River (Birrarrung) and the Koonung Creek valleys as they join the Ridgeline heading north away from the Eastern Freeway.</p> <p>At this crucial juncture, the urban design unifies a series of engineering and urban design moves into one significant gesture, the Yarra Link green bridge. This link provides an elegant and integrated design approach for the required tunnel infrastructure that acts as a landmark for people as they interact with the Southern Portal from multiple directions.</p> <p>The Southern Ventilation Structure, whilst not dominating the skyline, will be clearly visible on approach to the intersection. Its unique curvaceous form emerges from the Yarra Link green bridge landscape to create a landmark that is clearly identifiable yet sensitively sited and architecturally compelling.</p> <p>In addition to these key moves, the significant structures which form the Ventilation Structures have been developed as elegant expressions of this relationship to Country. Taking inspiration from the fluid form of traditional Wurundjeri Woi-wurrung eel traps, the major Ventilation Structures at Simpson Barracks and the Yarra Link green bridge emerge out of the landscape.</p> <p>Refer to: <i>Sections 5.3.1, 5.3.2, 5.3.3 of this UDLP Report.</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
Key place-specific Requirement 2D	<p>Provide a walking and cycling crossing of the Eastern Freeway linking the new walking and cycling path to the Koonung Creek Trail.</p> <p><b>Place-specific context and opportunities</b></p> <p>The existing paths on the Bulleen Road bridge over the Eastern Freeway are narrow and are located on the road side of the vehicle containment barriers. This creates an uncomfortable and low-quality experience for pedestrians and cyclists moving between North Balwyn and Bulleen. The Project must enhance the pedestrian and cycling network in the area, by improving the link across the freeway between schools such as Marcellin College and Belle Vue Primary, sporting facilities and residential areas.</p>	<p>A separate SUP bridge has been provided adjacent Bulleen Road bridge over the Eastern Freeway, providing better connectivity north along Bulleen Road and west to Thompsons Road and the adjacent schools.</p> <p>SUPs connecting from Thompsons Road and Bulleen Road will connect along the Koonung Creek Trail to the eastern side of NEL. A series of boardwalks, paths and pedestrian bridges will connect through the Koonung Creek Valley area to the Yarra Link the Southern Interface connections.</p> <p>Yarra Link green bridge creates a landscaped connection between Bulleen parklands and the Yarra River (Birrarrung) to the west with Marcellin College, Trinity Grammar and Carey Grammar School sports fields and the Koonung Creek Trail to the east.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
Key place-specific Requirement 2E	<p>Provide an alternative grade-separated crossing of Bulleen Road for pedestrians and cyclists traveling along the Koonung Creek Trail.</p> <p><b>Place-specific context and opportunities</b></p> <p>The existing at-grade crossing at Bulleen Road diminishes the safety, efficiency and enjoyment of the Koonung Creek Trail for pedestrians and cyclists. A grade-separated alternative would enhance the user experience of the trail for both commuter and recreational cyclists, as well as pedestrians. The design must sensitively integrate the path into the surrounding landscape and carefully consider useability and safety.</p>	<p>Grade separated SUPs connecting from Thompsons Road and Bulleen Road for pedestrian and cyclist paths to Koonung Creek and Main Yarra Trail.</p> <p>A series of boardwalks, paths and pedestrian bridges will connect through the Koonung Creek Valley area wetland to the Yarra Link green bridge, Bulleen Park, and the Yarra Valley parklands with planting to enhance visual amenity, biodiversity, and habitat link along the Koonung Creek Valley area corridor.</p> <p>Creating a continuous vegetation corridor will provide a habitat and movement network for wildlife strengthened by the selection of native plant species chosen for their ability to provide habitat and food sources for wildlife.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

Table 36: Place specific requirements responses for Eastern Freeway interchange continued

Key design requirement number	Requirement	UDLP response
Key place-specific Requirement 4A	<p>Provide planting to enhance visual amenity, biodiversity and habitat link along the Koonung Creek corridor</p> <p><b>Place-specific context and opportunities</b></p> <p>The quality of the Koonung Creek environment is relatively poor, where it passes by the Boroondara Tennis Centre and Manningham Hotel. The creek is in a concrete channel, at the eastern end near Thompsons Road. The area is not very accessible to people other than car park users. There is an opportunity for the community to reengage with the Koonung Creek, by improving access and landscaping in the area, addressing hydrology and health of the waterway, maximising opportunities for strengthening the habitat link along the creek corridor.</p>	<p>Koonung Creek north of Thompsons Road flows into a new wetland next to the Yarra Link green bridge where its water is naturally filtered prior to passing under the tunnel road way and ramps, re-emerging on the western side of Bulleen Road.</p> <p>To connect the riparian landscape of the Koonung Creek and Yarra River (Birrarrung), the riparian vegetation species of the creek and associated wetland are planted within the new open space environs of the Yarra Link green bridge reconnecting on the western side. This creates both a seamless habitat corridor and landscape gateway for motorists entering the tunnel.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone)</i>.  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure)</i>.  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure)</i>.</p>

## 5.0 Consistency with Urban Design Strategy

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Table 37: UDS - Detailed requirements & benchmarks for Eastern Freeway interchange

Requirement	UDLP response
7.1 Integration with surroundings	<p>The urban design approach improves access to public open spaces, improves the quality of those environments, and adds more public open space. We have reduced impacts on local environments wherever possible.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
7.2 Open space infrastructure	<p>Across the NEL Tunnels Project, the Project has included new public infrastructure for public open space including bicycle hoops, bins, public toilets, park benches, sheltered BBQ and picnic tables, drinking fountains, two and three phase power connection points, bicycle repair stations, E-bike charging points, fitness stations, half basketball courts and digital bike counters.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
13.2 Encourage cross-community connectivity	<p>Opportunities are maximised for cross-corridor connectivity, enabling the community to reach everyday amenities within a 20-minute walk and to remove barriers that discourage walking and cycling. These barriers include physical obstructions, and a lack of shade and rest stops. Pedestrian and cycle crossings of the Project corridor are celebrated and emphasised to encourage greater sense of connectivity.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
13.8 Prioritise pedestrians	<p>Pedestrian priority is maximised on key walking routes into and around key community facilities and destinations such as activity centres, bus stations, nearby schools and aged care facilities. Shade, rest stops with seating and drinking fountains at appropriate intervals have also been included. Pedestrian-friendly walkways are free from obstructions and have a smooth surface. Outdoor furniture and fixtures such as bins, bicycle parking, and drinking fountains are offset from pedestrian pathways.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
14.1 Walking and cycling bridge design	<p>The SUP design across the Eastern Freeway and alongside Bulleen Road allows for passive surveillance and has a form and texture that responds to the family of bridges proposed along the Eastern Freeway as part of the Freeway Packages.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
13.2 Encourage cross-community connectivity	<p>Opportunities are maximised for cross-corridor connectivity, enabling the community to reach everyday amenities within a 20-minute walk and to remove barriers that discourage walking and cycling. These barriers include physical obstructions, and a lack of shade and rest stops. Pedestrian and cycle crossings of the Project corridor are celebrated and emphasised to encourage greater sense of connectivity.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

## 5.0 Consistency with Urban Design Strategy

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Table 37: UDS - Detailed requirements & benchmarks for Eastern Freeway interchange continued

Requirement	UDLP response
13.6 Perceived safety	<p>SUPs meet Australian guidelines for safety, including unobstructed path edges, maintaining adequate sight lines and using appropriate gradual path grades. Speeds of movement and reduction of path conflicts are managed through path design, signage, and surrounding landscape treatments.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
17.5 Enhance habitat and biodiversity	<p>Our new landscape corridors are designed to enhance both new and existing biodiversity and habitat links. Indigenous vegetation from the local EVCs are planted in existing habitat linkages and corridors to strengthen biodiversity and provide habitat networks for existing native terrestrial fauna to move more easily through the urban landscape such as our new Yarra Link green bridge, designed to connect the ecology of the Koonung Creek and Yarra parklands. Opportunities to create fauna habitat and links will be maximised, including the use of hollow logs, nesting boxes, and rope ladders as part of any landscape works undertaken within biodiversity zones and natural open spaces.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
18.2 Healthy waterways	<p>The Project urban design concept will improve the river health of the Yarra River (Birrarung) and Koonung Creek by creating new wetlands and bio-retention raingardens to treat storm-water runoff. Koonung Creek has been maintained as daylighted in the section north of Thompsons Road and reimagined as a part of the Project's WSUD Strategy, including retention basins and revegetation, adding significant amenity along the habitat corridor as well as increasing biodiversity. The creek is accessible to the public via a series of boardwalks and platforms.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
18.3 Daylighting waterways	<p>No additional areas of Koonung Creek were able to be daylighted due to technical constraints.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>
18.4 Minimise habitat impacts	<p>Road infrastructure is carefully located, designed, and constructed to minimise short and long-term impacts on riparian, riverbed and aquatic habitat throughout NEL. Bridges are also designed touch the earth lightly.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0130 to 0147 (Southern Interface Zone).</i>  Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0001 to 0008, 0050, 0051, 0066 to 0067, 0072, 0080 to 0082, 0093 to 0098 (Landscape-Southern Interface).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0060 to 0076 (Southern Ventilation Structure).</i>  Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0100 to 0117 (Road infrastructure).</i></p>

# 5.0 Consistency with Urban Design Strategy

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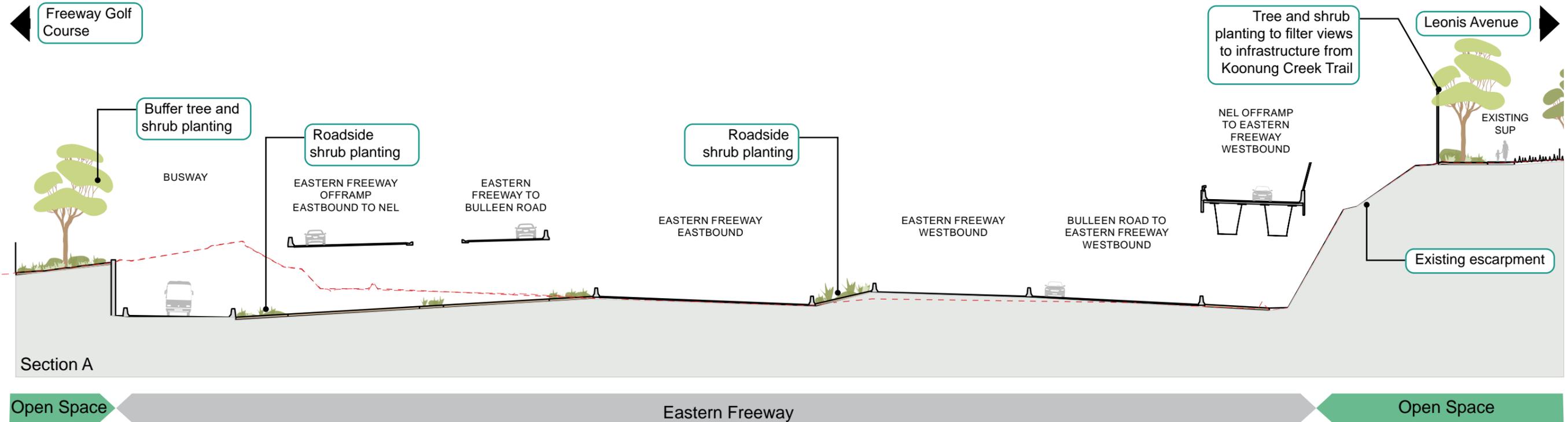


Figure 131: Design Response: Section through Eastern Freeway interchange

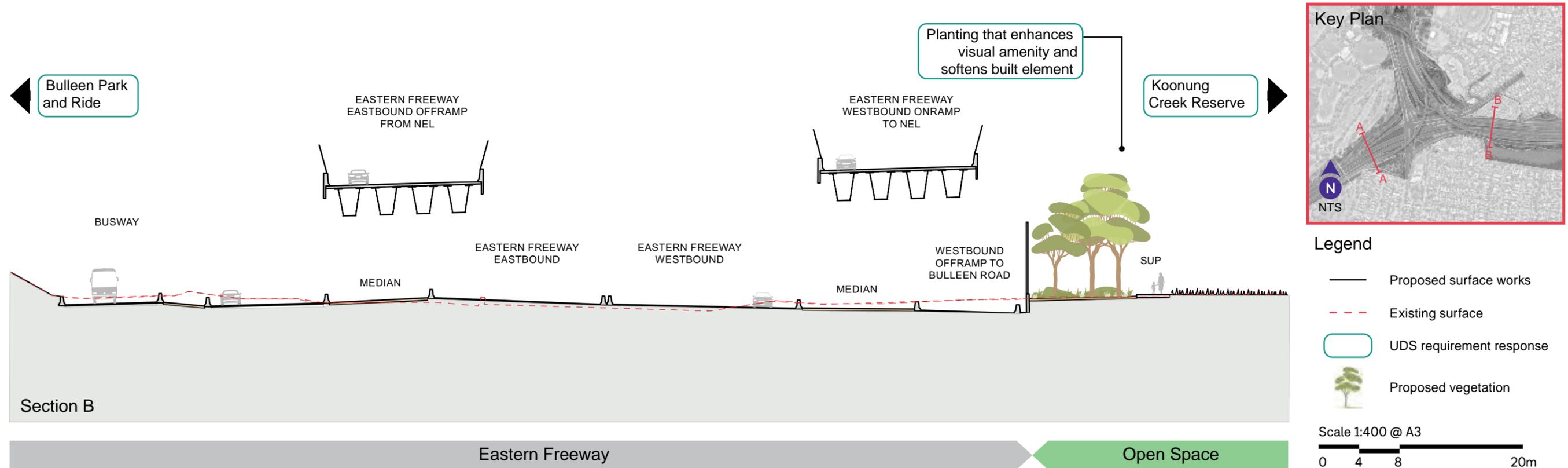


Figure 132: UDS Design Response: Section through Eastern Freeway interchange

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# 5.0 Consistency with Urban Design Strategy

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Figure 133: Design Response: Section through Eastern Freeway interchange

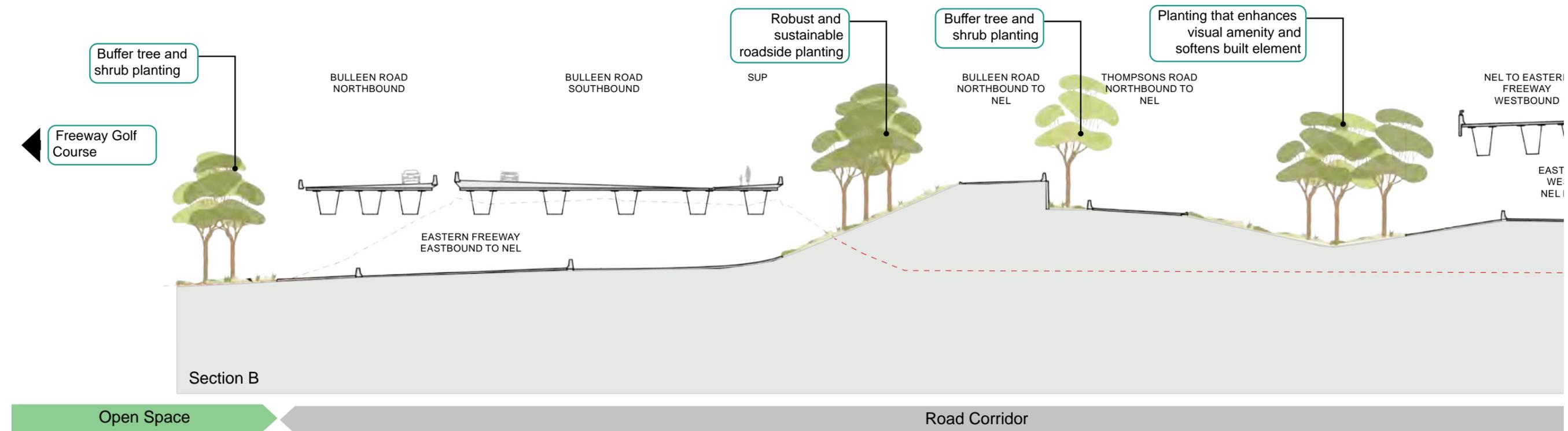
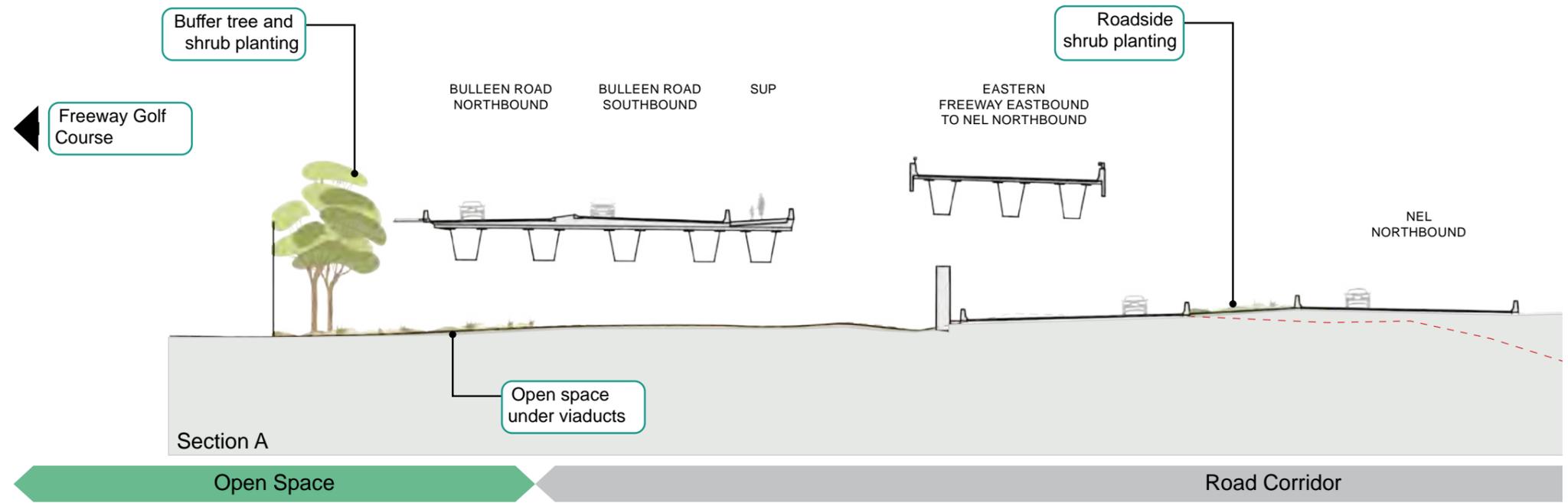
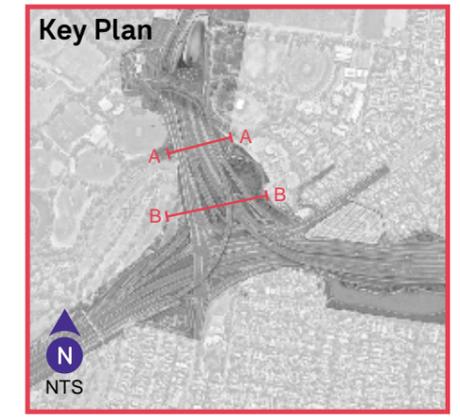
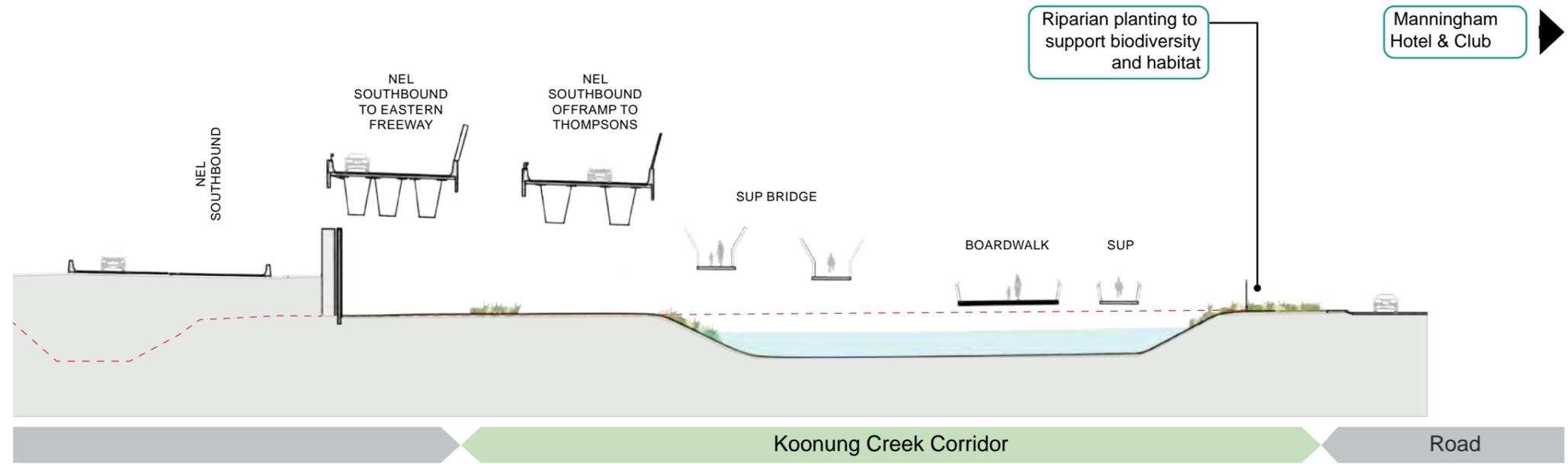


Figure 134: UDS Design Response: Section through Eastern Freeway interchange

# 5.0 Consistency with Urban Design Strategy

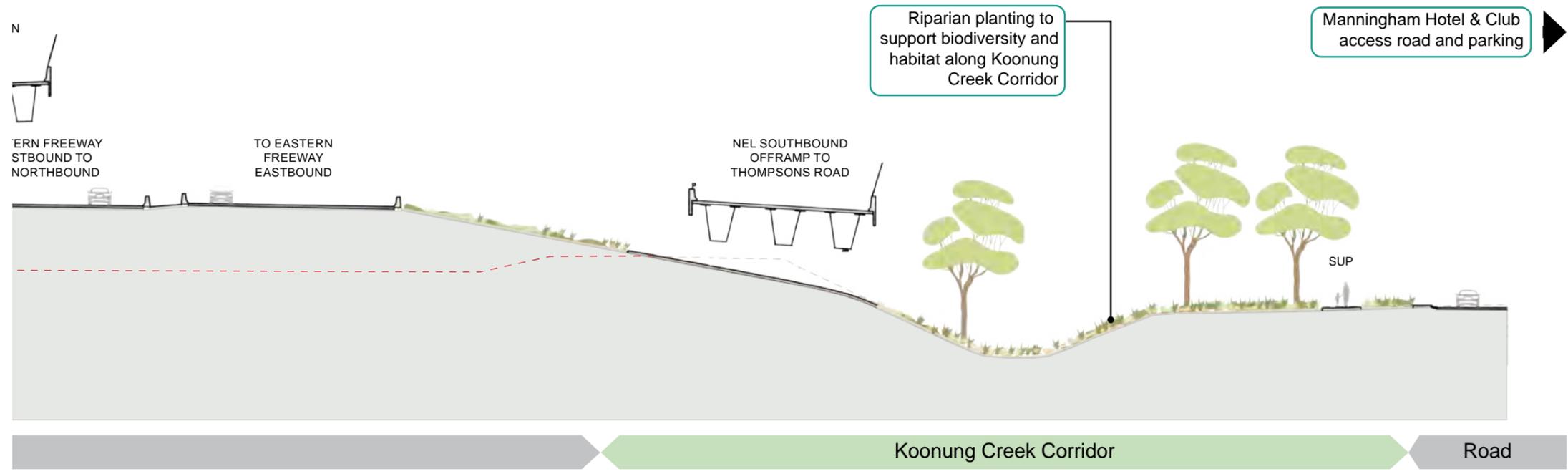
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Illustrative sections are indicative only and subject to change. The final project design does not have to reflect this particular layout in order to be in accordance with the UDS.



- Legend**
- Proposed surface works
  - - - Existing surface
  - UDS requirement response
  - 🌳 Proposed vegetation

Scale 1:400 @ A3  
 0 4 8 20m



NTS



**NORTH  
EAST LINK**  
PROGRAM

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# 6.0 Compliance with Environmental Performance Requirements

## 6.0 Compliance with Environmental Performance Requirements

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and design detail from  
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to this UDLP.

### Introduction

The Incorporated Document requires at Clause 4.9.3 that an UDLP submitted to the Minister is to be accompanied by:

- b. An explanation demonstrating how the UDLP would comply with the EPRs included in the approved EMF.

The UDLP design is a high level planning document and additional site investigation works will be required during the development of preliminary design (such as topographic surveys, utility proofing, arborist and ecological surveys, traffic studies and acoustic modelling and the like) to further inform the EPR responses. Each relevant EPR will be addressed in greater detail by the Project Contractor in the design reports commencing at preliminary design.

The following table (Table 38) lists all the EPRs and assesses how the Project Contractor would comply with the applicable EPRs.

It is acknowledged that those EPRs pertaining to construction and the like are not strictly applicable, or able to be assessed, at this stage of the Project; however, due consideration of these EPRs has been undertaken to ensure that the design will not compromise the ability to achieve compliance during construction.

Note:

1. The Tunnels Project sustainability targets are different to the requirements that the future Southern Alliance will need to meet. The Southern Alliance contractor will demonstrate compliance with the EPR requirements and specific targets in its own Sustainability Management Plan
2. The term “Project Contractor” has been used throughout the EPR responses, as these EPRs to apply to the Tunnels Project or the Southern Alliance Contractor where applicable

The Southern Alliance Contractor will prepare its own management plans as required by the EPRs

3. As the Project Contractor has not been nominated for the Southern Interface area, no EPR management plans have been prepared on behalf of the future Project Contractor for these works.

The Tunnels Project has provided a status of the relevant EPR management plans below for the NEL Tunnels Package:

- Spoil Management Plan-Conditional approval
- Tree Removal and Canopy Replacement Plan-Conditional approval
- WASS Management Sub-Plan-Will be issued
- Construction Environment Management Plan (CEMP)-Issued for use
- Monitoring Management Plan-Will be issued
- CNVMP (Simpson Barracks)-Will be issued
- Construction Noise and Vibration Management Plan (CNVMP)- Issued for use
- Dust, Air Quality Management & Monitoring Plan-Issued for use
- Flood Emergency Management Plan-Conditional approval
- Surface Water Management Plan-Issued for use
- Ecology Management Plan-Issued for use
- Archaeology and Heritage Management Plan-Issued for use
- Ground Movement Plan-Will be issued
- Groundwater Management Plan (incorporating the Groundwater Dependent Ecosystem (GDE) Monitoring and Mitigation Plan)- Issued for review
- Sustainability Management Plan-Issued for use
- IS Rating Management Plan-Issued for review
- Green Infrastructure Management Plan-Issued for review
- GS Rating Management Plan-Issued for use
- Transport Management Plan-Issued for use
- Business Disruption Mitigation Plan-Issued for review.

The EPRs are broken down into the following sections:

1. Environmental Management (EMF)
2. Aboriginal Heritage (AH)
3. Air Quality (AQ)
4. Arboriculture (AR)
5. Business (B)
6. Contamination and Soil (CL)
7. Flora and Fauna (FF)
8. Ground Movement (GM)
9. Groundwater (GW)
10. Historical Heritage (HH)
11. Land Use Planning (LP)
12. Landscape and Visual (LV)
13. Noise and Vibration (NV)
14. Social and Community (SC)
15. Surface Water (SW)
16. Sustainability and Climate Change (SCC)
17. Traffic and Transport (TT).

# 6.0 Compliance with Environmental Performance Requirements

Approved SIZ content and design detail from NEL Tunnels UDLP has been TRANSFERRED to this UDLP.

Table 38: Compliance with Environmental Performance Requirements

Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>1. Environmental Management (EMF)</b>				
<p>Australian Standard AS/NZS ISO 14001:2015 Environmental management systems – requirements with guidance for use</p> <p>EPA Publication 1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</p>	<b>EMF1</b>	<p>Deliver project in general accordance with an Environmental Management System</p> <p>Develop, implement and maintain an Environmental Management System (EMS) that conforms to Australian Standard AS/NZS ISO 14001:2015 Environmental Management Systems – requirements with guidance for use through design, construction and operation of North East Link.</p>	All	<p>The Project Contractor will prepare an Environmental Management System that is certified with Australian Standard AS/NZS ISO 14001:2015. This provides guidance for use through design, construction, and operation of North East Link Tunnel. The Environmental Management System forms part of the Environmental Management Framework which is a statutory requirement under the Incorporated Document.</p>
	<b>EMF2</b>	<p>Deliver project in accordance with an Environmental Strategy and Management Plans</p> <p>Prepare and implement an Environmental Strategy, Construction Environmental Management Plan (CEMP), Worksite Environmental Management Plans (WEMPs), Operation Environmental Management Plan (OEMP) (operator only) and other plans as required by the Environmental Performance Requirements (EPRs) and in accordance with the Environmental Management Framework (EMF).</p> <p>The Environmental Strategy, CEMP, WEMPs and OEMP must be developed in consultation with relevant stakeholders as listed in the EMF and as required by NELP or under any statutory approvals.</p> <p>The CEMP must be prepared with reference to best practice and EPA Publication 1834, Civil construction, building and demolition guide.</p>	All	<p>The Project Contractor will prepare an Environmental Strategy, CEMP and WEMP and other plans as required by the EPRs as a contractual condition to satisfy the statutory requirement under the Incorporated Document. The CEMP will be prepared with reference to best practice and relevant EPA publications and site specific controls are detailed in the WEMP.</p> <p>These documents will be subject to separate stakeholder consultation requirements and review and verification by the Independent Environmental Auditor.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	<b>EMF3</b>	<p>Audit and report on environmental compliance</p> <p>Appoint an Independent Environmental Auditor (IEA) to:</p> <ul style="list-style-type: none"> <li>Review the Environmental Strategy, CEMP, WEMPs, OEMP and other plans required by the EPRs for compliance with the EMF and the EPRs</li> <li>Undertake environmental audits of compliance with and implementation of the EPRs and the Environmental Strategy, CEMP, WEMPs, OEMP and other plans required by the EPRs.</li> </ul> <p>The IEA must include persons with expertise, based on qualifications and experience, appropriate to allow the roles specified for the IEA in the EMF to be properly carried out; including a person(s) appointed by the EPA as an environmental auditor for contaminated soil and groundwater given the potential risk of acid sulfate soils, and to ensure that there is no risk of vapour or gas intrusion from former landfills.</p> <p>Audits must occur during construction and for five years after opening of North East Link, or as otherwise agreed with the Minister for Planning.</p> <p>A six-monthly summary report must be provided to the Minister for Planning that summarises the findings of audits carried out during the reporting period. A close-out report must be provided to the Minister for Planning at the conclusion of the auditing and reporting period. The summary reports must be made publicly available on a project website for the period of construction and a minimum of five years after opening of North East Link.</p>	Design, construction, operation	<p>An Independent Environmental Auditor has been appointed and will ensure the relevant plans comply with the EPRs and will undertake environmental audits to satisfy this EPR.</p> <p>The reviews and audits will be in accordance with the requirements of the EMF. The IEA incorporates expertise for this role in accordance with the EPR requirements.</p> <p>The IEA will provide a six-monthly summary report to the Minister for Planning. These will be made available on the Project website.</p> <p>The Audit will be undertaken as per the this EPR.</p>
	<b>EMF4</b>	<p>Complaints Management System</p> <p>Prior to the commencement of works a process for recording, managing, and resolving complaints received from affected stakeholders must be developed and implemented. The complaints management arrangements must be consistent with Australian Standard AS/NZS 100002: 2014 Guidelines for Complaints Management in Organisations.</p> <p>The complaints management system must be consistent with the Communications and Community Engagement Management Plan required under EPR SC3.</p>	Design, construction, operation	<p>The Project Contractor will prepare a Communications and Community Engagement Management Plan that includes a complaints management system consistent with Australian Standard AS/NZS 100002:2014, to satisfy the statutory requirement under the Incorporated Document.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>2. Aboriginal Heritage (AH)</b>				
<p><i>Aboriginal Heritage Act 2006</i></p> <p>Aboriginal Heritage Regulations 2007</p>	AH1	<p><b>Comply with the Cultural Heritage Management Plan</b></p> <p>Implement and comply with the Cultural Heritage Management Plan (CHMP) approved under the <i>Aboriginal Heritage Act 2006</i>.</p>	Design, construction	<p><b>Design</b></p> <p>The Cultural Heritage Management Plan (CHMP) 15576 has been prepared for the North East Link Project and approved under the <i>Aboriginal Heritage Act 2006</i>.</p> <p>There are registered sites within the project area and the Project Contractor will comply with the specific requirements of the CHMP in relation to their management.</p> <p>All CHMP conditions in relation to avoiding and minimising harm to Aboriginal places will be satisfied.</p> <p>The landscape design considers Aboriginal places and their respective management, triggers, and exclusions zones as identified in the CHMP.</p> <p><b>Construction</b></p> <p>During construction the Project Contractor will carry out Development Activities in compliance with CHMP No. 15576, including:</p> <ul style="list-style-type: none"> <li>• CHMP inductions delivered by the Registered Aboriginal Party representative for all personnel involved in ground disturbing activities</li> <li>• Specific management conditions such as exclusion fencing will be included in Worksite Environmental Management Plans (WEMPs) and Site Environment Plans (SEPs)</li> <li>• Ongoing consultation with the RAP for the area: Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
<b>3. Air Quality (AQ)</b>				
<p><i>Environment Protection Act 2017</i></p> <p>Environment Protection Regulations 2021</p> <p>Environment Reference Standard (Ambient Air)</p> <p>EPA Publication 1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</p>	AQ1	<p><b>Implement a Dust and Air Quality Management and Monitoring Plan to minimise air quality impacts during construction</b></p> <p>Prepare and implement a Dust and Air Quality Management and Monitoring Plan(s), in consultation with EPA, which sets out best practice measures and controls to minimise and monitor impacts on air quality during construction. The plan(s) must:</p> <ul style="list-style-type: none"> <li>• Set out how the project will monitor and control the emission of smoke, dust, fumes, odour and other pollution into the atmosphere during construction using best practice measures with reference to EPA Publication 1834, Civil construction, building and demolition guide</li> <li>• Identify the main sources of dust and airborne pollutants, and the location of sensitive land uses relevant to each construction area</li> <li>• Describe the monitoring requirements for each construction area including real-time particulate matter monitoring to manage dust control were deemed to be required, and with reference to sensitive receptors and utilising consistent and common monitoring equipment across the project</li> <li>• Describe the air quality triggers for investigation, the mitigation measures, and the processes for implementing appropriate controls.</li> </ul>	Construction	<p>The Project Contractor will prepare a Dust and Air Quality Management and Monitoring Plan informed by the requirements of EPA Publication 1834 and in consultation with EPA.</p> <p>The aspect-specific control measures are identified in the Dust and Air Quality Management Plan and Monitoring Plan with site specific controls in the WEMP. This is subject to separate stakeholder consultation requirements and reviewed by the Independent Environmental Auditor, including quarterly audits of performance throughout construction.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	AQ4	<p><b>Monitor ambient air quality</b></p> <p>Develop and undertake an ambient air quality monitoring program in consultation with EPA Victoria to measure the air quality impacts of North East Link during construction and operation. The ambient air quality monitoring program must be undertaken at a minimum of six locations (including a site where the highest increases of air pollution are predicted to occur), unless otherwise agreed by EPA Victoria; include at least one year of monitoring before operation; continue for 5 years after commencement of North East Link operation; and, for the Ventilation Structures, be in accordance with the EPA Victoria Operating licence. Monitoring results must be compared against the indicators and objectives (excluding odour) in Table 2.2 of the Environment Reference Standard (Ambient Air). Results (unvalidated) of the monitoring program are to be made publicly available on a website related to the project, or through EPA Victoria's Air Watch website, on a daily basis.</p>	Construction, operation	<p>NELP has developed and will be undertaking and reporting the results of an ambient air quality monitoring program, in consultation with EPA Victoria in accordance with this EPR.</p> <p>The Project Contractor will undertake ambient air quality monitoring during construction in accordance with the Construction Air Quality and Dust Management Plan.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Operations</b></p> <p>The ambient air quality monitoring program will continue for five years after commencement of North East Link operation; and, for the Ventilation Structures, be in accordance with the EPA Victoria Operating licence.</p> <p>Results (unvalidated) of the monitoring program will be made publicly available on a website related to the Project, or through EPA Victoria's Air Watch website, daily.</p> <p>Analysis of performance against Environmental Performance Conditions in EPA Victoria Operating Licence will be undertaken during the Operations Phase. Permission Information and Performance Statements, including results from air quality monitoring programs and other information requested by the Authority, will be provided to EPA Victoria upon request.</p>
	AQ5	<p><b>Monitor compliance of in-tunnel air quality and Ventilation Structure emissions</b></p> <p>Monitor the in-tunnel air quality and Ventilation Structure emissions during operation of the ventilation system to demonstrate compliance with EPR AQ2, EPR AQ3 and the EPA Victoria Operating licence to the satisfaction of EPA Victoria. Report the monitoring results publicly after validation and in accordance with the EPA Victoria Operating licence.</p> <p>If standards outlined in EPR AQ2, EPR AQ3 and the EPA Victoria Operating licence are not met, report to EPA Victoria, investigate the cause of the exceedance, and take remedial action as appropriate to the satisfaction of EPA Victoria.</p>	Operation	<p>In-tunnel air quality and Ventilation Structure emissions monitoring requirements will be undertaken in accordance with the Development Licence (EPA 2017 219663 / DL000219663). Details on the monitoring program will be included in the following design packages:</p> <ul style="list-style-type: none"> <li>Tunnel Ventilation System (3621)</li> <li>Plant Management &amp; Control Systems (3724).</li> </ul> <p>Air quality monitoring requirements will be included in the Operations Environmental Management Plan.</p> <p>Analysis of performance against Environmental Performance Conditions in EPA Victoria Operating Licence will be undertaken during the Operations Phase. Permission Information and Performance Statements including results from air quality monitoring programs and other information requested by the Authority will be provided to EPA Victoria upon request.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	AQ6	<p><b>Construction Haulage Vehicle Fleet</b></p> <p>Incentives must be provided for contractors and subcontractors to preferentially select on-road heavy vehicles for haulage that comply at a minimum with the Euro V European emission standards. The incentives must seek to increase the proportion of on-road heavy vehicles that comply at a minimum with Euro V European emission standards within the project's construction haulage fleet over the construction life of the project.</p>	Construction	<p>Incentives and a procurement strategy will be devised to seek to increase the proportion of on-road heavy vehicles that comply at a minimum with European V Emission emission standards within the Project Contractor's construction haulage fleet over the construction life of the Project Contractor.</p> <p>This data around procurement is commercially sensitive. The target is to comply with European V Emission standards in relation to the construction haulage fleet.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>4. Arboriculture (AR)</b>				
<p>Planning and Environment Act 1987</p> <p>AS4970-2009 Protection of Trees on Development Sites</p> <p>Guidelines for the removal, destruction or lopping of native vegetation, DELWP December 2017</p>	<b>AR1</b>	<p><b>Develop and implement a Tree Removal Plan</b></p> <p>Develop and implement a Tree Removal Plan, as part of the CEMP, that identifies all trees within the Project boundary and includes:</p> <ul style="list-style-type: none"> <li>Trees to be removed or retained as part of the works</li> <li>Confirmation of the condition and arboricultural value of the amenity trees to be removed</li> <li>The canopy area of all trees to be removed</li> <li>The procedure for tree removal that addresses the requirements of EPR FF1, EPR FF2 and EPR FF5.</li> </ul> <p>Tree retention must be maximised to the extent practicable through detailed design and selection of construction methods to minimise canopy loss, and in accordance with EPR FF1, including by retaining trees where practicable and minimising potential impacts to trees. This includes the River Red Gum at 39 Bridge Street, Bulleen.</p> <p>Arboricultural assessments are to verify existing details and inform the detailed design, Tree Removal Plan and Tree Canopy Replacement Plan (required by EPR AR3) in order to maximise tree retention and long-term viability of amenity plantings in accordance with Australian Standard AS4970:2009 Protection of Trees on Development Sites.</p> <p>The Tree Removal Plan must be informed by a pre-construction site assessment to confirm the area and number of trees and other vegetation proposed to be impacted. Trees to be retained must be protected in accordance with EPR AR2. Vegetation removal is to occur in a staged manner with removal only occurring once necessary for the current stage of works.</p> <p>The area and number of trees and other vegetation actually removed is to be confirmed through a post-construction assessment.</p>	Design, construction	<p><b>Design</b></p> <p>A Tree Removal and Canopy Replacement Plan will be developed as part of the documents for the CEMP and will be reviewed and audited by the Independent Environmental Auditor.</p> <p>This Plan will be prepared in accordance with this EPR. This has two objectives being:</p> <ul style="list-style-type: none"> <li>Minimise removal and maintain the long-term viability of trees through detailed design and construction methods, where practicable, to preserve visual amenity and ecological values in the Project</li> <li>Where removal of tree canopy is unavoidable by the Project Contractor, canopy replacement will be undertaken to achieve a net gain in tree canopy cover by 2045.</li> </ul> <p>A project-wide arboriculture and ecological survey will inform constructability and design to prioritise trees and vegetation of high value to be retained. The findings and recommendations will be reviewed and assessed for each landscape design package.</p> <p>Tree replacement is a Project wide requirement with an overall net gain canopy objective, and 2:1 replanting ratio for amenity trees (not for each specific zone).</p> <p>The design has maximised tree retention to the extent practicable, including minimising potential impacts to the existing River Red Gum at 39 Bridge Street, Bulleen.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Construction</b></p> <p>The CEMP references the Tree Removal and Canopy Replacement Strategy and will follow the documented procedures outlined in this report. Tree Protection Plan(s) will be implemented as part of Project Contractor's CEMP. Tree Protection Plans must be prepared based on detailed construction drawings and surveyed tree locations. They will identify protection measures for trees to be retained on the site. Controls to protect retained trees will include Tree Protection Zones, signposts, bunting and physical barriers in accordance with AS4970-2009 Protection of Trees on Development Sites. Trees subject to protection must be monitored for a three-year period following completion of construction works in that location to assess ongoing viability, with maintenance or replacement of stressed or damaged specimens to be undertaken.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	AR2	<p><b>Implement a Tree Protection Plan(s) to protect trees to be retained</b></p> <p>The CEMP must include a Tree Protection Plan(s), which is to be developed and implemented in accordance with Australian Standard AS4970-2009 Protection of Trees on Development Sites. The Tree Protection Plan(s) must provide details of any tree protection actions that will ensure that trees proposed to be retained are adequately protected from the impact of construction or related activities, prior to those works being undertaken.</p> <p>Tree Protection Plans must be prepared based on detailed construction drawings and surveyed tree locations.</p> <p>Trees subject to protection must be monitored for a three-year period following completion of construction works in that location to assess ongoing viability, with maintenance or replacement of stressed or damaged specimens to be undertaken.</p>	Design, construction, operation	<p><b>Design &amp; Construction</b></p> <p>The CEMP will reference the Tree Removal and Canopy Replacement Strategy and will follow the documented procedures outlined in this report. Tree Protection Plan(s) will be implemented as part of the CEMP. Tree Protection Plans must be prepared based on detailed construction drawings and surveyed tree locations. They will identify protection measures for trees to be retained on the site. Controls to protect retained trees will include Tree Protection Zones, signposts, bunting and physical barriers in accordance with AS4970-2009 Protection of Trees on Development Sites. Trees subject to protection must be monitored for a three-year period following completion of construction works in that location to assess ongoing viability, with maintenance or replacement of stressed or damaged specimens to be undertaken.</p> <p>A Project-wide arboriculture and ecological survey will inform constructability and design to prioritise trees and vegetation of high value to be retained. The findings and recommendations will be reviewed and assessed for each landscaping design package.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operation</b></p> <p>The process for ongoing monitoring, maintenance and replacement of protected trees will be further detailed in the OEMP.</p>
	AR3	<p><b>Implement a Tree Canopy Replacement Plan</b></p> <p>Develop and implement a Tree Canopy Replacement Plan to replace the canopy of native vegetation and amenity plantings removed as a result of the project and achieve a net gain in tree canopy cover by 2045. The plan must:</p> <ul style="list-style-type: none"> <li>Show the location, size (including canopy spread) and species of replacement trees, in consultation with councils and other relevant land managers</li> <li>Specify requirements to support the long-term viability of all replacement plantings including appropriate soil requirements, establishment works and ongoing maintenance.</li> <li>Maintain at least a ratio of 2:1 for replacement of amenity plantings</li> <li>Replanting should generally follow the hierarchy of: <ol style="list-style-type: none"> <li>Within the North East Link Project boundary - as first priority, in locations in close proximity to where trees are removed</li> <li>Outside the Project boundary and within 400m walking catchment from where trees are removed</li> <li>Within Victorian Government and local Council land within the municipalities of Manningham, Boroondara, Nillumbik, Yarra, Whitehorse and Banyule outside the Project boundary</li> <li>Within the wider north east area of metropolitan Melbourne outside the Project boundary, if required.</li> </ol> </li> </ul> <p>Note: all locations selected must provide for long-term tree growth</p> <ul style="list-style-type: none"> <li>Within the Project boundary, include understorey plantings in addition to the tree canopy replacement plantings where feasible in consultation with Councils and/or the land manager</li> <li>Specify requirements for the ongoing responsibility for maintenance and monitoring of the Tree Canopy Replacement Plan.</li> </ul> <p>The replacement planting should commence as soon as possible and in stages, once tree removal extent is confirmed and suitable replacement sites have been determined in consultation with relevant councils and authorities.</p> <p>A post-construction assessment is to be undertaken to confirm extent of tree removal and that the Tree Canopy Replacement Plan will achieve the net gain target set out above.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The Tree Removal and Canopy Replacement Plan will be prepared to align with the NELP Tree Removal and Canopy Replacement Strategy.</p> <p>The Plan has been prepared in accordance with this EPR. This has two objectives being:</p> <ul style="list-style-type: none"> <li>Minimise removal and maintain the long-term viability of trees through detailed design and construction methods, where practicable, to preserve visual amenity and ecological values in the Project</li> <li>Where removal of tree canopy is unavoidable by the Project Contractor, canopy replacement will be undertaken to achieve a net gain in tree canopy cover by 2045.</li> </ul> <p>The Plan will be updated throughout the landscape design progression for the Project and the design will respond to each of the requirements. A project-wide arboriculture and ecological survey and the findings and recommendations will be reviewed and assessed for each landscape design package.</p> <p>2:1 tree replacement is a project-wide requirement for amenity trees as well as and the overall net gain in tree canopy cover by 2045.</p> <p>Replanting is to be implemented in the following hierarchy within the Tree Removal and Tree Canopy Replacement Plan:</p> <ul style="list-style-type: none"> <li>Within the North East Link Tunnels boundary – as priority, in locations near where trees are removed</li> <li>Outside the Project boundary and within 400m walking catchment from where trees are removed</li> <li>Within Victorian Government and local Council land within the municipalities of Manningham, Boroondara, Nillumbik, Yarra, Whitehorse, and Banyule outside the boundary</li> <li>Within the wider north east area of metropolitan Melbourne outside the Project boundary, if required.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
				<p><b>Construction</b></p> <p>The CEMP will reference the Tree Removal and Canopy Replacement Strategy and will follow the documented procedures outlined in this report. Tree Protection Plan(s) will be implemented as part of the Project Contractor CEMP.</p> <p>A post-construction assessment is to be undertaken to confirm extent of tree removal and that the Tree Canopy Replacement Plan will achieve the net gain target set out above.</p>
<b>5. Business (B)</b>				
<p><i>Planning and Environment Act 1987</i></p> <p><i>Land Acquisition and Compensation Act 1986</i></p> <p>Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations</p>	<b>B1</b>	<p><b>Business disruption mitigation plan</b></p> <p>Prepare and implement a Business Disruption Mitigation Plan in accordance with the Victorian Small Business Engagement Guidelines (Victorian Small Business Commission) to ensure that business disruption for small businesses, including all disrupted businesses in the Bulleen Industrial Precinct, arising from the project is mitigated to the extent practicable.</p>	Design, construction	<p><b>Design</b></p> <p>A Business Disruption Mitigation Plan, included in the Communications and Community Engagement Management Plan (CCEMP), will be prepared and implemented to address works on this site.</p> <p>Throughout the design, development opportunities to reduce business disruption will be considered and implemented where reasonably practicable.</p> <p><b>Construction</b></p> <p>The CEMP will provide the specific details concerning the construction procedures, traffic management, construction sequencing and maintaining services to the local community businesses to ensure their ongoing operation.</p> <p>Part of this process will include ongoing consultation with affected businesses and landowners.</p> <p>The Business Relocation Strategy (refer to EPR response in B2) &amp; ESS (Employment Support Strategy B3) linkage is included in the Project CCEMP to ensure the construction team are aware of who will be managing these items and suitable protocols put in place to deal with any BRS &amp; ESS related comments received by the Tunnels Project construction team.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	B2	<p><b>Business Relocation Strategy</b></p> <p>MTIA must develop and implement a Business Relocation Strategy to assist businesses directly affected by acquisition. The strategy must be developed in consultation with affected businesses, relevant local Councils, relevant local trader associations, and other affected stakeholders affected, immediately on approval of the EMF.</p> <p>The strategy must include, but not be limited to:</p> <ul style="list-style-type: none"> <li>The identification of affected businesses and other relevant stakeholders</li> <li>Provide a program to support the relocation of businesses including identifying services and support programs.</li> <li>The appointment of an independent specialised relocation adviser(s) to support affected businesses.</li> <li>Procedures to disseminate information, including through the Business Liaison Group (EPR B8) regarding the business relocation strategy and services, key project milestones that may impact on business relocations, and other changes that may affect businesses during the closure of existing operations.</li> <li>Assistance in the provision of targeted marketing and promotional initiatives to build community and customer awareness for relocated businesses.</li> <li>Procedures to work with business and landowners to endeavour to reach agreement on the timeframe for possession of the land.</li> <li>Procedures to engage with businesses and other stakeholders, and through which affected businesses and relevant local trader associations can provide comment or feedback in relation to the relocation strategy and its associated services.</li> </ul> <p>NELP should also work with councils to identify and assess the feasibility of alternative location options for displaced businesses.</p> <p>In parallel with the Business Relocation Strategy, the independent specialised relocation adviser(s) must provide individual business planning and support to the businesses in the Bulleen Industrial Precinct, including to prepare and implement individual business plans prepared with each business in the Bulleen Industrial Precinct (except where a business has requested not to be part of such assistance) that:</p> <ul style="list-style-type: none"> <li>Understands at a fine-grained level their current operation</li> <li>Desire to relocate or cease operations</li> <li>Business needs for new sites</li> <li>Preliminary specific site identification</li> <li>Practical and reasonable assistance to implement these plans.</li> </ul> <p>Note: the requirements of this EPR are in addition to any rights or entitlements available under compulsory acquisition legislation.</p>	Design, construction	<p>A Business Relocation Strategy will be developed and implemented in accordance with EPR B2 by NELP.</p> <p>The BRS (refer to EPR response in B2) &amp; ESS (Employment Support Strategy B3) linkage will be included in the Project CCEMP to ensure the construction team are aware of who will be managing these items and suitable protocols put in place to deal with any BRS &amp; ESS related comments received by the construction team.</p>
	B3	<p><b>Employee Assistance Strategy</b></p> <p>MTIA must develop and implement an Employee Assistance Strategy to provide relevant workforce support measures for employees of businesses closing or relocating as a consequence of acquisition for the Project.</p> <p>The strategy must include, but not be limited to:</p> <ul style="list-style-type: none"> <li>The identification of affected businesses and employees</li> <li>Provide a co-ordinated link to support services for affected employees (for example, access to a range of services such as training advice, careers advice, resume workshopping, advice on government entitlements, referral to other job support services, and skills assessments).</li> <li>The identification of relevant government agencies and support services</li> <li>Procedures to disseminate information including through the Business Liaison Group (EPR B85), regarding the employee assistance strategy and services, key project milestones that may impact on business closures and relocations, and other changes that may affect businesses and their employees during the closure of existing operations.</li> </ul> <p>In parallel with the Employee Assistance Strategy, MTIA with appropriate expert advice, must prepare and implement a package of individual employee assistance plans prepared with and for each employee who requests it, in consultation with the employer, that:</p> <ul style="list-style-type: none"> <li>Understands at a fine-grained level their future employment plan</li> <li>Need for training and development</li> <li>Factors that would influence their desire to remain employed with a Bulleen Industrial Precinct business</li> <li>Practical and reasonable assistance to implement their assistance plan.</li> </ul>	Design, construction	<p>An Employee Support Strategy will be developed and implemented in accordance with EPR B3 by NELP.</p> <p>The BRS (refer to EPR response in B2) &amp; ESS (Employment Support Strategy B3) linkage will be included in the Tunnels Project CCEMP to ensure the construction team are aware of who will be managing these items and suitable protocols put in place to deal with any BRS &amp; ESS related comments received by the construction team.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	B4	<p><b>Minimise disruption to businesses from land acquisition and temporary occupation</b></p> <p>Minimise disruption to businesses from permanent acquisition or temporary occupation of land to the extent practicable, and work with affected businesses and land owners to endeavour to reach agreement on the terms for possession of the land in accordance with relevant legislation. Efforts to provide for Bulleen Art and Garden's continued operation from its current site should be undertaken.</p>	Design, construction	<p><b>Design</b></p> <p>Disruption from permanent acquisition to nearby businesses will be minimised in the design. Consultation has been undertaken with Bulleen Art and Garden (BAAG) to allow for its continued operation.</p> <p>Adequate land has been retained within the existing property so that BAAG's operation of its landscape supplies business can continue. The UDLP design shows access into the revised BAAG carpark and this design will be developed in greater detail during preliminary design when the topographic, arborist, ecology and utility information is obtained.</p> <p>The Project Contractor will consult with BAAG and other businesses during design and construction activities.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>Permanent above-ground works are contained within the Project boundary identified in the Incorporated Document. All works, including those that are permanent and above ground that may require the acquisition of land, will be delivered in line with the Business Disruption Mitigation Plan as per EPR B1, as well as the Business Relocation Strategy as per EPR B2 where relevant.</p> <p>The CEMP will provide the specific detail concerning the construction procedures, traffic management, construction sequencing and maintaining services to the local community businesses to support their ongoing operation.</p> <p>Part of this process will include ongoing consultation with affected businesses and landowners. Continued operation of BAAG and its landscape supply business will be facilitated during construction.</p>
	B5	<p><b>Minimise and remedy damage or impacts on third party property and infrastructure</b></p> <p>Through detailed design and construction, and in consultation with relevant land owners and parties as necessary, design and construct the works to minimise, to the extent practicable, impacts to, and interference with, third party property and infrastructure and to ensure that infrastructure and property is protected during construction and operation. Any damage caused to property or infrastructure as a result of North East Link must be appropriately remedied in consultation with the property or asset owner.</p>	Design, construction	<p><b>Design</b></p> <p>The design considers the risk of damage to third party property and infrastructure, including the major existing and proposed utilities. This process has included consultation with the relevant utility providers. The next level of third-party property and infrastructure coordination will be undertaken through the preliminary design phase.</p> <p><b>Construction</b></p> <p>The CEMP suite of documents will address the relevant construction works methodology and protection of existing third-party property and infrastructure.</p> <p>Any damage caused to property or infrastructure because of North East Link must be appropriately remedied in consultation with the property or asset owner.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	B6	<p><b>Minimise access and amenity impacts on businesses</b></p> <p>Any reduction in the level of access, amenity or function of any business or commercial facility must be minimised to the extent and duration necessary to carry out the relevant construction related works. Affected business and commercial facilities must be provided with adequate notification of potential impacts and temporary access arrangements. Emergency access must be maintained at all times. Access must be maintained for customers, delivery and waste removal unless there has been a prior arrangement with affected businesses.</p> <p>As well as minimising impacts above, temporary occupation of sites for construction must:</p> <ul style="list-style-type: none"> <li>Minimise impacts on the viability of nearby businesses</li> <li>Minimise adverse amenity impacts on views and amenity experience from nearby businesses</li> <li>Minimise significant increases in travel time from residential areas to businesses and shopping precincts including Watsonia Village</li> <li>Not reduce car parking available to shoppers and traders in shopping areas including Watsonia Village.</li> </ul> <p>All permanent access to business and commercial facilities affected by North East Link works is to be reinstated, or relocated as agreed with the relevant property owner, including associated landscaping and reinstatement works, and temporary access arrangements put in place for construction must be removed when relevant construction activities have ceased.</p>	Design, construction	<p><b>Design</b></p> <p>Reduction in the level of access, amenity or function of any business or commercial facility will be minimised through the design process. Where there is a reduction, access will be reinstated or relocated as agreed with the relevant property owner.</p> <p><b>Construction</b></p> <p>The Project Contractor will prepare construction management plans which include measures for minimising access and amenity impacts during construction, including Traffic Management Plans (TMP), CEMP, Noise and Vibration Management Plan and a Dust and Air Quality Management Plan.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	B7	<p><b>Protect utility assets</b></p> <p>Protect or, where required, relocate utility assets to the reasonable satisfaction of the service provider and/or asset owners.</p>	Design, construction	<p><b>Design</b></p> <p>The UDLP design has considered the major existing and proposed utilities and this process has included consultation with the relevant utility providers. Landscaping, SUPs, buildings and SUP bridges have been located to minimise impacts on existing and proposed utilities.</p> <p>During development of the preliminary design information obtained from detailed site investigation works such as topographic surveys and utility proofing will be analysed and the design further developed minimise impacts on existing utilities.</p> <p>All relevant authority approvals will be obtained prior to construction commencement of these works.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the construction procedures to protect or, where required, relocate utility assets.</p>
	B8	<p><b>Business liaison groups</b></p> <p>Contractors must participate in the Business Liaison Groups established and managed by the North East Link Project to facilitate business and stakeholder involvement for the construction phase of the project. Participation must include:</p> <ul style="list-style-type: none"> <li>Attendance at meetings</li> <li>Regular and timely reporting of design and construction activities and key project milestones</li> <li>Provision of advance notice about changes to traffic and parking conditions and the duration of impact</li> <li>Timely provision of relevant information, including response to issues raised by the group</li> <li>Regular reporting and monitoring of business community feedback, impacts and discussion of mitigation measures and their effectiveness</li> <li>Recording, managing and resolving complaints from affected businesses in accordance with the complaints management process required under EPR EMF4.</li> </ul>	Design, construction	<p>The Project Contractor will participate in the Business Liaison Groups (BLGs) established by the NEL which will include feedback and responding to project issues. Representatives from design and construction will report on key construction and design activities and key Project milestones to ensure businesses and stakeholders are kept informed about Project activities.</p> <p>Feedback from the BLGs will be used to inform continuous improvement in project delivery, stakeholder engagement or updates to construction operations and practice.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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<b>6. Contamination and Soil (CL)</b>				
<p><i>Dangerous Goods Act 1985</i></p> <p><i>Environment Protection Act 2017</i></p> <p>Environment Protection Regulations 2021</p> <p>Environment Reference Standard (Land, Ambient Air)</p> <p><i>Occupational Health and Safety Act 2004</i></p> <p>National Environment Protection (Assessment of Site Contamination) Measures 2013 (ASC NEPM)</p> <p>PFAS National Environmental Management Plan 2018</p> <p>Occupational Health and Safety Regulations 2007</p> <p>AS1940 Storage Handling of Flammable and Combustible Liquids</p> <p>AS 44821-2005 Guide to the investigation and sampling of sites with potentially contaminated soil</p> <p>AS 4439.2:1997 Wastes, sediments and contaminated soils (Part 2: Preparation of leachates – Zero headspace procedure)</p> <p>AS 4439.3:1997 Wastes, sediments and contaminated soils (Part 3: Preparation of leachates –Bottle leaching procedure)</p> <p>Industrial Waste Resource Guideline 702 Soil Sampling</p> <p>Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulfate Soil, 2003</p>	<b>CL1</b>	<p><b>Implement a Spoil Management Plan</b></p> <p>Prepare and implement a Spoil Management Plan (SMP) in accordance with relevant regulations, standards and best practice guidelines and with reference to the Spoil Management Strategy contained within the EES (Technical Report O). The SMP must be developed in consultation with the EPA Victoria, any relevant public land managers and, in respect of transport of spoil, the relevant road authorities. The SMP must include processes and measures to manage spoil, define roles and responsibilities and include requirements and methods for:</p> <ul style="list-style-type: none"> <li>• Complying with applicable regulatory requirements</li> <li>• Completing a detailed site investigation (in accordance with Australian Standards AS 4482.1:2005 Guide to the investigation and sampling of sites with potentially contaminated soil, AS 4439.2:1997 Wastes, sediments and contaminated soils (Part 2: Preparation of leachates – Zero headspace procedure), AS 4439.3:1997 Wastes, sediments and contaminated soils (Part 3: Preparation of leachates – Bottle leaching procedure), EPA Victoria Industrial Waste Resource Guideline 702 with respect to the twenty times leachable concentration threshold approach (the ‘Twenty Times Rule’), and EPA Publication 1828.2 Waste disposal categories – characteristics and thresholds) prior to any excavation of potentially contaminated areas to identify location, types and extent of impacts and to characterise spoil to inform spoil and waste management</li> <li>• Identifying the nature and extent of spoil (clean fill and contaminated spoil)</li> <li>• Identifying, in consultation with the waste industry, the capacity for contaminated spoil material to be treated and/or disposed</li> <li>• Storage, handling, transport and disposal of spoil in a manner that protects human health and the environment and is consistent with the transport management plan(s) required by EPR T2. This includes requirements and methods for the appropriate treatment/remediation of any contaminated excavated spoil and contaminated residual material left on site</li> <li>• Design and management of temporary stockpile areas</li> <li>• Minimising impacts and risks from disturbance of acid sulfate soils (as per EPR CL2), odour (as per EPR CL3) and vapour and ground gas intrusion (as per EPR CL4)</li> <li>• Transport of spoil along appropriate roads with reference to the transport management plan(s) required by EPR T2</li> <li>• Management of hazardous substances, including health, safety and environment procedures that address risks associated with exposure to hazardous substances for visitors, the general public; and local fauna; contain measures to control exposure in accordance with relevant regulations, standards and best practice guidance and to the requirements of WorkSafe and EPA Victoria; and include method statements detailing monitoring and reporting requirements</li> <li>• Identifying where any contaminated or hazardous material is exposed during construction (notably through former landfills, service stations and industrial land) and how it will be made safe for the public and the environment. Environmental values of land and National Environment Protection (Assessment of Site Contamination) Measures 2013 guidance on criteria protective of those environmental values must be considered for the land uses in these areas. This must include methods for: <ul style="list-style-type: none"> <li>– Construction of appropriate cover (soil, concrete, geofabric etc) such that no contamination is left exposed at the surface or where it may be readily accessed by the public and local fauna such that it cannot generate runoff or leachate during rain events</li> <li>– Maintenance of the cover</li> <li>– Identification of the nature and depth of the contaminants</li> <li>– Mitigating impacts during sub-surface works in those areas, e.g., drilling and excavation</li> </ul> </li> <li>• Monitoring and reporting</li> <li>• Identifying locations and extent of any industrial waste, priority waste, reportable priority waste, other waste, and the method for characterising industrial waste, priority waste, reportable priority waste and other waste prior to excavation</li> <li>• Application of the <i>Environment Protection Act 2017</i> waste management hierarchy, including: <ul style="list-style-type: none"> <li>– Ongoing identification and, where practicable, adoption of options for the re-use of spoil</li> <li>– Identification of options for management of spoil</li> </ul> </li> </ul>	Design, construction	<p><b>Design</b></p> <p>Areas of known contamination identified during site investigations have been used to inform the design and construction methodology prior to excavation works commencing. Further site investigations will be undertaken to inform Project design. As additional data becomes available additional reports will be reviewed and used to update management requirements for spoil following the process presented in the Spoil Management Plan (SMP).</p> <p><b>Construction</b></p> <p>A construction SMP will be prepared addressing spoil management measures relevant to this site.</p> <p>The Project Contractor will prepare and implement Transport Management plan(s) required by EPR T2 for transport of spoil on roads on approved routes.</p> <p>The SMP will assess potential management options based on the EPA Waste Hierarchy including reuse onsite and offsite disposal.</p> <p>The SMP will include requirements for the storage, handling, treatment, and transport of spoil generated on the Project.</p> <p>Each EPR will be audited annually by the IEA. Consequently as the plan is an EPR requirement it will be audited at least once a year.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<p>EPA Victoria publications:</p> <ul style="list-style-type: none"> <li>• 1698 Liquid Storage and Handling Guidelines</li> <li>• 1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</li> <li>• 1827.1 Waste classification assessment protocol (EPA Victoria 2020)</li> <li>• 1828.2 Waste disposal categories – characteristics and thresholds (EPA Victoria 2021)</li> <li>• 1968: Guide to classifying industrial waste</li> </ul>		<ul style="list-style-type: none"> <li>– Identifying suitable sites for disposal of any waste. This includes identifying contingency arrangements for management of waste, where required, to address any identified capacity issues associated with the licensed landfill's ability to receive PIW and other waste</li> <li>• In areas used for temporary construction works, and the construction of surface water management works, contamination attributable to the project must be appropriately remediated in consultation with the relevant land manager.</li> </ul>		
	<p><b>CL2</b></p>	<p><b>Minimise impacts from disturbance of acid sulfate soil</b></p> <p>The SMP referenced in EPR CL1 must include requirements and methods to minimise impacts from disturbance of acid sulfate soil, including but not limited to:</p> <ul style="list-style-type: none"> <li>– Characterising acid sulfate soil and rock prior to excavation</li> <li>– Developing appropriate stockpile areas including lining, covering and runoff collection to prevent release of acid to the environment, including wetlands, and impact to human health</li> <li>– Identifying suitable sites for re-use management or disposal of acid sulfate soil and rock</li> <li>– Preventing oxidation that could lead to acid formation, if possible, through cover and/or scheduling practices, i.e., ensuring acid sulfate soil and rock is not left in stockpiles for any length of time and/or addition of neutralising compounds.</li> </ul> <p>Requirements and methods must be in accordance with relevant sections of EPA Publication 1834 Civil construction, building and demolition guide, EPA Victoria Publication 655.1 Acid Sulfate Soil and Rock, and the Department of Sustainability and Environment's Victorian Best Practice Guidelines for Assessing and Managing Coastal Acid Sulfate Soil.</p>	<p>Construction</p>	<p>A Waste Acid Sulfate Soil Management Plan will be prepared addressing spoil management measures relevant to this site for the management of actual acid sulfate soil and potential acid sulfate soil (ASS/PASS). The plan will be developed in accordance with the relevant EPA requirements and best practice guidelines. This plan will be reviewed and verified by the Independent Environmental Auditor.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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	CL3	<p><b>Minimise odour impacts during spoil management</b></p> <p>The SMP referenced in EPR CL1 must include requirements and methods for odour management (in accordance with EPA Victoria requirements) during the excavation, stockpiling and transportation of contaminated material including:</p> <ul style="list-style-type: none"> <li>Identifying the areas of contamination that may pose an odour risk</li> <li>Monitoring of the excavated material for possible odour risk</li> <li>Management measures to minimise odour.</li> </ul>	Construction	<p>A construction SMP will be prepared addressing spoil management measures relevant to this site. This includes management of odour impacts.</p> <p>Specific control during construction may include:</p> <ul style="list-style-type: none"> <li>Utilising the Contamination Assessment which identifies areas of contamination that may pose an odour risk</li> <li>Monitoring of the excavated material for possible odour risk and to confirm if the implemented odour or gaseous emission mitigation and management measures are adequate</li> <li>Where waste is generating offensive odours, identify and implement appropriate odour controls such as odour covers e.g., tarps over stockpiles to reduce odours emissions, or store waste in a container, where possible</li> <li>Remove and cover odorous material from site and do not stockpile. Use odour suppressants as a last resort, if necessary.</li> </ul> <p>Odour risk and identification is managed in the dust and air quality management plan whilst unidentified contamination related to odour is addressed in the spoil management plan.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	CL4	<p><b>Minimise risks from vapour and ground gas intrusion</b></p> <p>Relevant North East Link sections must be designed and constructed to prevent ingress of vapours and gases associated with any construction that interfaces with landfill sites or contaminated areas.</p> <p>The SMP referenced in EPR CL1 must include requirements for assessment, monitoring and management of intrusive vapour including potentially toxic, flammable or explosive conditions in enclosed spaces or other impacts on human health and the environment. The plan must address vapour risks associated with excavation of impacted soils, extraction of impacted groundwater, open excavations and stockpiles and gases associated with landfills. This must include, where relevant:</p> <ul style="list-style-type: none"> <li>Securing of the excavation and stockpile area from the public and signage warning of open excavations</li> <li>Monitoring of vapours and odours while excavations are open, and stockpiles remain onsite</li> <li>Mitigation measures to prevent fugitive releases of vapours and gasses during construction.</li> </ul>	Design, construction	<p><b>Design</b></p> <p>Areas of known contamination identified during site investigations have been used to inform the design and the construction methodology prior to excavation works commencing. Further site investigations will be undertaken to inform Project design. As additional data becomes available additional reports will be reviewed and used to update management requirements for the spoil following the process presented in the Spoil Management Plan.</p> <p><b>Construction</b></p> <p>A construction SMP will be prepared addressing spoil management measures relevant to the sites impacted by contamination. This includes management of vapour and ground gas intrusion.</p> <p>Risk minimisation from vapour and ground gas intrusion will be addressed through the implementation of specific monitoring controls in areas where investigation works have identified these hazards as a concern. These measures will be captured in the WEMPs. With respect to management measures:</p> <ul style="list-style-type: none"> <li>Areas of contamination that may pose a vapour and ground gas intrusion risk will be identified in the WEMPs</li> <li>Specific controls that may be implemented during construction include: <ul style="list-style-type: none"> <li>Securing of excavation and stockpile areas from the public and signage warning of open excavations</li> <li>Monitoring of vapours and odours while excavations are open, and stockpiles remain onsite.</li> </ul> </li> </ul> <p>Odour risk and identification is managed in the Dust and Air Quality Management Plan whilst unidentified contamination related to odour is addressed in the Spoil Management Plan.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	CL5	<p><b>Manage chemicals, fuels and hazardous materials</b></p> <p>The CEMP and OEMP must include requirements for management of chemicals, fuels and hazardous materials including:</p> <ul style="list-style-type: none"> <li>Minimise chemical and fuel storage on site and store hazardous materials and dangerous goods in accordance with the relevant guidelines and requirements</li> <li>Comply with the Victorian WorkCover Authority and Australian Standard AS1940 Storage Handling of Flammable and Combustible Liquids and with reference to EPA Victoria Publication 1834 Civil construction, building and demolition guide and 1698 Liquid Storage and Handling Guidelines</li> <li>Develop and implement management measures for hazardous materials and dangerous substances, including: <ul style="list-style-type: none"> <li>Creating and maintaining a dangerous goods register</li> <li>Disposing of any hazardous materials, including asbestos, in accordance with regulations and relevant guidelines</li> <li>Implementing requirements for the installation of bunds and precautions to reduce the risk of spills</li> </ul> </li> <li>Contingency and emergency response procedures to handle fuel and chemical spills, including availability of on-site hydrocarbon spill kits.</li> </ul>	Design, construction, operation	<p><b>Design</b></p> <p>Design will consider siting of permanent chemical and fuel storage locations to minimise impacts on surrounding sensitive receivers and potential impacts to human health. Permanent chemical and fuel storage will be designed to comply with the Victorian WorkCover Authority and Australian Standard AS1940 Storage Handling of Flammable and Combustible Liquids and EPA Publication 1698 Liquid Storage and Handling Guidelines.</p> <p><b>Construction</b></p> <p>A CEMP will be prepared incorporating measures for management of chemicals and hazardous materials used during construction.</p> <p><b>Operation</b></p> <p>An OEMP will be prepared for the operation phase. A suitable work method procedure will be developed to respond to any fuel or chemical spills in compliance with the relevant work safety requirements.</p> <p>Permanent chemical and fuel storage will be designed and operated to comply with the Victorian WorkCover Authority and Australian Standard AS1940 Storage Handling of Flammable and Combustible Liquids and EPA Publication 1698 Liquid Storage and Handling Guidelines.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	CL6	<p><b>Minimise contamination risks during operation</b></p> <p>The OEMP must include requirements and methods for minimising contamination risks during operation and maintenance of North East Link including:</p> <ul style="list-style-type: none"> <li>Maintaining relevant controls and preventing impacts during operation from contaminated material, odour, vapour and gas</li> <li>Maintaining controls implemented as part of North East Link to make any known areas of contamination or hazardous material that were exposed during construction (notably through former landfills) safe for the public and the environment</li> <li>Mitigating impacts during sub-surface works in any identified areas of contamination or hazardous materials, e.g., drilling and excavation</li> <li>Implementing contingency measures, where required, to address any potential contamination, odour, vapour or gas impacts or incidents.</li> <li>Monitoring any potential mobilisation of contaminants towards ecological and recreational assets including the Yarra River and wetlands and must include a groundwater monitoring program, intervention trigger levels and mitigation actions.</li> </ul>	Operation	<p>An OEMP will be prepared for the operation phase. Any specific management measures for the operator to minimise contamination risks will be incorporated into the OEMP and relevant sub plans.</p> <p>Management measures during operation may include:</p> <ul style="list-style-type: none"> <li>Maintaining a register of contaminated sites to ensure that operations and maintenance activities do not impact on controls implemented during construction</li> <li>Monitoring of controls such as cover over areas of existing contamination or landfills</li> <li>Odour and vapour monitoring where required</li> <li>Monitoring of groundwater for mobilisation of contaminants to be included in the OEMP.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>7. Flora and Fauna (FF)</b>				
<p><i>Environment Protection and Biodiversity Conservation Act 1999</i></p> <p><i>Conservation, Forests and Lands Act 1987</i></p> <p><i>Flora and Fauna Guarantee Act 1988</i></p> <p><i>Planning and Environment Act 1987</i></p> <p><i>Water Act 1989</i></p> <p><i>Wildlife Act 1975</i></p> <p>State Environment Protection Policy (SEPP) Waters 2018 (Vic)</p> <p>Environment Reference Standard (Water)</p> <p>Guidelines for the removal, destruction or lopping of native vegetation, DELWP December 2017</p>	<b>FF1</b>	<p><b>Avoid and minimise impacts on fauna and flora</b></p> <p>The CEMP must include requirements and methods for avoiding, or where avoidance is not feasible minimising to the greatest extent reasonably possible, for:</p> <ul style="list-style-type: none"> <li>Managing fauna that may be displaced due to vegetation removal or encountered on site during construction works in compliance with the <i>Wildlife Act 1975</i> and in consultation with public land managers where relevant</li> <li>Complying with the <i>Fisheries Act 1995</i></li> <li>Undertaking pre-clearing surveys and inspections to confirm the on-site location of fauna immediately prior to habitat removal or, where relevant, works on waterways, and to assist fauna to safety as necessary</li> <li>Prepare a Kangaroo Management Plan for the project interface with Simpson Barracks and for the M80 interchange in consultation with DELWP</li> <li>Contingency and reporting procedures for the event that a listed threatened species is identified in order to mitigate any potential for significant impacts on the listed threatened species.</li> <li>Protection of all vegetation inside and adjacent to the Project area that is not required to be removed, provided that such measures should be limited to activities undertaken inside the Project boundary.</li> </ul> <p>Surveys, inspections and management actions must be undertaken by a qualified wildlife ecologist or aquatic ecologist with all necessary authorisations obtained prior to removal of fauna habitat.</p> <p>The CEMP must be prepared in consultation with relevant land managers.</p> <p>A copy of the flora and fauna sub plan(s) of the approved CEMP must be provided to relevant land managers and each relevant municipal Council.</p>	Construction	<p>A CEMP and Ecology Management Plan will be prepared that incorporates the requirements for managing and minimising construction ecological impacts for relevant areas of the Project. An Avoid and Minimise Statement will be prepared to justify removal of native vegetation. Implementing the CEMP is required to satisfy the statutory requirement under the Incorporated Document.</p> <p>The controls will be addressed through both the CEMP and Ecology Management Plan which will include:</p> <ul style="list-style-type: none"> <li>Undertaking pre-clearing surveys and inspections to confirm the on-site location of fauna immediately prior to habitat removal or, where relevant, works on waterways, and to assist fauna to safety as necessary</li> <li>A wildlife handler is to be on site during the removal of habitat trees</li> <li>Follow the Kangaroo Management Procedure for the Project Contractor interface with Simpson Barracks in consultation with DELWP</li> <li>Report a listed threatened species when identified</li> <li>Protection of native vegetation and listed species, including establishment of no-go zones</li> <li>Feeding and/or capture of native fauna or feral animals is not permitted</li> <li>Trenches, excavations, and other sources of potential entrapment are to be inspected for trapped fauna and quality/quantity of shelter/escape structures</li> <li>Detail the ecology management and mitigation measures, including protection measures to be implemented for flora and fauna</li> <li>Outlines the monitoring process for flora and fauna during construction</li> <li>Surveys, inspections, and management actions will be undertaken by a qualified wildlife ecologist or aquatic ecologist with all necessary authorisations obtained prior to removal of habitat.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	FF2	<p><b>Minimise and offset native vegetation removal</b></p> <p>Through detailed design, avoid, or where avoidance is not feasible, minimise to the greatest extent reasonably possible, the removal of native vegetation and fauna habitat and impacts on habitat connectivity, in particular in relation to <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth) or <i>Flora and Fauna Guarantee Act 1988</i> listed threatened species. This must include minimising removal of Matted Flax Lily, the locally endemic Studley Park Gum and the loss of potential foraging habitat for the Powerful Owl, Swift Parrot and Grey-headed Flying Fox. Key areas for minimisation efforts must include Simpson Barracks, Yarra Bend, Trinity Grammar wetlands, Banksia parkland, River Gum Walk Creek Bend Reserve and the Koonung Creek valley.</p> <p>The CEMP must include requirements for protection of native vegetation and listed species, including establishment of no-go zones to protect vegetation and habitat to be retained and Tree Protection Plan(s) as required by EPR AR2. No-go zones must also be established for:</p> <ul style="list-style-type: none"> <li>The Grey-headed Flying fox Campsite within the Yarra Bend Park</li> <li>Bolin Bolin Billabong</li> <li>The Plains Grassy Woodland community between Enterprise Drive and the M80 Ring Road in Bundoora</li> <li>The portion of 49 Greenaway Street, Bulleen (former Drive-in) heavily vegetated with trees along the Yarra River</li> <li>Surface impacts in the Banyule Flats and Warringal parklands and the Heide Museum of Modern Art.</li> </ul> <p>Every effort must be made to avoid ecological impacts in other locations that are known to provide high habitat value for significant fauna species.</p> <p>Where the removal of native vegetation is unavoidable the project must meet the offset requirements of the Guidelines for the removal, destruction or lopping of native vegetation, DELWP December 2017 except as otherwise agreed to by the Secretary to DELWP.</p> <p>Where appropriate for the landscape and project location, tree replacement (as required by EPR AR3) and landscaping is to use locally indigenous species (utilising seed collected from species within the Project boundary where appropriate and practical), which are suited to the landscape profile and setting being revegetated and seek to maximise habitat value and connectivity for native fauna. Where practicable and appropriate for the landscape and project location, best practice measures must be applied to retain and reinstate topsoil to support growing conditions for native species. Where topsoil cannot be retained or reused for North East Link, alternative opportunities for reuse must be explored.</p>	Design, construction	<p><b>Design</b></p> <p>A project wide arboriculture and ecological survey will inform constructability and design to prioritise trees and vegetation of high value to be retained. The findings and recommendations will be reviewed and assessed for each landscape design package. The design will endeavour to minimise native vegetation removal.</p> <p>Where native vegetation requires removal, the Project Contractor will meet the offset requirements of the Guidelines for the removal, destruction or lopping of native vegetation, DELWP December 2017 except as otherwise agreed to by the Secretary to DELWP.</p> <p>The Tree Removal Plan will be prepared and approved by the contractor. The NEL Project holds sufficient native vegetation credits to fulfill the requirements of the DELWP Guidelines of this package. Native vegetation removal will be included in the iterative Project wide Native Vegetation Removal Report to demonstrate sufficient offsets are held prior to works commencing.</p> <p><b>Construction</b></p> <p>The CEMP will address the construction approach to protecting these aspects.</p> <p>Where native vegetation requires removal, the Project Contractor will meet the offset requirements of the Guidelines for the removal, destruction or lopping of native vegetation, DELWP December 2017 except as otherwise agreed to by the Secretary to DELWP.</p> <p>'No Go' zones will be established for:</p> <ul style="list-style-type: none"> <li>The interface landscaping area along the Yarra River (Birrarrung) and Bolin Bolin Billabong area</li> <li>The portion of 49 Greenaway Street, Bulleen that is heavily vegetated with trees along the Yarra River (Birrarrung)</li> <li>Surface impacts in the Banyule Flats and Warringal parklands and the Heide Museum of Modern Art.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	FF3	<p><b>Avoid introduction or spread of weeds and pathogens</b></p> <p>The CEMP must include measures to avoid the spread or introduction of weeds and pathogens during construction, including vehicle and equipment hygiene.</p>	Construction	<p>A CEMP and Ecology Management Plan will be prepared by incorporating the requirements for managing weeds. Specific controls may include the following:</p> <ul style="list-style-type: none"> <li>Complete a Project Plant and Equipment Clean Down Declaration form for all earthmoving and mobile construction equipment</li> <li>Weed control program to remove declared noxious weeds prior to any ground disturbing activities</li> <li>Signage shall be used where necessary to communicate the weed status of an area or topsoil stockpile and the hygiene requirements</li> <li>The Project Contractor will endeavour to ensure that all soil brought to the site shall be free of noxious weeds and soil pathogens.</li> </ul> <p>The Project will comply with the <i>Catchment and Land Protection Act 1994</i>.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	FF4	<p><b>Protect aquatic habitat</b></p> <p>In consultation with public land managers and Melbourne Water where relevant, design, locate and construct structures to minimise short- and long-term adverse impacts on riparian, riverbed and aquatic habitat in waterways and wetlands, including billabongs. The CEMP must contain and require implementation of measures to minimise adverse impacts from construction activities on riparian, riverbed and aquatic habitat and aquatic fauna connectivity.</p>	Design, construction	<p><b>Design</b></p> <p>A CEMP will be prepared by the Project Contractor incorporating the requirements for managing construction impacts to minimise adverse impacts from construction activities on riparian, riverbed and aquatic habitat and aquatic fauna connectivity. Implementing the CEMP will satisfy the statutory requirement under the Incorporated Document.</p> <p>Additional site investigation such as arboriculture and ecological surveys will be required to inform the design along with assessments of existing ecological studies relevant to the Project.</p> <p>Design measures have been developed to minimise adverse impacts as part of the drainage design solution.</p> <p>A few key design outcomes include:</p> <ul style="list-style-type: none"> <li>• Daylighting of a portion of the Banyule Creek along with water retention areas and biodiversity basins</li> <li>• A Cultural Precinct wetland near the Manningham interchange</li> <li>• The Yarra Link green bridge at the Bulleen Road and Eastern Freeway interchange which connects the riparian landscape from east to west</li> <li>• Providing surface water runoff over the existing underground Koonung Creek alignment.</li> </ul> <p>Consultation has occurred with the public land managers and Melbourne Water where relevant, in preparation of the UDLP and consultation will be ongoing through the design development which will include meeting and workshops to inform the stakeholders of the design progression and determine and address any concerns or requirements these stakeholders may have as well as alignment on the approvals required.</p> <p>Typical anticipated Design Development Outputs for Landscaping:</p> <ul style="list-style-type: none"> <li>• Arborist and ecology surveys</li> <li>• Planting removal and replacement outcomes</li> <li>• Tree protection zones</li> <li>• Existing and proposed canopy coverage</li> <li>• Environmental responses</li> <li>• Refinement of planting densities</li> <li>• Tree root extents</li> <li>• Screen planting optimisation</li> <li>• Furniture</li> <li>• Refinement of finishes</li> <li>• Handrail finish</li> <li>• Retaining wall locations.</li> </ul> <p><b>Construction</b></p> <p>The CEMP will outline the measures to minimise adverse impacts from construction activities on riparian, riverbed and aquatic habitat and aquatic fauna connectivity.</p> <p>Approval would be sought where required from Melbourne Water for works in a waterway.</p> <p>Temporary construction related works that could affect waterways and aquatic will be delivered in accordance with relevant measures identified in the CEMP.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	FF5	<p><b>Obtain <i>Flora and Fauna Guarantee Act 1988</i> permits</b></p> <p>Prior to commencement of relevant works, a permit(s) must be obtained to take and destroy flora species protected under the <i>Flora and Fauna Guarantee Act 1988</i>.</p>	Construction	<p>In accordance with submitted CEMP and relevant WEMPs, the Project Contractor will obtain any necessary approvals and permits prior to construction activities that may destroy flora species protected under the <i>Flora and Fauna Guarantee Act 1988</i>.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	FF6	<p><b>Implement a Groundwater Dependent Ecosystem Monitoring and Mitigation Plan</b></p> <p>Prepare and implement a Groundwater Dependent Ecosystem Monitoring and Mitigation Plan with no objection from the relevant water authorities. * The Groundwater Dependent Ecosystem Monitoring and Mitigation Plan must be informed by the groundwater modelling and groundwater monitoring required by EPR GW1 and EPR GW2, and must include (but not be limited to):</p> <ul style="list-style-type: none"> <li>• Identification of Groundwater Dependent Ecosystems (GDEs) predicted to be impacted prior to relevant construction commencing, including Bolin Bolin Billabong if relevant.</li> <li>• Details of the monitoring procedures and program for each relevant GDEs including monitoring periods appropriate to each GDE</li> <li>• Specific procedures to monitor groundwater levels at GDEs predicted to be impacted including monitoring as close as possible to the GDE (considering ecological and access constraints) and for aquatic GDEs monitoring the surface water levels and quality as appropriate, including Bolin Bolin Billabong. These procedures should include: <ul style="list-style-type: none"> <li>– Groundwater monitoring of the alluvium by specific monitoring bores as close as possible to billabongs must be undertaken before, during and after construction.</li> <li>– Monitoring of water levels and water quality in billabongs must be undertaken before, during and after construction.</li> <li>– Estimation of water balance input and output volumes to and from billabongs must be undertaken before, during and after construction, based on analysis of the monitoring of water levels in the billabong and surrounding groundwater monitoring bores</li> </ul> </li> <li>• Identification of relevant monitoring and management programs by Melbourne Water or other authorities and how these are referenced in the Groundwater Dependent Ecosystem Monitoring and Mitigation Plan</li> <li>• Measures to mitigate monitored changes in water levels and quality that could impact the billabongs or other GDEs, which take into account the natural variability</li> <li>• Where the survival of Groundwater Dependent Large Trees not requiring removal is predicted to be affected by groundwater drawdown during construction or operation based on groundwater modelling outputs, include measures to maintain the health of large trees</li> <li>• In relation to any trees unlikely to survive during operation as a consequence of groundwater drawdown, processes for offsets to be obtained in accordance with EPR FF2</li> <li>• The process for review of the Plan, including how the groundwater modelling and monitoring under EPR GW1 and EPR GW2 will be considered and the GDE monitoring program and periods subsequently reviewed.</li> </ul> <p>All reasonable endeavours must be made to reach a position of no objection, provided the stakeholder responds within a reasonable timeframe.</p>	Construction, operation	<p><b>Construction</b></p> <p>The Project Contractor will prepare a Groundwater Management Plan which has the objective to avoid or minimise adverse effects on groundwater, groundwater related receptors including groundwater dependent ecosystems. The Groundwater Dependent Ecosystem (GDE) Monitoring and Mitigation Plan will be incorporated into the Groundwater Management Plan.</p> <p>The plan includes mitigation controls to address impact on groundwater dependent ecosystems, including:</p> <ul style="list-style-type: none"> <li>• Pre-condition assessment report to be carried out by a suitably qualified person, and ongoing visual monitoring of Studley Park Gums and Large Trees. The assessment, monitoring and subsequent mitigations to be carried out in accordance with the Studley Park Gum Groundwater Dependent Ecosystem Monitoring and Mitigation Strategy, where applicable</li> <li>• Supplemental watering of the billabong by topping up the wetland with inputs from other suitable sources (considering seasonal variation and stakeholder requirements)</li> <li>• Water or irrigate stressed trees should they be adversely affected by construction activities. This watering would be designed and implemented by a suitably qualified arborist subject to agreement with the IEA</li> <li>• Design permanent structures to ensure drawdown risk does not cause adverse effects on groundwater dependent ecosystems.</li> </ul> <p><b>Operation</b></p> <p>Operational management and monitoring of GDEs will be captured in the OEMP. Management and monitoring measures to be implemented during operations include but are not limited to:</p> <ul style="list-style-type: none"> <li>• A Groundwater Monitoring Program to be developed and implemented in accordance with the OEMP requirements</li> <li>• Monitoring of the health of large groundwater dependant trees</li> <li>• Plans for maintaining the health of large groundwater dependant large trees that are predicted to be impacted by groundwater drawdown.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	FF7	<p><b>Implement a salvage and translocation plan for Matted Flax-lily</b></p> <p>Where direct impacts on Matted Flax-lily occur, a salvage and translocation plan must be developed and implemented to the satisfaction of the Department of Environment, Land, Water and Planning and the Commonwealth Department of Environment and Energy, prior to the commencement of relevant works.</p>	Construction, operation	<p>NELP is responsible for implementation of the salvage and translocation plan for Matted Flax-lily, in accordance with the EPBC Act approval conditions.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	FF8	<p><b>Minimise intense noise and vibration impacts on Australian Grayling</b></p> <p>The CEMP must include and require implementation of reasonable measures to avoid and mitigate intense noise and vibration impacts in or near the Yarra River (e.g., from activities such as pile driving and similar activities). This must include, to the extent practicable:</p> <ul style="list-style-type: none"> <li>• Selection of work methods to minimise noise and vibration</li> <li>• Avoiding activities that may generate intense noise and vibration and impact on the Australian Grayling during critical migration or breeding periods (March to June, September to November) as defined within the National Recovery Plan for the Australian Grayling <i>Prototroctes maraena</i> (Backhouse, G, Jackson, J &amp; O'Connor, J 2008)</li> <li>• Management and monitoring of noise and vibration in accordance with the CNVMP (EPR NV4).</li> </ul>	Construction	<p>The Project Contractor will prepare a Construction Noise and Vibration Management Plan (CNVMP) that outlines mitigation measures to reduce noise and vibration impacts on the Australian Grayling. The Project Contractor's design has reduced the size of, as well as moved the cut and cover box further away from the Yarra River (Birraring) in Manningham, which results in reduced impact on the Australian Grayling.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	FF9	<p><b>Protect fauna habitat values in existing waterbodies that are modified for drainage purposes</b></p> <p>Where existing waterbodies within or near the Project boundary are to be modified for drainage purposes (for example Simpson's Lake, billabongs, and the southernmost waterbody in the Freeway golf course), the CEMP must include and require implementation of measures to minimise impacts on waterbirds and other fauna that use the wetlands including:</p> <ul style="list-style-type: none"> <li>• Retain dead and alive standing trees and other vegetation in and surrounding the waterbody</li> <li>• As far as practicable, undertake activities outside the typical nesting period for waterbirds (typically Sept to Jan)</li> <li>• Minimise the construction period to the extent practicable and refill the wetlands post construction if they have been drained</li> <li>• Use of gross pollutant traps and water quality treatment measures to the requirements of the relevant waterway manager.</li> </ul>	Construction	<p>The Project will require modifications to existing waterways. Appropriate design measures have been developed to minimise adverse impacts as part of the drainage design solution.</p> <p>The implementation of new landscapes or existing landscape upgrades will firstly retain existing vegetation (including trees, logs, and large branches) as part of habitat creation and restoration measures.</p> <p>Temporary construction related works that could affect waterways and fauna habitat will be delivered in accordance with relevant measures identified in the CEMP.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	FF10	<p><b>Studley Park Gum Mitigation</b></p> <p>To mitigate impacts on the Studley Park Gum, a Studley Park Gum Management Framework must be developed, and corresponding management plan must be developed and implemented in consultation with DELWP.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The State has developed a Studley Park Gum Management Framework that will be implemented on the Project.</p> <p>The preliminary design phase will address the mitigation impacts as outlined in the Studley Park Gums Management Framework.</p> <p>The additional information obtained from the arborist and ecology surveys will feed into the design outcomes.</p> <p><b>Construction</b></p> <p>Suitable construction procedures will be addressed to protect existing vegetation during construction as part of the CEMP.</p> <p><b>Operations</b></p> <p>Ongoing monitoring requirements for the Studley Park Gum Management Framework will be included in the OEMP.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>8. Ground Movement (GM)</b>				
N/A	GM1	<p><b>Design and construction to be informed by a geotechnical model and assessment</b></p> <p>Develop and maintain geological and groundwater model(s) (as per EPR GW1) to inform tunnel and trench design and the construction techniques to be applied for the various geological and groundwater conditions. The model(s) are to:</p> <ul style="list-style-type: none"> <li>Identify sensitive receptors that may be impacted by ground movement</li> <li>Inform monitoring of ground movement and ground water levels prior to construction to identify pre-existing movement</li> <li>Inform tunnel design and the construction techniques to be applied for the various geological and groundwater conditions</li> <li>Assess potential drawdown and identify trigger levels for implementing additional mitigation measures to minimise potential primary consolidation settlement</li> <li>Assess potential ground movement from excavation and identify trigger levels for implementing additional mitigation measures to minimise potential ground movement.</li> </ul>	Design, construction	<p><b>Design</b></p> <p>The design is informed by a geotechnical and groundwater model and assessment. The Project Contractor will complete further ground investigative works that will be used to update the model throughout preliminary design.</p> <p><b>Construction</b></p> <p>Suitable construction methodologies and controls to minimise ground movement impacts will be detailed in the Project Contractor's Ground Movement Management Plan.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	GM2	<p><b>Implement a Ground Movement Plan to manage ground movement impacts</b></p> <p>Develop and implement a Ground Movement Plan(s). The Ground Movement Plan must be informed by EPR GM1 and EPR GW1 (predictive model) and:</p> <ul style="list-style-type: none"> <li>Address the location of structures/assets which may be susceptible to damage by ground movement</li> <li>Identify baseline ground movement monitoring prior to construction. A baseline monitoring report is to be compiled summarising the results of the baseline surveys undertaken and included in the plan</li> <li>Identify appropriate ground movement impact acceptability criteria</li> <li>Identify appropriate mitigation measures should the geotechnical model (EPR GM1), predictive groundwater model (EPR GW1), or subsequent monitoring program indicate acceptability criteria may not be met</li> <li>Establish ground movement monitoring requirements for the area surrounding proposed project works to measure ground movement consistency with the anticipated ground movement in the predictive model.</li> </ul>	Design, construction	<p><b>Design</b></p> <p>The design of the planned excavations will consider the potential ground movement comment with investigations undertaken to inform the design. A Ground Movement Management Plan will be developed (informed by the predictive model) and will be implemented during the construction phase.</p> <p><b>Construction</b></p> <p>A Ground Movement Management Plan will be developed (informed by the predictive model) and will be implemented during the construction phase.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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	<b>GM3</b>	<p><b>Carry out Condition surveys for potentially affected property and infrastructure</b></p> <p>Conduct condition survey(s) of property and infrastructure predicted to be affected by ground movement based on the results of the geological and groundwater model (EPR GM1) or, where a property owner reasonably expects to be potentially affected and has requested a pre-construction condition survey. Develop and maintain a database of pre-construction and as-built condition information for each potentially affected structure identified as being in an area susceptible to damage (see EPR GM1) or where a property owner has requested a pre-construction condition survey, specifically including:</p> <ul style="list-style-type: none"> <li>• A list of identified structures/assets which may be susceptible to damage resulting from ground movement resulting from project works</li> <li>• Results of pre-construction condition surveys of structures, pavements, significant utilities and parklands to establish baseline conditions and potential vulnerabilities</li> <li>• Records of consultation with land owners in relation to the condition surveys</li> <li>• Post-construction stage condition surveys conducted, where required, to ascertain if any damage has been caused as a result of project works.</li> </ul> <p>Pre- and post-condition assessments must be proactively shared with the property owner.</p> <p>All stakeholder engagement activities must be undertaken in accordance with the Communications and Community Engagement Management Plan (see EPR SC2).</p>	Construction	<p>The Project Contractor will carry out condition surveys for potentially affected property and infrastructure as identified in the geological and groundwater model, or where the property owner reasonably expects to be potentially affected and has requested a pre-construction condition survey.</p> <p>A Ground Movement Management Plan will be developed (informed by the predictive model) and will be implemented during the construction phase.</p> <p>Post-construction stage condition surveys will be conducted, where required, to ascertain if any damage has been caused because of Project works.</p> <p>Pre- and post-condition assessments will be proactively shared with the property owner.</p> <p>All stakeholder engagement activities will be undertaken in accordance with the Communications and Community Engagement Management Plan (see SC3).</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	<b>GM4</b>	<p><b>Rectify damage to properties and assets impacted by ground movement or settlement</b></p> <p>For properties and assets (including natural landscapes and parklands) damaged by ground movement caused by the project, undertake necessary repair works or other actions as agreed with the relevant property or asset owner (or land manager). For places listed on the Victorian Heritage Register, consultation with Heritage Victoria must be undertaken.</p> <p>Establish an independent mediation process for the assessment of claims for property and asset damage that cannot be agreed between the Project and the property or asset owner.</p>	Construction	<p>The Project Contractor will rectify any damage caused by Project construction activity to on site assets or nearby properties and assets.</p> <p>If any places listed on the Victorian Heritage Register are impacted, consultation with Heritage Victoria will be undertaken.</p> <p>An independent mediation process will be established for the assessment of claims for property and asset damage that cannot be agreed between the Project Contractor and the property or asset owner.</p> <p>All stakeholder engagement activities will be undertaken in accordance with the Communications and Community Engagement Management Plan (see SC3).</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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<b>9. Groundwater (GW)</b>				
<p>Water Act 1989</p> <p>Water Industry Regulations 2006 (Vic)</p> <p>Environment Protection Act 2017</p> <p>Environment Protection Regulations 2021</p> <p>State Environment Protection Policy (SEPP) Waters 2018</p> <p>Environment Reference Standard (Land, Water)</p> <p>VicRoads Integrated Water Management Guidelines (June 2013)</p> <p>EPA Publications:</p> <ul style="list-style-type: none"> <li>1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</li> <li>275 (1991) Construction techniques for sediment pollution control</li> </ul>	<b>GW1</b>	<p><b>Design and construction to be informed by a groundwater model</b></p> <p>Develop a predictive and numerical groundwater model in consultation with EPA Victoria, informed by field investigations, to predict changes in groundwater levels and flow and quality, as they are affected by construction, and develop mitigation strategies, as per EPR GM1. The groundwater model must be of a standard that is at least comparable to the modelling documented within the Report on Additional Groundwater Modelling prepared by GHD and dated July 2019 and must be updated to take account of any changes to construction techniques or operational design features, and additional monitoring data from EPR GW2.</p> <p>The groundwater model must be developed with a process that involves independent review by the Independent Environmental Auditor consistent with the Australian Groundwater Modelling Guidelines (June 2012).</p>	Design, construction	<p><b>Design</b></p> <p>The design was informed by a geotechnical and groundwater model and assessment. The Project Contractor will complete further ground investigative work that will be used to update the model throughout detailed design.</p> <p>A predictive and numerical groundwater model will be further developed in consultation with EPA Victoria, informed by field investigations, to predict changes in groundwater levels and flow and quality, as they are affected by construction, and develop mitigation strategies. The groundwater model will be of a standard that is at least comparable to the modelling documented within the Report on Additional Groundwater Modelling prepared by GHD and dated July 2019 and will be updated to take account of any changes to construction techniques or operational design features, and additional monitoring data from EPR GW2.</p> <p>The groundwater model will be developed with a process that involves independent review by the Independent Environmental Auditor consistent with the Australian Groundwater Modelling Guidelines (June 2012).</p> <p><b>Construction</b></p> <p>The CEMP will be updated to take account of any changes to construction techniques or operational design features, and additional monitoring data from EPR GW2.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	<b>GW2</b>	<p><b>Monitor groundwater</b></p> <p>Develop and implement a pre-construction, and construction groundwater monitoring program to:</p> <ul style="list-style-type: none"> <li>Establish baseline water level and quality conditions throughout the study area, including the delineation (to the extent practicable) of those portions of existing contaminant plume(s) that may be impacted by the project</li> <li>Calibrate the predictive model prior to commencement of construction, manage construction activities, and verify the model predictions</li> <li>Assess the adequacy of proposed design and construction methods, and where required, identify and implement any additional measures required to mitigate impacts from changes in groundwater levels, flow and quality.</li> <li>A post-construction groundwater monitoring program must be developed and implemented to:</li> <li>Confirm the acceptability of resultant water quality and water level recovery (and potential mounding) as predicted by the numerical groundwater model. Acceptability is to be assessed with consideration to the Groundwater Dependent Ecosystem Monitoring and Mitigation Plan (as required by EPR FF6) and other identified environmental values of groundwater</li> <li>Confirm the effectiveness of applied measures as identified in the Groundwater Management Plan (refer EPR GW4) and if required, identify and implement contingency measures to restore groundwater to an acceptable level.</li> </ul> <p>The duration of post-construction monitoring must be a minimum of two years or until acceptable restoration of groundwater and a relatively stable hydrogeological regime, taking into account prevailing climatic conditions and natural variability, has been confirmed by the Independent Environmental Auditor, in consultation with EPA Victoria and Melbourne Water. The pre-construction, construction and post-construction monitoring program(s) must be developed in consultation with EPA Victoria and Melbourne Water and be consistent with EPA Victoria Publication 668 Hydrogeological assessment groundwater quality guidelines, EPA Victoria Publication 669 Groundwater Sampling Guidelines, and the State Environment Protection Policy (Waters).</p>	Design, construction, operation	<p><b>Design</b></p> <p>The design will address any groundwater potential impacts and suitable mitigation outcomes developed.</p> <p><b>Construction</b></p> <p>The Project Contractor will develop a pre-construction and construction groundwater monitoring program that is included within the CEMP and Groundwater Management Plan. The monitoring program includes establishing baseline water level and quality conditions throughout the study area, including the identification (to the extent practicable) of existing contaminant plumes that may be impacted by the Project to the extent required to manage groundwater impacts to eliminate or minimise so far as reasonably practicable.</p> <p>Monitoring results will be used to calibrate the predictive model prior to commencement of construction, to manage construction activities, and verify the model predictions.</p> <p>The pre-construction, construction and post-construction monitoring program(s) will be developed in consultation with EPA Victoria and Melbourne Water and be consistent with EPA Victoria Publication 668 Hydrogeological assessment groundwater quality guidelines, EPA Victoria Publication 669 Groundwater Sampling Guidelines, and the State Environment Protection Policy (Waters).</p> <p>This is guided by Australian Legislation and determination of the project proponent in conjunction to consultation with EPA and water authority (Melbourne Water).</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
				<p><b>Operations</b></p> <p>Post construction groundwater monitoring shall be conducted for a minimum period of two years post construction or until acceptable restoration of groundwater and stability of the hydrogeological regime. The requirements for operations phase groundwater monitoring will be included in the OEMP. Post construction management and monitoring will include the following but is not limited to:</p> <ul style="list-style-type: none"> <li>Monitoring of groundwater levels to ensure groundwater levels and quality return to acceptable levels as predicted by the numerical groundwater model</li> <li>Mitigation measures to restore groundwater levels should groundwater not return to acceptable levels.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
<ul style="list-style-type: none"> <li>668 (2006) Hydrogeological assessment groundwater quality) guidelines</li> <li>669 (2000) Groundwater Sampling Guidelines.</li> <li>Ministerial Guidelines for Groundwater Licensing and the Protection of High Value Groundwater Dependent Ecosystems (2015)</li> </ul> <p>Australian groundwater modelling guidelines (Barnett et al. 2012)</p>	<b>GW3</b>	<p><b>Minimise changes to groundwater levels through tunnel and trench drainage design and construction methods</b></p> <p>Design long term tunnel and trench drainage and adopt construction methods which minimise changes to groundwater levels during construction and operation to manage, mitigate and/or minimise to the extent practicable:</p> <ul style="list-style-type: none"> <li>Requirements for groundwater management and disposal</li> <li>Mobilisation of contaminated groundwater</li> <li>Dewatering and potential impacts of acid sulfate soils, including both unconsolidated sediments and lithified sedimentary rock</li> <li>Potential impacts on waterways and potential groundwater dependent ecosystems, including terrestrial ecosystems</li> <li>Any other adverse impacts of groundwater level changes such as subsidence.</li> </ul> <p>Design and implement engineering control measures and/or ground treatment to limit to the extent practicable groundwater inflow and groundwater drawdown during excavation, construction and operation of tunnels and trenches, cross passages and subsurface excavations.</p> <p>The Groundwater Management Plan (as required by EPR GW4) must contain measures and/or controls to minimise groundwater inflow during construction to excavations and groundwater drawdown, including contingency measures should monitoring indicate adverse impacts are occurring. These must include measures to:</p> <ul style="list-style-type: none"> <li>Minimise to the extent practicable reduction or loss of groundwater discharge to waterways or loss of water availability for terrestrial ecosystems</li> <li>Manage, mitigate and minimise the oxidation of acid sulfate soil materials and acidification of groundwater</li> <li>Manage, mitigate and minimise any movement of contamination that is identified</li> <li>Manage, mitigate and minimise impacts on environmental values and risk of vapour intrusion</li> <li>Ensure that groundwater seepage is collected, treated and disposed during construction in accordance with the <i>Environment Protection Act 2017</i> waste management hierarchy and EPA Victoria requirements. Obtain a trade waste agreement from the relevant water authority where disposal to sewer is required or approval from EPA and the relevant water authority (as required) if discharge to waterways is determined to be appropriate.</li> </ul>	Design, construction	<p><b>Design</b></p> <p>The Project Contractor's design is informed by a geotechnical and groundwater model and assessment. The Project Contractor will complete further ground investigative work that will be used to update the model throughout detailed design to ensure changes in groundwater levels are minimised.</p> <p><b>Construction</b></p> <p>The Project Contractor will develop and will implement a Groundwater Management Plan that includes requirements to minimise changes to groundwater levels during construction.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	GW4	<p><b>Implement a Groundwater Management Plan to Protect groundwater quality and manage groundwater interception</b></p> <p>A Groundwater Management Plan must be developed in consultation with EPA Victoria and Melbourne Water and implemented to protect groundwater quality and manage interception of groundwater including documenting the measures required to achieve EPR GW2 and EPR GW3. The Groundwater Management Plan must be informed by the groundwater modelling required by EPR GW1 and updated where required in response to modelling results, new information resulting from the monitoring programs required by GW2 and assessment of the adequacy or effectiveness of controls.</p> <p>The Groundwater Management Plan must include requirements and construction methods to protect groundwater quality including where appropriate, but not limited to:</p> <ul style="list-style-type: none"> <li>• Selection and use of sealing products, caulking products, lubricating products and chemical grouts during construction that will not diminish the groundwater quality</li> <li>• Selection and use of fluids for artificial recharge activities that will not diminish the groundwater quality</li> <li>• Requirements to ensure compatibility of construction material with groundwater quality to provide long term durability for infrastructure design life</li> <li>• Design and development of drainage infrastructure that minimises clogging and maintenance risks from dissolved constituents in groundwater precipitating out of solution</li> <li>• Measures to assess, remove and dispose of contaminated groundwater and impacted soils associated with excavation and construction</li> <li>• Reinjection borefields for hydraulic control of drawdowns (or contaminated groundwater plumes)</li> <li>• Remedial grouting.</li> </ul> <p>The Groundwater Management Plan must include requirements and methods for management of groundwater interception during construction including where appropriate, but not limited to:</p> <ul style="list-style-type: none"> <li>• Identification, treatment, disposal and handling of contaminated seepage water and/or slurries including vapours in accordance with relevant legislation and guidelines</li> <li>• Assessment of barrier/damming effects</li> <li>• Subsidence management</li> <li>• Dewatering and potential impacts on acid sulfate soils, including both unconsolidated sediments and lithified sedimentary rock</li> <li>• Protection of waterways and potential groundwater dependent ecosystems</li> <li>• Management of unexpected, contaminated groundwater e.g., using treatments, hydraulic controls, grouting and exclusion methods</li> <li>• Management of possible impact to groundwater monitoring and management by third parties of existing contamination plumes</li> <li>• Contingency actions when interventions are required.</li> </ul> <p>The Groundwater Management Plan must also include a review to confirm the status of potential use of extraction bores within the estimated construction drawdown area. Where required, measures must be developed and implemented, to the satisfaction of Southern Rural Water, to maintain water supply to identified, impacted groundwater users.</p>	Design, construction	<p><b>Design</b></p> <p>The design will address any groundwater potential impacts and suitable mitigation outcomes will developed.</p> <p>The Groundwater Management Plan will include controls to manage loss of groundwater assets, including:</p> <ul style="list-style-type: none"> <li>• Use materials that will be incorporated into the permanent works that are durable and do not diminish the groundwater quality</li> <li>• Design and develop drainage infrastructure that minimises clogging and maintenance risks from dissolved constituents in groundwater precipitating out of solution</li> <li>• Controls to manage seepage and drawdown and related potential impacts including permanent design to minimise groundwater drawdown.</li> </ul> <p><b>Construction</b></p> <p>The Project Contractor will develop and implement a Groundwater Management Plan that includes requirements to protect groundwater quality and to manage groundwater interception.</p> <p>The plan will be developed in consultation with EPA Victoria and Melbourne Water and will be implemented to protect groundwater quality and manage interception of groundwater including documenting the measures required to achieve EPR GW2 and EPR GW3.</p> <p>The Groundwater Management Plan will be informed by the groundwater modelling required by EPR GW1 and updated where required in response to modelling results, new information resulting from the monitoring programs required by GW2 and assessment of the adequacy or effectiveness of controls.</p> <p>These controls include:</p> <ul style="list-style-type: none"> <li>• Controls to manage groundwater contamination, including the using Material Safety Data Sheets for all chemicals brought to the site, controls on storing hazardous substances, the availability of spill kits, staff training, controls on refuelling and remediation at Yallambie service</li> <li>• Controls to manage loss of groundwater assets, including controls on the use of sealing products, model and monitor groundwater levels and trigger levels to ensure groundwater assets are not depleted and recharging groundwater assets where required</li> <li>• Controls to manage contamination plume movement, including a monitoring regime to track groundwater plume movement</li> <li>• Controls to manage seepage and drawdown and related potential impacts, including the TBM operating requirements and construction methods requirements.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	GW5	<p><b>Manage groundwater during operation</b></p> <p>Prepare as part of the OEMP and implement measures for management, monitoring, reuse where possible and disposal of groundwater inflows during operation that comply with relevant legislation and guidelines (and include provisions of EPR FF6 where relevant), including but not limited to:</p> <ul style="list-style-type: none"> <li>State Environment Protection Policy (Waters)</li> <li>Environment Reference Standard (Land)</li> <li>Environment Protection Regulations 2021</li> <li>Water Act 1989 and Water Industry Regulations 2006</li> <li>Occupational Health and Safety Act 2004 and Occupational Health and Safety Regulations 2017.</li> </ul> <p>The OEMP must include contingency measures and emergency response plans if unexpected groundwater contamination is encountered and requires disposal.</p> <p>A trade waste agreement from the relevant water authority must be obtained in accordance with regulatory requirements, where disposal to sewer is proposed. Approval from EPA and the relevant water authority (as required) must be obtained in accordance with regulatory requirements, where discharge to waterways is proposed.</p>	Operation	<p>An Operations Environmental Management Plan (OEMP) will be prepared (for the operation phase) and include specific management measures to manage groundwater. Prior to the commencement of any construction activities that have the potential to impact groundwater the Tunnels Project must have input from EPA and relevant water authority.</p> <p>Groundwater management measures implemented during operations will include but not be limited to:</p> <ul style="list-style-type: none"> <li>Capture, treatment, and disposal of groundwater via sumps, water treatment facilities and appropriate discharge or reuse opportunities</li> <li>Contingency measures if unexpected groundwater contamination is identified and measures to appropriately contain treat and dispose of this water</li> <li>Requirements for monitoring of trade waste discharges as outlined in the relevant Trade Waste Agreement including monthly water quality monitoring and flow meter readings</li> <li>Approval from EPA and the relevant water authority (as required) will be obtained in accordance with regulatory requirements, where discharge to waterways is proposed.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 10. Historical Heritage (HH)

<p><i>Heritage Act 2017</i></p> <p>Guidelines for Investigating Historical Archaeological Artefacts and Sites, Heritage Victoria 2014</p>	HH1	<p><b>Design and construct to minimise impacts on heritage</b></p> <p>Undertake detailed design of the permanent and temporary works to minimise impacts to the greatest extent practicable on the cultural heritage values of heritage places in consultation with Heritage Victoria and/or local councils (as applicable).</p> <p>Prior to commencement of works with capacity to affect heritage places, structures or features, directly or indirectly, develop and implement in consultation with the relevant heritage authority:</p> <ul style="list-style-type: none"> <li>Physical protection measures for potentially affected heritage places, structures or features as appropriate</li> <li>Where required, a methodology for any required dismantling, storage or reinstatement of heritage fabric (with reference to the ICOMOS Burra Charter 2013) and works to ensure an appropriate setting if relocation is required.</li> </ul>	Design, construction	<p><b>Design and Construction</b></p> <p>The design has considered heritage places within the Project footprint.</p> <p>The landscape plans have shown the relevant impacted heritage areas and provided a design to respond to minimising impacts on these areas.</p> <p>The design will be developed further to minimise impacts to the Manningham Planning Scheme Heritage Overlay 24 River Red Gum. This will be subject to further investigation as per the Tree Removal and Canopy Replacement Plan. The design retains the existing River Red Gum tree.</p> <p>Although the design and construction does not propose impacts to registered heritage places, consultation with Heritage Victoria will be ongoing throughout the Project.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	HH2	<p><b>Implement an Archaeological Management Plan to avoid and minimise impacts on historic archaeological sites and values</b></p> <p>Develop and implement an Archaeological Management Plan in consultation with Heritage Victoria detailing measures to avoid, minimise, mitigate and manage disturbance of archaeological sites and values affected by the project. Undertake investigations in accordance with the Guidelines for Investigating Historical Archaeological Artefacts and Sites, Heritage Victoria 2015 and to the satisfaction of the Executive Director, Heritage Victoria.</p> <p>The Archaeological Management Plan must include:</p> <ul style="list-style-type: none"> <li>Requirements for background historical research, excavation methodology, research design, reporting and artefact management, artefact conservation, and analysis</li> <li>Protocols for managing previously unidentified historical archaeological sites discovered during the works.</li> </ul>	Construction	<p>The Project Contractor will develop and implement an Archaeological Management Plan (AMP) in consultation with Heritage Victoria detailing measures to avoid, minimise, mitigate and manage disturbance of archaeological sites and values affected by the Project.</p> <p>The Project Contractor will also undertake investigations in accordance with the Guidelines for Investigating Historical Archaeological Artefacts and Sites, Heritage Victoria 2015 and to the satisfaction of the Executive Director, Heritage Victoria.</p> <p>The Archaeological Management Plan will include:</p> <ul style="list-style-type: none"> <li>Requirements for background historical research, excavation methodology, research design, reporting and artefact management, artefact conservation, and analysis</li> <li>Protocols for managing previously unidentified historical archaeological sites discovered during the works.</li> </ul> <p>This AMP will be referenced in the Projects CEMP &amp; WEMP with suitable mitigation measures.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	HH3	<p><b>Monitor condition of heritage sites</b></p> <p>Undertake pre-construction and post-construction condition survey(s) in accordance with EPR GM3 for heritage places at risk of impact from settlement and structural integrity disturbance as a result of the project. Measures to manage and monitor potential vibration impacts on heritage places during construction must be implemented in accordance with the Construction Noise and Vibration Management Plan required by EPR NV4 and Groundwater Management Plan required by EPR GW4. Report the results of monitoring for heritage places to the Executive Director, Heritage Victoria and take remedial action, if required, to the satisfaction of the Executive Director, Heritage Victoria.</p>	Construction	<p>If Archaeological places are proposed to be impacted during the works, the Archaeological Management Plan includes several controls to monitor condition of heritage sites, including:</p> <ul style="list-style-type: none"> <li>Undertake pre and post condition surveys of heritage places likely to be impacted by works</li> <li>Heritage Advisor to undertake inspections of areas suspected of potential archaeological remnants</li> <li>Implement measures to manage potential vibration impacts from the works in accordance with the Construction Noise and Vibration Management Plan</li> <li>Reporting the results of monitoring to Heritage Victoria, and take remedial action, if required, to the satisfaction of the Executive Director, Heritage Victoria.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	HH4	<p><b>Undertake archival photographic recording</b></p> <p>Prior to commencement of relevant works, undertake archival photographic recording of all heritage places (including trees) and their settings, demolished or modified by the works in accordance with Heritage Victoria's specification for the archival photographic recording of heritage places or alternative applicable Heritage Victoria guidelines as updated, to the satisfaction of the Executive Director, Heritage Victoria.</p>	Construction	<p>The Project Contractor will undertake pre and post condition surveys including archival photographic recording of heritage places likely to be impacted by works.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	HH5	<p><b>Minimise impacts on heritage trees</b></p> <p>Comply with any requirements of Heritage Victoria if the trees that are to be impacted by the project are listed on the Victorian Heritage Register.</p>	Construction	<p>The design solution for the Project does not result in any impacts to trees listed on the Victorian Heritage Register.</p> <p>The existing River Red Gum is significant to the local community and subject to the heritage overlay under the Manningham Planning Scheme. The design retains the existing River Red Gum tree.</p> <p>The Project Contractor will assess the tree and modify our design to ensure impacts to the tree are minimised, subject to further investigation.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>11. Land Use Planning (LP)</b>				
Planning & Environment Act 1987	LP1	<p><b>Minimise land use impacts</b></p> <p>The project must be designed and constructed to:</p> <ul style="list-style-type: none"> <li>Minimise the construction and design footprint and avoid, or, where avoidance is not feasible, minimise to the greatest extent reasonably possible, any temporary and permanent impacts on the following land uses:                             <ul style="list-style-type: none"> <li>Parks and reserves including passive and active open space and pathways</li> <li>Significant landscapes including those around the Yarra River</li> <li>Other sensitive land uses such as educational facilities</li> <li>Sport, recreational and community facilities</li> <li>Residential properties</li> <li>Commercial and industrial sites</li> <li>Sites of identified cultural or social value including Heide Museum of Modern Art and Bulleen Art and Garden.</li> </ul> </li> <li>Consolidate or minimise the fragmentation of, and provide access to, residual land parcels to support future viable land use to the extent practicable.</li> </ul>	Design, construction	<p>The project has been designed and will be constructed to minimise the construction and design footprint and avoid, or, where avoidance is not feasible, minimise to the greatest extent reasonably possible, any temporary and permanent impacts on the following land uses via the following approach:</p> <p><b>Parks and reserves including passive and active open space and pathways and significant landscaping including those around the Yarra River (Birraring)</b></p> <ul style="list-style-type: none"> <li>A longer tunnel length which results in less open cut trenches than the EES Reference Design along Greensborough Road which results in greater parkland and recreational areas</li> <li>Improvements to Manningham interchange which results in less of an impact to the Cultural Landscape Precinct area than the EES Reference Design</li> <li>Avoidance of disturbance to Banksia Park by minimising the Project's interface works as well as through construction staging and procedures</li> <li>Retaining the existing landscaping interface areas at Bolin Bolin Billabong as well as the Yarra River landscaping areas</li> <li>Retaining trees where possible</li> <li>Undergrounding of building where possible to allow for additional overhead parkland</li> <li>Detailed arborist and ecology surveys have been undertaken for the Project along with the development of a tree removal and canopy replacement plan in alignment with these EPRs, AR3 Implement a Tree Canopy Replacement Plan. The Tunnels Project has submitted and had approved the TRCRP for the tunnel works and the Project Contractor will be required to submit a TRCRP for the Eastern Freeway interchange area, including Koonung Creek.</li> </ul> <p>The design and construction methodology is to minimise impact on existing vegetation where possible.</p> <p><b>Other sensitive land uses such as educational facilities</b></p> <ul style="list-style-type: none"> <li>The design impact on the nearby educational facilities such as Marcellin College and Trinity Grammar has been considered and the design has responded to mitigate these impacts. Consultation has occurred with these stakeholders to ensure an agreed functional and urban design outcome is achieved which includes a signalised intersection at Bulleen Road, screen planting, raised pedestrian crossings and improved pedestrian and cycling paths connected to the surrounding network</li> <li>Incorporation of noise walls to comply with the Project's EPRs.</li> </ul> <p><b>Sport, recreational and community facilities</b></p> <ul style="list-style-type: none"> <li>Where the design interfaces or includes works to sporting and recreational/ community facilities the design approach is to reduce or avoid potential impacts and if that cannot be avoided then the construction approach will take into consideration the anticipated community requirements for the facilities and endeavour to program and sequence the associated works to minimise the subsequent impact which may include temporary access, construction staging, undertaking the works during low use periods and suitable traffic management which will be outlined in the CEMP.</li> </ul>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
				<p><b>Residential Properties</b></p> <ul style="list-style-type: none"> <li>The proposed SUP bridge across Lower Plenty Road has less of a footprint impact than that of an underpass Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081 to 0084.</i></li> <li>Locating the tunnel portals away from residential areas thus minimising the visual built form, avoiding overshadowing impacts and ensuring construction works are minimised where possible near these residential areas</li> <li>Incorporation of noise walls to comply with the Project's EPR's Commercial and industrial sites</li> <li>The design has been developed to minimise impacts on adjoining commercial and industrial properties such as Heide Museum of Modern Art and the Bulleen Art and Garden by locating tunnel portals clear of these areas, improving pedestrian and cycling connectivity from adjoining networks through to these areas, reducing local traffic congestion by providing a tunnel connection from the Eastern Freeway through to Greensborough Road boulevard and staging of the construction works to allow continuity of operations for surrounding businesses which will be addressed in the CEMP and suite of supporting management plans.</li> </ul> <p><b>Sites of identified cultural or social value including Heide Museum of Modern Art and Bulleen Art and Garden.</b></p> <ul style="list-style-type: none"> <li>The design has considered the continuity of operational requirements for these facilities and the CEMP will provide suitable staging and sequencing of the works to mitigate the subsequent impacts.</li> </ul> <p>The CEMP and suite of associated management plans will outline the approach to the construction related activities and provide mitigation strategies for any associated works that may impact on adjoining properties.</p> <p>The design minimises fragmentation for the future development areas by providing suitable land parcels and arrangements to enable functional and practicable design outcomes which includes keeping services required for the Tunnels Project outside of these areas where possible, a road geometry that can be amended for the future development needs, pedestrian and cycling connections around the designated future development land areas as well as signalised intersections.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	LP2	<p><b>Minimise impacts from location of new services and utilities</b></p> <p>New above ground services and utility infrastructure are to be located in a way that minimises impacts to existing residential areas, public open space and recreational facilities. This must include considering options to co-locate infrastructure where practicable.</p>	Design	<p>The utilities design has been developed to minimise impacts to existing residential areas, public open space, and recreational facilities.</p> <p>Co-location of infrastructure will be utilised where possible and the main services will be located alongside roadways, paths and where future maintenance can occur without having to undertake significant rectification works.</p> <p>For example, submerging utilities at Borlase Reserve has reduced the impact of above-ground infrastructure on public open space.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	LP3	<p><b>Minimise inconsistency with strategic land use plans</b></p> <p>Design and development of the project must have regard to relevant approved urban design and land use strategies, plans and frameworks including the Yarra Strategic Plan and Draft Yarra River Bulleen Precinct Land Use Framework Plan when approved or any approved superseding document. Consultation must occur with land managers and authorities responsible for the implementation of the relevant strategic land use plans and policies in preparing Urban Design Framework Plans required by the Incorporated Document.</p> <p>An integrated approach must be adopted to the Manningham Road interchange in consultation with Manningham City Council which supports viable future land uses (such as commercial and industrial) and includes maximising the developable area at surface level to the extent practicable in addition to requirements for the Urban Design Framework Plan for this interchange to be approved under the Incorporated Document as part of the Urban Design Strategy.</p> <p>The project must avoid, or where avoidance is not feasible, minimise to the greatest extent reasonably possible, impacts on residential, commercial, industrial, open space, culturally valued and community facility land uses from project development and operations which would be inconsistent with approved strategic land use policies.</p>	Design	<p>The design has had regard to relevant strategic land use plans, with the most pertinent to the future development of the Manningham Road interchange being:</p> <ul style="list-style-type: none"> <li>• Yarra Strategic Plan (Burndap Birrarung burndap umarkoo) 2022–32</li> <li>• The Bulleen Land Use Framework Plan (Draft 2021).</li> </ul> <p>The design has been prepared in response to the objectives of the Yarra Strategic Plan and the Draft Bulleen Land Use Framework Plan. Importantly, the UDLP has been developed in accordance with the UDS, which has been prepared in response to these strategies, as well as overarching strategic documents, such as Plan Melbourne 2017–2050 and Healthy Waterways Strategy 2018–28.</p> <p>The design has had regard to the four performance objectives of the Yarra Strategic Plan, being healthy rivers and land, culturally diverse, quality parklands, and landscape protection. These objectives have been reflected in the three core pillars of the design, which have guided the design of the Project (Connection to Country, Caring for Country, and Connecting People).</p> <p>The design is particularly aligned with the strategic ambition of the Draft Bulleen Land Use Framework Plan, in that the proposed development of the Manningham Road interchange will:</p> <ul style="list-style-type: none"> <li>• Link key destinations throughout the broader precinct, such as Heide Museum and the Bolin Bolin Billabong, via new and improved pedestrian and cycling networks (Objective 2)</li> <li>• Protect and celebrate Aboriginal cultural heritage places, weave shared storytelling elements in collaboration with the Wurundjeri, and not impede the future development of Heide Museum (Objective 3)</li> <li>• Provide consolidated land for future development within the former Bulleen Industrial Precinct, which allows for the integration of employment uses and cultural activities (Objective 3)</li> <li>• Provide the opportunity for a new cultural gateway to be delivered as part of the future development of land within the Bulleen Industrial Precinct (not part of this UDLP) (Objective 4).</li> </ul> <p>The design’s ambition to establish connections between the interchange area and the Yarra River parkland with new pedestrian and cycling paths is strongly aligned with the intent of the Yarra River Strategic Plan, as well as the strategies explored in Manningham City Council’s Yarra River Corridor Concept Plan (2019). The Concept Plan’s ambition to improve walking and cycling accessibility within the precinct and to enhance access to key cultural attractions such as Heide Museum, BAAG, and Banksia Park, is facilitated through the new connections to be delivered by the design.</p> <p>The Design imagines a structure for development at the Manningham Road interchange which could accommodate a cultural precinct and future commercial/ industrial development and any future use would be subject to additional planning approvals and is not covered by this UDLP.</p> <p>The treatment of this area considers the strategic planning assessments undertaken through the Yarra Strategic Plan and draft Yarra River – Bulleen Precinct Land Use Framework Plan processes, to ensure the area of developable land at surface level is maximised, allowing for future viable land uses such as commercial or industrial.</p> <p>While these developments fall outside the North East Link Tunnels scope, their consideration was invaluable in shaping a solution which could realise such future aspirations by the State which includes minimising infrastructure near and through the future development site that is required for the Tunnels Project works as well as defragmenting the future development areas by providing land parcels that can achieve practical design outcomes.</p>

## 6.0 Compliance with Environmental Performance Requirements

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				<p>Our consideration of this future potential has influenced the repositioning of the interchange entry and exit ramps and public transport infrastructure is structured to service the future development area. Long-term thinking also factored in the creation of the right scale of floor plates for future development.</p> <p>The future use considerations are consistent with the EPRs and the relevant strategic planning policies and the parcels of land allocated for future use are of a suitable size to cater for greater flexibility in development solutions.</p> <p>Enjoying strong connectivity to the Yarra River parklands and cultural amenities, it provides the public with open space until its future use is decided.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	LP4	<p><b>Minimise overshadowing from noise walls and elevated structures and overlooking from elevated structures</b></p> <p>Overshadowing from elevated structures and noise walls to residential properties (including existing solar panels), community facilities, open spaces, waterways and valuable natural habitats must be minimised through detailed design. Consultation must occur with directly affected property owners and occupiers to inform formulation of parameters for these structures including location, design and materials.</p> <p>Unless with the consent of an affected landowner or in exceptional circumstances, the extent of additional overshadowing of residential properties from non transparent structures:</p> <ul style="list-style-type: none"> <li>Should be no greater than the existing shadowing of secluded private open spaces associated with residential properties cast by existing structures including existing noise walls and other structures (e.g., elevated walkways) between the hours of 9:00 am to 3:00 pm as measured on September 22.</li> <li>If additional overshadowing occurs it must not be greater than 50% of the secluded private open space or 40 sqm, whichever is the greater, between the hours of 9:00 am to 3:00 pm as measured on September 22.</li> </ul> <p>Overlooking from elevated structures, especially within a distance of 15 metres to secluded open space and habitable room windows of residential properties, must be minimised through detailed design as far practicable. Consultation must occur with directly affected property owners and occupiers to inform formulation of parameters, designs and materials for these structures.</p>	Design	<p>An overshadowing and part overlooking analysis has been conducted where relevant against the proposed design solution in regard to the requirements specified under EPR LP4.</p> <p>Please refer to the greater detail in the overshadowing and overlooking analysis (undertaken where relevant) as shown in Attachment 4.</p> <p>Project wide, all key elements (as listed below) have been considered in their respective contexts – considerations such as structure siting, orientation, height and massing of forms, materiality (solid / open structures), visibility from public areas and privacy considerations have been considered with respect to their impact on the surrounding neighbourhoods to ensure the subsequent overshadowing and overlooking outcomes are negligible or kept to a minimum.</p> <p>Further analysis will be undertaken during preliminary design when additional site investigation information becomes available such as topographic and arborist surveys.</p> <p>Subject to site surveys which are to be undertaken during the design development phase which will include surveys of existing building locations, solar panel locations, site levels and habitable windows, subsequent additional overshadowing assessment will be undertaken and the relevant impacted properties consulted.</p> <p>Typical anticipated Design Development Outputs for Overshadowing/overlooking:</p> <ul style="list-style-type: none"> <li>As the design develops the relevant above-ground structural forms will be used for these assessments</li> <li>Additional site surveys to impacted properties which will include site levels, existing vegetation, private open space, building locations and solar panel locations</li> <li>From the above information a further refinement of the overshadowing analysis will be undertaken.</li> </ul> <p>Some examples of design considerations include:</p> <ul style="list-style-type: none"> <li>Northern Ventilation Structure – Ventilation Structure form is setback from Greensborough Road to eliminate overshadowing of residential properties. Ventilation Structure form minimised to reduce overshadowing on adjacent natural context. No overlooking occurs to adjacent residential properties</li> <li>The Iuk (Eel) SUP bridge is located adjacent to residential properties and assessments have demonstrated compliance with overshadowing and overlooking requirements to private open space. An overlooking privacy screen has been included in the Iuk (Eel) SUP bridge design</li> </ul>

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				<ul style="list-style-type: none"> <li>• Manningham MCC including Ventilation Structures – low rise building form does not create overshadowing or overlooking to adjacent residential context. Form of stack elements designed to minimise effect on adjacent landscape. No overlooking occurs to adjacent residential properties</li> <li>• Southern Ventilation Structure – Ventilation Structure form is setback to south of structure to limit shadowing of adjacent ovals and facilities. No overlooking occurs to adjacent residential properties</li> <li>• Eastern Freeway interchange (walls, flyovers) – the design limits overshadowing and overlooking of adjacent residential properties. Noise walls will assist in providing privacy to adjoining properties and natural topography assists this minimisation</li> <li>• Noise wall locations and heights will be refined during the design development phase to minimise impacts to adjoining properties. Additional noise modelling and the subsequent impact on noise wall extent, heights and treatments will be undertaken. We will consult with the relevant key stakeholders on the subsequent findings and outcomes during the design development phase prior to completion of the relevant documentation packages. The noise walls shown to the properties near Viewpoint Road and Belle Vue Primary School will have clear sections of acrylic noise walls to assist in alleviating the overshadowing impacts from the noise walls and further noise wall design refinement will be undertaken when additional noise modelling data becomes available.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p>Typical anticipated Design Development Outputs for Noise Walls:</p> <ul style="list-style-type: none"> <li>• Additional noise modelling</li> <li>• Heights and extent</li> <li>• Material, texture, and colour</li> <li>• Overshadowing impacts</li> <li>• Whole of life analysis</li> <li>• Acoustic performance of materials.</li> </ul> <p>Refer to: <i>UDLP Attachment.4-Architecture and Urban Design Overshadowing Assessment (Overshadowing)</i>.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	LP5	<p><b>Prepare and implement a Public Open Space Relocation and Replacement Plan</b></p> <p>Prior to operation of the Project, the Proponent in conjunction with the State and in consultation with relevant stakeholders including DELWP, Parks Victoria, Melbourne Water and Birrarung Council, must develop and implement a Public Open Space Relocation and Replacement Plan to provide for replacement of public open space permanently required for the project, where not already being replaced in accordance with EPR SC5. The plan should reflect an underlying philosophy of replacement on a like-for-like basis.</p> <p>The Public Open Space Relocation and Replacement Plan must set out the process for selecting and acquiring replacement public open space, including but not limited to:</p> <ul style="list-style-type: none"> <li>Identifying public open space to be permanently required for the project, including public land used for parkland, reserves, passive open space and active open space including recreation facilities (where not addressed by EPR SC5)</li> <li>A process for the acquisition of replacement land, including within the Public Acquisition Overlay or land in key strategic locations</li> <li>Assessment of the suitability of potential replacement land by reference to: <ul style="list-style-type: none"> <li>the location and characteristics of the land</li> <li>relevant approved strategic land use plans and policies, including those within planning schemes</li> <li>existing and proposed public purpose reservations</li> <li>the Yarra Strategic Plan (when released), reference to the Yarra River Bulleen Land Use Framework Plan (when released)</li> </ul> </li> <li>An approach for the preparation of functional concept plans for the future use of each replacement site, where the plans will be prepared with input from relevant councils, land managers, public asset owners and stakeholders (in the case of formal sporting uses being replaced)</li> <li>A program identifying the timing and scope of works to be undertaken to implement the functional concept plans and provide appropriate or upgraded facilities at the replacement sites.</li> </ul> <p>In addition, where public open space is to be temporarily lost during construction, residual public open space should be enhanced where practical to minimise and mitigate land use impacts.</p> <p>Note:</p> <p>Land in a Road Zone is excluded from the replacement calculation and land on a land bridge that is part of the access network will not count as replacement public open space.</p>	Design, construction	<p>Development and implementation of the Public Open Space Relocation and Replacement Plan would be undertaken by NELP in advance of the operation of the NEL Project. The Public Open Space Relocation and Replacement Plan will be for the NEL Project as a whole and is to be implemented prior to operation of the Project.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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<b>12. Landscape and Visual (LV)</b>				
Planning & Environment Act 1987  Australian Standards AS 4282-1997 Control of the obtrusive effects of outdoor lighting	LV1	<p><b>Design to be in accordance with the Urban Design Strategy</b></p> <p>Urban Design and Landscape Plans must be developed and implemented for permanent above-ground buildings or structures (excluding preparatory buildings and works) in accordance with the North East Link Project – Incorporated Document. The design response must be in accordance with the North East Link Urban Design Strategy and, to the extent practicable:</p> <ul style="list-style-type: none"> <li>Avoid or minimise landscape and visual, overlooking, and shading (with reference to EPR LP4) impacts in extent, duration and intensity.</li> <li>Maximise opportunities for enhancement of public and private receptors including public amenity, open space and facilities, and heritage places by the project including by facilitating value add/capture opportunities.</li> <li>Respond to opportunities and constraints identified in an Urban Design Framework Plan forming part of the approved Urban Design Strategy for key interchanges, activity centres and interfaces identified in the Incorporated Document (where applicable).</li> <li>Identify residential areas with the potential for high visual impact and develop targeted design options to avoid or minimise amenity impacts on these areas, including as a result of the proposed noise walls.</li> <li>Detailed design to ensure landmark elements balance visual impact with minimal overshadowing.</li> </ul>	Design, construction	<p>A separate assessment against the UDS has been completed as set out in the consistency with the UDS section of this report.</p> <p>Permanent aboveground works are contained within the Project Land identified in the Incorporated Document. All permanent aboveground works will be in accordance with the UDS. Consistency with the UDS is outlined in the UDLP report and associated design drawings.</p> <p>The overshadowing aspects are addressed in EPR LP4. The durability and intensity of materials have been chosen to sit harmoniously within the landscape and be of suitable quality to maintain its appearance. The overshadowing assessment is contained in Attachment 4 of the documents supporting the UDLP.</p> <p>Through the careful siting and rationalisation of the road and interchange design at Borlase Reserve and the Manningham precinct, value add, and value capture opportunities are maximised through increased public open space and future redevelopment areas.</p> <p>Key residential areas have been identified along the corridor where targeted design solutions have been developed and have focussed on reducing the amenity impacts to these areas. This is achieved through the careful siting of built elements, use of high-quality materials of muted, natural tones appropriate for its context and buffer or screen planting where possible. All elements of the Project will be optimised during design development as far as practical and include additional analysis on site levels, residential area surveys and opportunities to reduce any structural form heights.</p> <p>The design of key landmark elements within the Project, such as the Northern and Southern Ventilation Structures, the Motorway Control Centre (MCC) and the SUP bridge - Iuk (Eel) SUP bridge over Lower Plenty Road has balanced visual impacts with minimal overshadowing.</p> <p>Refer to: <i>UDLP Attachment.1-Architecture and Urban Design NEL-CNT-WMI-2990-UUD-DRG-0081-0084.</i></p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	LV2	<p><b>Minimise landscape and visual impacts during construction</b></p> <p>Temporary and construction works must be located, designed and carried out in accordance with a Construction Compound Plan to be approved under the Incorporated Document and the Urban Design Strategy guidance on using design to help manage construction impacts. Areas disturbed by temporary and construction works must be reinstated with no objection from the relevant land manager, waterway manager and any relevant public asset owners. *</p> <p>Design of acoustic sheds used during construction, to contribute to the image and identity of the area.</p> <p>Develop and implement measures to use temporary landscaping, features or structures (including viewing portals) during construction to minimise adverse visual impact of project works and provide visual appeal. Temporary landscape treatments, features or screening must be reused across the project, where appropriate.</p> <p>Implement landscaping enhancement including early tree planting (with reference to EPR AR3 as part of permanent works) prior to construction works commencing, where practicable.</p> <p>* All reasonable endeavours must be made to reach a position of no-objection, provided the relevant stakeholder responds within a reasonable timeframe.</p>	Design, construction	<p><b>Design of the construction compound areas</b></p> <p>The Project Contractor will prepare Construction Compound Plans (CCP) that have identified where temporary and construction works will be located and the landscaping drawing in Attachment 2 identifies the locations of the anticipated construction compounds and further detail will be shown in the actual CCPs.</p> <p>Tree removal and retention will be addressed in the Tree Removal and Retention Plan which will be approved for construction related impacts.</p> <p>The CCPs will address aspects outlined in the UDS (Section 7.2 Using urban design) to help manage construction impacts and the designs for Construction Compounds will strive to retain and minimise impacts to existing vegetation where possible.</p> <p><b>Construction</b></p> <p>Construction activities will be undertaken in alignment with the approved construction management plans and CCPs.</p> <p>The construction compound areas will be regularly maintained to ensure a suitable safe and aesthetically acceptable appearance is achieved throughout the construction period.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p>Refer to: <i>UDLP Attachment.2-Landscape Design NEL-CNT-TRA-2990-ULS-DRG-0026,0027,0028,0029,0080,0081,0082,0083,0084 and 0085.</i></p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	LV3	<p><b>Minimise construction lighting impacts</b></p> <p>Develop and implement effective measures to minimise light spillage and glare during construction including from construction vehicles and equipment to protect the amenity of adjacent neighbourhoods, parks, community facilities and any known significant native fauna habitat to the extent practicable. Such measures must have regard to the content of guidelines or Australian Standards pertaining to outdoor lighting and best available technology and best practice.</p>	Design, construction	<p><b>Design</b></p> <p>Design of temporary lighting will consider impacts on sensitive residential receivers and light sensitive native fauna and will include measures for minimising light spill impacts. Lighting design will consider Australian Standards AS4282-1997 Control of the obtrusive effects of outdoor lighting.</p> <p>The Ecology Management Plan and Noise Vibration Management Plan contain provisions for mitigation to address light spill impacts in relation to sensitive receptors including fauna.</p> <p><b>Construction</b></p> <p>Measures to minimise light spillage and glare will be incorporated into the Worksite Environmental Management Plan (WEMP) and Construction Compound Plans</p> <p>Controls may include:</p> <ul style="list-style-type: none"> <li>Ensuring lighting will be angled and placed to avoid impact on nearby sensitive receivers e.g. angled down and away</li> <li>Perimeter fencing/hoarding to be installed to manage impacts from office lighting.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	LV4	<p><b>Minimise operation lighting impacts and maximise operational lighting benefits for open space</b></p> <p>Design and install lighting used during operation of permanent structures and resulting from the orientation of all permanent structures (including from vehicle headlights) in accordance with relevant standards, including but not limited to relevant guidelines and Australian Standards pertaining to outdoor lighting and the protection of beneficial uses.</p> <p>Design and install lighting to minimise light spill and disturbance to significant fauna sites including the Grey-headed Flying fox colony at Yarra Bend, wetlands and waterways immediately adjacent to roadways.</p> <p>Subject to consultation with and the views of future asset owners, provide sensitively designed lighting to shared user paths and open spaces to provide improved safety for users without causing unreasonable effects on residential amenity or environmental and landscape values.</p> <p>Designs must consider Crime Prevention Through Environmental Design, including effects on safe movements of pedestrians and cyclists; including within undercrofts, bicycle and pedestrian tunnels and open spaces areas.</p>	Design, construction	<p>All relevant standards are to be adhered to in the detailed design, including those regarding lighting used during the operation of permanent structures.</p> <p>This design will include additional consideration to minimise impact on local fauna sites and will consider crime prevention through environmental design.</p> <p>Modelling of light spill (lux plots) will be completed on all proposed lighting infrastructure, which will allow the design to assess and mitigate any impacts from light spill.</p> <p>Assessment of lighting levels on SUP, pedestrian routes and parklands will be completed through the design phases and are subject to consultation with future asset owners. CPTED approaches are applied when assessing Safety in Design of lighting packages, open spaces, and visual surveillance passive and electronic.</p>

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<b>13. Noise and Vibration (NV)</b>				
<p>Australian Standards AS 2187.2, Explosives – Storage and use – Use of explosives</p> <p>Australian Standard 2436 2010 Guide to Noise Control on Construction, Maintenance and Demolition Site (reconfirmed 2016)</p> <p>VicRoads Road Design Note RDN 6-1 Interpretation and application of VicRoads traffic noise reduction policy 2005</p> <p>VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011</p> <p>EPA Publications:</p> <ul style="list-style-type: none"> <li>EPA Publication 1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</li> <li>1826.4 (2021) Noise limit and assessment protocol for the control of noise from commercial, industrial and trade premises and entertainment venues</li> </ul>	<b>NV1</b>	<p><b>Achieve traffic noise objectives</b></p> <p>Design, construct and maintain the works to meet the following traffic noise objectives.</p> <p>(a) Traffic noise from North East Link Project Roads* must be no greater than:</p> <ul style="list-style-type: none"> <li>63 dBA (L10,18hr) measured between 6 am and midnight at Category A buildings**</li> <li>63 dBA (L10, 12hr) measured between 6 am and 6 pm at Category B buildings**.</li> </ul> <p>(b) For Category A and Category B buildings on non-Project Roads which:</p> <ul style="list-style-type: none"> <li>Abut the North East link project roads, or directly intersect with North East Link project roads, and</li> <li>where total traffic noise for the design year and with Project exceeds the thresholds listed in paragraph (a).</li> </ul> <p>The combined noise from North East Link Project Roads and non-Project Roads must not be more than 2 dBA higher than the predicted traffic noise level under the design year 'do nothing' scenario. Intersecting non-Project Roads must be modelled for a distance of 100 m from the intersection with North East Link Project Roads or to the first traffic intersection (whichever is the lesser).</p> <p>(c) Night-time traffic noise for category A buildings must meet the WHO 2009 interim target of LAeq night 55dB when adjusted to Australian conditions as per the EES Technical Appendix C i.e. be no greater than 58dB LAeq 8hr (including façade correction). The 8hour time period is to be between 2200-0600hrs as consistent with the Better Apartment Design Standards.</p> <p>(d) The noise criteria in paragraphs (a), (b), and (c) above and (e) are to apply to the lowest habitable level of Category A buildings and Category B buildings at both the year of opening and 20 years thereafter. Traffic noise mitigation measures must be maintained throughout this period. For the purposes of this EPR, Category A buildings and Category B buildings to be considered are those that are either existing or known to have planning approval prior to exhibition of the North East Link Environment Effects Statement.</p> <p>(e) Where external traffic noise cannot be mitigated through project design solutions to meet the criteria outlined in paragraphs (a), (b) and (c), at-property treatments will be required to be designed and constructed so that internal noise levels achieve the following:</p> <ul style="list-style-type: none"> <li>35dBA for bedrooms assessed as an LAeq, 8 h from 10pm -6am</li> <li>40dBA for living areas assessed as LAeq, 16h from 6am-10pm</li> </ul> <p>At-property treatments would be undertaken in accordance with section 7.3 of the NSW Road and Maritime Services document 'Noise Mitigation Guidelines 2015 – Roads and Maritime Services', and in consultation with the owner of the relevant building. In circumstances where at-property treatments are proposed, the Independent Environmental Auditor must review the project design solutions to confirm that the criteria outlined in paragraphs (a), (b) and (c), could not be achieved by the adoption of reasonable and feasible detailed design measures.</p> <p>* Project Roads are defined to be the M80 Ring Road (east of Plenty Road), the Greensborough Bypass (west of the Plenty River bridge and up to the M80 interchange with North East Link), the upgrade of the Eastern Freeway (between Hoddle Street and Springvale Road) and the new North East Link freeway (connecting the M80 Ring Road to the Eastern Freeway), including all access ramps.</p> <p>** Category A Buildings and Category B Buildings means:</p> <ul style="list-style-type: none"> <li>Category A Buildings – Residential dwellings, aged persons homes, hospitals, motels, caravan parks and other buildings of a residential nature</li> <li>Category B Buildings – Schools (including buildings within the Carey Sports Complex), kindergartens, libraries and other noise-sensitive community buildings.</li> </ul> <p>Note: If a resident of a dwelling advises NELP that they consider their residence to be noise affected, external noise levels must be investigated against the above criteria. If the external noise levels do not comply and mitigation is not feasible (as confirmed by the IEA) then at property treatment to achieve the required internal noise levels must be undertaken in accordance with (e) above.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The design will achieve the relevant noise objectives for project and non-project roads.</p> <p>The noise walls shown on the UDLP plans are located to respond to anticipated acoustic requirements to sensitive receptors, such as residential areas, based on preliminary assessments. This will be further refined through detailed modelling during preliminary design.</p> <p>The key sensitive noise areas include the residential interface areas along Greensborough Road boulevard and the southern interchange road alignments.</p> <p>The typical noise walls are shown on the UDLP Attachment 1 drawings and additional analysis will be required during preliminary design to inform the final noise wall form.</p> <p>Additional landscaping and landscape mounding will be another design element used to mitigate potential traffic noise along with speed limitations and suitable traffic warning signs.</p> <p>Predicted traffic data for 2026 and 2036 provided by NELP will be utilised to inform the design mitigation outputs against NELP's baseline data.</p> <p>Local road traffic counts abutting to the Project will also be undertaken to inform the noise modelling and design outputs to meet NV1 EPR</p> <p>Further noise investigations and modelling will be undertaken to determine:</p> <ul style="list-style-type: none"> <li>Appropriate noise wall locations and design height to mitigate noise impact to residents/ businesses</li> <li>Pavement/asphalt types to reduce noise is currently being considered to further reduce the noise impacts</li> <li>Treatment to homes such as windows, plants, for relevant properties at the northern and southern ends of the Project.</li> </ul> <p>In circumstances where at-property treatments are proposed, the Independent Environmental Auditor will review the Project Contractor design solutions, to confirm that the relevant criteria could not be achieved by the adoption of reasonable and feasible detailed design measures.</p> <p><b>Operation</b></p> <p>A traffic noise monitoring program to address the requirements of EPR NV1 will be developed and implemented as part of the OEMP. It is expected that this will include at a minimum a program to undertake continuous monitoring of traffic noise during the operations phase to assess the effectiveness of noise controls implemented during design and construction and to ensure that traffic noise objectives are met, and contingency measures should these targets not be met.</p> <p>The process for engaging with affected stakeholders will be captured in the CEMP suite of documents and specifically captured in the Operational Environmental Management Plan.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<p>New South Wales Interim Construction Noise Guideline (ICNG) (2009)</p> <p>New South Wales Roads and Maritime Services Construction Noise and Vibration Guideline (CNVG) (2016)</p> <p>New South Wales Roads and Maritime Services Noise Mitigation Guideline (2015)</p>	NV2	<p><b>Monitor traffic noise</b></p> <p>Traffic noise monitoring must be carried out for at least the following time periods:</p> <ul style="list-style-type: none"> <li>Baseline traffic noise must be re-measured after project award and prior to construction works</li> <li>Traffic noise must be re-measured within six months of project opening during normal traffic flows (outside school or public holidays). For the purpose of determining compliance, the measurements conducted after project opening must be adjusted to the 10-year traffic flows</li> <li>Traffic noise must be re-measured 10 years and 20 years after project opening.</li> </ul> <p>All traffic noise monitoring must be undertaken in accordance with the VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011, to verify conformance with the external traffic noise objectives set out in EPR NV1. The adequacy of the monitoring program is to be verified by the Independent Environmental Auditor.</p> <p>Remedial action must be taken in the event that the measured traffic noise levels demonstrate that the external traffic noise objectives set out in EPR NV1 are not met. The timeframe and the criterion for remedial action must be determined by the IEA and reporting of compliance must be provided to the Minister for Roads or his/her successor.</p>	Design, operation	<p><b>Design</b></p> <p>Baseline traffic noise will be re-measured by NELP prior to construction works commencing. Traffic noise monitoring requirements have been included in the Construction Noise and Vibration Management Plan. Traffic noise will be re-measured and captured in the OEMP.</p> <p><b>Operations</b></p> <p>A traffic noise monitoring program to address the requirements of EPR NV1 will be developed and implemented as part of the OEMP. It is expected that this will include at a minimum a program to undertake continuous monitoring of traffic noise during the operations phase.</p> <p>The hourly L10 dB(A) and Leq dB(A) levels over the continuous measurement period will be recorded in accordance with the VicRoads Traffic Noise Measurement Requirements for Acoustic Consultants – September 2011.</p> <p>Remedial actions should traffic noise objectives are not met will be developed and documented in the OEMP. This may include additional monitoring or rectification works where required.</p> <p>Remedial actions will be delivered in accordance with the overarching project Communications and Stakeholder Engagement Plan / Strategy.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
<p>ASHRAE Chapter 48 Sound and Vibration Control Standards</p> <p>German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (2016)</p> <p>British Standard BS6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting.</p>	NV3	<p><b>Minimise construction noise impacts to sensitive receptors</b></p> <p>Construction noise and vibration must be managed in accordance with the Construction Noise and Vibration Management Plan (CNVMP) required by EPR NV4.</p> <p><b>Non-residential sensitive receptors</b></p> <p>For sensitive land uses (based on AS/NZS 2107:2016) implement management actions as per EPR NV4 if construction noise is predicted to or does exceed the internal or external noise management levels set out in the table below, and a noise sensitive receptor is, or is predicted to be, adversely impacted. If construction exceeds the noise management levels below, in determining whether a noise sensitive receptor is, or is predicted to be, adversely impacted:</p> <ul style="list-style-type: none"> <li>Consider the duration of construction noise</li> <li>Consider the existing ambient noise levels</li> <li>Consult with the owner or operator of the noise sensitive receptor</li> <li>Consider any specific acoustic requirements of land uses listed below to determine whether a noise sensitive receptor is adversely impacted.</li> </ul>	Construction	<p>A Construction Noise and Vibration Management Plan (CNVMP) will be developed by the Project and will include measures to meet the construction noise management levels and construction noise guideline targets. The CNVMP will include requirements for noise modelling to predict impacts on sensitive receivers and establish noise management levels which will inform mitigation measures.</p> <p>Mitigation measures may include but are not limited to selection of quieter equipment, noise barriers, community notification through letter box drops, spot checks of noise levels using hand held noise monitors, continuous noise monitoring and scheduling of noisy activities.</p> <p>The CNVMP contains a process for assessing and planning for unavoidable works, including verification by the Independent Environmental Auditor.</p> <p>A CNVIA and Noise modelling (undertaken by the Project) are used to inform the engagement strategy with stakeholders/sensitive receptors around construction activities and potential effects. All unavoidable works are reviewed and verified by the IEA before they may commence including stakeholder consultation records.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

# 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response																								
		<p><b>Land use</b></p> <p><b>Construction noise management level, LAeq(15 min) applies when properties are in use</b></p> <table border="1"> <tr> <td>Classrooms in schools and other educational institutions</td> <td>Internal noise level 45 dB(A)</td> </tr> <tr> <td>Healthcare facilities with inpatient care including hospital wards and operating theatres, and rehabilitation centres</td> <td>Internal noise level 45 dB(A)</td> </tr> <tr> <td>Places of worship</td> <td>Internal noise level 45 dB(A)</td> </tr> <tr> <td>Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion</td> <td>External noise level 65 dB(A)</td> </tr> <tr> <td>Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation</td> <td>External noise level 60 dB(A)</td> </tr> <tr> <td>School grounds used for teaching purposes are to be considered as passive recreation areas, where feasible and reasonable ***</td> <td></td> </tr> <tr> <td>Community centres</td> <td>Depends on the intended use of the centre. Refer to the recommended upper internal levels in AS/NZS 2107:2016 for specific uses</td> </tr> <tr> <td>Industrial premises</td> <td>External noise level 75 dB(A)</td> </tr> <tr> <td>Offices, retail outlets</td> <td>External noise level 70 dB(A)</td> </tr> <tr> <td>Other noise sensitive land uses as identified in AS/NZS 2107:2016</td> <td>Refer to the noise levels in AS/NZS 2107:2016</td> </tr> </table>	Classrooms in schools and other educational institutions	Internal noise level 45 dB(A)	Healthcare facilities with inpatient care including hospital wards and operating theatres, and rehabilitation centres	Internal noise level 45 dB(A)	Places of worship	Internal noise level 45 dB(A)	Active recreation areas characterised by sporting activities and activities which generate their own noise, making them less sensitive to external noise intrusion	External noise level 65 dB(A)	Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example reading, meditation	External noise level 60 dB(A)	School grounds used for teaching purposes are to be considered as passive recreation areas, where feasible and reasonable ***		Community centres	Depends on the intended use of the centre. Refer to the recommended upper internal levels in AS/NZS 2107:2016 for specific uses	Industrial premises	External noise level 75 dB(A)	Offices, retail outlets	External noise level 70 dB(A)	Other noise sensitive land uses as identified in AS/NZS 2107:2016	Refer to the noise levels in AS/NZS 2107:2016						
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		<p><b>Residential receptors</b></p> <p>For residential dwellings, management actions must be implemented as per EPR NV4 if noise from construction works during normal working hours is predicted to or does exceed the noise management levels for normal working hours below.</p> <p>Noise from construction works during weekend/evening work hours and the night period must meet the weekend/evening and night period noise guideline targets in the table below unless they are Unavoidable Works verified by the Independent Environmental Auditor as per EPR NV4. All reasonable strategies to mitigate the impacts of such Unavoidable Works must be applied.</p> <table border="1"> <thead> <tr> <th>Time of day</th> <th>Construction noise guideline targets</th> </tr> </thead> <tbody> <tr> <td><b>Normal working hours:</b></td> <td>Noise affected: Background LA90+10 dB</td> </tr> <tr> <td><b>7 am – 6 pm Monday to Friday</b></td> <td>Highly noise affected: 75 dB(A)</td> </tr> <tr> <td><b>7 am – 1 pm Saturday</b></td> <td>Source: NSW Interim Construction Noise Guideline (ICNG) Chapter 4.1.1 Table 2</td> </tr> <tr> <td></td> <td>The noise affected level represents the point above which there may be some community reaction to noise</td> </tr> <tr> <td></td> <td>The highly noise affected level represents the point above which there may be strong community reaction to noise.</td> </tr> <tr> <td><b>Weekend/evening work hours:</b></td> <td>Noise level at any residential premises not to exceed background noise (LA90) by:</td> </tr> <tr> <td><b>6 pm – 10 pm Monday to Friday</b></td> <td> <ul style="list-style-type: none"> <li>10 dB(A) or more for up to 18 months</li> </ul> </td> </tr> <tr> <td><b>1 pm – 10 pm Saturday</b></td> <td> <ul style="list-style-type: none"> <li>5 dB(A) or more after 18 months</li> </ul> </td> </tr> <tr> <td><b>7 am – 10 pm Sunday and public holidays</b></td> <td>Source: EPA Publication 1834 Chapter 4</td> </tr> <tr> <td><b>Night period:</b></td> <td>Noise inaudible within a habitable room of any residential premises</td> </tr> <tr> <td><b>10 pm – 7 am Monday to Sunday</b></td> <td>Source: EPA Publication 1834 Chapter 4</td> </tr> </tbody> </table>	Time of day	Construction noise guideline targets	<b>Normal working hours:</b>	Noise affected: Background LA90+10 dB	<b>7 am – 6 pm Monday to Friday</b>	Highly noise affected: 75 dB(A)	<b>7 am – 1 pm Saturday</b>	Source: NSW Interim Construction Noise Guideline (ICNG) Chapter 4.1.1 Table 2		The noise affected level represents the point above which there may be some community reaction to noise		The highly noise affected level represents the point above which there may be strong community reaction to noise.	<b>Weekend/evening work hours:</b>	Noise level at any residential premises not to exceed background noise (LA90) by:	<b>6 pm – 10 pm Monday to Friday</b>	<ul style="list-style-type: none"> <li>10 dB(A) or more for up to 18 months</li> </ul>	<b>1 pm – 10 pm Saturday</b>	<ul style="list-style-type: none"> <li>5 dB(A) or more after 18 months</li> </ul>	<b>7 am – 10 pm Sunday and public holidays</b>	Source: EPA Publication 1834 Chapter 4	<b>Night period:</b>	Noise inaudible within a habitable room of any residential premises	<b>10 pm – 7 am Monday to Sunday</b>	Source: EPA Publication 1834 Chapter 4		
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# 6.0 Compliance with Environmental Performance Requirements

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		<p>Note:</p> <ul style="list-style-type: none"> <li>* Where any reference is made to the rating background level (RBL) or background LA90; the 'average background':                             <ul style="list-style-type: none"> <li>- it applies to each discrete time period to ensure that averaging does not necessarily occur over day, evening or night-time hours. For example, background noise between 0100 and 0400 may be substantially different to that between 2200 and 0100 and hence should not be averaged over the entire night time period; and</li> <li>- over the assessment period as per Victorian noise policy practices is to be used. This applies to all receptors and all time periods.</li> </ul> </li> <li>** In relation to sensitive receptors, the construction noise guideline targets apply to construction works and construction compounds.</li> <li>*** Consultation with affected schools should be undertaken to designate the most sensitive areas where teaching occurs within school grounds.</li> </ul> <p><b>Unavoidable Works</b></p> <p>Unavoidable Works must be verified by the Independent Environmental Auditor for each instance they are undertaken, as per EPR NV4 and include the following:</p> <ul style="list-style-type: none"> <li>- The delivery of oversized plant or structures that police or other authorities determine require special arrangements to transport along public roads</li> <li>- Emergency work to avoid the loss of life or damage to property, or to prevent environmental harm</li> <li>- Maintenance and repair of public infrastructure where disruption to essential services and/or considerations of worker safety do not allow work within standard hours</li> <li>- Tunnelling works including mined excavation elements and the activities that are required to support tunnelling works (i.e., spoil treatment facilities)</li> <li>- Road and rail occupations or works that would cause a major traffic hazard</li> <li>- Other works where a contractor demonstrates and justifies a need to operate outside normal working hours and exceed the noise guideline targets such as work that once started cannot practically be stopped.</li> </ul>		

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	NV4	<p><b>Implement a Construction Noise and Vibration Management Plan (CNVMP) to manage noise and vibration impacts</b></p> <p>Prepare, implement and maintain a Construction Noise and Vibration Management Plan (CNVMP) in consultation with EPA Victoria, relevant councils and relevant stakeholders. The CNVMP must comply with and address the Noise and Vibration EPRs, be informed by the noise modelling and monitoring results and must include (but not be limited to):</p> <ul style="list-style-type: none"> <li>• Identification and assessment of noise and vibration sensitive receptors along the project alignment, including but not limited to: <ul style="list-style-type: none"> <li>– habitat for listed threatened fauna likely to be impacted by the project (refer to EPR FF8)</li> <li>– buildings used for shop, gallery, commercial, office or industrial purposes including Bulleen Art and Garden and the Heide Museum of Modern Art</li> <li>– school buildings and school grounds</li> <li>– Residential buildings</li> </ul> </li> <li>• Construction noise and vibration targets as per EPRs NV3, NV5, NV8, NV9, NV10, NV11 and NV12, including any details of conversions between alternative metrics</li> <li>• Details of construction activities and an indicative schedule for construction works, including the identification of key noise and/or vibration generating construction activities that have the potential to generate airborne noise and/or surface vibration impacts on surrounding sensitive receivers</li> <li>• How construction noise (including truck haulage) and vibration would be minimised (see EPR T2)</li> <li>• A requirement for preliminary tests using the actual equipment to validate modelling for vibration and regenerated noise and review, with predictions to be remodelled as necessary and confirm prevention/mitigation/remediation measures confirmed</li> <li>• Management actions and notification and mitigation measures to be implemented with reference to the Appendix B and Appendix C of the New South Wales Roads and Maritime Services Construction Noise and Vibration Guideline 2016 (CNVG)</li> <li>• Any processes and measures to be implemented as part of the Communications and Community Engagement Management Plan including managing matters of interest raised by key stakeholders through CCEMP processes, and measures concerning complaints management (see EPR SC2)</li> <li>• Requirements to assess and manage vibration impacts to scientific or medical establishments to the higher of ambient levels or ASHRAE VC Standards (as defined in the 2015 handbook), or manufacturers equipment levels (unless by agreement with occupant)</li> <li>• Measures to ensure effective monitoring of noise and vibration associated with construction with consideration to the construction noise and vibration targets</li> <li>• Measures to minimise noise and vibration impacts from temporary traffic diversions and altered access to parking facilities</li> <li>• The Unavoidable Works (refer to EPR NV3) that would be undertaken, including their location, timing and duration. The CNVMP must either include a clear rationale for defining works or a list of the type of planned works that constitute Unavoidable Works and response strategies to mitigate the impacts of these Unavoidable Works, consistent with Chapter 4 of EPA Victoria Publication 1834 Civil construction, building and demolition guide and with reference to Appendix B and Appendix C of the CNVG. The Independent Environmental Auditor must verify that the proposed Unavoidable Works meet the definition of Unavoidable Works (refer to EPR NV3) for each instance they are undertaken. Details of Unavoidable Works must be made publicly available. For emergency Unavoidable Work, a rationale must be provided to the satisfaction of the Independent Environmental Auditor as soon as practicable</li> <li>• Noise from construction works during weekend/evening work hours and the night period must meet the weekend/evening work hours and night period noise guideline targets unless they are unavoidable works verified by the Independent Environmental Auditor. All reasonable measures must be implemented to mitigate the impacts of such unavoidable works. A clear framework for managing Unavoidable Work must be developed and include noise level thresholds and details of mitigation measures. The framework must be approved by the Independent Environmental Auditor.</li> </ul> <p>The CNVMP must be reviewed (including consultation with external stakeholder as required) and updated as appropriate on a six-monthly basis and verified by the Independent Environmental Auditor.</p> <p>Note: * The CNVMP applies to construction works and construction compounds.</p>	Construction	<p>A Construction Noise and Vibration Management Plan (CNVMP) will be developed and implemented by the Project Contractor, and will be subject to consultation with EPA Victoria, relevant councils, and relevant stakeholders.</p> <p>The CNVMP includes measures to meet the construction noise management levels and construction noise guideline targets. The CNVMP includes requirements for noise modelling to predict impacts on sensitive receivers and establish noise management levels which will inform mitigation measures. Mitigation measures may include but are not limited to selection of quieter equipment, noise barriers, community notification through letter box drops, spot checks of noise levels using handheld noise monitors, continuous noise monitoring and scheduling of noisy activities.</p> <p>The subsequent residual impacts will be further assessed and consideration to further action to reduce the risk of harm so far as reasonably practicable will be undertaken.</p> <p>The CNVMP contains a process for assessing and planning for unavoidable works, including verification by the Independent Environmental Auditor.</p> <p>All unavoidable works are reviewed and verified by the IEA before they may commence including stakeholder consultation records.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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	NV5	<p><b>Establish vibration guidelines to protect utility assets</b></p> <p>Prior to commencement of relevant works, undertake condition assessments of above and below ground utility assets (EPR GM3) and consult with asset owners to establish and agree construction vibration guidelines to maintain asset integrity. In all cases the asset owner's criteria takes precedence.</p> <p>Where construction vibration guidelines are not proposed by the asset owner, reference should be made to the relevant sections of German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (2016) for guideline assessment procedures for buried pipework or underground infrastructure. The integrity of the asset should be reviewed and assessed (by the contractor, in conjunction with the asset owner) to confirm these values are appropriate. If necessary, based on this assessment, limits must be reduced to the level necessary to maintain asset integrity.</p> <p>Monitor vibration levels during construction to demonstrate compliance with agreed vibration guidelines. Identify contingency measures to be implemented if guidelines are not met. Where necessary rectify any defects that are attributable to the project.</p> <p>An overview of the key vibration guidelines values is presented below. In all cases, the supporting documentation within the Standard which describes, clarifies and sometimes modifies the tables below must be considered.</p> <p><b>Table 39: Guideline values for <math>v_i</math>, max, for evaluating the effects of short-term vibration on the lining of underground cavities</b></p> <table border="1"> <thead> <tr> <th>Line</th> <th>Lining material</th> <th>Guideline values for <math>v_i</math>, max in mm/s perpendicular to lining surface</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Reinforced or sprayed concrete, tubbing segments</td> <td>80</td> </tr> <tr> <td>2</td> <td>Concrete, stone</td> <td>60</td> </tr> <tr> <td>3</td> <td>Masonry</td> <td>40</td> </tr> </tbody> </table> <p>Note: The guideline values were measured during nearby mine blasting operations and apply only to the lining of underground structures, but not to any associated installations.</p> <p><b>Table 40: Guideline values for <math>v_i</math>, max, for evaluating the effects of short-term vibration on buried pipework</b></p> <table border="1"> <thead> <tr> <th>Line</th> <th>Lining material</th> <th>Guideline values for <math>v_i</math>, max in mm/s perpendicular to lining surface</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Steel, welded</td> <td>100</td> </tr> <tr> <td>2</td> <td>Vitrified clay, concrete, reinforced concrete, prestressed concrete, metal (with or without flange)</td> <td>80</td> </tr> <tr> <td>3</td> <td>Masonry, plastics</td> <td>50</td> </tr> </tbody> </table>	Line	Lining material	Guideline values for $v_i$ , max in mm/s perpendicular to lining surface	1	Reinforced or sprayed concrete, tubbing segments	80	2	Concrete, stone	60	3	Masonry	40	Line	Lining material	Guideline values for $v_i$ , max in mm/s perpendicular to lining surface	1	Steel, welded	100	2	Vitrified clay, concrete, reinforced concrete, prestressed concrete, metal (with or without flange)	80	3	Masonry, plastics	50	Construction	<p>The Project Contractor will detail the procedure for assessment, mitigation and monitoring of vibration sensitive assets. Controls may include pre- and post-condition surveys of potentially affected buildings or assets, vibration monitoring during high-risk activities, establishing safe working distances for specific pieces of plant.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
Line	Lining material	Guideline values for $v_i$ , max in mm/s perpendicular to lining surface																										
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	NV6	<p><b>Design permanent tunnel ventilation system and relevant fixed infrastructure to meet EPA requirements for noise</b></p> <p>Design and construct the permanent tunnel ventilation system and relevant fixed infrastructure that is subject to EPA Publication 1826.4 Noise Protocol to achieve compliance with EPA Publication 1826.4 Noise Protocol and in accordance with the EPA Victoria Development Licence.</p> <p>Where EPA Victoria Publication 1826.4 Noise Protocol does not apply, design and implement the permanent tunnel ventilation system to comply with the internal lower Recommended Design Sound Levels as defined in AS/NZS 2107 for the types of occupancies, relevant to spaces within the affected Category A and Category B buildings, as defined in EPR NV1.</p> <p>If the existing internal background noise level within any identified relevant Category A or Category B buildings already exceeds the upper Recommended Design Sound Level in AS/NZS 2107 for the types of occupancies relevant to spaces within these buildings, then noise from the fixed plant associated with the Project must not exceed the existing background levels within these buildings.</p>	Design, construction	<p><b>Design</b></p> <p>Design of the permanent tunnel ventilation system and relevant fixed infrastructure is designed accordance with EPA Publication 1826.4 and Development Licence EPA 2017 219663 / DL000219663.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>																								

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	NV7	<p><b>Monitor noise from tunnel ventilation system and relevant fixed infrastructure</b></p> <p>Measure noise from the permanent tunnel ventilation system and relevant fixed infrastructure that is subject to EPA Publication 1826.4 Noise Protocol on commencing road operation and monitor noise from the tunnel ventilation system post opening of the North East Link, as agreed with EPA Victoria, to verify compliance with EPA Publication 1826.4 Noise Protocol and the EPA Victoria Operating Licence. Identify and implement contingency measures to be implemented if noise level limits are not met.</p>	Operation	<p>The tunnel ventilation system (TVS), including Ventilation Structures, will be designed to meet the requirements of EPA Publication 1826.4 and Development Licence EPA 2017 219663 / DL000219663.</p> <p>A detailed noise assessment will be completed as part of the design of the tunnel ventilation system and the design package will document technical requirements based on Acoustic assessment reports.</p> <p>Monitoring will be undertaken at the required locations and frequency, post construction to ensure compliance. It is expected that this may include continuous monitoring and spot checks of noise levels from the tunnel ventilation system at locations to be determined.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>																												
	NV8	<p><b>Minimise construction vibration impacts on amenity</b></p> <p>Implement management actions if the following guideline target levels for vibration from construction activity to protect human comfort of occupied buildings (including heritage buildings) are not achieved (levels are calculated from the British Standard BS6472-1:2008 Guide to evaluation of human exposure to vibration in buildings. Vibration sources other than blasting.).</p> <table border="1"> <thead> <tr> <th rowspan="3">Type of space occupancy</th> <th colspan="4">Vibration Dose Values (m/s 1.75)</th> </tr> <tr> <th colspan="2">Day (7am to 10 pm)</th> <th colspan="2">Night (10pm to 7am)</th> </tr> <tr> <th>Preferred Value</th> <th>Maximum Value</th> <th>Preferred Value</th> <th>Maximum Value</th> </tr> </thead> <tbody> <tr> <td>Residential</td> <td>0.2</td> <td>0.4</td> <td>0.1</td> <td>0.2</td> </tr> <tr> <td>Offices, schools, educational institutions, places of worship</td> <td>0.4</td> <td>0.8</td> <td>0.4</td> <td>0.8</td> </tr> <tr> <td>Workshops</td> <td>0.8</td> <td>1.6</td> <td>0.8</td> <td>1.6</td> </tr> </tbody> </table> <p>Notes</p> <ol style="list-style-type: none"> <li>The Guideline Targets are non-mandatory; they are goals that should be sought to be achieved through the application of practicable mitigation measures. If exceeded, then management actions would be required.</li> <li>The Vibration Dose Values may be converted to Peak Particle Velocities within a noise and vibration construction management plan.</li> <li>For the purpose of this EPR, the guideline target levels for 'offices, schools, educational institutions, places of worship' also apply to the Heide Museum of Modern Art and the outdoor sculpture exhibition area at Heide Museum of Modern Art.</li> </ol>	Type of space occupancy	Vibration Dose Values (m/s 1.75)				Day (7am to 10 pm)		Night (10pm to 7am)		Preferred Value	Maximum Value	Preferred Value	Maximum Value	Residential	0.2	0.4	0.1	0.2	Offices, schools, educational institutions, places of worship	0.4	0.8	0.4	0.8	Workshops	0.8	1.6	0.8	1.6	Construction	<p>The Project CNVMP details the procedure for assessment, mitigation and monitoring of vibration impacts on amenity.</p> <p>Vibration modelling will be undertaken and will include Vibration Dose Value (VDV) assessment to gauge potential vibration impacts at representative sensitive receivers prior to construction activities, in compliance to EPR NV8.</p> <p>Modelling will inform the controls that are required to manage vibration impacts on amenity. Controls may include vibration monitoring using an accelerometer type vibration monitor during high-risk activities, establishing safe working distances for specific pieces of plant and ensuring respite periods are provided when high risk vibration intensive activities are undertaken.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response																																																																				
	NV9	<p><b>Minimise construction vibration impacts on structures</b></p> <p>Construction vibration targets for structures based on German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (2016) must be adopted. All sections of the German Standard DIN 4150 – Part 3 – Structural Vibration in Buildings – Effects on Structures (2016) standard apply, noting the guideline levels detailed in Section 5 and Section 6 (and any references sections).</p> <p>An overview of the key vibration guidelines values is presented below. In all cases, the supporting documentation within the Standard which describes, clarifies and sometimes modifies the tables below must be considered.</p> <p><b>Table 41: Guideline values for vibration velocity, <math>v_i</math>, max, for evaluating the effects of short-term vibration on structures</b></p> <table border="1"> <thead> <tr> <th rowspan="3">Type of structure</th> <th colspan="6">Guideline values for <math>v_i</math>, max in mm/s</th> </tr> <tr> <th colspan="3">Foundation, all directions, <math>i = x, y, z</math>, at a frequency of</th> <th>Topmost floor, horizontal direction, <math>i = x, y</math></th> <th colspan="2">Floor slabs, vertical direction, <math>i = z</math></th> </tr> <tr> <th>1 Hz to 10 Hz</th> <th>10 Hz to 50 Hz</th> <th>50 Hz to 100 Hz (a)</th> <th>All frequencies</th> <th colspan="2">All frequencies</th> </tr> <tr> <th>Column Line</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td> <td>20</td> <td>20 to 40</td> <td>40 to 50</td> <td>40</td> <td>20</td> </tr> <tr> <td>2</td> <td>Residential buildings and buildings of similar design and/or occupancy</td> <td>5</td> <td>5 to 15</td> <td>15 to 20</td> <td>15</td> <td>20</td> </tr> <tr> <td>3</td> <td>Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g., listed buildings)</td> <td>3</td> <td>3 to 8</td> <td>8 to 10</td> <td>8</td> <td>20 (b)</td> </tr> </tbody> </table> <p>Note: Even if guideline values as in line 1, columns 2 to 5, are complied with, minor damage cannot be excluded.</p> <p>(a) At frequencies above 100 Hz, the guideline values for 100 Hz can be applied as minimum values.</p> <p>(b) Paragraph 2 of 5.1.2 must be observed.</p> <p><b>Table 42: Guideline values for <math>v_i</math>, max, for evaluating the effects of long-term vibration on buildings</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Type of building</th> <th colspan="2">Guideline values for <math>v_i</math>, max, in mm/s</th> </tr> <tr> <th>Topmost floor, horizontal direction, all frequencies</th> <th>Floor slab, vertical direction, all frequencies</th> </tr> <tr> <th>Column Line</th> <th>1</th> <th>2</th> <th>3</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Buildings used for commercial purposes, industrial buildings, and buildings of similar design</td> <td>10</td> <td>10</td> </tr> <tr> <td>2</td> <td>Residential buildings and buildings of similar design and/or occupancy</td> <td>5</td> <td>10</td> </tr> <tr> <td>3</td> <td>Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g., listed buildings)</td> <td>2.5</td> <td>10 (a)</td> </tr> </tbody> </table> <p>Note: Even if guideline values as in line 1, column 2, are complied with, minor damage cannot be ruled out.</p> <p>(a) Section 6.1.2 must be observed.</p> <p>(b) Vibration levels above apply to all works, including unavoidable works as defined in NV3.</p>	Type of structure	Guideline values for $v_i$ , max in mm/s						Foundation, all directions, $i = x, y, z$ , at a frequency of			Topmost floor, horizontal direction, $i = x, y$	Floor slabs, vertical direction, $i = z$		1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz (a)	All frequencies	All frequencies		Column Line	1	2	3	4	5	6	1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40	20	2	Residential buildings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15	20	3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g., listed buildings)	3	3 to 8	8 to 10	8	20 (b)	Type of building	Guideline values for $v_i$ , max, in mm/s		Topmost floor, horizontal direction, all frequencies	Floor slab, vertical direction, all frequencies	Column Line	1	2	3	1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	10	10	2	Residential buildings and buildings of similar design and/or occupancy	5	10	3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g., listed buildings)	2.5	10 (a)	Construction	<p>Project Contractor's CNVMP will detail the procedure for assessment, mitigation and monitoring of vibration sensitive assets.</p> <p>Vibration modelling will be undertaken and will include Vibration Dose Value (VDV) assessment to gauge potential vibration impacts at representative sensitive receivers prior to construction activities, in compliance to EPR NV8.</p> <p>Modelling will inform the controls that are required to manage vibration impacts on structures. Controls may include pre- and post-condition surveys of potentially affected buildings or assets, vibration monitoring during high-risk activities, establishing safe working distances for specific pieces of plant.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response															
	NV10	<p>Minimise impacts from ground-borne (internal) noise</p> <p>Implement management actions in consultation with potentially affected land owners to protect amenity at residences where the following ground borne noise guideline targets based on Section 4.2 of the New South Wales Interim Construction Noise Guidelines are exceeded during construction.</p> <table border="1"> <thead> <tr> <th>Time of Day</th> <th>Internal noise level measured at the centre of the most affected habitable room</th> </tr> </thead> <tbody> <tr> <td>Evening (6 pm to 10 pm)</td> <td>LAeq (15 minute) = 40 dBA</td> </tr> <tr> <td>Night (10 pm to 6 am)</td> <td>LAeq (15 minute) = 35 dBA</td> </tr> </tbody> </table> <p>Notes</p> <ol style="list-style-type: none"> <li>Levels are only applicable when ground borne noise levels are higher than airborne noise levels.</li> <li>Management actions include community consultation to determine acceptable level of disruption and provision of respite accommodation in some circumstances.</li> <li>Noise levels above apply to all works, including unavoidable works as defined in NV3</li> </ol>	Time of Day	Internal noise level measured at the centre of the most affected habitable room	Evening (6 pm to 10 pm)	LAeq (15 minute) = 40 dBA	Night (10 pm to 6 am)	LAeq (15 minute) = 35 dBA	Construction	<p>A Construction Noise and Vibration Management Plan (CNVMP) will be developed and implemented for the Project and will include measures to meet the construction noise management levels and construction noise guideline targets. The CNVMP includes requirements for noise modelling to predict impacts on sensitive receivers and establish noise management levels which will inform mitigation measures. Mitigation measures may include community notification through letter box drops, spot checks of noise levels using handheld noise monitors, continuous noise monitoring and scheduling of noisy activities.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>									
Time of Day	Internal noise level measured at the centre of the most affected habitable room																		
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	NV11	<p>Minimise amenity impacts from blast vibration</p> <p>Implement management actions if the following vibration values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <table border="1"> <thead> <tr> <th>Category (as defined in AS 2187.2-2006)</th> <th>Type of blasting operations</th> <th>Peak component particle velocity (mm/s)</th> </tr> </thead> <tbody> <tr> <td>Sensitive site</td> <td>More than 20 blasts</td> <td>5 mm/s for 95% blasts per year 10 mm/s maximum (unless by agreement with occupier)</td> </tr> <tr> <td>Sensitive site</td> <td>Less than 20 blasts</td> <td>10 mm/s maximum (unless by agreement with occupier)</td> </tr> <tr> <td>Non-sensitive site (with occupants)</td> <td>All blasting</td> <td>25 mm/s maximum value (unless by agreement with occupier).</td> </tr> <tr> <td>Scientific equipment</td> <td>All blasting</td> <td>Existing ambient levels or ASHRAE VC Standards (as defined in the 2015 handbook) (whichever is the higher) or manufacturers equipment levels (unless by agreement with occupier)</td> </tr> </tbody> </table>	Category (as defined in AS 2187.2-2006)	Type of blasting operations	Peak component particle velocity (mm/s)	Sensitive site	More than 20 blasts	5 mm/s for 95% blasts per year 10 mm/s maximum (unless by agreement with occupier)	Sensitive site	Less than 20 blasts	10 mm/s maximum (unless by agreement with occupier)	Non-sensitive site (with occupants)	All blasting	25 mm/s maximum value (unless by agreement with occupier).	Scientific equipment	All blasting	Existing ambient levels or ASHRAE VC Standards (as defined in the 2015 handbook) (whichever is the higher) or manufacturers equipment levels (unless by agreement with occupier)	Construction	<p>The Project Contractor's CNVMP details the procedure for assessment, mitigation and monitoring of blast vibration.</p> <p>Modelling will consider regenerated noise and vibration modelling for the blasting of cross-passages (if blasting is intended to be undertaken for these works) regarding blasting amenity criteria provided in EPR NV 11 and NV12 for blast overpressure.</p> <p>Modelling will inform the controls to be implemented to manage amenity impacts from blast vibration.</p> <p>Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
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Scientific equipment	All blasting	Existing ambient levels or ASHRAE VC Standards (as defined in the 2015 handbook) (whichever is the higher) or manufacturers equipment levels (unless by agreement with occupier)																	
	NV12	<p>Minimise amenity impacts from blast overpressure</p> <p>Implement management actions if the following overpressure values are not achieved. Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <table border="1"> <thead> <tr> <th>Category (as defined in AS 2187.2-2006)</th> <th>Type of blasting operations</th> <th>Peak Overpressure Value (dBL)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Sensitive Site</td> <td>More than 20 blasts</td> <td>115 dBL for 95% blasts 120 dBL maximum (unless by agreement with occupier)</td> </tr> <tr> <td>Less than 20 blasts</td> <td>120 dBL for 95% blasts 125 dBL maximum (unless by agreement with occupier)</td> </tr> <tr> <td>Occupied non-sensitive sites such as factories and commercial premises</td> <td>All blasting</td> <td>125 dBL maximum (unless by agreement with occupier) For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturers specification or levels that can be shown to adversely affect the equipment operation</td> </tr> </tbody> </table>	Category (as defined in AS 2187.2-2006)	Type of blasting operations	Peak Overpressure Value (dBL)	Sensitive Site	More than 20 blasts	115 dBL for 95% blasts 120 dBL maximum (unless by agreement with occupier)	Less than 20 blasts	120 dBL for 95% blasts 125 dBL maximum (unless by agreement with occupier)	Occupied non-sensitive sites such as factories and commercial premises	All blasting	125 dBL maximum (unless by agreement with occupier) For sites containing equipment sensitive to vibration, the vibration should be kept below manufacturers specification or levels that can be shown to adversely affect the equipment operation	Construction	<p>The Project Contractor's CNVMP will detail the procedure for assessment, mitigation and monitoring of blast overpressure</p> <p>Modelling will be undertaken and will consider regenerated noise and vibration modelling for the blasting of cross-passages (if blasting is intended to be undertaken for these works) regarding blasting amenity criteria provided in EPR NV 11 and NV12 for blast overpressure.</p> <p>Modelling will inform the controls to be implemented to manage amenity impacts from blast over pressure.</p> <p>Blasting activities must comply with Australian Standard AS2187.2-2006, Explosives – Storage and use Part 2 – Use of explosives for all blasting.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>				
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	NV13	<p>Noise mitigation – noise walls</p> <p>Construction of permanent noise attenuation must, where feasible, be installed in advance of adjacent works.</p> <p>Where the ultimate wall cannot be constructed prior to demolition of the existing wall and noise sensitive premises will be exposed to significantly increased traffic noise for an extended period, install temporary noise walls where practicable.</p>	Construction	<p>A CNVMP will be prepared and implemented by the Project Contractor. The CNVMP contains a process for noise modelling, impact assessment and identifying mitigation measures for construction activities. Where feasible, permanent noise attenuation will be installed ahead of adjacent work. Where permanent noise attenuation cannot be installed prior to demolition of existing noise walls, temporary noise walls will be considered.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	NV14	<p>Reduce impacts from engine brake noise</p> <p>Measures to encourage heavy vehicle drivers to reduce use of engine brakes must be considered and implemented, where practicable.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The Project Contractor has completed an assessment of maximum grades across the Project including truck speed modelling in the tunnel to ensure that gradients are favourable for maintaining minimum speeds.</p> <p>Approach and departure grades for all intersections are within authority tolerances. The Project area does not include long steep grades and the surface roads have a low design speed.</p> <p>It is expected that the Project will result in most heavy vehicles travelling in the trench and tunnel and therefore not traversing roads adjacent to residential areas. This is a reduction in heavy vehicles on the current arrangement.</p> <p><b>Construction</b></p> <p>A Construction Noise and Vibration Management Plan (CNVMP) will be developed and implemented for the Project and will include measures to meet the construction noise management levels and construction noise guideline targets. The CNVMP outlines measures to reduce engine break noise which include the use of engine compression brakes by heavy vehicles at night and when stopping at roads in residential areas will be limited or prohibited.</p> <p>Heavy vehicles shall be fitted with maintained original equipment manufacturer exhaust silencers or silencers that comply with the National Transport Commission's 'In-service test procedure' and standard.</p> <p><b>Operations</b></p> <p>During operations, measures to reduce engine break noise which include the use of engine compression brakes by heavy vehicles at night will be included in the OEMP. Mitigation measures have yet to be developed however these may include monitoring programs and driver education programs.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	NV15	<p>Noise at public open space and school recreation grounds</p> <p>Predicted noise levels at existing public open space and school grounds detailed in updated noise modelling for the final design and as-built construction of the Project must not exceed the predicted design year noise levels detailed in the EES -Technical Appendix C.</p> <p>Noise monitoring at appropriate locations must be performed post construction to verify that predicted levels have been achieved. Monitoring must be performed 10 years and 20 years after Project opening.</p>	Design, operation	<p><b>Design</b></p> <p>Additional noise modelling will be undertaken during the development of the design and suitable acoustic treatments applied to the Project to ensure all relevant EPR noise requirements are achieved.</p> <p>Mitigation measures such as noise reducing pavements, extending noise walls, planter buffering and planting mounds have been incorporated into the design to mitigate these aspects in anticipation of the noise modelling outcomes but will be refined during design development phase and included additional analysis on the noise wall extent, heights and treatment requirements.</p> <p>Typical anticipated Design Development Outputs for Noise walls:</p> <ul style="list-style-type: none"> <li>• Additional noise modelling</li> <li>• Heights and extent</li> <li>• Material, texture, and colour</li> <li>• Overshadowing impacts</li> <li>• Whole of life analysis</li> <li>• Acoustic performance of materials.</li> </ul> <p>Predicted traffic data for 2026 and 2036 provided by NELP will be utilised to inform the design mitigation outputs against the NELP's baseline data.</p> <p>Local traffic counts will also be undertaken to inform the noise modelling and design outputs.</p> <p>The provided predicted noise level data will inform the design to enable the appropriate mitigation measures to the noise impact at existing public open space and school grounds detailed in updated noise modelling for the final design and as-built construction of the Project to not exceed the predicted design year noise levels detailed in the EES -Technical Appendix C.</p> <p><b>Operation</b></p> <p>Operational noise monitoring requirements will be included in the OEMP to be developed for the Project Contractor. Mitigation measures are expected to include a monitoring program performed 10 years and 20 years after Project Contractor opening undertaken by a suitably qualified acoustic consultant which may include continuous monitoring at locations to be determined.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	NV16	<p>Monitoring of Ongoing performance of operational traffic noise mitigation measures</p> <p>Permanent noise monitoring stations must be established in representative locations based on a programme developed in consultation with the IEA and the EPA, to enable the ongoing real time monitoring of operational traffic noise.</p> <p>Where open graded asphalt is used and is relied on to achieve compliance with noise limits the acoustic performance of the OGA must be assessed at least once in each 12 months to ensure that it continues to reduce operational traffic noise to the project traffic noise objectives in EPR NV1.</p> <p>NELP interactive noise tool</p> <p>The following information is to be made freely available on a publicly accessible website as interactive layers:</p> <ul style="list-style-type: none"> <li>- Existing (pre-Project) noise levels</li> <li>- Final operational road traffic noise contours for the Project</li> <li>- Operational noise criteria for the Project</li> <li>- Operational noise monitoring data for the Project.</li> </ul> <p>The maps are to be interactive so as to enable the public to locate their position on a map, identify the operational noise criteria and data relevant to their location and submit a query or complaint to NELP online.</p>	Operation	<p>The Project Contractor and NELP will be responsible for addressing NV16 to satisfy the statutory requirement under the Incorporated Document.</p> <p>Operational traffic monitoring will be outlined in the OEMP.</p> <p>The permanent noise monitoring stations and the interactive noise tool will be established by NELP and developed in consultation with the IEA and the EPA to enable ongoing real-time monitoring of operational traffic noise.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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<b>14. Social and Community (SC)</b>				
<p><i>Planning and Environment Act 1987</i></p> <p>Australian Standard AS/NSZ 10002:2014 Guidelines for Complaint Management in Organisations.</p>	SC1	<p>Reduce community disruption and adverse amenity impacts</p> <p>Design and construct the project to reduce disruption to residences, community infrastructure facilities and open space from direct acquisition or temporary occupation to the maximum extent reasonably possible to preserve acceptable levels of amenity.</p>	Design, construction	<p><b>Design</b></p> <p>The design has been developed to reduce disruption to residences, community infrastructure facilities and open space from acquisition or temporary occupation to preserve acceptable levels of amenity.</p> <p>For example, the road diversions along Greensborough Road and Bulleen Road have designed and staged to reduce the disruption impact to local community, schools, sporting precincts and businesses.</p> <p>This is achieved by designing the temporary alignment to be consistent with the permanent road alignment wherever possible. Measures and outcomes include:</p> <ol style="list-style-type: none"> <li>Redesigning road pavement to allow for construction traffic and heavy vehicles to utilise the road pavement</li> <li>Drainage, lighting, and earthworks designed to permanent works design to reduce rework and disruptions to surrounding community, schools, sporting precincts and businesses at Bulleen Road</li> <li>Reducing land acquisition adjacent to the Project</li> <li>Reducing construction time and reconstruction by designing and constructing some permanent elements of the road alignment, in particular Bulleen Road.</li> </ol> <p><b>Construction</b></p> <p>Impacts to sensitive receivers will be managed in accordance with the relevant EPRs as detailed in relevant management plans.</p> <p>Management of complaints arising from construction activities are outlined in section 10.4 of the CEMP and the CCEMP NEL-CNT-SDC-2990-PSC-MPL-0001.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	SC2	<p>Minimise and manage impacts of land acquisition and occupation</p> <p>Where private land is to be permanently acquired or temporarily occupied, the project must:</p> <ul style="list-style-type: none"> <li>Minimise the extent of the acquisition or the extent or duration of the occupation</li> <li>Use a case-management approach for project interactions with affected land owners and occupants including appointing a social worker, buyers' advocate or equivalent to assist households with special needs to manage the transition, except where a land owner or occupier has requested not to be part of such assistance</li> <li>Endeavour to reach agreement on the terms for possession of the land including purchasing properties early when identified for permanent acquisition and agreed by the landowner</li> <li>Consider the relative vulnerability and special needs of land owners and occupants</li> <li>Communicate likely timing and steps to be taken including updates as relevant</li> <li>Return private land not required for permanent project infrastructure to its pre-existing use post-construction as soon as practicable, unless otherwise agreed with the land owner.</li> </ul> <p>Where public land is to be permanently acquired or temporarily occupied, the project will:</p> <ul style="list-style-type: none"> <li>Minimise the extent of the acquisition or the extent or duration of the occupation</li> <li>Stage works to the greatest extent reasonably possible to maintain functionality of the land for all users either within the site or on proximate land, subject to the Public Open Space Relocation and Replacement Plan required by EPR LP5</li> <li>Endeavour to reach agreement with the land manager on the terms for possession of the land</li> <li>Return public land not required for permanent project infrastructure to its pre-existing use post-construction as soon as practicable, including with all relevant reinstatement works, unless otherwise agreed with the land manager</li> <li>In the case of public land used for formal active recreation, ensure that impacts are minimised in accordance with SC5.</li> </ul>	Design, construction	<p><b>Design</b></p> <p>The design has been developed to reduce the extent of land acquisition and duration of temporary occupation required for the Project.</p> <p>The State and NELP are responsible for Acquisition of the land in accordance with divestment processes available under the <i>Major Transport Projects Facilitation Act 2009</i>.</p> <p>The Contractor will return private and public land not required for permanent Project infrastructure to its pre-existing use post-construction as soon as practicable, unless otherwise agreed with the land owner.</p> <p>The extent and duration of temporary occupation of land required for the Project has been minimised via optimised construction staging of the works, consolidation of design elements, planned alignment between temporary and permanent design stages.</p> <p>The Victorian Government (NELP) is responsible for the acquisition of the land in accordance with relevant legislation, such as the <i>Major Transport Projects Facilitation Act 2009</i> or the <i>Land Acquisition and Compensation Act 1986 (Vic)</i>.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	SC3	<p>Implement a Communications and Community Engagement Management Plan</p> <p>Prior to construction, prepare and implement a Communications and Community Engagement Management Plan to engage the community and potentially affected stakeholders and communicate progress of construction activities and operation. The plan must include:</p> <ul style="list-style-type: none"> <li>– A process for identifying community issues and the recording, management and resolution of complaints from affected stakeholders including business owners, community service providers, education providers, public and active transport key user groups and residents, consistent with Australian Standard AS/NZS 10002:2014 Guidelines for Complaint Management in Organisations</li> <li>– Approach to stakeholder identification</li> <li>– Enquiry management and record keeping approach and procedures including making available an attended 24-hour telephone number, postal address, and an email address and publishing these on the project website</li> <li>– Approach to communicating and engaging with the community and potentially affected stakeholders in relation to: <ul style="list-style-type: none"> <li>• Construction activities including temporary facilities and impacts that may affect the community, businesses or individual stakeholders (e.g., dust, noise, vibration and light) and relevant mitigation (e.g., relocations policy)</li> <li>• Changes to transport conditions and relevant mitigation (e.g., road closures, detours)</li> <li>• Timelines and an outline of works that will affect particular local areas, to be updated to reflect current and anticipated conditions</li> <li>• Identifying how stakeholders can access information on environmental performance that is to be made publicly available</li> </ul> </li> <li>– Incident and emergency communications, including notification methods and timeframes in the event of a major incident or overrun</li> <li>– Approach and processes to ensure that the workforce has appropriate community awareness and sensitivity including to prevent the workforce from parking in local roads and in public parking in the vicinity of local shopping areas except when frequenting those areas for private purposes.</li> <li>– Innovative communications tools and methods to enhance the project’s ability to effectively communicate and engage with the community and stakeholders including best available technology in addition to conventional means</li> <li>– Approach to engaging with local schools to ascertain safety requirements (including evacuation procedures) and to provide education opportunities on project activities.</li> <li>– Approach to making relevant project information available to the community, including updates on project works, with specific consideration to vulnerable groups (including culturally and linguistically diverse groups) and a responsive process for resolving complaints by vulnerable groups or individuals</li> <li>– How it will evaluate the effectiveness of the communication and engagement under the Communications and Community Engagement Management Plan.</li> </ul> <p>The Communications and Community Engagement Management Plan must consider and where appropriate address matters of interest or concern to the following stakeholders, and provide for the appointment of a dedicated liaison officer (as appropriate):</p> <ul style="list-style-type: none"> <li>– Municipal councils</li> <li>– Recreation, sporting clubs and community groups</li> <li>– Schools and other educational institutions</li> <li>– Potentially affected residents and property owners</li> <li>– Potentially affected business</li> <li>– Other public facilities in proximity</li> <li>– Religious and worship groups</li> <li>– Vulnerable groups</li> <li>– Traditional owners</li> <li>– Public transport users.</li> </ul>	Design, construction, operation	<p><b>Design</b></p> <p>The design solution has been informed by the stakeholder consultation undertaken throughout the planning phase of the Project. Mitigation strategies proposed by stakeholders such as those in Environment Effects Statement submissions have been considered and have informed the design solution of the Project.</p> <p><b>Construction</b></p> <p>The Project Contractor will prepare and implement a Communications and Community Engagement Management Plan that will ensure the community is kept informed of the progress of construction. Regular communication such as letter box drops, community meetings, information sessions and social media posts will ensure stakeholders are kept informed of construction progress. The CCEMP includes requirements for the recording, managing and resolving complaints from affected residents in accordance with the complaint management process.</p> <p><b>Operations</b></p> <p>The Communications and Community Engagement Management Plan also addresses requirements during Operations and will be updated in the lead-up to delivery completion.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	SC4	<p>Participate in the Community Liaison Group</p> <p>Contractors must participate in the Community Liaison Group (CLG) that has been established and managed by North East Link Project, to facilitate community and stakeholder involvement for the design and construction phases of the project. Participation must include:</p> <ul style="list-style-type: none"> <li>– Attendance at meetings</li> <li>– Regular reporting of design and construction activities</li> <li>– Timely provision of relevant information, including response to issues raised by the group</li> <li>– Regular reporting and monitoring of community feedback, impacts and discussion of mitigation measures and their effectiveness.</li> </ul>	Design, construction	<p>The Project Contractor will participate in Community Liaison Groups throughout the design and construction phase.</p> <p>Throughout the design and construction phase the Project Contractor will provide updates to this forum on design and construction activities, respond to issues raised and regular reporting and monitoring of community feedback, impacts and discussion of mitigation measures and their effectiveness.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	SC5	<p>Minimise impacts of displacement of formal active recreation facilities</p> <p>The project must be designed and delivered to minimise displacement of formal active recreation facilities including facilities on private land such as schools.</p> <p>Where formal active recreation facilities are displaced by the construction or operation of the project, the project must facilitate the reasonable relocation of all such facilities to enable their continued functionality at a reasonable level of service for those activities (except where otherwise agreed with the relevant facility owner or where other compensation is provided by agreement or under relevant legislation).</p> <p>The Proponent must work in collaboration with facility operators, local Councils, public land managers and relevant State authorities, to prepare and implement a Formal Active Recreation Facilities Relocation Plan. The Plan must:</p> <ul style="list-style-type: none"> <li>– seek to relocate all formal active recreation facilities to reasonable relocation sites to the extent possible before existing facilities are discontinued</li> <li>– document measures to be provided by the Proponent to provide reasonable replacement facilities at all relocation sites</li> <li>– where facilities are not permanently displaced, document measures to be provided by the Proponent to restore facilities that have been vacated to at least the same standard than when the use was discontinued, accounting for identified growth of clubs (where applicable) and for any decline in condition of the facility during the time of disuse</li> <li>– consider and provide a suite of reasonable measures to enable the ongoing viability of relevant sporting and recreation clubs affected by displacement and to reduce material disadvantage.</li> </ul>	Design, construction, operation	<p>The State is responsible for preparing the formal Active Recreation Facilities Relocation Plan, which outlines a series of measures being implemented to manage impacts to active sport and recreational facilities across the alignment of the Project.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	SC6	<p>Minimise impacts on formal active recreation and other facilities</p> <p>Where construction or operation activities directly impact formal active recreation facilities or community infrastructure facilities not on public land such as schools, child care centres, and aged care centres, consultation must occur with facility operators, owners and user groups of the facilities to understand and, implement any practical measures that can be taken to avoid or minimise impacts. Such measures must provide for the continued operation of each facility (except where the facility is permanently displaced), with suitable access, provision of generally proximate parking comparable to pre-development conditions (where possible), reasonable protection of amenity, and maintenance of the current level and nature of activity, except where otherwise agreed with relevant facility owners.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The design, including the longer tunnel solution, has contributed to minimising the extent of above-ground works and as such has contributed to minimising impacts on community infrastructure facilities.</p> <p>The Yarra Link green bridge area will impact on the adjoining recreational facilities at Carey Grammar School, Marcellin College and Trinity Grammar School and the design has addressed the temporary and permanent works in these areas to minimise impacts.</p> <p>Access to the schools will be maintained during construction, and any impacts outside schools, sport facility or clubs/businesses will be coordinated with the Project Contractor's communications team with clear times/dates and impacts.</p> <p><b>Construction</b></p> <p>Relevant sub-plans will include traffic management, construction staging, utility relocation and/or temporary services solutions to address the necessary functionality and access requirements for formal active recreation and other facilities.</p> <p>The relevant stakeholders will be consulted throughout the development of the outcomes as outlined in the CEMP.</p> <p>The Project Contractor will provide generally proximate parking where possible, for those places lost during construction, be it temporary or permanent.</p> <p>The CCEMP will ensure the community is kept informed of the progress of construction.</p> <p><b>Operation</b></p> <p>An Operations Communications and Community Engagement Management Plan will be developed and will include measures to minimise disruptions to impact formal active recreation facilities or community infrastructure facilities not on public land such as schools, child care centres, and aged care centres. Controls may include notification of stakeholders of potential operational activities and contingency measures where disruptions cannot be avoided.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	SC7	<p>Implement a Community Involvement and Participation Plan (CIPP)</p> <p>Develop and implement a CIPP in consultation with local councils for communities within those council areas affected by the impacts of the Project, in order to improve community connectedness and cohesiveness, enhance the local area and create a positive project legacy. The plan must include:</p> <ul style="list-style-type: none"> <li>– Identification of affected communities relevant to the CIPP</li> <li>– Approach and processes for funding allocation with funding to be proportionate to the level of impact on each community</li> <li>– Identification of types of initiatives that the CIPP may facilitate including community led, community partnership programs; community support grants; community events; sponsorships of local sporting clubs; small capital works projects targeting community, sporting and recreation facilities.</li> </ul>	Construction, operation	<p>NELP will develop and implement a CIPP in consultation with Councils in accordance with the EPR.</p>

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	SC8	<p>Implement a voluntary purchase scheme for residential properties</p> <p>Develop and implement a voluntary purchase scheme for residential properties that satisfy defined criteria relating to significant amenity impacts.</p> <p>The voluntary purchase scheme must include principles and criteria for eligibility of residential properties for inclusion in the voluntary purchase scheme. The principles and criteria must be developed having regard to:</p> <ul style="list-style-type: none"> <li>– Construction impacts including proximity of the residential property to major works and likely extent and duration of proximate works; and</li> <li>– Built form impacts on the residential property including visual intrusion and overshadowing.</li> </ul> <p>In applying the principles and criteria of the voluntary purchase scheme, consideration must also be given to the presence of vulnerable occupants of residential properties.</p>	Construction, operation	A voluntary purchase scheme is being developed by NELP for residential properties and will be applicable where defined criteria are met.
<b>15. Surface Water (SW)</b>				
<p>Water Act 1989</p> <p>Conservation, Forests and Lands Act 1987</p> <p>Water Industry Regulations 2006 (Vic)</p> <p>State Environment Protection Policy (Waters) 2018 (Vic)</p> <p>Environment Reference Standard (Land, Water)</p> <p>Victorian WorkCover Authority and Australian Standard AS1940 Storage Handling of Flammable and Combustible Liquids</p> <p>DELWP Integrated Water Management Framework for Victoria (September 2017)</p> <p>VicRoads Integrated Water Management Guidelines (June 2013)</p>	SW1	<p>Discharges and runoff to meet State Environment Protection Policy (Waters)</p> <p>Meet the State Environment Protection Policy (Waters) requirements for discharge and run-off from the project, including by complying with the Victorian Stormwater Committee’s Best Practice Environmental Management Guidelines for Urban Stormwater (as published by CSIRO in 1999 with assistance from EPA Victoria and others).</p>	Design, construction, operation	<p><b>Design</b></p> <p>Flood design and water sensitive urban design is presented in the UDLP.</p> <p>The design includes stormwater treatment elements within public open spaces that meet BPEMG targets. The Bioretention Basins and Wetlands not only treat stormwater flows from the Project but also from local council drainage systems.</p> <p>Examples include:</p> <ul style="list-style-type: none"> <li>• Borlase Reserve <ul style="list-style-type: none"> <li>– 800 m2 Bioretention Basin south of Manningham Road</li> <li>– 2000 m2 Wetland adjacent to Kay Court</li> <li>– 2 no. Bioretention basins within Drysdale Street retarding basin (1000 m2 combined)</li> </ul> </li> <li>• Manningham Precinct <ul style="list-style-type: none"> <li>– 60 m2 Bioretention Basin south of Blamey Road</li> <li>– 8000 m2 Wetland next to the Manningham Control Centre.</li> </ul> </li> </ul> <p>Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling is being undertaken to confirm these WSUD elements will meet the pollutant removal targets set by the Project. As noted above, the targets set by Project will exceed the State Environment Protection Policy (Waters) requirements for discharge and run-off from the Project.</p> <p>An overarching Water Sensitive Urban Design strategy will be prepared for the Project in consultation with the relevant authorities and land managers. This strategy is integrated as part of this UDLP, which accords with the UDS.</p> <p>The Project to comply with the Best Practice Environmental Management Guidelines for Urban Stormwater (BPEM); Constructed Waterway Design Manual.</p> <p><b>Construction</b></p> <p>The Project Contractor will develop a CEMP and a Surface Water Management Plan (SWMP), which address surface water management and impacts during construction in accordance with EPA and best practice guidelines. Further details on the SWMP can be seen in response to SW5.</p> <p><b>Operation</b></p> <p>An operational surface water monitoring program will be developed and will be documented in the OEMP.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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<p>EPA Publications:</p> <p>275 (1991) Construction techniques for sediment pollution control</p> <p>EPA Publication 1834, Civil construction, building and demolition guide (EPA Victoria November 2020)</p> <p>596 (1998) Point source discharges to streams: protocol for in-stream monitoring and assessment</p> <p>Victorian Stormwater Committee's Best Practice Environmental Management Guidelines for Urban Stormwater (as published by CSIRO in 1999 with assistance from EPA Victoria and others)</p> <p>Industrial waste resource guidelines IWRG701 Sampling and analysis of waters, wastewaters, soils and wastes</p>	<b>SW2</b>	<p>Design and implement spill containment</p> <p>Design and construct the spill containment capacity of the stormwater drainage system for all freeway pavements (including ramps) to manage the risk of hazardous spills from traffic accidents at or prior to every stormwater outlet, to meet AustRoads requirements (Part 5 Drainage – General &amp; Hydrology Considerations). The design and location of spill containment must consider the risk and potential impact of a spill, as well as the effectiveness in reducing the risks associated with a spill on the environment. Develop procedures for freeway roads and ramps to be implemented in response to a hazardous spill. The OEMP must include requirements to maintain spill containment infrastructure and implement associated procedures.</p>	Design, construction, operation	<p><b>Design</b></p> <p>Spill containment will be provided on all outlets for the Project to meet AustRoads requirements (Part 5 Drainage – General &amp; Hydrology Considerations). These will either be open basins where possible, or supplied underground structures where space is limited.</p> <p>Examples:</p> <p>The design includes spill containment units at:</p> <ul style="list-style-type: none"> <li>• 6 locations discharging into Banyule Creek</li> <li>• 3 locations at Manningham precinct upstream of WSUD elements that will discharge into the Yarra River (Birrarrung).</li> <li>• 2 locations around the Southern Portal (to discharge to a drain to the Yarra River (Birrarrung) and to Koonung Creek).</li> </ul> <p>An overarching Water Sensitive Urban Design strategy will be prepared for the Project in consultation with the relevant authorities and land managers. This strategy is integrated as part of this UDLP, which accords with the UDS.</p> <p><b>Construction</b></p> <p>The CEMP will address the spill containment measure for the construction phase of works.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operation</b></p> <p>The OEMP will be developed and will include measures to maintain spill containment infrastructure. This will include a maintenance program for wetlands to ensure these are regularly monitored and maintained to ensure there is sufficient capacity for spill containment. Operations manuals will also detail operation and maintenance of in-tunnel spill containment infrastructure. The OEMP will include procedures for spill response and may include measures such as installation of floating booms to contain spills, removal and disposal of contamination resulting from spills and water quality monitoring following spill clean-up.</p>
	<b>SW3</b>	<p>Waste water discharges to be minimised and approved</p> <p>The Surface Water Management Plan (refer EPR SW5) and OEMP must include requirements and methods for minimising, handling, classifying, treating, disposing and otherwise managing waste water. Any proposed discharge of waste water from the site must be approved by the relevant authority prior to discharges occurring and meet the State Environment Protection Policy (Waters) requirements.</p>	Construction, operation	<p><b>Construction</b></p> <p>The Project Contractor will prepare and implement a Surface Water Management Plan (SWMP). The SWMP will include requirements for minimising, handling, classifying, treating, disposing, and otherwise managing wastewater.</p> <p>Any proposed discharge of waste water from the site will be approved by the relevant authority prior to discharges occurring and meet the State Environment Protection Policy (SEPP) (Waters) requirements.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operation</b></p> <p>The OEMP will include requirements for minimising, handling, classifying, treating, disposing, and otherwise managing waste water. The methods for minimising, handling, classifying, treating, disposing, and otherwise managing waste water.</p>

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	SW4	<p>Monitor water quality</p> <p>Develop and implement a surface water monitoring program prior to commencement of, and during construction, to assess surface water quality in multiple locations at suitable distances upstream and downstream of works to establish baseline conditions, and enable assessment of construction impacts on receiving waters. The surface water quality monitoring program must be implemented for a period up to three years after commencement of North East Link operation, or a lesser period agreed with the EPA, to assess the discharges and runoff from the project against SEPP (Waters) requirements and confirm the effectiveness of environmental controls. The monitoring program must be developed in consultation with EPA Victoria and the asset owner/manager and as appropriate with reference to applicable policies and guidelines, including SEPP (Waters), Victorian Stormwater Committee's Victoria Best Practice Environmental Management Guidelines for Urban Stormwater (as published by CSIRO in 1999 with assistance from EPA Victoria and others), EPA Victoria Publication 596 Point source discharges to streams: protocol for in-stream monitoring and assessment and Industrial Waste Resource Guideline 701 Sampling and analysis of waters, wastewaters, soils and wastes. The surface water monitoring program is to be used to inform the development and refinement of the Surface Water Management Plan (EPR SW5).</p>	Design, construction, operation	<p><b>Design and Construction</b></p> <p>The Project Contractor will prepare and implement a Surface Water Management Plan (SWMP) which will include a surface water monitoring program prior to commencement of and during construction.</p> <p>A baseline will be established prior to construction impacts during the Project works. The surface water monitoring program is to be used to inform the development and refinement of the Surface Water Management Plan (EPR SW5).</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operation</b></p> <p>An operational surface water monitoring program will be developed in consultation with the EPA and will be documented in the OEMP which will include a surface water quality monitoring program for a period up to three years after commencement of the Services Contractor's operation or a lesser period agreed with the EPA.</p> <p>The monitoring program will be developed in consultation with EPA Victoria and the asset owner/manager and as appropriate with reference to applicable policies and guidelines, including SEPP (Waters), Victorian Stormwater Committee's Victoria Best Practice Environmental Management Guidelines for Urban Stormwater (as published by CSIRO in 1999 with assistance from EPA Victoria and others), EPA Victoria Publication 596 Point source discharges to streams: protocol for in-stream monitoring and assessment and Industrial Waste Resource Guideline 701 Sampling and analysis of waters, wastewaters, soils and wastes.</p>
	SW5	<p>Implement a Surface Water Management Plan during construction</p> <p>Develop and implement a Surface Water Management Plan, in consultation with EPA Victoria, for construction that sets out requirements and methods for:</p> <ul style="list-style-type: none"> <li>• Best practice sediment and erosion control and monitoring, in general accordance with EPA Victoria publications 275 Construction techniques for sediment pollution control, 1834 Civil construction, building and demolition guide, and Industrial Waste Resource Guideline 701 Sampling and analysis of waters, waste waters, soils and wastes</li> <li>• Maintaining the key hydrologic and hydraulic functionality and reliability of existing flow paths, drainage lines and flood plain storage</li> <li>• Retain existing flow characteristics to maintain waterway stability downstream •Location and bunding of any contaminated material (including tunnel spoil and stockpiled soil) to the 1% AEP flood level and to the requirements of EPA Victoria and the relevant drainage authority</li> <li>• Works scheduling to reduce flood related risks</li> <li>• Bunding of significant excavations including tunnel portals and interchanges to an appropriate level during the construction phase</li> <li>• Protecting against the risk of contaminated discharge to waterways when working in close proximity to potential pollutant sources (eg landfill or sewer infrastructure)</li> <li>• Documenting the existing condition of all drainage assets potentially affected by the works (including their immediate surrounds) to enable baseline conditions to be established and potential construction impacts on these assets to be assessed and managed.</li> </ul>	Construction	<p>The Project Contractor will prepare a SWMP in accordance with EPA Victoria publications 275 Construction techniques for sediment pollution control, 1834 Civil construction, building and demolition guide, and Industrial Waste Resource Guideline 701 Sampling and analysis of waters, wastewaters, soils and wastes. The SWMP contains the following information to satisfy statutory requirements under the Incorporated Document:</p> <ul style="list-style-type: none"> <li>• Best practice sediment and erosion control and monitoring</li> <li>• Maintaining the key hydrologic and hydraulic functionality and reliability of existing flow paths, drainage lines and floodplain storage</li> <li>• Retain existing flow characteristics to maintain waterway stability downstream of construction</li> <li>• Location and bunding of any contaminated material (including tunnel spoil and stockpiled soil) to the 1% AEP flood level and to the requirements of EPA Victoria and the relevant drainage authority</li> <li>• Works scheduling to reduce flood related risks</li> <li>• Bunding of significant excavations including tunnel portals and interchanges to an appropriate level during the construction phase</li> <li>• Protecting against the risk of contaminated discharge to waterways when working near potential pollutant sources</li> <li>• Documenting the existing condition of all drainage assets potentially affected to establish baseline conditions and identify potential construction impacts on these assets to be assessed and managed.</li> </ul> <p>Consultation with relevant stakeholders will be undertaken during the design and construction phase and the SWMP will be developed in consultation with EPA Vic.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	SW6	<p>Minimise risk from changes to flood levels, flows and velocities</p> <p>Permanent works and associated temporary construction works must not increase overall flood risk at relevant locations or modify the flow regime of waterways without the acceptance of the relevant flood plain manager, drainage authority or asset owner (typically Melbourne Water) and in consultation with other relevant authorities (e.g., Council, Department of Transport, Parks Victoria, SES, emergency services).</p> <p>Prior to commencement of relevant works, flood risk should be appropriately assessed using modelling of the design of permanent and temporary works to demonstrate the resultant flood levels and risk profile in accordance with Melbourne Water Standards for Infrastructure Projects in Flood-Prone Areas (2019).</p> <p>This modelling analysis is to include sufficient events (at least up to and including the 1% AEP event) and scenarios (e.g., with and without blockage) to support the estimation of tangible (e.g., average annual damages) and intangible flood damages. If significant increases in flood risk are predicted for any events analysed, an assessment of overall flood risk considering tangible and intangible flood damages must be prepared and presented with appropriate mitigation measures for the acceptance of the relevant drainage authority or asset owner prior to commencement of construction for the relevant section of the works. If there are significant design changes during construction, the model must continue to be updated, as appropriate to represent those changes.</p>	Design, construction	<p><b>Design</b></p> <p>The design of the Permanent works and associated temporary construction works will not increase overall flood risk at relevant locations or modify the flow regime of waterways without the acceptance of the relevant flood plain manager, drainage authority or asset owner (typically Melbourne Water).</p> <p>Modelling and design packages will be designed in consultation with Melbourne Water for the Yarra River catchment, Banyule Creek, Watsonia Station Drain and Koonung Creek in accordance with Melbourne Water requirements.</p> <p>Following consultation with Melbourne Water on the model and report outputs, the Contractor will seek confirmation of no objections from Melbourne Water to proceed with construction works.</p> <p>The modelling analysis includes sufficient scenario events (as per Melbourne Water requests) and the 1% AEP event, incorporating Climate Change, as per EPR SW6 and Melbourne Water requirements.</p> <p>Flood risks and mitigation measures have been identified and applied in the design packages to protect the asset design life such as flood walls, freeboard allowances (based on model outputs), flood gates at tunnel portals and with flood warning systems.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the minimising of the risks to changes of flood levels for the construction phase of works.</p>
	SW7	<p>Develop flood emergency management plans</p> <p>Develop and implement flood emergency management plans for each of construction and operation. Flood emergency management plans are to include but not be limited to measures to manage flood risk to construction sites (including consideration of scheduling works), the tunnels and tunnel portals including interchanges and substations, and operation, maintenance and emergency management procedures for flood protection works.</p>	Construction, operation	<p><b>Construction</b></p> <p>The Project Contractor will prepare and implement a Flood Emergency Management Plan during construction.</p> <p>Melbourne Water and Councils will be approving the packages as the asset owners.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operation</b></p> <p>An Operations Flood Emergency Response Plan will be developed and will include measures to respond to flood emergencies.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	SW8	<p>Minimise impacts from waterway modifications</p> <p>Where waterway or flow regime modification is necessary, modifications will be designed and undertaken in a way that mitigates to the extent practicable the effects of changes to flow and minimises, to the extent practicable, the potential for erosion, sediment plumes, impacts on bed or bank stability and exposure or mobilisation of contaminated material during construction and operation to the requirements of Melbourne Water or the relevant drainage authority.</p> <p>Waterway modifications are to be designed and undertaken in a way that supports the visual and aesthetic amenity and environmental conditions (including habitat, connectivity, refuge and hydraulic conditions) to support aquatic ecosystems of the waterways having regard to relevant strategies, policies and plans for that waterway and in consultation with Melbourne Water or the relevant drainage authority.</p>	Design, construction	<p><b>Design</b></p> <p>Where waterway or flow regimes are to be modified, the modification will be designed and undertaken in consultation with Melbourne Water with the intent to mitigate to the extent practicable any extraneous negative effects.</p> <p>This includes the potential for erosion, sediment plumes, impacts on bed or bank stability and exposure or mobilisation of contaminated material during operation.</p> <p>Creek diversions are required for Banyule Creek in Borlase Reserve to allow for creek alignment and a piped network.</p> <p>Koonung Creek in the Southern Interface Zone, will be diverted to accommodate for the proposed culvert and bridge structures which will be further designed and developed through the secondary contractor. In addition to these, provisions will be made to protect the existing bebo arches.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address minimising impacts from waterway modifications for the construction phase of works.</p>
	SW9	<p>Maintain bank stability</p> <p>Develop and implement appropriate measures to minimise erosion and protect bank stability of waterways affected by construction or operation activities both directly or indirectly (for example as a result of site access), to the requirements of Melbourne Water or the relevant drainage authority.</p>	Design, construction, operation	<p><b>Design</b></p> <p>Where waterway or flow regimes are to be permanently modified (Banyule Creek within Borlase Reserve and Koonung Creek in the Southern Interface Zone), appropriate mitigations have been provided within the drainage design solution to maintain bank stability. In addition, the landscape planting design and the Green Infrastructure Plan specifies requirements specifically for planting on waterway banks.</p> <p>Flood modelling is also being completed that will assess changes to flow velocities within waterways. This information will allow for issues to be identified and mitigations to be developed if necessary.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to maintaining bank stability for the construction phase of works along with suitable temporary design works which will be required to be approved by the IREA.</p> <p><b>Operation</b></p> <p>The OEMP will include measures to monitor bank stability and the adequacy of control measures implemented during construction and will include the requirements of Melbourne Water or the relevant drainage authority.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	SW10	<p>Provide for access to Melbourne Water and other drainage assets</p> <p>Provide adequate clearances and access for ongoing maintenance of Melbourne Water and other drainage authority assets to the requirements of the relevant drainage authority.</p>	Design, construction	<p><b>Design</b></p> <p>The design solution for the Project has been informed by consultation with Melbourne Water and the project councils, and allows for maintenance access for relevant authorities.</p> <p>All WSUD assets will be maintained assets, and designs are being developed with a careful consideration given to access and maintenance activities. Drainage assets will be both maintained and returned in accordance with the asset owner access requirements.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to maintaining access to Melbourne Water assets during the construction phase of works.</p>
	SW11	<p>Adopt Water Sensitive Urban and Road Design</p> <p>Adopt and implement water sensitive urban design and integrated water management principles in the stormwater treatment design in consultation with the relevant flood plain manager, drainage authority, asset owner or land manager and in general accordance with the Urban Design Strategy, the specifications of the relevant local council as applicable, and VicRoads Integrated Water Management Guidelines (June 2013), the Victorian Stormwater Committee's Victoria Best Practice Environmental Management Guidelines for Urban Stormwater (as published by CSIRO in 1999 with assistance from EPA Victoria and others) and the DELWP Integrated Water Management Framework for Victoria (September 2017).</p>	Design, construction	<p><b>Design</b></p> <p>An overarching Water Sensitive Urban Design strategy will be prepared for the Project in consultation with the relevant authorities and land managers. This strategy is integrated as part of this UDLP, which accords with the UDS.</p> <p>The WSUD strategy includes the construction of wetlands and bioretention basins in Public Open Spaces at Borlase Reserve, Cultural Landscape Precinct wetland at Manningham and the east and west treatment basins at Bulleen near the Southern interchange area.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to water sensitive principals during the construction phase of works.</p>
	SW12	<p>Minimise impacts on irrigation of sporting fields</p> <p>Maintain existing storage and available water supply of a quality that is suitable for the irrigation of sporting fields impacted by the project as necessary in consultation with the impacted stakeholders.</p>	Design, construction, operation	<p><b>Design</b></p> <p>The Project Contractor has designed the construction phasing to ensure existing water supply of Trinity Grammar School sporting grounds is maintained.</p> <p>An urban design package will be completed for the Trinity Lake area that maintains existing water volumes within the lake to not reduce available water supply. Subject to consultation with the school, the solution will likely involve deepening of the existing lake.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to minimising any impacts on irrigation to sporting fields during the construction phase of works.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Operations</b></p> <p>Operations will ensure existing water supply of Trinity Grammar School sporting grounds is maintained throughout the operations phase.</p>

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	SW13	<p>Consider climate change effects</p> <p>The flood risk assessment (as required by EPR SW6) must consider current climate conditions as well as the potential effects of climate change on pre and post work scenarios for future climate conditions (i.e., increased rainfall intensity and sea-level rise) as predicted at the end of the asset's design life using RCP8.5 projections from CSIRO to the requirements of Melbourne Water or the relevant drainage authority.</p>	Design	<p>The flood modelling (to inform a risk assessment) undertaken for EPR SW6 in accordance with Melbourne Water Standards for Infrastructure Projects in Flood-Prone Areas (2019) has considered climate change.</p> <p>To allow for climate change in design of the NEL Project, the Project Contractor will include 18.5% increase in rainfall intensity to flood modelling and drainage hydraulic analysis in accordance with Melbourne Water guidance in their document, AM STA 6200 Flood Mapping Projects – Specification (October 2021).</p> <p>The project is far enough upstream from the bay to be unaffected by an increase in sea-level rise.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>
	SW14	<p>Meet existing water quality treatment performance</p> <p>Retain or replace existing water quality treatment assets to meet or exceed water quality treatment performance as originally designed for that asset. In consultation with relevant asset owner or land manager, consider climate change effects and the potential for improved treatment outcomes where practicable.</p>	Design, construction	<p><b>Design</b></p> <p>There are no existing formal water quality treatment elements being impacted by the works. There would be some pollutant removal occurring naturally in creeks such as Banyule Creek, however the treatment outcomes would be modest. The waterway relocation works, combined with the online WSUD elements proposed at locations of waterway relocations could exceed these existing treatment outcomes.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to meeting existing water quality treatments during the construction phase of works.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>
	SW15	<p>Water Sensitive Urban Design asset transfer strategy</p> <p>Prepare a strategy identifying Water Sensitive Urban Design assets constructed as part of the Project to be transferred to public authorities. The strategy must include a process to consult with relevant asset managers to confirm the relevant delivery and maintenance standards to be met.</p>	Design, construction, operation	<p><b>Design</b></p> <p>Delivery, operational and maintenance plans for WSUD infrastructure will be developed with relevant public authorities.</p> <p>All WSUD assets in the Central Package will be maintained assets, which means the assets will be maintained and operated by the NEL tunnel operators for the duration of their Deed. Therefore, a Water Sensitive Urban Design Asset Transfer Strategy will not be required.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>The CEMP will address the approach to any water sensitive asset transfer during the construction phase of works.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>16. Sustainability and Climate Change (SCC)</b>				
<p>Protocol for Environmental Management (Greenhouse Gas Emissions and Energy Efficiency in Industry)</p> <p>Infrastructure Sustainability Council of Australia rating tool</p>	SCC1	<p>Implement a Sustainability Management Plan</p> <p>North East Link Project must set sustainability targets and specify ratings to be achieved under the Infrastructure Sustainability Council of Australia's Infrastructure Sustainability Rating Tool. Contractors must develop and implement a Sustainability Management Plan that contains measures to meet, as a minimum, the sustainability targets and specified ratings.</p>	Design, construction, operation	<p>The NEL Project Contractor will establish sustainability targets that apply across the Project for design and construction, and these are publicly available on the NEL Project website. Achieving the targets will be a statutory requirement under the Incorporated Document.</p> <p>The Sustainability Management Plan will identify sustainability performance measures for design, construction and operation, defined roles, and responsibilities to ensure that they measure, monitor and review sustainability performance in line with sustainability targets and IS requirements.</p> <p>Key targets include:</p> <ul style="list-style-type: none"> <li>• Achieve at least a 30% reduction in carbon emissions from the construction of North East Link against an ISC verified base case calculated in accordance with their independent standards</li> <li>• Use 100% renewable energy for electricity used to construct the central tunnelling package and at least 50% for other NEL packages of work</li> <li>• Reduce the amount of Portland Cement content in concrete across the Project by a minimum of 30% (against Green Building Council of Australia reference mix design levels)</li> <li>• Maximise harvest and reuse of rainwater, stormwater, wastewater, groundwater and tunnel inflow water through design and construction</li> <li>• Infrastructure Sustainability Design and As Built Rating (v2.1) (Achieve a minimum 50 points for the Program Rating), and GBCA Green Star 5 Star Design and As Built Rating for the NEL Motorway Control Centre and any occupied permanent buildings (excluding the Alternate Motorway Control Centre)</li> <li>• Incorporation of solar photovoltaic (PV) panels along the alignment, including anti-throw barriers and ventilation outlets, to provide renewable energy to power NEL assets</li> <li>• Implementation of construction optimisation solutions that both reduce cost and greenhouse gas emissions, including:             <ul style="list-style-type: none"> <li>– Reduce the amount of Portland Cement content in concrete across the Project by a minimum of 30% (against Green Building Council of Australia reference mix design levels)</li> <li>– The use of larger and/or alternative truck and trailer configurations will be considered wherever feasible to increase productivity and reduce truck movements and congestion</li> <li>– Ensuring transport routes for the movement of spoil are minimised in terms of distance travelled and to avoid areas of residential dwellings.</li> </ul> </li> </ul>

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				<p><b>Climate Change</b></p> <ul style="list-style-type: none"> <li>Sustainability design caters for Climate Change impacts through the consideration of long-term risks impacting the asset in its design lifetime (up to 100 years)</li> <li>These risks are identified by SME's in interdisciplinary teams in both internal design and external stakeholder workshops</li> <li>The risks identified are ranked for likelihood and severity, using worst case scenario RCP 8.5 projections</li> <li>Mitigation methods are identified and implemented in the design and operational stage to reduce the risk of climate change</li> <li>Through this risk assessment process, the Project creates a long-term resilient asset that can better withstand impacts of Climate Change</li> <li>To allow for climate change in design of the NEL Project, the Project Contractor will include 18.5% increase in rainfall intensity to flood modelling and drainage hydraulic analysis in accordance with Melbourne Water guidance in their document, AM STA 6200 Flood Mapping Projects – Specification (October 2021).</li> </ul> <p><b>Operations</b></p> <p>The Sustainability Management Plan will identify the following key targets for operation phase:</p> <ul style="list-style-type: none"> <li>15% reduction in absolute GHG emissions (excludes renewable energy)</li> <li>100% reduction in net GHG emissions (includes renewable energy)</li> <li>40% diversion (by volume of office waste)</li> <li>10% minimum increase in cyclist numbers travelling the NEL corridor after three years of operation.</li> </ul> <p>The Project is Targeting a Version 1.2 Operations rating.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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	SCC2	<p>Minimise greenhouse gas emissions</p> <p>Integrate sustainable design practices which are best practice for major road and tunnel infrastructure projects into the design process and implement these to minimise, to the extent practicable, greenhouse gas emissions arising from construction, operation and maintenance of North East Link. In detailed design, select materials and consider energy and carbon during construction, to target:</p> <ul style="list-style-type: none"> <li>– At least a 30% reduction in carbon emissions from the construction of North East Link against an Infrastructure Sustainability Council of Australia (ISCA) verified base case calculated in accordance with their independent standards (IS v1.2 Ene-1 Level 3 or v2.0 equivalent)</li> <li>– Use of a minimum of 50% of renewable energy for electricity used to construct North East Link (IS v1.2 Ene-2 Level 1.5 or v2.0 equivalent)</li> <li>– Net zero emissions in the operation and maintenance of North East Link (excluding emissions from traffic) with reference to the IS v2.0 energy and carbon guideline</li> <li>– Reduction of the amount of Portland Cement content in concrete across the project by a minimum of 30% against Green Building Council of Australia reference mix design levels subject to durability and strength requirements.</li> </ul>	Design, construction, operation	<p><b>Design</b></p> <p>The Sustainability Management Plan will be developed with a goal to limit the Project's contribution to climate change and support the economy-wide transition needed to achieve the State's net zero by 2050 target and objectives to:</p> <ul style="list-style-type: none"> <li>• Deliver a carbon neutral Project</li> <li>• Support the growth and transition of the State's renewable energy sector and jobs</li> <li>• Lower the embodied carbon of construction materials.</li> </ul> <p>The plan has the goal to design, plan and adapt for climate and natural hazard risk mitigation, as identified under science-based future climate change scenarios and includes the objective to mitigate major climate and natural hazard risks.</p> <p>Key targets include:</p> <ul style="list-style-type: none"> <li>• 30% reduction in absolute greenhouse gas emissions (all NEL packages)</li> <li>• 100% renewable electricity (central tunnelling package).</li> </ul> <p>Average 30% replacement of Portland cement will be through Portland cement with Supplementary Cementitious Materials. Pavement materiality optimisation will be undertaken to reduce the overall quantity of asphalt, resulting in embodied impact savings. Recycled Asphalt Pavement will be implemented in non-surface layers. Recycled glass fines will replace natural sand in wearing and base course layers of asphalt.</p> <p>The Project Contractor will integrate sustainable solutions in the development of the preliminary design. Throughout the design process sustainability in design workshops will be held to ensure that sustainability targets incorporated into the design of the Project. These workshops will identify opportunities for greenhouse gas reduction across the whole of life of the asset through design.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Construction</b></p> <p>Throughout the construction phase, sustainability in construction workshops will be held to ensure that sustainability targets incorporated into the construction of the Project. These workshops will identify opportunities for greenhouse gas reduction throughout the construction phase. To maximise the opportunity for sustainability outcomes at both the macro and micro-scale during the construction period, the Project Contractor will integrate sustainability considerations into construction processes including:</p> <ul style="list-style-type: none"> <li>• Fuel efficiency for plant operators</li> <li>• Optimisation of logistics</li> <li>• Sustainability inspection checklists</li> <li>• Clean Fuel Switching Program</li> <li>• Employee Sustainable Transport Program.</li> </ul>

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				<p><b>Operation</b></p> <p>During operations the Services Contractor will ensure net zero emissions <sup>(1)</sup> in the operation and maintenance of North East Link, with reference to the IS v2.0 energy and carbon guideline, is achieved. Measures to achieve net zero emissions in operation will include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Electric light vehicles for Ventia staff in the Operational Phase</li> <li>• Electric charging stations to service these vehicles are included in the MCC Concept Design.</li> </ul> <p><sup>(1)</sup> Net zero emissions does not include emissions from public vehicles using the NEL Freeway or electricity procured by State Parties and provided for the operation and maintenance of the Project.</p> <p>In addition, solar photovoltaic (PV) panels are incorporated along the alignment, including anti-throw barriers and ventilation outlets, to provide renewable energy to power portions of the corridor infrastructure.</p>
	SCC3	<p>Apply best practice measures for energy usage for tunnel ventilation and lighting systems</p> <p>Best practice measures for energy usage are to be applied for the tunnel ventilation and lighting systems in accordance with the Protocol for Environmental Management (Greenhouse Gas Emissions and Energy Efficiency in Industry), the EPA Victoria Development Licence and the EPA Victoria Operating Licence.</p>	Design, operation	<p><b>Design</b></p> <p>Best practice measures for energy usage for the tunnel ventilation system design will be included in the relevant design packages which will be submitted to EPA for their approval in accordance with the Development Licence conditions.</p> <p>Incidental shading of the tunnel entrances has been estimated to reduce lighting power demand in the tunnel by approximately 5%. This initiative will be assessed as part of the detailed design.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Operations</b></p> <p>During operations we will investigate opportunities to reduce tunnel energy use, for example where we see improvement in vehicle emissions. Fewer traditional fuel vehicles using the tunnels will result in a better tunnel air quality. This gives us the opportunity to demonstrate, through monitoring, that amending the tunnel licence to permit portal emissions will not impact community air quality.</p> <p>This will provide a strong contribution to decarbonising the Project.</p> <p>The tunnel lighting system has dimmable LED features, reflecting best practice in tunnel lighting design. This design feature leads to smooth lighting demand profile curves, which facilitates greater energy efficiency during operation, compared to the business-as-usual systems.</p>

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	SCC4	<p>Minimise and appropriately manage waste</p> <p>Develop and implement management measures for waste (excluding soils) minimisation during construction and operation in accordance with the <i>Environment Protection Act 2017</i> waste management hierarchy and management options, to address:</p> <ul style="list-style-type: none"> <li>- Litter management</li> <li>- Construction and demolition wastes including, but not limited to, washing residues, slurries and contaminated water</li> <li>- Organic wastes</li> <li>- Inert solid wastes.</li> </ul>	Construction, operation	<p><b>Construction</b></p> <p>The Project Contractor will develop measures as part of a Sustainability Management Plan to address waste diversion from landfill and achieve landfill diversion rates in accordance with the NEL sustainability objectives and targets.</p> <p>The Sustainability Management Plan includes a compost program initiative. Through this program the Project Contractor will utilise AS 4454 certified composts in the landscaping activities of the Development Phase. This compost can be sourced from processed local council garden waste.</p> <p>The Spoil Management Plan will assess potential management options based on the EPA Waste Hierarchy, including reuse onsite and offsite disposal of spoil generated on the Project.</p> <p>To maximise the opportunity for sustainability outcomes at both the macro and micro-scale during the construction period, the Project Contractor will integrate sustainability considerations into construction processes including:</p> <ul style="list-style-type: none"> <li>• Minimising the over-ordering of materials</li> <li>• Planning for waste management in construction activities (e.g., allocating the appropriate space for source separation, where possible, ordering the required recycling bins and collection services)</li> <li>• D&amp;C Compost Program – utilisation of AS 4454 certified composts, a key step in the nitrogen and phosphorous cycles, in the landscaping activities of the Development Phase.</li> </ul> <p>The management plan will respond to and comply with all items as listed in this EPR.</p> <p><b>Operations</b></p> <p>During operations an Operations Waste Management Plan will be developed. The following measures will be implemented to minimise waste generation during operations:</p> <ul style="list-style-type: none"> <li>• 40% diversion (by volume of office waste)</li> <li>• Reuse or recycling of asphalt profiling generated during maintenance works</li> <li>• Reuse or recycling of green waste generated through maintenance activities</li> <li>• Providing ample waste bins to allow for waste segregation including as a minimum, steel waste, timber waste, paper, and cardboard, used batteries, glass, plastic and organic waste</li> <li>• Investigate opportunities throughout operations to minimise waste sent to landfill.</li> </ul>

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	SCC5	<p>Minimise potable water consumption</p> <p>Stormwater, recycled water and groundwater inflow to tunnels or other water sources must be used in preference to potable water for construction activities, including concrete mixing and dust control, where this is available, practicable, of suitable quality, and meets health and safety requirements.</p>	Construction	<p>The Sustainability Management Plan will have the target to maximise harvest and reuse of rainwater, stormwater, wastewater, groundwater and tunnel inflow water through design and construction.</p> <p>A water reuse and recycling workshop will be undertaken prior to construction to identify opportunities to maximise the reuse and recycling of water in the construction phase.</p> <p>The Sustainability Management Plan will include a range of initiatives. This includes:</p> <ul style="list-style-type: none"> <li>• Improvements across various parks and linear parks including additional wetlands and rain gardens to treat stormwater. The Project includes the creation of over four hectares of new and upgraded wetlands and associated habitat. This includes new wetlands and bioretention systems at Koonung Creek Reserve which allow more stormwater to be treated</li> <li>• The MCC and construction site offices, pre-cast yard and spoil shed will include rainwater tanks to harvest rainwater from roofs. The rainwater will be used for handwashing, toilet flushing and vehicle washdown</li> <li>• Water efficient fixtures and appliances will be one star higher than the average WELS rating for each product group. A closed loop water recycling system for maintenance vehicle wash bays and water-less graffiti removal processes for the Operational Phase.</li> </ul> <p>Potable water consumption will be minimised via initiatives such as:</p> <ul style="list-style-type: none"> <li>• Rainwater Harvesting – The MCC and construction site offices, pre-cast yard and spoil shed will include rainwater tanks to harvest rainwater from roofs. The rainwater will be used for handwashing, toilet flushing and vehicle washdown across the Term.</li> </ul> <p>Drought resistant and water-wise planting – The Project Contractor’s urban design landscaping solution specifies drought resistant and water-wise native vegetation species. The Project Contractor’s approach to Integrated Water Management prioritises the creation of structural ecosystems with a good balance of natural resources required for ecosystem function, including water provision. Water ‘re-use’ can thereby be achieved in the long-term for the Project landscaping features through new or enhanced water bodies.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
<b>17. Traffic and Transport (TT)</b>				
Planning and Environment Act 1987  Road Management Act 2004	T1	Optimise design performance  Optimise the design of the works in consultation with appropriate road management authorities, public transport authorities, relevant land managers and local councils as part of the detailed design process to: <ul style="list-style-type: none"> <li>- Minimise adverse impact on travel times for all transport modes, including walking and cycling</li> <li>- Maintain, and where practicable, enhance the traffic movements at interchanges and adjacent intersections within the Project boundary</li> <li>- Design the road, walking and cycling and public transport elements to meet relevant road and transport authority requirements</li> <li>- Design any truncation of local access roads in consultation with directly affected residents</li> <li>- Maintain, and where practicable, enhance pedestrian movements, bicycle connectivity, and shared use paths, including access (both vehicular and pedestrian) to public open space and reserves</li> <li>- Work with relevant public transport authorities and road authorities to minimise impacts on buses, trams and rail and, where practicable, enhance public transport facilities and services that cross or run parallel to the alignment of North East Link</li> <li>- Replace and enhance commuter car parking, where affected by the Project, in consultation with the Department of Transport</li> <li>- Minimise loss of other car parking in consultation with relevant local councils and other directly affected stakeholders.</li> </ul>	Design	<b>The Design</b>  Design performance will be optimised for the works and will be developed further through consultation with the appropriate road management authorities, land managers and local councils through detailed design. The design meets or exceeds minimum authority requirements.  Design optimisation will be implemented in the design to achieve: <ul style="list-style-type: none"> <li>• Improved travel times by the users of all transport modes in general. The inclusion of extra traffic lanes on surface at Greensborough Road will provide additional traffic capacity</li> <li>• Additional Shared Use Paths and pedestrian networks will provide additional connectivity to local and regional users. Existing footpaths are being maintained and tied into new network where works allow</li> <li>• Truncation of existing local access roads has been minimised with functionality being maintained through construction of new cul-de-sac road assets. Additional consultation will be undertaken with effected residences during the design development phase to examine opportunities for the refinement of the design such as existing property access analysis, reducing impacts on existing vegetation and utilities, staging of work and the interface with the access through to Borlase Reserve</li> <li>• Bus infrastructure provided including new bus stops both on and off road along the route of the Project</li> <li>• Design assesses and seeks to mitigate any impact on existing car parking on municipal roads.</li> </ul> <p>Public transport authorities have been and will continue to be consulted throughout the development of the design.</p> <p>Carparking loss is being addressed initially in the design but also through ongoing consultation with the relevant stakeholders during design development which will include a detailed parking analysis to nearby areas and opportunities to add additional parking.</p> <p>An example being:</p> <p>The Tunnels Project has continued to engage with Manningham Council and Carey Grammar School concerning the entry from Bulleen Road, vehicle manoeuvring and carparking arrangements to the Carey Grammar School sports ovals and Bulleen Park carparking and additional car spaces will be provided and will be shown in the relevant design packages.</p> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

## 6.0 Compliance with Environmental Performance Requirements

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	T2	<p>Transport Management Plan(s) (TMP)</p> <p>Prior to commencement of relevant works, develop and implement Transport Management Plan(s) (TMP) to minimise disruption to affected local land uses, traffic, car parking, public transport (rail, tram and bus), pedestrian and bicycle movements and existing public facilities during all stages of construction.</p> <p>The TMP must be informed and supported by an appropriate level of transport modelling and must include:</p> <ul style="list-style-type: none"> <li>– Requirements for maintaining transport capacity for all travel modes in the peak demand periods</li> <li>– Requirements for limiting the amount of construction haulage during the peak demand periods</li> <li>– A monitoring program to assess the effectiveness of the TMPs on all modes of transport</li> <li>– Where monitoring identifies adverse impacts, implement practicable and appropriate mitigation measures</li> <li>– Consideration of construction activities for other relevant major projects occurring concurrently with construction activities for North East Link and potentially impacting modes of transport in the same area</li> <li>– Potential routes for construction haulage and construction vehicles travelling to and from the project construction site, recognising sensitive receptors and avoiding the use of local streets where practicable</li> <li>– Suitable measures, developed in consultation with emergency services, to ensure emergency service access is not inhibited as a result of project construction activities</li> <li>– Provision of alternative parking where practicable to replace public, private and commuter parking lost as a result of project construction activities</li> <li>– Requirements to minimise impacts on local streets, community and commercial facilities by providing parking for construction workers at construction compounds where practicable</li> <li>– Measures to ensure connectivity and safety for all transport network users during construction</li> <li>– Measures to limit the extent of road closures</li> <li>– Consultation with the Department of Transport, relevant transportation authorities and relevant local Councils.</li> <li>– A TMP may be split into precincts where appropriate but must consider other precinct TMPs through the Transport Management Liaison Group as per EPR T3.</li> <li>– TMPs must be submitted to the relevant authority for approval.</li> </ul>	Construction	<p>The Project Contractor will prepare and will implement Transport Management Plans as required for these works.</p> <p>The Project Contractor commits to providing any traffic modelling as reasonably required by the project scope within the WTMP. Organisation and coordination of traffic analysis required will be the responsibility of the Construction Traffic Manager and may include the following analysis:</p> <ul style="list-style-type: none"> <li>• First principles analysis</li> <li>• SIDRA analysis</li> <li>• Car parking surveys, pedestrian and cycling surveys and analysis</li> <li>• VISUM - DOMINO modelling coordinated through DoT as required</li> <li>• Strategic traffic modelling</li> <li>• MicroSIM modelling</li> <li>• SCATS analysis.</li> </ul> <p>Measures to minimise traffic disruption during construction include but are not limited to the following:</p> <ul style="list-style-type: none"> <li>• Short-term high impact works will be completed overnight to minimise impacts during peak hour periods</li> <li>• Construction activities that involve significant impacts will be scheduled during off-peak periods</li> <li>• The Project Contractor will engage with public transport operators during the development of the detailed construction methodology and program</li> <li>• Where a footpath or SUP requires closure, pedestrians and/or cyclists will be detoured to an alternative existing footpath or SUP.</li> </ul> <p>The Traffic Management Plan provides detailed information on the frequency with which updated traffic modelling may be undertaken over the lifetime of construction activities to inform improved traffic management practices during construction, as per NELP and DoT transport network requirements to operate the road network during construction.</p> <p>Monitoring will occur at least every 6 months, which will involve assessing travel times against an agreed baseline, on road links selected in consultation with Road Authorities. Traffic volumes on select roads will also be assessed against an agreed baseline, for roads selected in consultation with Road Authorities. Mitigations will be developed if significant issues are detected to disruption of roads, including bus routes.</p> <p>The management plan will respond to and comply with all items as listed in this EPR.</p>

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Applicable Legislation and Policy	EPR Code	Environmental Performance Requirement	Phase	Project Response
	T3	<p>Transport Management Liaison Group</p> <p>A Transport Management Liaison Group (TMLG) must be established and convene prior to the commencement of any works that may impact on existing roads, paths or public transport infrastructure. The TMLG must include representatives from the State, the Department of Transport, emergency services, the project, relevant transportation authorities and relevant local councils.</p> <p>The TMLG will be a forum for exchange of information and discussion of issues associated with Transport Management Plans. This must include review of proposed haulage routes for construction sites to minimise reliance on a single haulage route between Bell Street and the M80 Ring Road and facilitate different sites using different haulage routes.</p> <p>The TMLG must be provided with the Transport Management Plans, details as to timing of implementation, information about construction traffic monitoring conducted by the project, relevant sections of road safety audit reports and other reports, as relevant.</p> <p>Where construction activities have the potential to significantly impact on specific stakeholder or community group facilities, the TMLG should be satisfied that there has been adequate consultation to inform the Transport Management Plans and should consider inviting stakeholder representatives to relevant TMLG meetings.</p> <p>The TMLG must meet at least monthly until the completion of construction.</p>	Design, construction	<p>The TMLG has been initiated as part of the Early Works Program. The group will be advised of the program for the North East Link Tunnels. The Project Contractor will prepare and provide Transport Management Plans to the TMLG.</p> <p>The State will coordinate and facilitate a TMLG (Construction) which will include key stakeholders including the Project Contractor, Responsible Road Authorities: DoT, Relevant Local Councils, and Public Transport Victoria Emergency Services. The TMLG (Construction) will provide a forum to directly interface with key stakeholders and Responsible Road Authorities to share and disseminate information as well as raise any key issues.</p>
	T4	<p>Road safety design</p> <p>Undertake independent road safety audits after each stage of detailed design and during and after construction. The project design and operational activities must meet all relevant road and transport authority requirements with respect to transport network user safety.</p>	Design, construction, operation	<p><b>Design</b></p> <p>In the subsequent design stages, road safety audits will be undertaken on the functional and detailed road designs of the interim layout. The design will be prepared in accordance with Project specific design requirements, and relevant design standards and guidelines. Where required, Department of Transport (DoT) approval will be sought in relation to road safety matters where it is the responsible road authority.</p> <p><b>Construction</b></p> <p>The Transport Management Plan provides traffic management approach to manage safety, including outlining staff responsibilities, including a Construction Traffic Manager with the responsibility to:</p> <ul style="list-style-type: none"> <li>• Ensure that all traffic management measures are planned, implemented, and maintained in accordance with stakeholders and the Project scope and best practice, including all relevant safety regulations and standards</li> <li>• Manage the road safety audit and inspection process, implement corrective actions, and maintain detailed records.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p>

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	T5	<p><b>Traffic monitoring</b></p> <p>Undertake traffic monitoring on selected roads (arterial and non-arterial) identified in consultation with the relevant transportation authorities and local council pre-construction, at six monthly intervals during construction, and up to two years after construction is complete. As part of the selection process, consideration must be given to roads that carry public transport services. Ensure any material adverse traffic impacts of the Project are mitigated by implementing local area traffic management strategies, including other works as required in consultation with the relevant road management authorities.</p> <p>Develop and implement traffic performance management to monitor conditions during construction. Real time traffic information must be provided to drivers.</p>	Design, construction, operation	<p><b>Design &amp; Construction</b></p> <p>The Project Contractor will develop and undertake a traffic monitoring program. The Transport Management Plan outlines monitoring requirements including the ITS solution. As part of the delivery of the Project, the following ITS solutions have been considered:</p> <ul style="list-style-type: none"> <li>• Travel time VMS boards</li> <li>• VSL Signage will be put in place to enable up to date communication of real travel times across the network in instances where traffic changes are implemented</li> <li>• Travel time monitoring via services</li> <li>• Bluetooth and Infrared data collection and monitoring</li> <li>• Consideration of GPS monitoring on construction trucks through the road network</li> <li>• Any additional ITS system that is made known, available or is developed that may assist with monitoring, management and optimisation of the optimisation of the network, will be considered.</li> </ul> <p>The project contractor will demonstrate further compliance with these EPR requirements in the development of the design packages.</p> <p><b>Construction</b></p> <p>As above</p> <p>Temporary CCTV traffic monitoring in real time with DoT signals team during peak travel times to provide optimisation to new traffic signal phasing to reduce delays.</p> <p><b>Operation</b></p> <p>Traffic monitoring will continue for up to two years after construction is complete.</p> <p>Monitoring will occur at least every 6 months, which will involve assessing travel times against an agreed baseline, on road links selected in consultation with the responsible road authority. Traffic volumes on select roads will also be assessed against an agreed baseline, for roads selected in consultation with the responsible road authority. Mitigations will be developed if significant issues are detected to disruption of roads, including bus routes.</p>

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## Sections

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## Revision

Issue	Date	Reason for Issue
01	11/05/22	Public Exhibition
02	23/06/22	For Review
03	10/08/22	For Review
04	1/9/2022	For Review
05	12/10/22	For Review
06	14/10/22	For Review