




Quality Assurance Statement	
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This ULDF has been developed in collaboration with representatives from Mana Whenua groups of the project area, including: Te Ākitai Waiohua, Ngāti Te Ata Waihoua, Ngāti Paoa, Ngāti Maru Runanga, Te Kawarau Kawerau a Maki, Ngāi Tai Ki Tāmaki, Ngāti Whatua Ōrakei, Te Runanga o Ngāti Whatua, Te Ahi Waru, Ngāti Tamaoho.

Quality Assurance Statement					
Rev. N°	Date	Description	Prepared by	Reviewed by	Approved by
0	November 2016	Final for lodgement	Lynne Hancock & Sarah Johnson	Lynne Hancock, Amelia Linzey & Andrea Rickard	Patrick Kelly

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East West Link

Urban and Landscape Design Framework
for lodgement / November 2016

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1 INTRODUCTION

1 INTRODUCTION

1.1. Project description

The EWL Project involves the construction, operation and maintenance of a new four lane arterial road from State Highway 20 (SH20) at the Neilson Street Interchange in Onehunga, connecting to State Highway 1 (SH1) at Mt Wellington as well as an upgrade to SH1 between the Mt Wellington Interchange and the Princes Street Interchange at Ōtāhuhu. New local road connections are provided at Galway Street, Captain Springs Road, the port link road and Hugo Johnston Drive. Cycle and pedestrian facilities are provided along the alignment.

The primary objective of the Project is to address the current traffic congestion problems in the Onehunga, Penrose and Mt Wellington commercial areas which will improve freight efficiency and travel reliability for all road users. Improvements to public transport, cycling and walking facilities are also proposed.

For consistency with specialist assessments and ease of comparison with the Assessment of Environment Effects plan set, Section 5 of the ULDF divides the Project into six sectors:

- Sector 1. Neilson Street Interchange and Galway Street connections
- Sector 2. Foreshore works along the Māngere Inlet foreshore including dredging
- Sector 3. Anns Creek to Great South Road
- Sector 4. Great South Road to SH1 at Mt Wellington Highway Interchange
- Sector 5. SH1 at Mt Wellington Highway Interchange to the Princes Street Interchange
- Sector 6. Onehunga local road works.

A full description of the Project including its design, construction and operation is provided in Part C: Description of the Project in the Assessment of Effects on the Environment Report (AEE) contained in Volume 1: AEE and shown on the Drawings in Volume 2: Drawing Set.

1.2. Project objectives

The project transport objectives are:

- To improve travel times and travel time reliability between businesses in the Onehunga-Penrose industrial area and SH1 and SH20
- To improve safety and accessibility for cycling and walking between Māngere Bridge, Onehunga and Sylvia Park, and accessing Ōtāhuhu East; and
- To improve journey time reliability for buses between SH20 and Onehunga Town Centre.

For the purposes of the Urban and Landscape Design Framework, these objectives also set the scene for developing project-specific urban and landscape objectives and strategies for the East West Link. This means in particular responding to the connections with State Highway 1 and State Highway 20, the interface between the corridor and the local road and walking and cycling networks, the interface with Onehunga Port, and the different road conditions through the corridor.

The urban and landscape design objectives are:

- A travel experience that responds to the changing context and the sequence of motorway – arterial – motorway environments
- A well-connected, high amenity movement network that supports access to centres and communities
- A landscape where drivers, cyclists and pedestrians can appreciate and relate to the place

1.3. Mana Whenua urban design objectives

The following Mana Whenua urban design objectives were prepared following extensive consultation with Mana Whenua as Project partners, and have been a key consideration throughout the preparation of the ULDF:

- The values of the environment (including the economy, culture, nature and community) are holistic across the project area.
- The cultural landscape of the area is significant, for settlement (as a residence but also as a meeting place), for access (as a portage) and for movement (as a trade hub and with different whakapapa for many iwi)
- The project should seek to restore and / or replenish the mauri of the environment – to enhance and acknowledge the mana of the Māngere Inlet and the Manukau Harbour
- The project should seek opportunities to increase the restorative rehabilitation capacity of the environment
- The project should acknowledge and give special design consideration to the following remaining iconic 'geographic areas' of interest as 'features of the cultural landscape', including:
 - Te Hōpua a Rangi
 - Anns Creek
 - Mutukāroa
 - Te Apunga o Tainui, waahi tapu site
 - Ōtāhuhu Creek
 - Pikes Point / Pahoeheo lava flows
 - Portages: Karetu and Ōtāhuhu.

1.4. Strategic context

A number of documents have informed the urban and landscape design process.

1.4.1. Background documents

Background documents that emphasise the NZ Transport Agency's (and its consultants') responsibility to address or consider social and environmental factors are:

- Resource Management Act (1991)
- Land Transport Management Act (2003)
- NZ Transport Agency Environmental Plan (2008)
- NZ Transport Agency Environmental and Social Management Standard (Z/19) (2016)

1.4.2. Foundation documents

Documents that have generally informed the ULDF principles and outcomes to date, and are design standards to implement the ULDF going forward, are:

- Bridging the Gap: NZ Transport Agency Urban Design Guidelines (2013)
- NZ Transport Agency Landscape Guidelines (Final Draft) (2014)

These are key NZTA policy documents that should be promoted by NZTA in all future stages of the Project, as a basis to cross check the developed / detailed design. There are 10 over-arching principles in each, with some cross-over between them in terms of a collaborative, considered and holistic process that encourages place-sensitive design. Both documents deal with process as well as outcomes. Bridging the Gap includes advice on the content of Urban and Landscape Design Frameworks. Both documents also include specific guidance on highway and landscape elements respectively.

- NZ Transport Agency P39: Standard Specification for Highway Landscape Treatments (2013)

This baseline landscape specification includes the minimum standards for highway projects and is to be used alongside the project-specific landscape plans and schedules. It is therefore a supporting document to the landscape principles and design, to assist in delivering the quality outcomes envisaged. It covers quality control, site preparation, plant pest and animal control, plant propagation, topsoil supply, planting, grassed surfaces, hydroseeding, irrigation, defects liability and maintenance.

Te Aranga principles, Auckland Design Manual (2013)

The Te Aranga principles were developed by Auckland Council in collaboration with Mana Whenua and constitute a Te Aranga Framework whose key purpose is to ensure the protection, reinstatement and reaffirmation of Mana Whenua connection and association to the cultural landscape through design, so that all parties have the opportunity to connect and to deepen their appreciation and knowledge of the history of the area. The principles are underpinned by the high level values of rangatiratanga, kotahitanga, kaitiakitanga, whanaungatanga, manaakitanga, mātauranga and wairuatanga. Refer to the Appendix: Te Aranga principles for a fuller description of the principles and outcomes, and how they relate to the specific opportunities identified by Mana Whenua for the EWL.

Given the significant cultural values that exist through the project area it is critical that all stages of the design continue to give regard to the Te Aranga principles and engage with Mana Whenua as active design collaborators, so that Mātauranga Māori can complement and improve the urban design outcomes.



Bridging the Gap urban design principles:

- Design to the context
- Integrate transport and land use
- Contribute to good urban form
- Integrate all modes of transport
- Support community cohesion
- Maintain local connectivity
- Respect cultural heritage values
- Design with nature
- Create a positive road user experience
- Achieve a low maintenance design



NZ Transport Agency landscape principles:

- Take a context-sensitive and place-based approach
- Facilitate green infrastructure and landscape integration
- Understand the physical conditions
- Put the right plant in the right place
- Promote biodiversity and build resilience
- Champion low impact design
- Deliver a quality user experience
- Deliver low maintenance and whole of life value
- Consider Safety in Design
- Facilitate community engagement and a collaborative approach.

Auckland Transport Code of Practice (ATCOP) (2014)

Auckland Transport’s Urban Design principles and Safety and Accessibility principles are relevant to the local road, and pedestrian and cycle networks. They are consistent with the NZTA urban design principles in supporting an integrated, safe and accessible movement network. This has been an important consideration for the ULDF and is expected to be addressed in the detailed design of the local road connections and shared paths going forward.

1.4.3. Other policy documents

The Statutory Analysis contained in Report 2 (Volume 3) of the AEE contains a full assessment of relevant policy for the Project. This includes National Policy Statements, the New Zealand Coastal Policy Statement, National Environmental Standards, the Auckland Unitary Plan (AUP), and the operative regional and district plans, to the extent that the provisions of those plans are still operative following decisions on the AUP. It also covers non-statutory documents.

1.4.4. Non-Statutory and Strategic documents

Auckland Council documents with policies, strategies and/or urban design aspirations that have shaped the context of the Project are:

- Auckland Plan (2012). The Auckland Plan (2012) is a 30 year strategy for growth and development that sets objectives and policies for centres, neighbourhoods, and integrated land use and transport planning, to underpin appropriate urban growth. The East West Link is a priority project to support the objective of improved public transport and freight efficiency. A number of other plans sit underneath it.
 - The Auckland Plan will be delivered via a number of means including the Auckland Council Long Term Plan (2012-2022) which identifies Onehunga as the “southwestern gateway to the Auckland Isthmus” and a key area for public investment to support its growth and development. LTP projects like the Onehunga Foreshore upgrade (completed 2015), Onehunga Mall Streetscape improvements to Church Street (completed 2015), and plans for improving Neilson Street and connections between Onehunga Mall and the foreshore are drivers for the urban and landscape design.
 - The Proposed Auckland Unitary Plan (PAUP) is another means to achieve the Auckland Plan’s vision through appropriate zoning and planning rules. The (mostly industrial) properties directly adjoining the Onehunga-Penrose Project area are unlikely to see significant zoning changes except for the Port of Onehunga (which is envisaged as a mixed-use area by Panuku, the development arm of Auckland Council - this proposal is still in early stages and is not included within the PAUP). Future access to the Port area, and connections between it and Onehunga town centre, are therefore important.

Māngere-Ōtāhuhu Area Plan (2014) covers the area south of the East West Link alignment across the Māngere Inlet including Māngere Bridge, Māngere and Ōtāhuhu town centres, Favona and Māngere East. It includes broad “transformation opportunities” to: improve the water quality of the Manukau Harbour and promote opportunities for appropriate public access to the coast; and recognise the kaitiaki role of Mana Whenua, while conserving, supporting and celebrating Māngere-Ōtāhuhu’s rich heritage and distinctive Pasifika, European, Asian and multicultural identity.

The Maungakiekie-Tāmaki Local Board Plan (2014) covers the south-eastern part of the isthmus, including One Tree Hill, Royal Oak, Onehunga, Penrose, Mt Wellington, Panmure and Glen Innes. It is bordered by the Manakau Harbour and the Tāmaki Estuary. There are masterplans and concept plans for Waikaraka Park, Onehunga Bay Reserve, 101 Church Street, Captain Springs Reserve, and the Greenways Network, which collectively contribute to an area vision that this Project has considered. The local board’s goals include:

- Enhance walking and cycling opportunities to tourist destinations in the area; enhance and better market walking and cycling experiences, such as the coast to coast walkway and Ngā Haere national cycle trail; scope and deliver interpretative and directional signage
- Ecological restoration along the water’s edge as part of transport projects
- Enhance use of recreational space; maximise use of Waikaraka Park; improve public facilities; enhance or develop new play spaces; support community gardens
- Enhance distinctive local character; invest in public art; improve the amenity and activation of streets and public realm interfaces around business sites.

The Māngere Inlet vision (draft October 2016) is a collaborative, multi-organisational vision from agencies (NZ Transport Agency, Auckland Council, Auckland Transport, Kiwirail, Watercase, the Department of Conservation) and Iwi “to restore the Mauri of the Māngere Inlet”. The strategy was developed following early engagement on the EWL project, with outcomes and indicators developed to support the key values of the inlet. It is intended for use by contributing members within their own organisations and has an important focus on integrating different projects within a collective vision. The Environmental Strategy vision is closely related to a key theme in the ULDF of “restoring the whenua”, whose values are explored through the ULDF context analysis (Section 2) and expressed through the vision and design themes (Section 3). The Strategy outcomes are about process as well as the design, construction and use of the place. This approach is important for the urban and landscape design and is reflected in the ULDF required outcomes (Sections 4 and 5).

1.5. Purpose and scope of the Urban and Landscape Design Framework

Urban and Landscape Design Frameworks (ULDFs) are required to be prepared for major projects as part of the NZ Transport Agency's commitment to high quality urban and landscape design outcomes, "to ensure that the urban and landscape design concepts are appropriately defined, developed and implemented" [Bridging the Gap, p.114] and to show how the projects are integrated into the surrounding environment. This ULDF illustrates and describes the outcomes sought for the East West Link. It takes a strategic 'whole of place' and 'whole of discipline' approach to the environment, showing how the Project is integrated with its urban, landscape and cultural context, and exemplifying a collaborative approach across the design, environmental and consultation workstreams. While it draws on all the technical assessments for the Project, the ULDF has a particularly strong relationship with and is intended to support the Landscape and Visual Assessment.

The purpose of the ULDF is fourfold:

- It demonstrates how the East West Link project fulfils the Urban Design and Landscape policy requirements of the NZ Transport Agency
- It is a guidance document that describes the desired urban and landscape design outcomes in relation to both the NZ Transport Agency and the project-specific design principles
- It assists and supports the assessment of urban design aspects of the Project
- It supports the key recommendations of the Landscape Visual Assessment
- It assists and guides the procurement process and detailed design phase

The ULDF also shows that the desired design outcomes are informed by Mātauranga Maori and align with Te Aranga design principles through consultation and engagement with Mana Whenua.

Consistent with the approach recommended in Bridging the Gap, the ULDF:

- sets out an urban and landscape vision and design themes,
- sets out the corridor design moves for the project;
- describes the high level design principles that support the strategies;
- describes the types of design outcomes that would satisfy the principles and in doing so, indicates how urban and landscape design considerations may be embedded in the procurement process for implementation;
- provides overall project and design context for the subsequent Urban Design and Landscape Plans that will be referred to in the recommended Conditions; and
- provides a framework for design development in subsequent stages, such as in Urban and Landscape Masterplans, Sector Plans and Management Plans, and a benchmark against which such Plans can be certified (see Figure 2).

The design will continue to evolve beyond this Project, and subsequent iterations of Urban and Landscape Plans with it. The ULDF represents a 'moment in time' for the Project design, where it provides the basis for the Assessment of Effects on the Environment.

1.6. Approach

While the scope of the design outcomes expected by the ULDF relates to the project area, the area beyond the corridor (the 'context') has been an important consideration. This has meant not precluding future rail, recreational activities and regional pedestrian and cycle links. It has also meant considering the public / private realm interface, street hierarchies and appropriate urban structure and built form edging development in the future.

The ULDF has been prepared by an urban design and landscape architecture team. It is informed by inputs from engineering and environmental specialist disciplines, through joint participation in multi-criteria assessment (MCA) of alignment options, and through formal and informal discussions. In particular, landscape and visual, social, cultural and heritage, and traffic and transport (including active modes) have been important considerations in refining the urban and landscape design principles, and in identifying opportunities for the project to deliver quality design outcomes.

Urban and Landscape design specialists participated in the earlier (Indicative and Detailed Business Case) stages, in option development and evaluation, and worked informally with the design team to promote amenity, landscape and design quality integrated with transport outcomes. The urban and landscape design issues and opportunities identified (along with other Project disciplines issues and opportunities) were considerations for the developing urban and landscape design vision, objectives and principles. In particular, the opportunities diagram in the Detailed Business Case (DBC) report provided a springboard for the design philosophy for this Project (Refer Section 2.4 Opportunity Analysis which summarises the opportunities identified by the DBC and how they link to the subsequent context analysis and key consultation inputs).

This ULDF has been developed in collaboration with representatives from Mana Whenua groups of the project area, including: Te Ākitai Waiohua, Ngāti Te Ata Waihoua, Ngāti Paoa, Ngāti Maru Runanga, Te Kawarau Kawerau a Maki, Ngāi Tai Ki Tāmaki, Ngāti Whatua Ōrakei, Te Runanga o Ngāti Whatua, Te Ahi Waru, Ngāti Tamaoho.

The ULDF structure reflects the integrated design and consultation process.

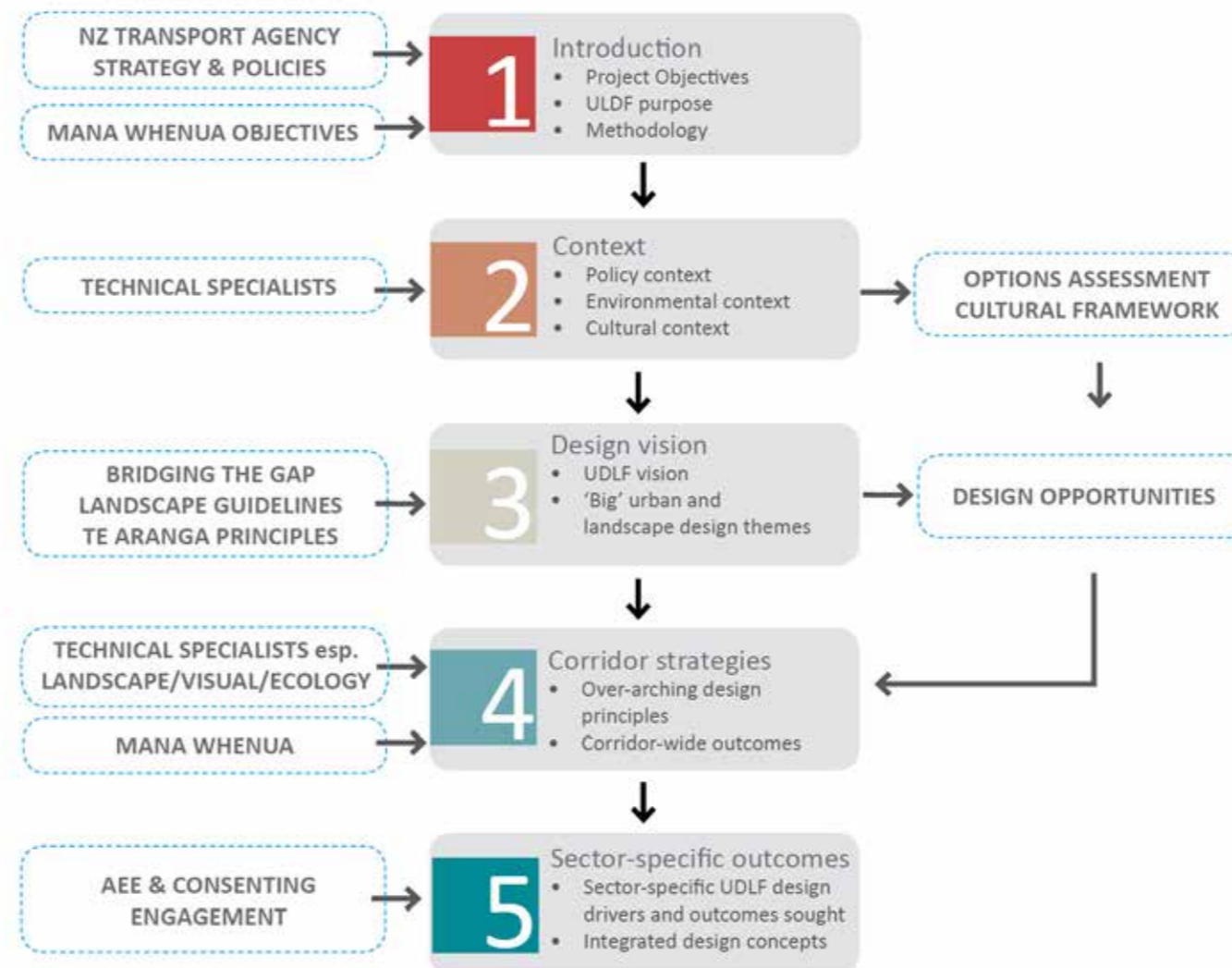


Figure 1. Structure of the ULDF

1.7. Implementing the Design

The ULDF enables design development during subsequent stages of the design, and / or in consultation with stakeholders. This means not precluding opportunities that are part of long term visions of stakeholder and community groups but which extend beyond the scope and timeframe of this Project. The ULDF is intended to be used by multiple stakeholders:

- The NZ Transport Agency, so that as the detailed design develops past the consenting stage, it maintains alignment with the Agency's design objectives, policies and requirements
- Local communities, community organisations and business owners, to help identify the issues and opportunities raised through engagement and consultation that have been considered in the design
- The tender team/s and construction team (and their designers) implementing the project, to provide a reference tool for place-specific design outcomes
- For communication with the public, landowners and other stakeholders that may be directly or indirectly affected by the project
- Iwi and/or nominated cultural advisors, working with the design professionals in future stages, to capture opportunities to inscribe cultural narratives into the project outcomes.

In accordance with 'Bridging the Gap', the ULDF will be supported by consent and designation conditions to ensure that the concepts developed and submitted as part of the statutory process are fully implemented and coordinated with the final design of the East West Link, by way of subsequent plans (for example Urban and Landscape Masterplans, Sector Plans and Management Plans - see Figure 2).

'Process opportunities' that are applicable to such plans in these future stages are:

- Embed a partnership approach between the NZ Transport Agency and Mana Whenua into the detailed design process, that fosters strong working relationships and accommodates the integration of Mātauranga Māori into the design of the East West Link
- Creatively inscribe cultural and historic narratives into the design environment, weaving together stories of Mana Whenua and Europeans where they overlap, to convey the richness of the area's history
- Urban and landscape design opportunities that fall outside the scope of the current EWL project (or sit outside of the Project designation) but would further enhance the Project area for residents, visitors and road users (and how they can be sought through the procurement process).

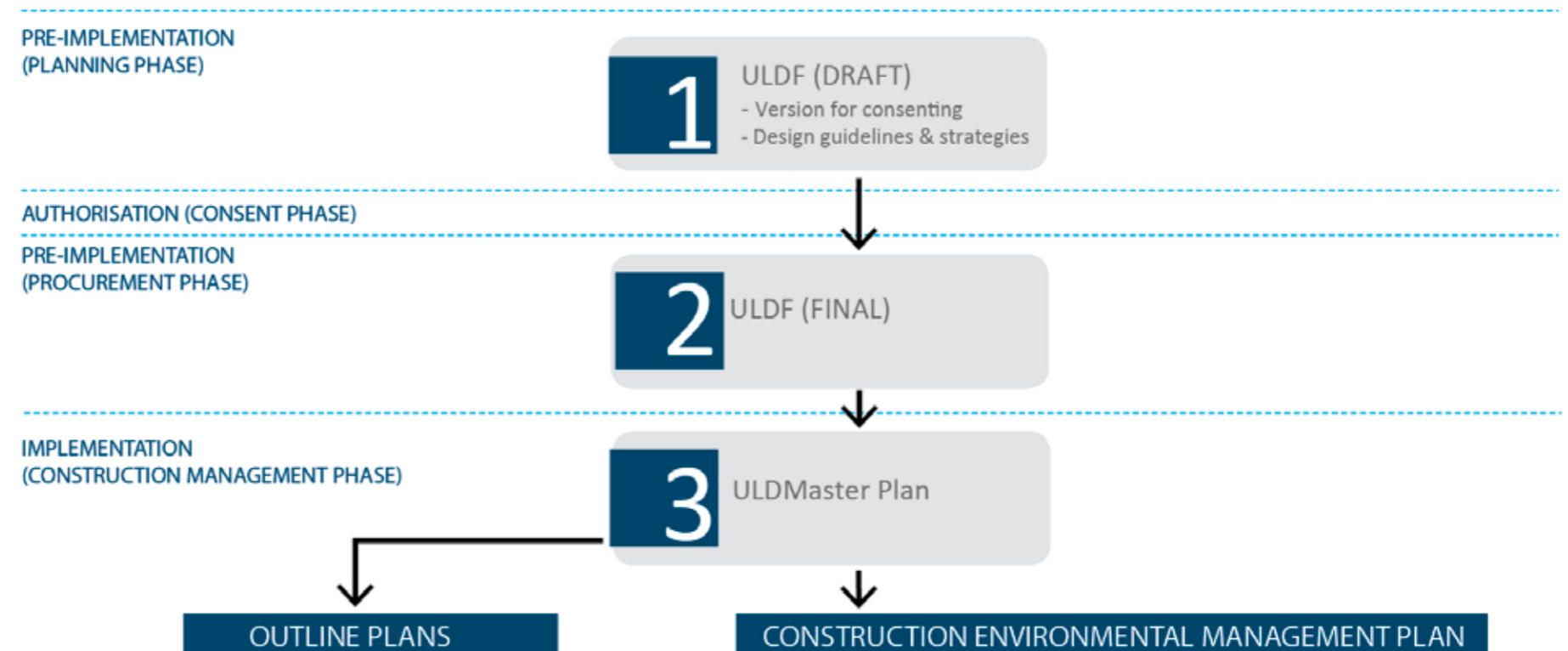


Figure 2. Implementing the ULDF



Māngere Inlet

2 CONTEXT

2 CONTEXT

This section of the ULDF sets out the contextual analysis that informs the urban and landscape vision, themes and principles that underpin the design. The purpose of the contextual analysis is to more fully understand the area, its complexities, and the key constraints and strategies that the Project presents to contribute to positive outcomes, and mitigation.

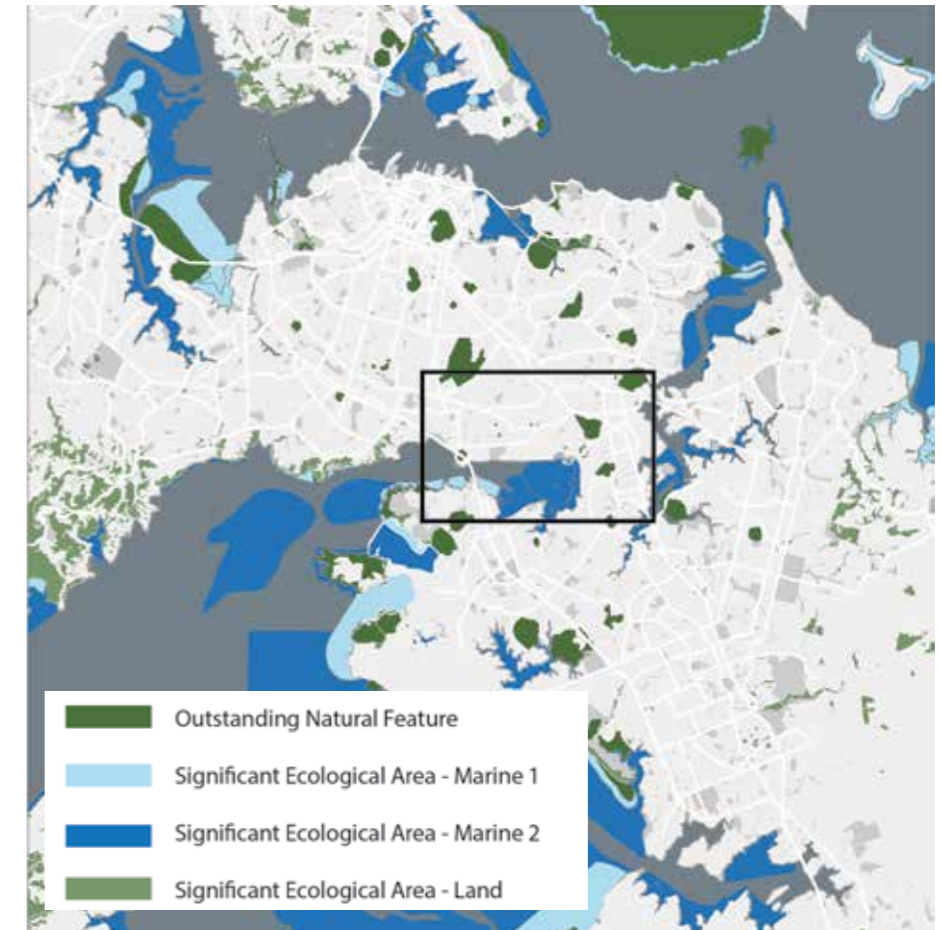
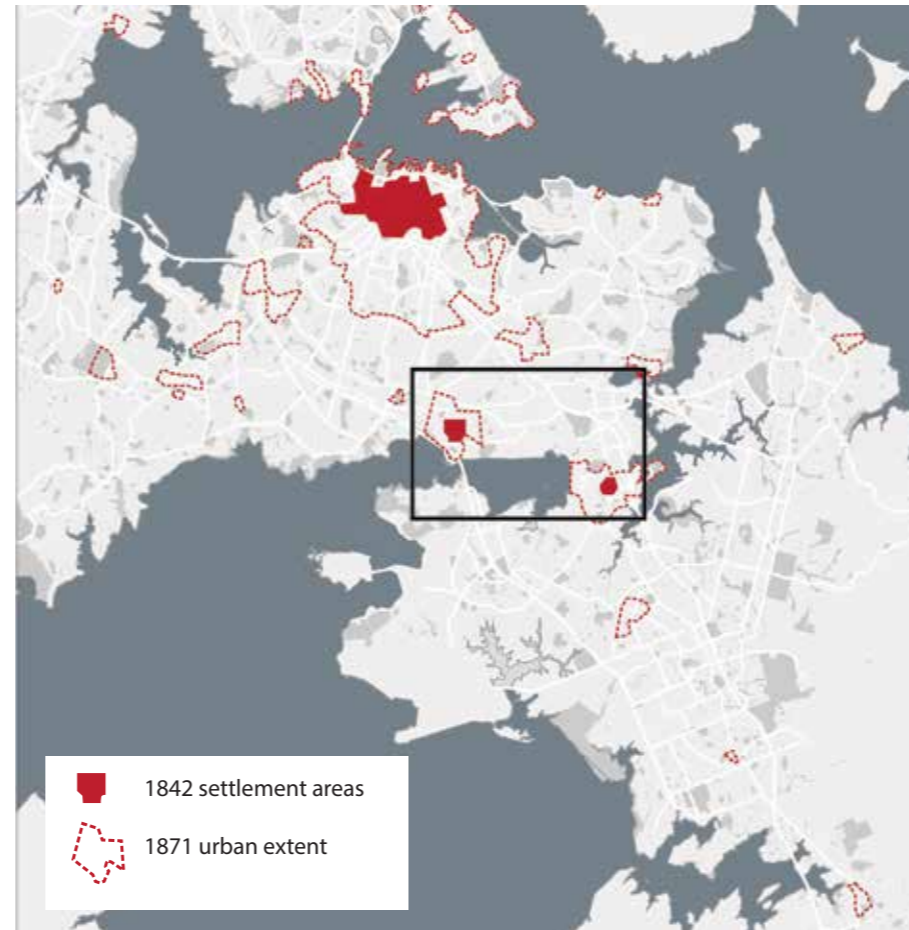
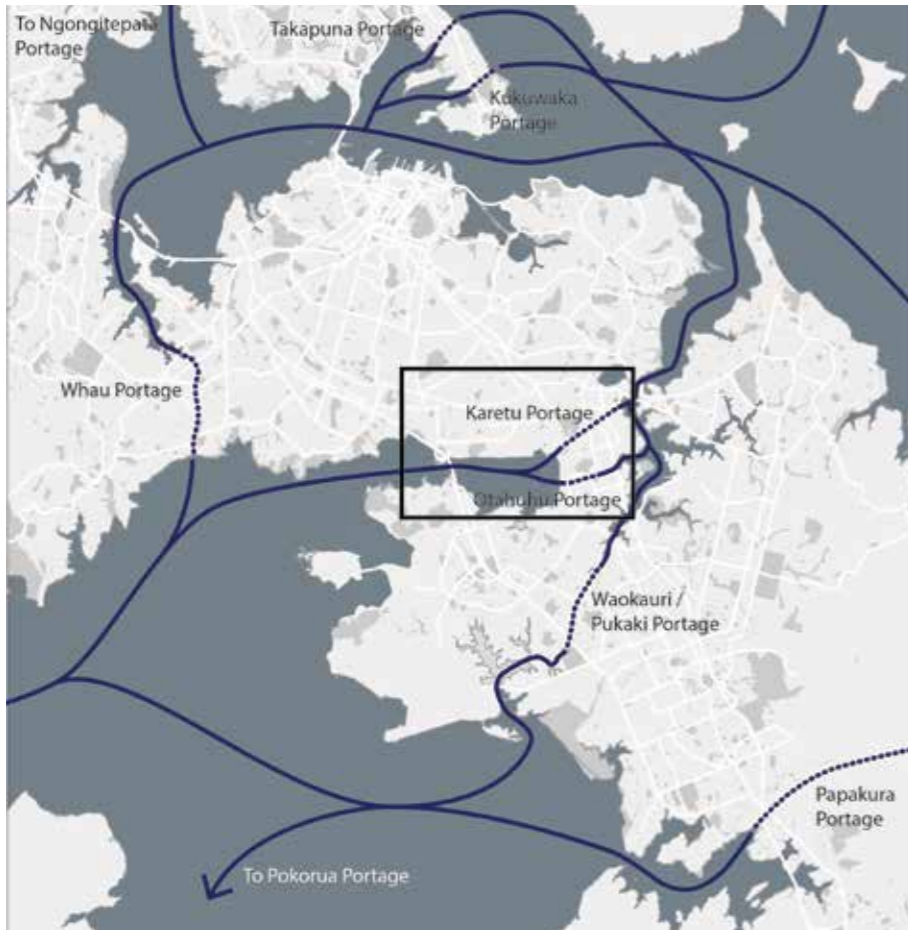
The following section (Section 3) takes the key findings from the analysis into a high level vision and design themes. Section 4 turns the design themes into strategies for the whole corridor. Section 5 is another level of detail down – at a closer scale – and illustrates the outcomes sought for particular areas. These steps are informed by the analysis work of Section 2 (this section).

2.1. Regional setting

The analysis diagrams include the corridor, and go beyond the immediate Project area to investigate where and how it fits within it. The analysis and design principles were also influenced by some key considerations of an even wider perspective. The four drawings here help to locate the project culturally, historically (urban form / built environment), ecologically, and in terms of connectivity for walking and cycling at a macro level across the region. For each of these, a 'zoomed in' diagram and accompanying text are included below.

From top left, clockwise:

- There was an extensive network of [portages](#) used by Māori (supporting waka) and early settlers through the area and around the North Island. Two of them are in the Project area.
- Onehunga was one of the earliest [European settlements](#) on the isthmus, it has long been an urban / modified environment and its surviving street pattern, main street and heritage buildings provide some clues to its importance as part of early Auckland.
- Māngere Inlet is a discrete and distinctive part of Manukau Harbour, but its waters, flora and fauna are also part of the wider environment and [ecological systems](#)
- [New walking and cycling paths](#) are being constructed or are planned but there are still many missing links. The Project provides a key connection in support of wider active mode transport routes, which is a stakeholder aspiration.



- Project Area (for analysis drawings)
- New funded urban cycleways
- Other new cycleways, to be completed by mid-2018 (funding / consent dependent)
- Existing cycleways
- Planned cycleways beyond 2018
- EWL shared path connection to Sylvia Park
- Potential future 'Isthmus' cycle loop
- Te Araroa Trail
- Coast to Coast walkway

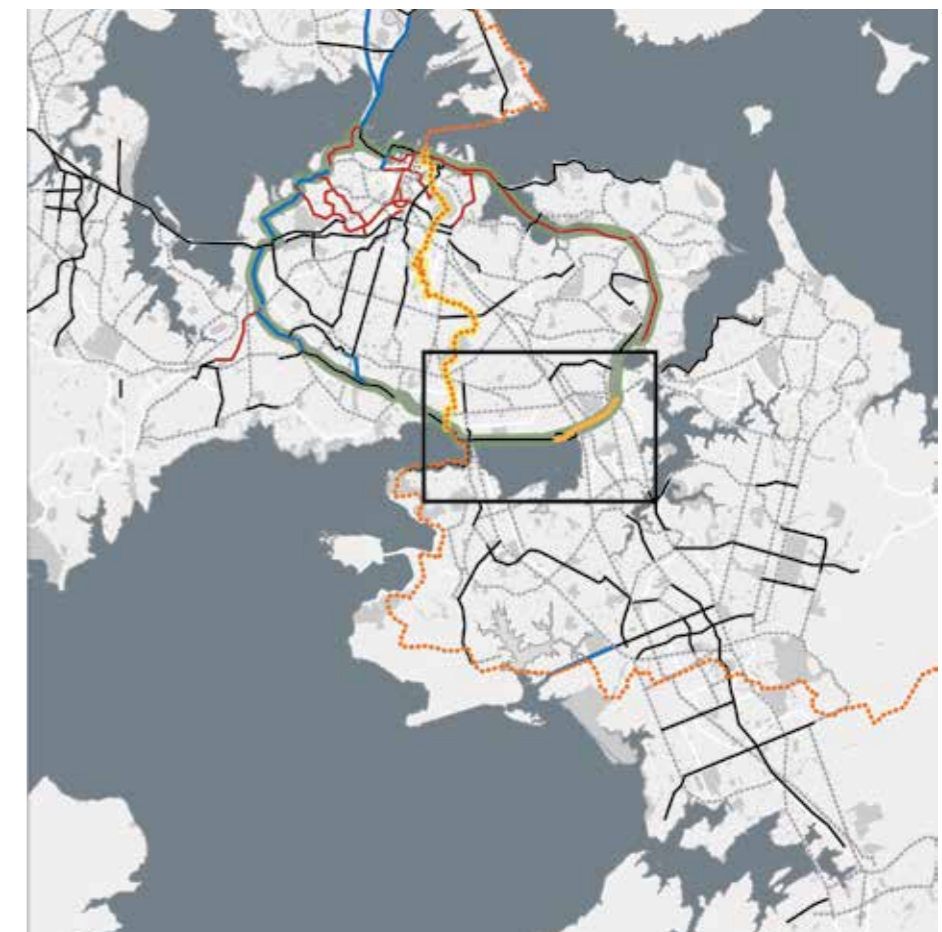


Figure 3. Regional systems: historic portages, urban development, ecology, walking and cycling

2.2. History and heritage

Māori (pre-European) history

The project extends from the eastern edge of the Manukau Harbour, along the northern foreshore of the Māngere Inlet, then inland. It traverses the Onehunga and Ōtāhuhu areas.

Tāmaki was visited by many of the important founding canoes, and several different iwi have lived on the lands between its two harbours. Some have occupied the area from the earliest times; others came and went, and some amalgamated to form new tribes.¹

Onehunga dates from the earliest time of occupation by the older tribes of Tāmaki such as Te Waiohūa and Te Kawerau-a-Maki. By 1100 the Ōtāhuhu portage linking the Māngere Inlet with the Tāmaki River was already in use. Onehunga saw the arrival of the Great Fleet's Tainui Waka into the project area via the Karetu and Ōtāhuhu portages (1600s). From this time onwards, successive tribes gained territory on the isthmus by marriage and through allegiances and warfare.

Kiwi Tāmaki, the paramount chief of Waiohūa, oversaw a period of relative stability on the Tāmaki isthmus until around 1740, when Ngāti Whatua began to move south into the area and gained ascendancy. At this time Ngāti Paoa occupied most of the eastern side of Tāmaki Makaurau. In the late 1700s Ngā Pūhi challenged the holdings of both Ngāti Whatua and Ngāti Paoa. The resulting musket wars in the 1820s resulted in huge losses and the abandonment of Tāmaki as the survivors fled south.

Onehunga was a desirable location for Māori for many reasons: its location adjacent to the Māngere Inlet (once a rich source of food); proximity to strategic portages connecting Manukau Harbour, Tāmaki River and Māngere Inlet; and its role as an important place of trade and commerce.

Cultural footprint

Mana Whenua have shared their histories and stories with the Alliance, identifying connections to significant places and opportunities to showcase them.

- Te Waimokoia / Māngere Inlet: the project runs along the extent of its northern edge, between the land and the water. The whole of the inlet is taonga, and contains:
 - the small island Ngā Rango e Rua o Tainui, the final resting place of the skids used to haul the great waka Tainui across the Ōtāhuhu portage around 1300
 - all coastline and riverbanks / marine and freshwater areas including Anns Creek.
 - Manukau and Tāmaki harbours: the project connects to the Onehunga foreshore to the west, and via the Ōtāhuhu and Karetu portages to the Tāmaki River to the east.

- Ngā Tapuwāe o Mataaho / the footprints of Mataaho (god of volcanoes): the volcanic cones in the southern part of the isthmus form the backdrop for the project. In the immediate area are the character-giving forms:
 - Te Hōpua a Rangi, the basin of Rangi (the wife of the first Waiohūa paramount chief Huakaiwaka), the tuff ring formerly open to the Manukau Harbour and now infilled and bisected by SH20.
 - Remnant lava flows at Pikes Point and west of Alfred Street.
- Portages: Waka portages were vital for east-west trade and supported a strategic network of pā from the far north to the South Island. Although barely visible today they still underlie the urban road structure:
 - The Karetu Portage linked Anns Creek with Karetu, south of Panmure Basin. The project follows the approximate alignment of the portage alongside Mutukāroa on Sylvia Park Road for about 1 kilometre.
 - The Ōtāhuhu (Tauoma / Te To Waka) portage was in use by 1100 and was the most important in the area because of its location, gradient and length: it was the narrowest point between the east and west coasts of New Zealand, sloping gently for less than 1 kilometre from the Tāmaki River to the Manukau Harbour. The project crosses the portage at Ōtāhuhu Creek.
 - The Pukaki portage, while outside the immediate project area, formed part of the linked waterway routes (refer Figures 3 and 4).

- Ancestral Pā: elevated pā sites reinforced the important role of maunga as landmarks, with visual links between the maunga, the pā, the inlet and the portages.
 - Mutukāroa: a strategic site for the Karetu portage, with many houses and storage pits set among its cultivated slopes
 - Rarotonga / Mt Smart, to the north of the project area but whose cultural sites reach down towards it
 - Ōtāhuhu / Maungatorohe / Mt Richmond, just north of the Ōtāhuhu portage routes and closely associated with it
 - Mauinaina and Mokoia, fortified pā at the mouth of the Panmure Basin and positioned to control movement on the Tāmaki River
 - At Ihumatao on or around the volcanic cones of Te Ihu o Mataaho / the nose of Mataaho, and at Te Pane o Mataaho / Māngere Mountain
 - Maungakiekie, dominating the centre of the isthmus between the harbours and one of the largest and most significant pā sites in the history of the area.
- Figure 4 shows the heights of the maunga (some of which have been reduced by quarrying) that were features in the landscape. Views to the remaining maunga are important for the urban and landscape design strategy.



Te Awatea Hou - waka built for 1990 Waitangi Day



Onehunga 1863, Joseph Hamley (provided by Ngāti Te Ata Waiohūa)



Fishing Scenes at Onehunga 1864 (Te Ara: Encyclopedia of New Zealand)



Detail of 1855 survey showing the Native Hostelry (provided by Ngāti Te Ata Waiohūa)

¹ Te Ara: The Encyclopedia of New Zealand, <http://www.teara.govt.nz/en/tamaki-tribes>

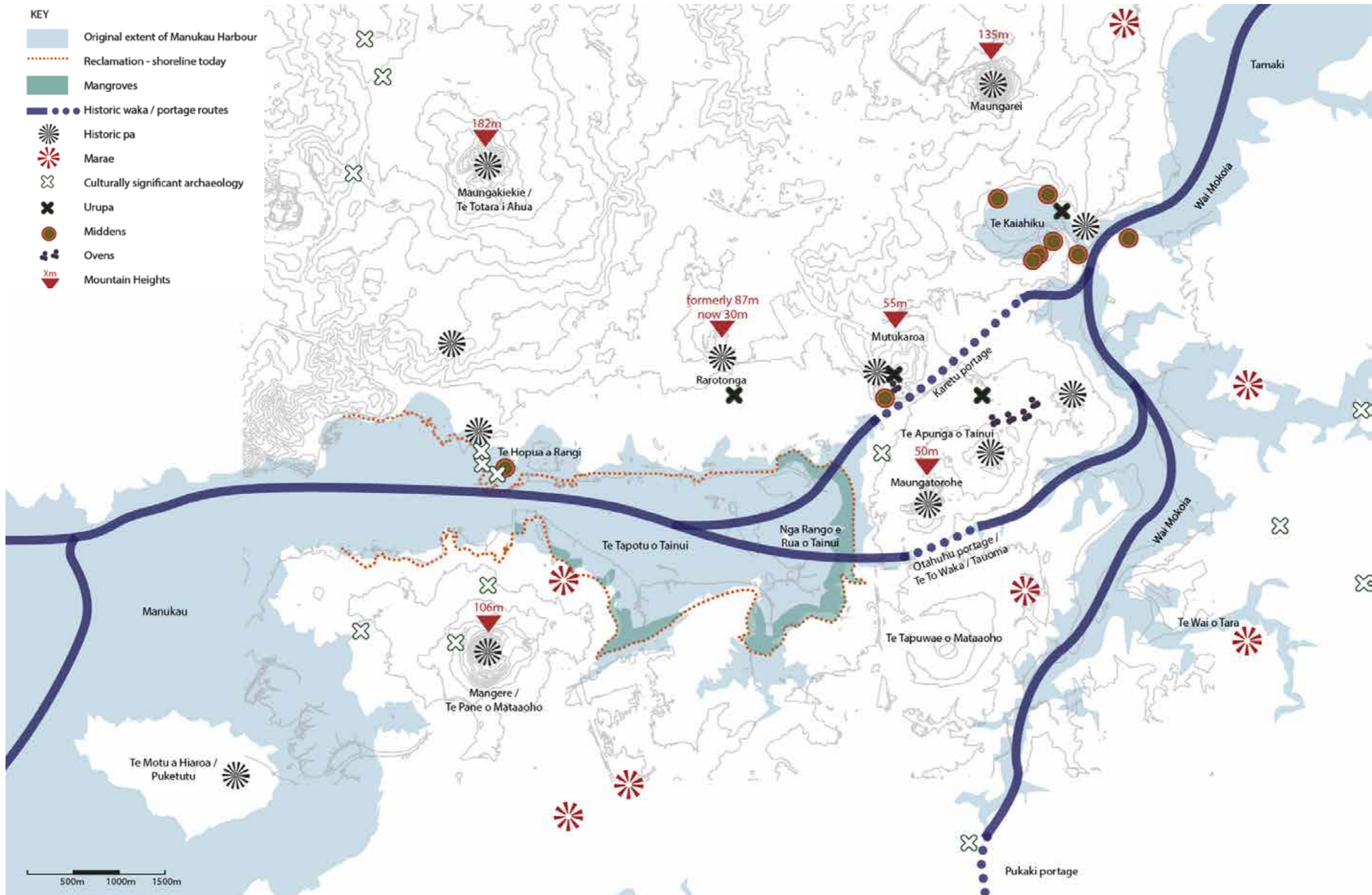


Figure 4. Māori cultural landscape

Early European history

Onehunga has an important place in the history of European settlement, one of the country's first and busiest ports and the origins of what is now considered one of New Zealand's major industrial and manufacturing hubs.

In 1820 the Reverend Samuel Marsden identified Onehunga as a suitable site for future missions due to opportunities for trade and resources. European settlers followed, drawn to its harbour position, timber, fresh water springs and rich soils. In 1834 Tom Mitchell, a timber and flour merchant who traded to Sydney, established a sawmill at Mill Bay. In 1838 the Fairburn purchase resulted in some 75,000 acres of Māori land being alienated from Māori. Other land surveys resulted in more land being obtained by the Crown and various settlers from the 1840s.

Onehunga town was founded in 1847 as New Zealand's first fencible settlement by Governor Grey, where former soldiers (mostly Irish) were granted land to settle down, with the implied understanding that if the town was threatened, they would defend it. Housing, churches and shops followed as the population grew rapidly over the next twenty years. Industrial development began with a flour mill constructed on Princes Street in 1854 and infrastructure expanded with it: the construction of wharves (1858 and 1865), the first operating section of the railways in the North Island, the Onehunga Branch to Auckland (1873), the first Māngere Bridge in 1875 (replaced by what is now known as the 'Old Māngere Bridge' in 1915) and the area's first water reservoir at Captain Springs (1878). Electricity was first supplied in 1887. An electric tram service connected Onehunga to Auckland City between 1903 and 1956.

In 1879 the Crown granted 47 Acres of land for Waikaraka Park and Cemetery. 1890 saw the first burial. The park, now a speedway and cricket ground, was used in its early years for horse racing. The cottage and walls were built in the depression years of the 1930s with stones that once covered the park. In 1886, the Onehunga Woollen Mill was established and still occupies a listed heritage building on Neilson Street – one of the oldest continuing industries in the area. Elizabeth Yates was elected as mayor of Onehunga Borough in 1893 – the first female mayor in the British Empire.

Onehunga has been a hub of water-based activity throughout human occupation. Post-European settlement it was a frequent port of call for coastal vessels operating between other ports along the west coast of New Zealand. In its heyday it rivalled Auckland's Waitemata port. Passenger travel was popular in the late 1800s with passenger steamers operating between many of the west coast ports. The sinking of the HMS Orpheus after hitting the Manukau Bar on 7 February 1863 was the worst maritime disaster in New Zealand history at the time with only 70 of 250 passengers surviving. In the early years of the twentieth century sporting and recreational activity grew along the foreshore. The "Manukau Yacht & MotorBoat Club" (now the Aotea Sea Scouts building) opened in 1911.

Extensive reclamation of the foreshore began in the 1960s with the establishment of Pikes Point and continued until 1975 with the creation of State Highway 20, significantly altering what was formerly a natural coastline well used by beach-goers and sailors. By 1982 a full container service had been established from a bustling Onehunga Port. In 1992, the Onehunga mainstreet programme started and a streetscape upgrade of Onehunga Mall between Arthur and Grey Street was completed in 2015. The most recent reclamation, the Onehunga Foreshore project (2015) reconnected Onehunga Bay to a new area of landscaped public open space along the foreshore.



Painting of The Landing, 1907



Waikaraka Cemetery



Aotea Sea Scout Hall, formerly Manukau Yacht & Motorboat Club, opened 1911



Onehunga, 1863



Wreck of the Orpheus, 1868



Onehunga Woollen Mills, 1886



Onehunga Railway Station, 1873



Queen Street, 1908 - on axis with Maungakiekie



Te Hopua a Rangi / Gloucester Park, 1948



Onehunga Wharf showing rail and tram lines

KEY

- ■ ■ ■ Proposed EWL Alignment
- Historic roads and street network (1859)
- ||||| Onehunga Branch line 1873
- Onehunga terminus 1873
- Onehunga Wharf 1878
- — — — Tram line (1903 - 1950)
- ||||| Te Awamutu rail line 1875
- ▨ Reclamation
- ▼ High points
- Mangroves (current)
- Parks (current)

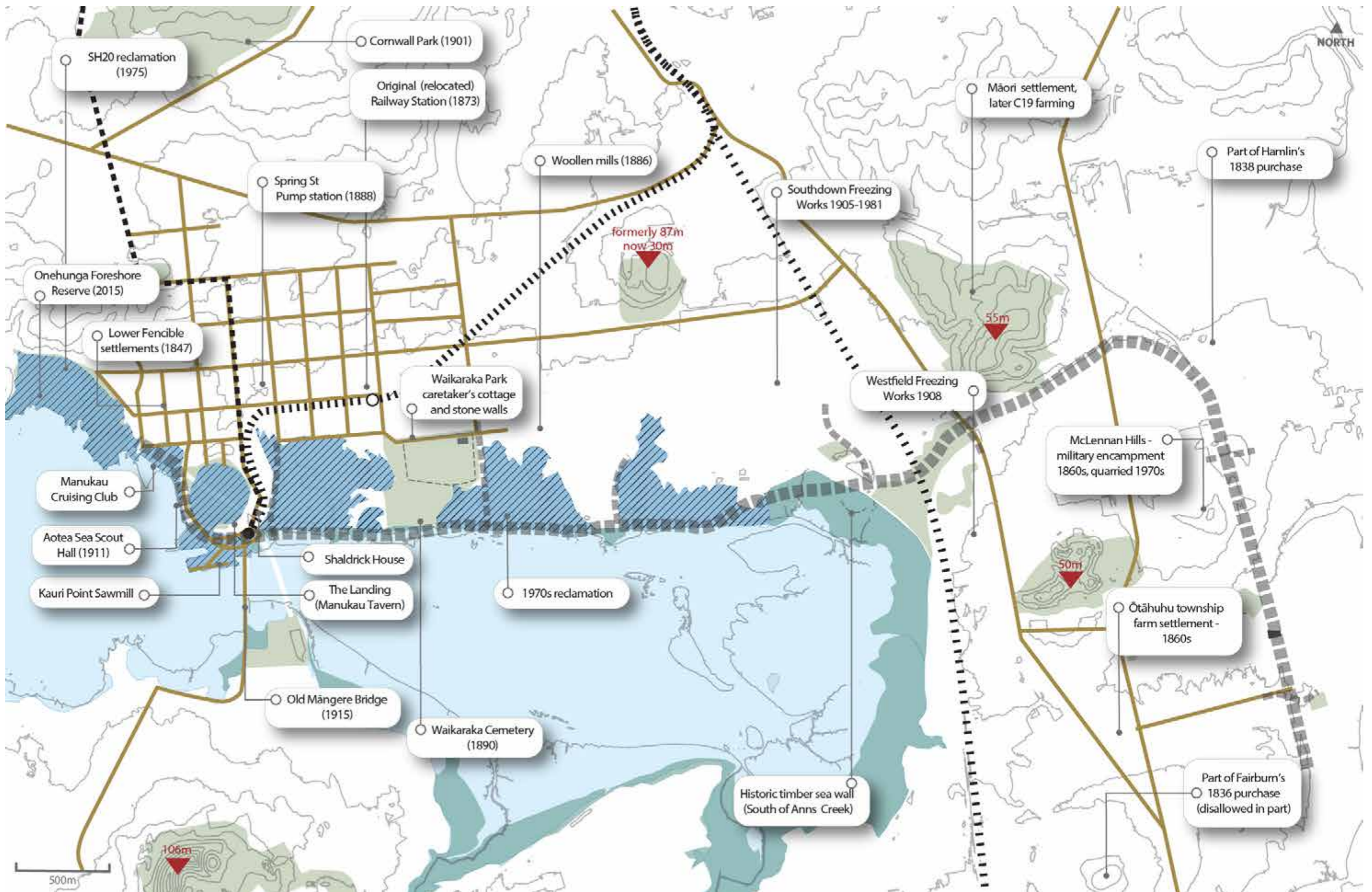


Figure 5. European history

2.3. Underlying environment

2.3.1. Geology

The Auckland volcanic field is dated from around 250,000 years ago and is currently dormant. It contains over 50 volcanoes which have produced a diverse array of maars (explosion of craters), tuff rings and scoria cones, and basaltic magma lava flows that cover much of the Auckland isthmus. Maungakiekie / One Tree Hill has three craters – one is intact and two were breached by lava flows that went in all directions (many towards Onehunga) covering an area of 20 square kilometres (the second largest area behind Rangitoto Island). Lava caves are evidence of this flow and one of the largest in the Auckland volcanic field can be found east of Maungakiekie – a lava cave which is approximately 270 metres in length. Evidence of lava flows can also be found through areas where lava caves have collapsed, such as the Grotto Street pond located north of Church Street and west of Captain Springs Road. The exact age of the Maungakiekie eruption is unknown but it is believed to be older than 28,500 years.

Many of Auckland's volcanic cones were once occupied by Māori pā prior to European settlement, as evidenced through terraces and other archaeological remains that are still visible today. Maungakiekie was the largest and most important Māori pā in pre-European times, housing approximately 5,000 Maori. Several of the volcanic cones have been altered, including Rarotonga / Mt Smart whose height has been reduced by almost 50 metres due to extensive quarrying, Te Hōpua a Rangi which was infilled in the 1930s, and McClennan Hills (Ngā Tapuwāe o Mataaoho) which were completely removed by quarrying.

Key geological features in and around the project area are:

- Te Hōpua a Rangi tuff crater – a small explosion crater with a low tuff ring. The tuff ring was once very visible along the foreshore and open to the sea. It has been extensively modified by reclamation and motorway construction, but is still discernible as a volcanic feature.
- Remnant basalt outcrops along the Onehunga foreshore at Pikes Point and Victoria Street – the distal margins of south-flowing lava from the volcanic field.
- Lava flows within and around the Anns Creek area – lava flows from Mt Smart and Mt Wellington are juxtaposed and there are some significant outcrops
- Mutukāroa / Hamlins Hill sandstone ridges and rhyolitic tuff – one of the least modified sandstone ridge complexes remaining in Auckland.



Māngere Mountain



from Māngere Mountain to Puketutu Island

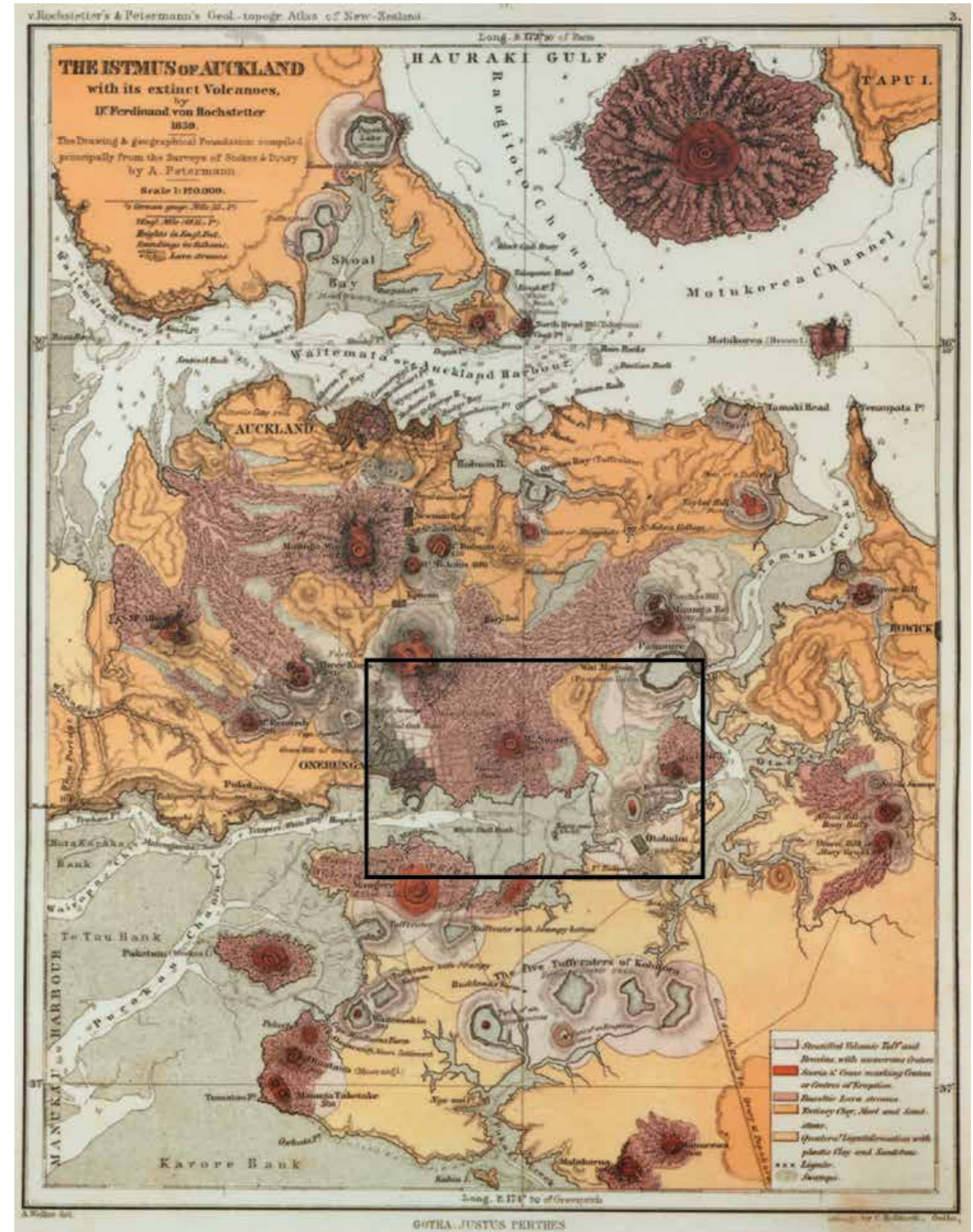


Figure 6. The volcanic landscape: Hochstetter's map of the isthmus, 1859

2.3.2. Coastal features

Māngere Inlet and Onehunga Bay have been subject to significant change since the mid 1800s. Several large-scale industrial developments have resulted in reduction of the Inlet, while ongoing development has resulted in foreshore reclamation, mostly along the northern embankment of the Māngere Inlet and to the west of Gloucester Park (refer Figure 7). The coastal edge is protected from erosion by a variety of coastal structures including tipped rock, rock revetments and vertical seawalls.

The coastal features in and around the project area include:

■ Onehunga:

- Onehunga Bay, originally a beach with a backdrop of cliffs, is now separated from the harbour by SH20 causeway and lagoon. A naturalistic shoreline has been recreated on the seaward side of the motorway
- Te Hōpua was a tidal lagoon. The tuff ring was bisected by SH20 in the 1970s and has been further disguised by building development

■ Māngere Inlet:

- Māngere Inlet is shallow and tidal, with mangrove margins. The shoreline has been straightened with reclamation and the former intricate lava flow shoreline mostly buried. Two notable basalt outcrops remain, at Pikes Point and the termination of Victoria Street.
- Anns Creek (the Karetu portage) is a tidal creek with lava flow banks, recognised as a significant natural area despite encroachment by railway and industry
- Ngārango O Tainui is a small sandstone island in the Inlet where the skids used to portage the Tainui waka were left

■ Ōtāhuhu Isthmus:

- Isthmus between head of Waitemata (Tāmaki River) and Manukau (Māngere Inlet) Harbours, with the Karetu and Ōtāhuhu portages between them.

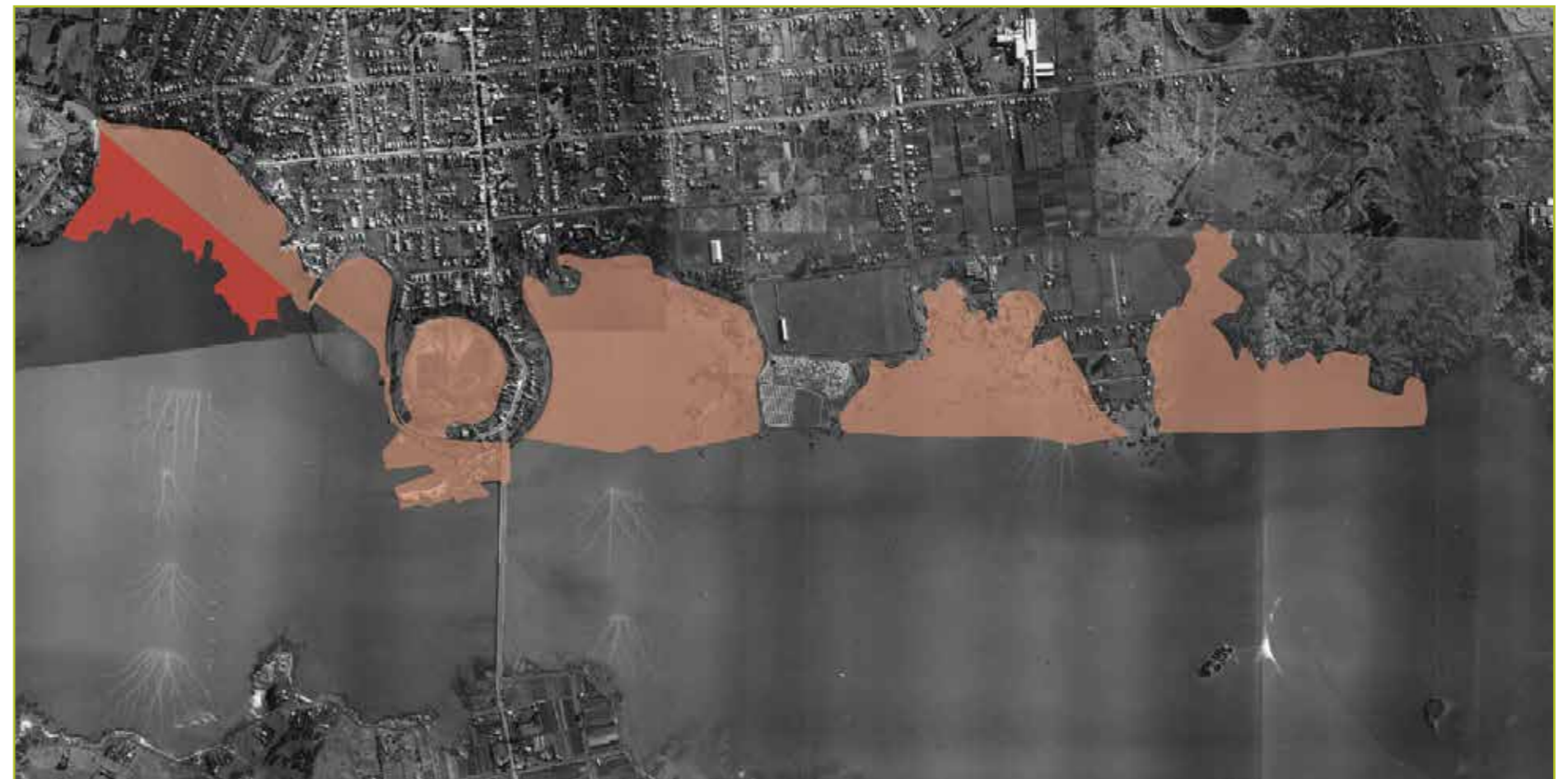


Figure 7. Māngere Inlet shoreline circa 1940 (Auckland Council GIS). The brown shows the area of historic reclamation, the red the recent reclamation at Taumanu Reserve (to revitalise the coastline) and the outer edge represents the current shoreline

2.3.3. Topography and views

The underlying topography of the area is directly connected to the Auckland volcanic field which forms a backdrop to the project. High points are Maungakiekie (182m high), Mt Wellington / Maungarei (135m), Māngere Mountain (106m), Mt Richmond / Ōtāhuhu (50m), Mt Smart / Rarotonga (formerly 87m high), and Hamlins Hill / Mutukāroa (55m high) – the only feature that is not volcanic.

The volcanic cones were markers for Māori as they journeyed along the waterways. There are still long connecting views between the foreshore segment of the alignment (east of the Hōpua tuff crater and west of Great South Road) and Māngere Mountain, Mutukāroa / Hamlins Hill and Mount Richmond. Localised views along Māngere Inlet shared path encompass the intertidal mudflats and mangroves, Māngere Mountain, Mutukāroa / Hamlins Hill, Anns Creek and surrounding industrial activities. The Landscape and Visual Assessment (LVA) notes that Māngere Inlet is a central element of the landscape upstream of Māngere Bridge, encircled by volcanic cones which stand out above the relatively subdued urban landscape surrounding the Inlet. Travelling towards Sylvia Park, Maungarei / Mt Wellington dominates the skyline.

Figure 8 maps volcanic viewshafts identified in the PAUP that are located within the Project area:

- to One Tree Hill from the Mahunga Drive interchange on SH20 (looking north over Onehunga township)
- to One Tree Hill northbound at two locations on the SH1 adjacent to Hamlins Hill
- to Māngere Mountain from SH20 at Orpheus Drive and Māngere Bridge.



View towards Māngere Harbour Crossing (SH20)



View towards Onehunga Port from within the Hōpua A Rangi tuff crater



View towards the existing northern Māngere Inlet foreshore from Old Māngere Bridge



View into the Port from Old Māngere Bridge



View towards Māngere Mountain, across Māngere Inlet



View from shared path looking east towards Mt Richmond



Looking across Anns Creek



View towards industrial land near Hugo Johnston Drive from Waikaraka cycleway



View towards Mutukāroa / Hamlins Hill from Great South Road



View from Mutukāroa / Hamlins Hill

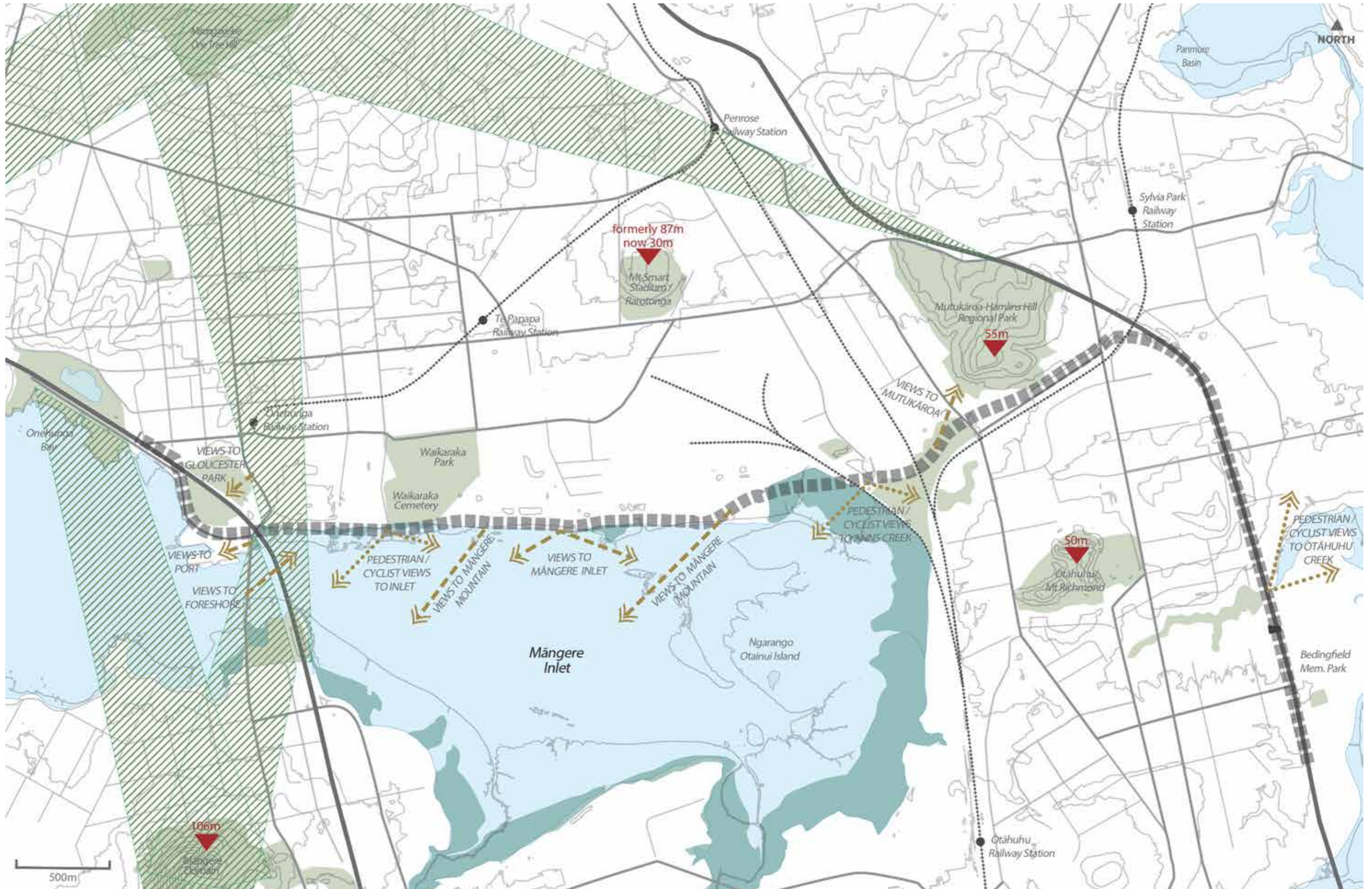


Figure 8. East West Link viewpoints and Auckland Council volcanic viewshfts

2.3.4. Ecology

The ecological environment surrounding the project area has been highly modified through years of reclamation and industrial activity. The draft Māngere Inlet Environmental Strategy (October 2016) captures some of this history, identifying that in the 1870s numerous small industries were established around the Inlet. These included meat works, tanneries, wool processing wood pulp and battery factories. Urban and industrial development expanded during the 1900s, with ongoing discharges from Ōtāhuhu Borough Council's septic tank, leachate from various refuse tips, run-off from the Ōtāhuhu railway workshops and later from the Pacific Steel Plant at Ōtāhuhu.

Nevertheless, areas that remain of particular ecological importance are (as illustrated in Figure 10):

- Anns Creek – a small patch of terrestrial vegetation along the shoreline that supports indigenous (and threatened) coastal species / unique terrestrial flora living on lava flows
- A significant roosting area for wader birds, located adjacent to the existing shared pathway running between the foreshore and industrial development
- Reefs / former shell banks within the Māngere Inlet
- Intertidal mudflats used extensively by avifauna for foraging
- Remnant stream sections around Mutukāroa / Hamlins Hill and downstream.

The Ngārango o Tainui Island is located in the south-east of the Inlet. It is one of the smallest privately owned islands in New Zealand, with a land area of approximately 3,288 square meters. Due to the presence of large macrocarpa trees - this island is a favoured location for Royal Spoonbill.

Anns Creek

Anns Creek is identified in the Proposed Auckland Unitary Plan (PAUP) as a Significant Ecological Area (SEA) due to the eco-tone sequence of the mangroves here with the only significant remaining piece of native shrublands on lava flows in the Tāmaki Ecological District. Anns Creek includes a mosaic of vegetation types in an ecological sequence including basalt lava shrubland, freshwater wetlands, saltmarsh, and mangroves (see Figure 9). The freshwater wetland comprises an area of deep aquifer-fed water dominated by raupo and stream (Anns Creek) which is dominated by grasses and sedges. The saltwater wetlands include a range of habitat types distributed along the salinity gradient. These include marsh clubrush (in brackish water – where salt and freshwater meet), glasswort, oioi, ribbonwood and mangrove communities. The lava substrate supports a shrubland community with a patchy distribution of native shrubs but the rocky substrate prevents a thick shrub cover leaving open patches of lava for herbs and ferns. Anns Creek is the only site in the region where a suite of native herbs remain growing together on lava, indicative of much of the vegetation cover of early Auckland.

Intertidal area of Inlet

The intertidal banks of the Manukau Harbour are a feeding ground for thousands of international migratory and NZ endemic wading birds and a variety of other coastal bird species, including a number of threatened species. The adjoining terrestrial habitat of the Manukau Harbour (especially Ambury Regional Park outside the project area) is the most important winter roost for South Island Pied Oystercatcher.

Ōtāhuhu Creek

Ōtāhuhu Creek has been extensively modified through the construction of State Highway 1 and the subsequent culverting of Ōtāhuhu Stream. While vegetation in the upper Ōtāhuhu Creek arm (west of State Highway 1) no longer provides appropriate foraging habitat for shorebirds, the intertidal creek is identified in the PAUP as a Significant Ecological Area due to its provision of extensive habitat for wading birds.



Ōtāhuhu Creek culverts under SH1



Mature mangrove stand, Anns Creek Estuary



Foraging Royal Spoonbill



Mangroves and saltmarsh, Anns Creek



Vegetation Types			
Brush wattle - pampas shrubland	Mangrove scrub and forest	Brush wattle - gorse weedfield	Ngaio - taupata - salt marsh ribbonwood shrubland on lava
Marsh clubrush - tall fescue reedland	Glasswort - bachelors button herbfield	Brush wattle - fennel weedfield	Native Plantings
Marsh clubrush reedland	Raupo reedland	Salt marsh ribbonwood shrubland	Pohutukawa
Tall fescue grassland	Oioi saltmarsh	Wattle shrubland and exotic grassland	Wattle - pampas - wild ginger shrubland
Pampas tussockland	Lava shrubland	Ngaio forest on lava	Scattered mangrove - taupata - karo on coastal edge
	Native Plantings	Austrostipa - pohuehue - Coprosma crassifolia shrubland on lava	Mixed Native and Exotic Plantings
			Flax Plantings
			Glasswort - Searush - oioi rushland
			Glasswort - Austrostipa herbfield
			Bamboo
			Tutu Tree
			Mixed native and exotic plantings

Figure 9. Terrestrial habitats: Anns Creek

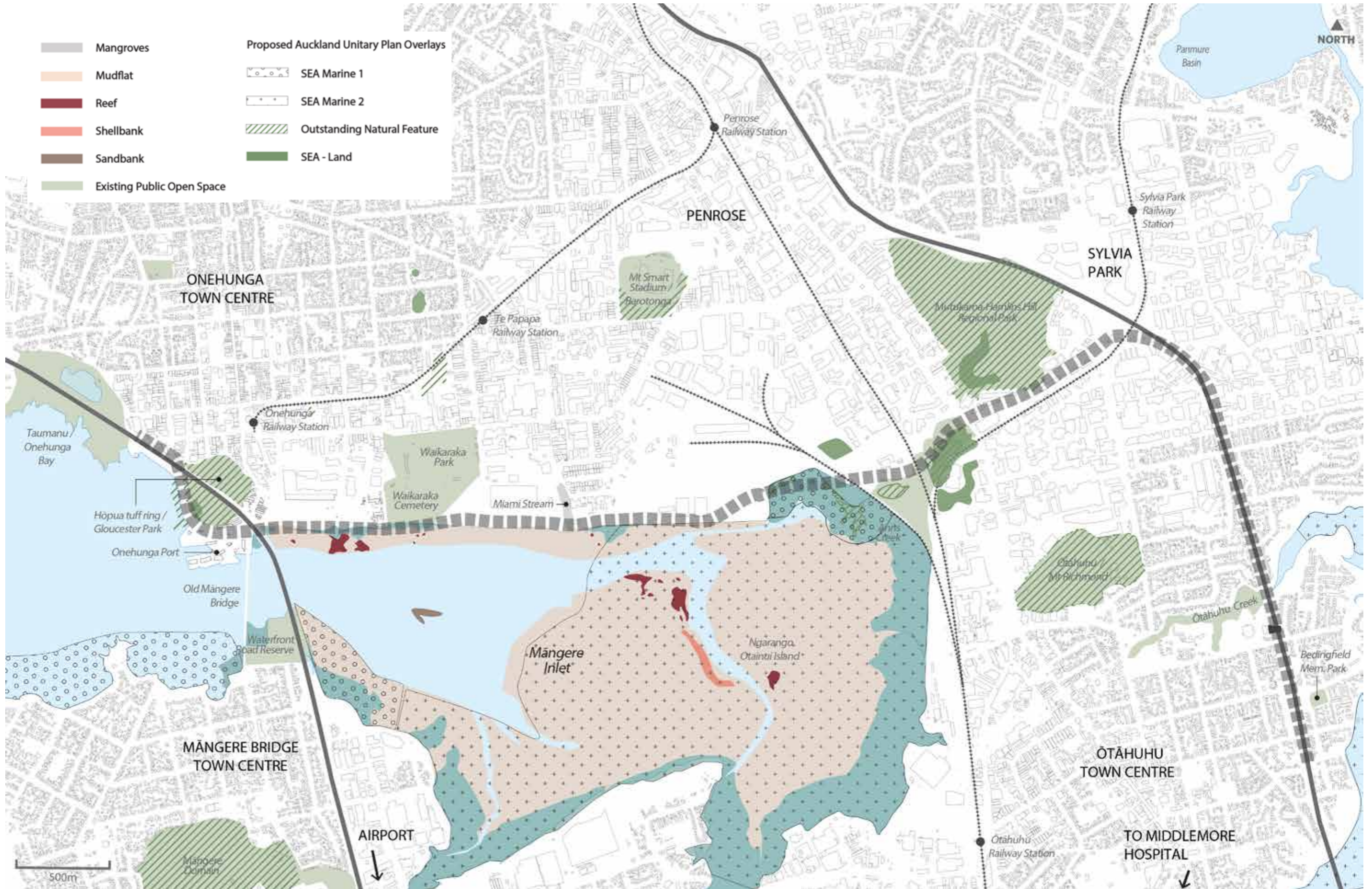


Figure 10. Ecology

2.3.5. Stormwater

Currently, an overall stormwater catchment area of approximately 1,350 hectares discharges into the Māngere Inlet east of the Neilson Street interchange (individual catchments are shaded in blue in Figure 11). Of this, approximately 50% drains to soakage and the remainder is serviced by the stormwater network which drains to 11 outfalls along the foreshore (outlets are represented by arrows in Figure 11). The underlying zoning of this catchment area is approximately 45% industrial, 10% park space and 45% residential, with a few special purpose zones throughout. Overall the area has been assumed (by the Project stormwater specialists) to have an impervious area of around 72%.

Most of the area to the south and south-east of the catchment, immediately adjacent to the Māngere inlet, consists of some of the most heavily industrialised parts of Auckland's central isthmus. There is a widespread legacy of activity that has left a legacy of contamination, including several coastal reclamation sites that were historically used for landfills and uncontrolled filling; and it is likely that some of these 'legacy' landfills along the foreshore are leaking leachate into the stormwater network, groundwater system, and to the Harbour.

Industrial land uses in this catchment area have also contributed to a higher overall likelihood of stormwater contamination and a reduced quality of stormwater discharging into the Inlet in this location. Based on previous studies and the sampling results received to date, it appears that:

- Water quality is poor, which is typical for developed catchments in Auckland in terms of the contaminant type and load.
- The common contaminants in stormwater are zinc, copper, total suspended solids, and to a lesser extent lead.
- Due to the age of the existing network, cross contamination (wastewater) overflow issues are assumed.
- Leachate quality is typical of aged landfills in the Auckland region and contaminants, likely due to the historical nature of the landfills in the foreshore and the continual tidal wash-out. Leachate is generally of a similar nature to the stormwater quality levels, with additional nutrient contaminants, specifically ammoniacal nitrogen.

Due to the EWL alignment, an opportunity has been identified to improve the quality of water within Māngere Inlet through stormwater and leachate attenuation and treatment. Elsewhere along the project corridor, stormwater treatment will be directly associated with impervious surfaces that are constructed as part of the project (as is typical for new roading projects).



Existing stormwater outlet channel into Māngere Inlet

Flood Risk

Auckland Council has undertaken flood hazard studies which summarised flood issues in the Onehunga and One Tree Hill catchments. These studies found that flooding of habitable floors in residential areas was limited, and upstream of the project area; but that there was some ponding of individual commercial sites further down the catchment. Limitations in pipe discharge capacity, lack of secondary overland flow paths into the Manukau Harbour and tidal influences contribute to flooding of these low commercial areas.

The lowest ground level of industrial property in the local area is estimated to be below the Highest Recorded Tide in this area. Climate change is an important consideration for the Project with regard to both tidal and rainfall-driven flood events. Over the next 100 years tide levels are predicted to increase by 0.5–1.0 metre. This would mean that the number of properties affected by the highest tide would also increase. The road embankment as part of the Project potentially provides an improved level of protection from coastal inundation as a result of any sea level rise.

2.3.6. Coastal processes

Māngere Inlet (the Inlet) and Onehunga Bay have been subject to significant change since the mid 1800s and been the location of several large scale industrial developments that have resulted in reduction of Inlet area. Up to the Old Māngere Bridge, the coastal marine area (CMA) of the original Inlet has reduced by 24% through reclamation. The diagram below shows the changes to the Māngere channel over time.

The coastal edge is protected by a variety of coastal structures including tipped rock, rock revetments and vertical seawalls offering varying degrees of coastal erosion protection.

Sediments within the inlet consist of mud and fine grained sand, a texture present since pre-human times. Suspended sediment investigations indicate that the Inlet acts as a sediment and contaminant sink, which reinforces the Project's desire to improve the quality of stormwater and leachate entering the Inlet (see Section 2.3.5).

Historical changes have been more pronounced with narrowing of the tidal Inlet channel than with reclamation. Changes to the Inlet due to reclamation have tended to be relatively benign and probably masked by the effects of narrowing the tidal Inlet channel and the increase in mangrove coverage (since their first appearance approximately 60 years ago, mangroves now occupy 20% of the Inlet). Narrowing of the tidal Inlet channel has resulted in a deepening of the channel and a reduction of wave energy entering the Inlet. As part of the Project, it is important that any affected tidal channels are redirected to a nearby location such that the overall distribution of tidal flows is similar.



Māngere Channel over time

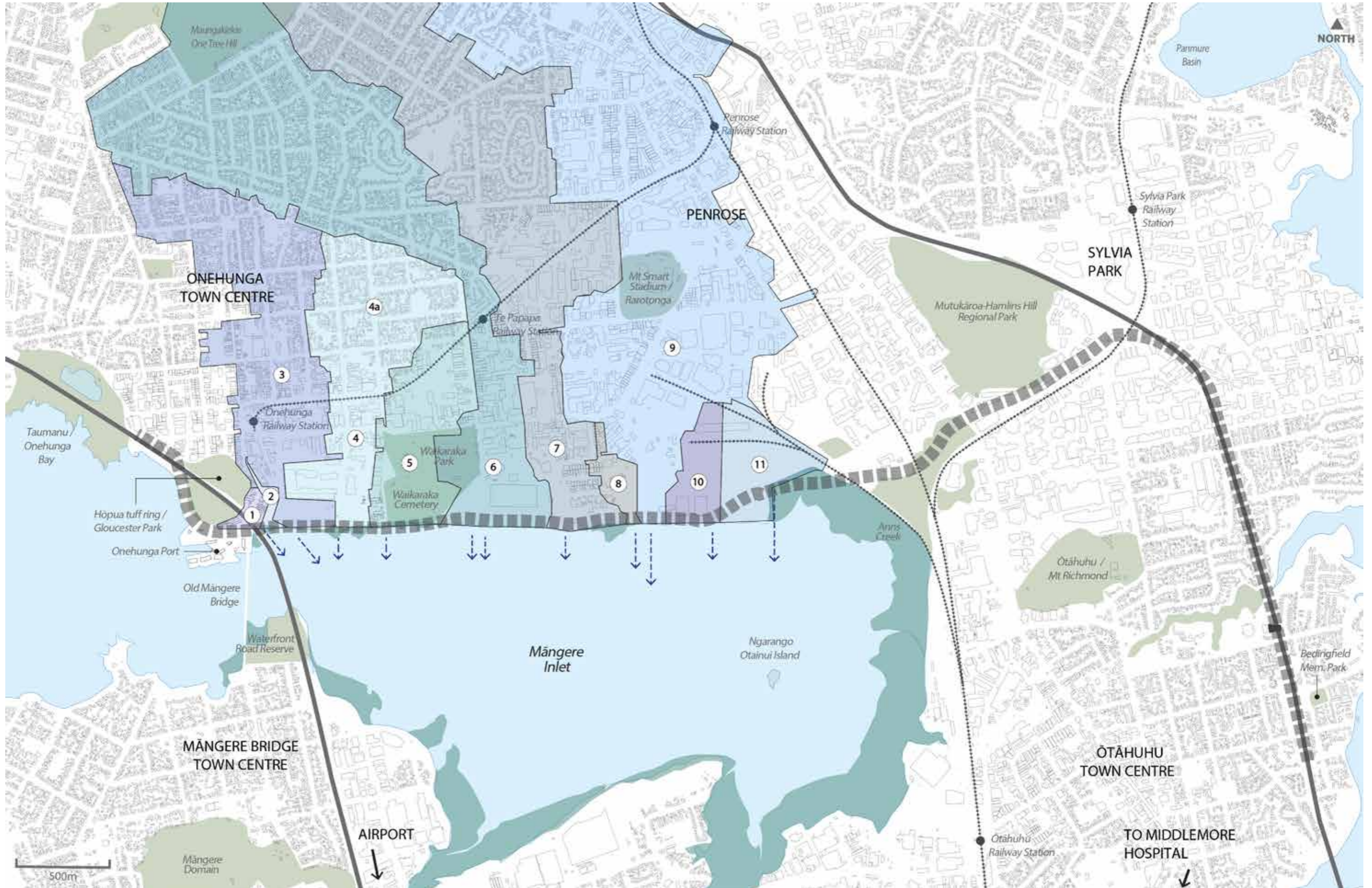


Figure 11. Stormwater catchments and outfalls

2.3.7. Urban morphology and area character

Urban structure is a strong determinant of past and present land use and built form character. The historic subdivision pattern, road layout and subsequent infrastructure have been shaped around and to take advantage of the Māngere Inlet. Land uses in the immediate area of the corridor are predominantly industrial, with the exception of the residential neighbourhoods south of Panama Road. Within the wider context of the Project, however, Figure 12 and the aerial photos below highlight the conglomeration of industry around the Māngere Inlet and how these separate the residential areas. Interestingly, the rectilinear Onehunga street grid supports both industrial and residential uses around the town centre; but there is a still a strong contrast between the character of large, 'shed' building types and the finer grain of residential neighbourhoods. It is notable that significant parks and recreational open spaces – Waikaraka, Mt Smart, Mutukāroa and Mt Richmond – are wholly or partly surrounded by industrial uses, which reduces their accessibility to the community.



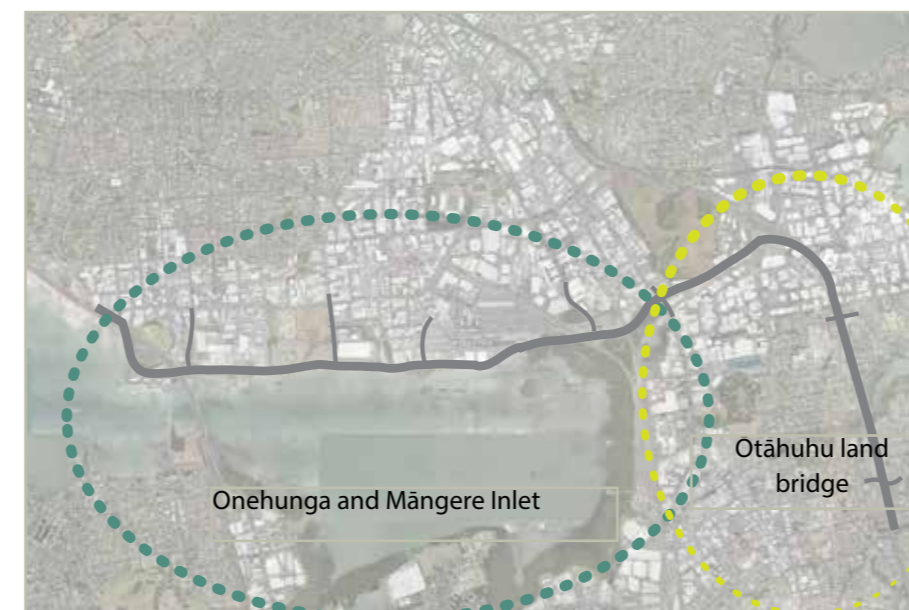
Around Te Papapa and the inland port, the urban structure 'loosens' and very large blocks and unconnected streets are typical



From the air, the urban morphology of Onehunga is clear: long streets, regular, interconnected street and block grid, contrasting building scales

The Landscape and Visual Assessment divides the project area into two broad landscapes: Onehunga and Māngere Inlet; and the Ōtāhuhu land bridge (see diagram below).

Within those is a sequence of 'experiences' or of a varying sense of place along and around the corridor, moving from urban (Onehunga) to industrial (backdrop to the Māngere Inlet) to natural (Anns Creek) to industrial/commercial (Sylvia Park Mall Shopping Centre) to residential (Panama Road to Princes Street).



The Ōtāhuhu land bridge connects the Auckland isthmus to the rest of the North Island (above); and has a different character to the area around the Inlet (below)

Onehunga

Onehunga's distinctive square grid street pattern is centred on the main street of Onehunga Mall (formerly Queen Street) and a principal cross-axis on Church Street, and led directly west and south to Manukau Harbour. The Landscape and Visual Assessment characterises the former west-facing beaches (now reclaimed) as the recreational connection – Onehunga's 'front door'; the port area as the working connection, and Māngere Inlet as the 'back door' where waste and industry was located. Even in the early days of European settlement, the town and port were somewhat separated by the Hōpua tuff ring as the connecting road (now Onehunga Harbour Road) ran around its rim. Neilson Street was the foreshore road until reclamation of the northern shore of the inlet.



The 1859 street and block layout is still evident, along with early reclamation for rail to the port: Neilson Street today is well inland from the Inlet

Today at the western end of the alignment, commercial development is mixed with light industrial. Within the town centre 'proper', cafes and shops line Onehunga Mall Road in a traditional retail strip (narrow lots, up to the street edge). Church Street divides residential (north) from industrial (south) uses. Historically, Onehunga's north-south and east-west streets extended to the foreshore, and the interface between land and water was more 'urban'. That sense of an urban edge has been lost to a large extent but there is potential through the Project to re-establish what was a strong relationship.

Onehunga Port

South of the Neilson Street interchange, Onehunga Port is an area which could change. Auckland Council's development arm (Panuku) is currently undertaking investigations which could see this area transition into residential mixed-use development. Such development would have the potential to result in an increase of residential density (and associated pedestrian, cycle and vehicle movements) and to re-shape the area around the Port. In a long term future, it could also influence a shift away from the predominantly industrial character of the area between the Port and Onehunga town centre.

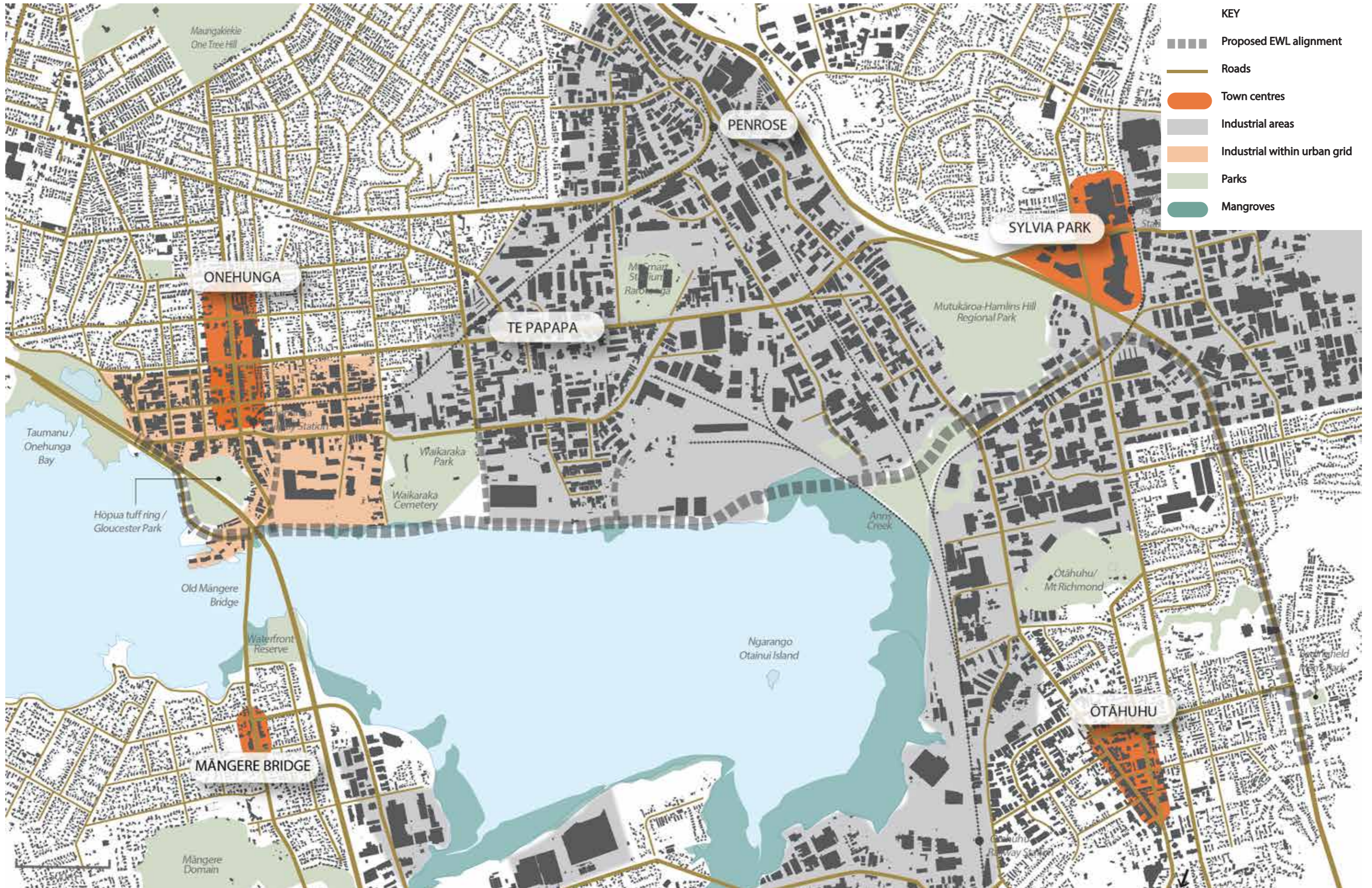


Figure 12. Urban morphology

Māngere Inlet

Waikaraka Park and Waikaraka Cemetery, which were formerly on a low promontory in the harbour, are now sandwiched between industrial sites. Moving east, Anns Creek was formerly part of a much more extensive swampy area that flanked the south-east side of Mutukāroa (Hamlins Hill) and which was part of the Karetu portage. The foreshore is experienced differently depending on outlook: looking out over the Māngere Inlet it is possible to appreciate the form of the maunga, the expanse of the water and (towards Anns Creek) the vegetation - a more 'natural' character. Looking inland, the backdrop to the Inlet is 'hard' and utilitarian in its built form character. This contributes to a sense that the water is somewhat severed from the land.

Te Papapa

The Onehunga railway line marks a distinct boundary between the fine-scale urban development pattern of Onehunga and the contrasting coarse scale of Te Papapa. Large landfills were subsequently converted to industrial and logistics use. As a consequence, Te Papapa has a coarse-grained and non-permeable street pattern, typically with dead-end streets connected back to Church Road or Neilson Street. Industrial buildings edging the project mostly have large open areas for parking and storage around them. There is scant relationship between these buildings and any public streets or footpaths: their functions are generally hidden inside and they present as 'closed' to view. Transmission towers and overhead cables close to the road add to the industrial character.

Ōtāhuhu land bridge

Prior to Pākehā settlement, the Karetu and Ōtāhuhu portages linking water-based (waka) travel between Northland and the Waikato made the Ōtāhuhu land bridge an important location. Ōtāhuhu township was built during the Waikato Wars of the 1860s for similar strategic reasons, controlling the Great South Road between Auckland and the Waikato. The town centre straddles Great South Road along the low ridge in the centre of the land bridge, with industrial activities located largely west and north along the railway lines and highway, and residential areas towards the east.

Sylvia Park

Sylvia Park Mall Shopping Centre is a large business park and shopping destination for both local residents and people living beyond the project area. The retail mall areas combine an internalised typology with smaller-scale outdoor areas that mimic traditional shopping streets. The Southern Motorway (SH1), South-Eastern Highway and the Mount Wellington Highway converge on the western edge (the South-Eastern also bisects it) and, with large areas of car parking, contribute to a vehicle-dominated environment. The train station is adjacent to 'back of house' service and parking entries although it also offers a direct - and well used - connection into the shopping centre. Strengthening the visual and physical connections between Sylvia Park Mall Shopping Centre and Onehunga is a key opportunity to encourage and enhance the use of both centres by their residential communities.

Ōtāhuhu residential areas

Towards Ōtāhuhu, from Panama Road, the industrial character gives way to residential (with the exception of a large industrial complex almost entirely within the footprint of the former McLennan Hills volcanic cone). The street and block pattern is loosely orthogonal, interrupted by SH1, and the subdivision of very large blocks has resulted in many houses tucked down the back, with no street address. Houses turn their backs on SH1 although they typically front the local roads that link to it. The area around Princes Street is severed and dominated by infrastructure - the 'spread' of the interchange - whose scale contrasts with the modest housing stock and small neighbourhood shops.



Onehunga Port



Onehunga Bay Foreshore Reserve



New industrial units on Waikaraka shared path (west of Alfred St)



Onehunga Mall



Looking towards residential Onehunga past SH20



Industrial land uses surrounding Mt Richmond



Sylvia Park



Containers adjacent to Waikaraka shared path



Transmission towers in Panama Road area



Princes Street neighbourhood shops

2.3.8. Connections

The waterways were the main movement corridors through Maori occupation of the isthmus. Key to the project area and for the wider region are the portage routes used by Mana Whenua to connect between Manukau Harbour, Tāmaki River and Māngere Inlet to drag waka (canoes) between the waterways. These portages (Ōtāhuhu and Karetu) date back over a thousand years and were famously utilised by the Tainui waka. An annual Waka Ama portage crossing festival pays tribute to the historic significance of these important connections.

Today, land-based connections – road, rail and pedestrian and cycle networks – have shaped the project area and changed the landscape, from constructing SH20 through the Hōpua tuff ring to creating a new public space on the Onehunga Foreshore (Figure 13). Linkages between the ‘attractors’ that draw people into and through the area are:

- Four town centres: the project will create a new, direct connection between Onehunga and Sylvia Park Mall Shopping Centre for pedestrians and cyclists, also linking to Māngere Bridge across the inlet. Ōtāhuhu lies to the south of the project area and draws people from both sides of SH1.
- Three train stations: Onehunga and Te Papapa on the Onehunga Line, and Sylvia Park on the Eastern Line
- Four employment destinations: the project touches the area loosely clustered around Onehunga town centre and train station; and edges and bisects the large industrial area spreading out from Church Street to Sylvia Park train station.
- Three residential neighbourhoods: Onehunga, Māngere Bridge, Ōtāhuhu
- Ten recreational locations: Onehunga Foreshore, Gloucester Reserve, Waikaraka Park, Mutukāroa and Bedingfield Memorial Park border the alignment. Onehunga Bay Reserve and Mount Smart Stadium are close by; the Māngere foreshore, Ambury Park and Maungakiekie are within two kilometres of the project area.
- Auckland Airport, while outside the project area, is a key destination and departure point for the city and the region, and access to and from it is important for both tourism and business.

Four key traffic and transport issues have been identified in the area:

- Unreliable journey times - Congested access to SH20 and convoluted and congested access to SH1.
- Bus journey time reliability for buses between SH20 and Onehunga Town Centre
- Conflict between through and local access traffic on Neilson Street
- Severance issues between Onehunga Town Centre and foreshore, amenity issues with through traffic for pedestrian and cyclists and poor pedestrian and cycle access in the east.

Road network

The project proposes a new arterial road linking SH1 and SH20. Current access between the state highways is unreliable and indirect. On the western side of the project area, access to SH20 is constrained by congestion at the Neilson Street/Onehunga Mall intersection, which results in a bottleneck. On the eastern side, the connection to SH1 is convoluted, also congested, and has a large number of traffic signals that contributes to large trip time variations.

Congestion and conflicts within the existing corridor create accessibility issues for local businesses, which detracts from both efficiency and safety. Heavy freight traffic and congestion along Neilson Street in particular exacerbates the perception of severance between the Onehunga Town Centre and its surrounding business neighbourhoods, and has resulted in an environment that is ‘unfriendly’ to pedestrians, cyclists and local traffic alike.

Public transport

Onehunga Rail Station is at the southern end of the town centre, at the junction of Neilson Street and Onehunga Mall, and within a 5 minute walk to the foreshore. Te Papapa Rail Station serves the Mount Smart Stadium, and the Sylvia Park Rail Station provides access to the Sylvia Park Mall Shopping Centre.

The existing bus network provides multiple, but infrequent connections, and is currently being converted into new Southern and Central bus networks that will run high frequency services on fewer routes. There will be ‘crosstown’ routes using Neilson and Church Streets, and support for multi-mode travel with several bus routes converging at the Onehunga, Sylvia Park and Ōtāhuhu rail stations.

Walking and cycling networks

The existing cycling and walking environment is a mix of high quality shared paths, overpasses and underpasses, on-road cycling, and footpaths of varying width, continuity and condition. Heavy vehicle through traffic and missing links to key destinations compromise the pedestrian and cycle experience. Travelling east, the infrastructure comprises:

Onehunga Foreshore and Orpheus Drive

The Onehunga Foreshore was completed in November 2015 and provides a high quality meandering ‘recreational’ trail as well as a direct cycle commuter route adjacent to the road. The direct commuter route is separated from general traffic with a fixed concrete curb. A new pedestrian and cycle bridge was constructed over SH20 to reconnect the Onehunga community with the foreshore. From the Manukau Cruising Club to the Sea Scout Hall a ‘shared space’ has been designed as a road, albeit with very little traffic, and was therefore assessed as a network gap.

Onehunga Harbour Road and Waikaraka Cycle Path

At Onehunga Harbour Road the shared path is separated from but close to the road, which sees heavy traffic, including large trucks. Moving east, there is a choice between a path that bridges over Onehunga Harbour Road and along an underpass under the Manukau Harbour Bridge to connect into Onehunga or continuing along the foreshore from the Māngere Bridge/Onehunga Harbour Road intersection through to Hugo Johnston Drive. The Waikaraka Cycle Path (formally signposted as the Manukau Foreshore Walkway), while edging industrial land and representing some isolation risk, has expansive views over the Māngere Inlet. Connections into the local road network are mixed in quality and perception of safety (two at the western end: Onehunga Mall and Onehunga Harbour Road; one at Alfred Street and two into the adjacent Waikaraka Cemetery are well connected; one from Miami Parade is not well overlooked).

Anns Creek and Sylvia Park Road

The Waikaraka Shared Path finishes at Hugo Johnston Drive. Pedestrians and cyclists can use the road network to access the adjacent business/industrial area, Mutukāroa Regional Park (Hamlins Hill) and Sylvia Park Mall Shopping Centre and Train Station but there are few facilities for them, namely a short distance of on-road bike lane at the intersection of Great South Road and Sylvia Park Road, sporadic foot paths (often only on one side of the road) along Great South Road and Sylvia Park Road; and bicycle parking at Sylvia Park Station.

State Highway 1

There is no cycle, and limited walking, infrastructure in this area. Auckland Transport and Auckland Council have two future network plans that include developing SH1 as a ‘metro’ style commuter route, and the Portage Road Greenway project which would see the northern edge of the Ōtāhuhu Creek developed as a recreational trail connecting to parkland around Ōtāhuhu College and then Portage Road. The walking and cycling strategy for EWL is not to preclude the future development of this cycling infrastructure.

Te Araroa Trail

Te Araroa - New Zealand's Trail - is a continuous 3,000 km walking track from Cape Reinga to Bluff. The trail route connects through the project area, linking from the west of Maungakiekie (One Tree Hill), along Manukau / Quadrant Roads, through Onehunga Bay Reserve, across State Highway 20 / Orpheus Drive, around the foreshore, past the Port, across Old Māngere Bridge and then continues south-west following the shoreline, through Ambury Farm before continuing south.

Nga Haerenga, The New Zealand Cycle Trail

New Zealand's Great Rides provide journeys on 2,500km of trails. The cycle trails navigate across old tracks, roads and railways. They offer leisurely travel, multi day cycling holidays and remote mountain bike adventures. 18 'Great Rides' are proposed as part of this government initiative - not all of which have been completed.



Onehunga Bay Foreshore pedestrian bridge



Onehunga Bay Foreshore reserve and shared path



Cyclists along Onehunga Harbour Road



Old Māngere Bridge pedestrian / cycle connection



Pedestrian Bridge connecting over Onehunga Harbour Rd



Lower Onehunga Mall underpass under SH20



Boardwalk linking beneath SH20 to Waikaraka Shared Path



Waikaraka Shared Path



Waikaraka Shared Path



Hugo Johnston Drive




Railway station at Sylvia Park



Princes St Bridge


 10-minute walk from railway stations


 10-minute walk from town centres

EXISTING

 Shared Path


 Walkway

 On-road pedestrian / cycle connection

 Pedestrian Bridge

 Underpass

PROPOSED

 Proposed EWL Alignment

 Priority Link (Local Board)

 Long Term Network (Local Board, Auckland Transport)

 Te Araroa Trail

 Airport to CBD National Cycling Trail

 Coast to Coast walkway

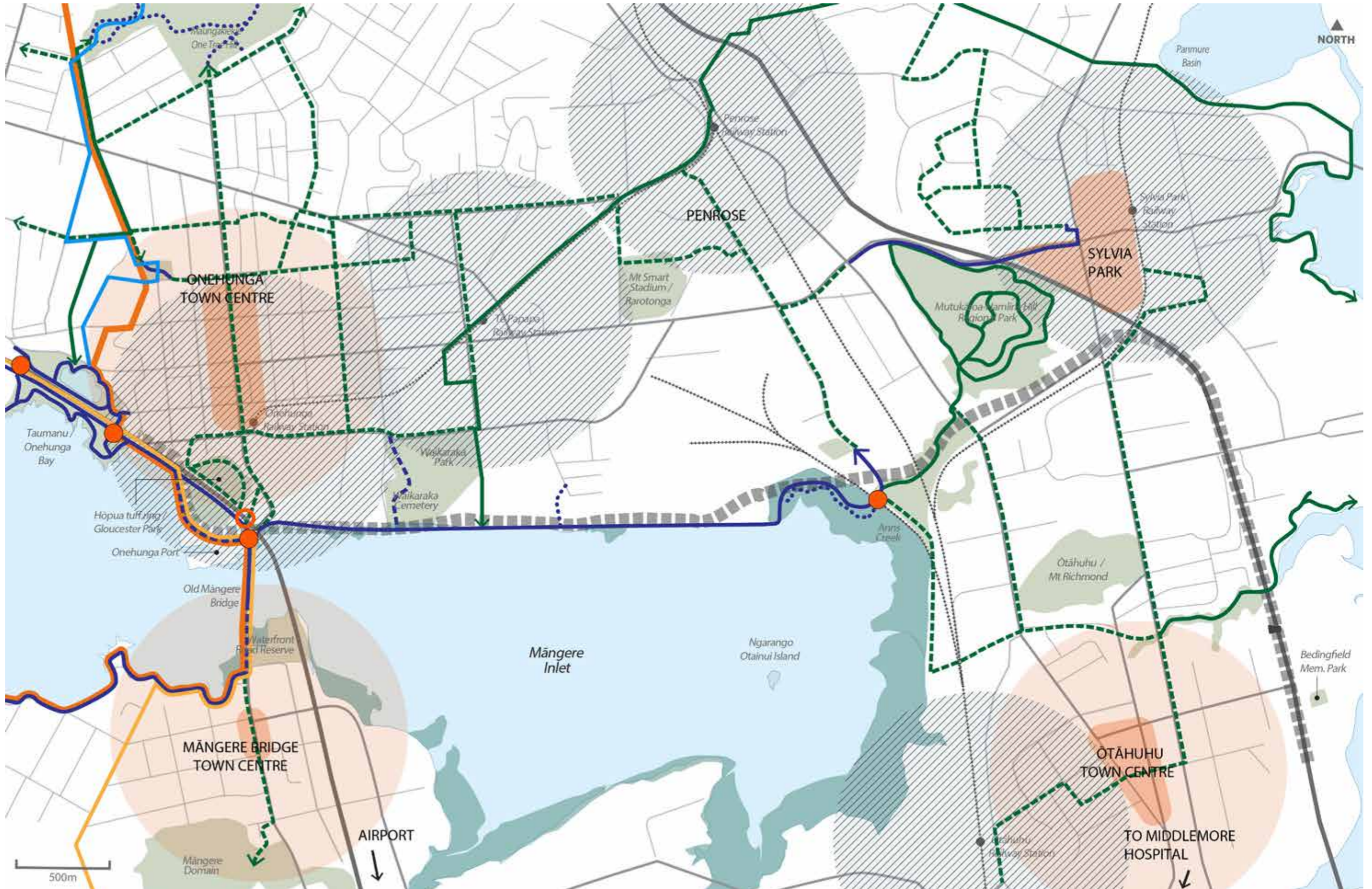


Figure 13. Walking and cycling networks

2.4. Opportunity analysis and responses

Figure 14 summarises the underlying character of the alignment as it moves from west to east - from highway around the Neilson Street Interchange, to coastal arterial along Māngere Inlet (with local streets above), then to industrial arterial along Sylvia Park Road and ending with highway again at State Highway 1 to the east. These underlying corridor characteristics and the wider contextual analysis help in understanding the area, its complexities, and the key constraints and opportunities. This includes consideration of opportunities identified in earlier work by stakeholders and community members (captured in the Detailed Business Case, illustrated below), with Mana Whenua and through the analysis mapping carried out for this Project and illustrated in this section of the ULDF. These are summarised in Figure 15 and in the accompanying table. Refer also to the Appendix: Te Aranga principles, which shows the relationship between these Māori design principles and opportunities identified by Mana Whenua.

The Project design has captured and built on the key design opportunities identified. In other words, they have moved from being opportunities to being design responses.

There are also process opportunities which are applicable to future stages (e.g. detailed design and construction). These are:

- Embed a partnership approach between NZTA and Mana Whenua into the design process, that fosters strong working relationships and accommodates the integration of Mātauranga Maori into the design of the East West Link
- Creatively inscribe cultural and historic narratives into the design environment, weaving together stories of Mana Whenua and Europeans where they overlap, to convey the richness of the area's history
- Urban and landscape design opportunities that fall outside the scope of the current EWL project (or sit outside of the Project designation) but would further enhance the Project area for residents, visitors and road users (and how they can be sought through the procurement process).

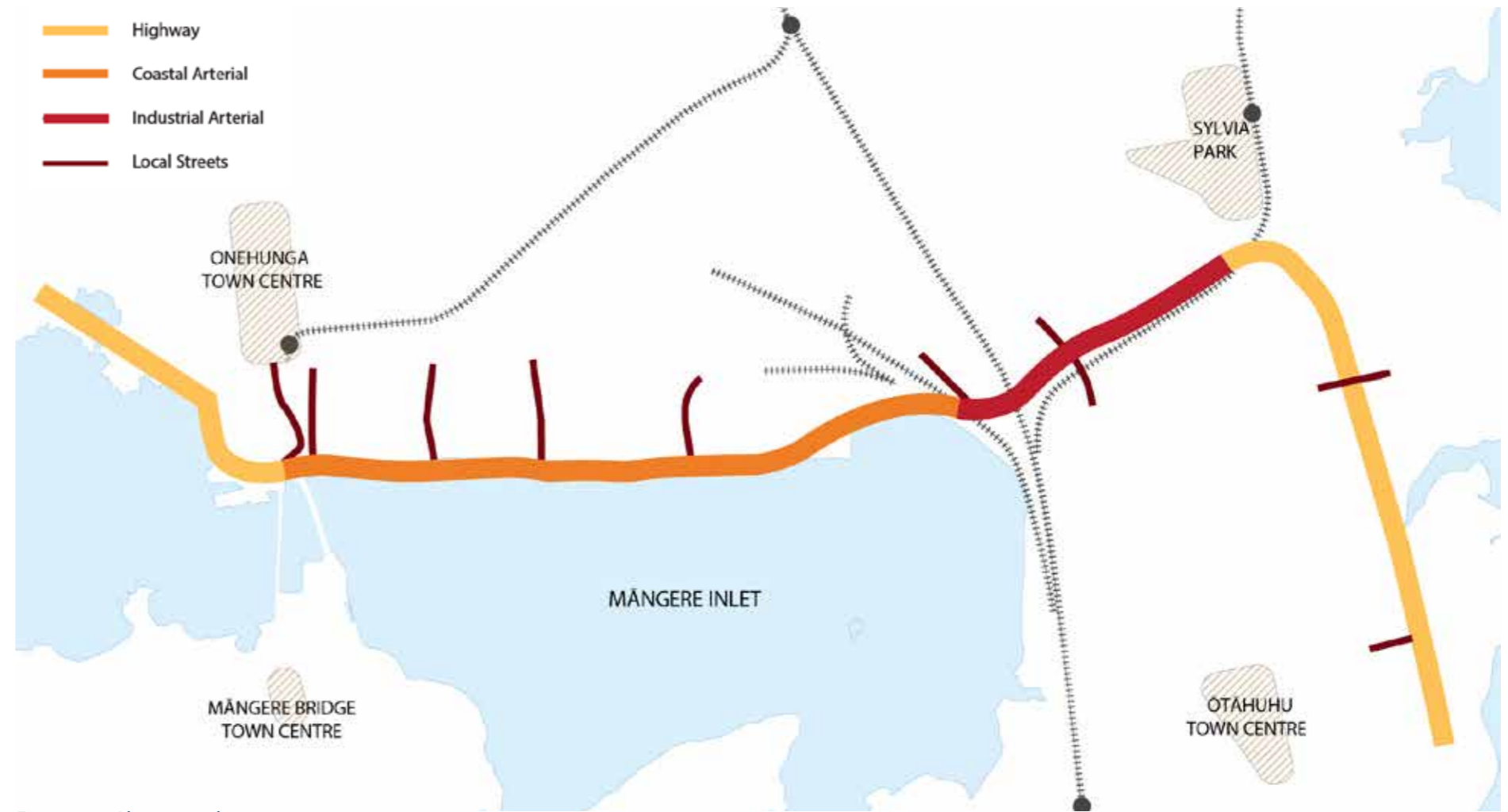
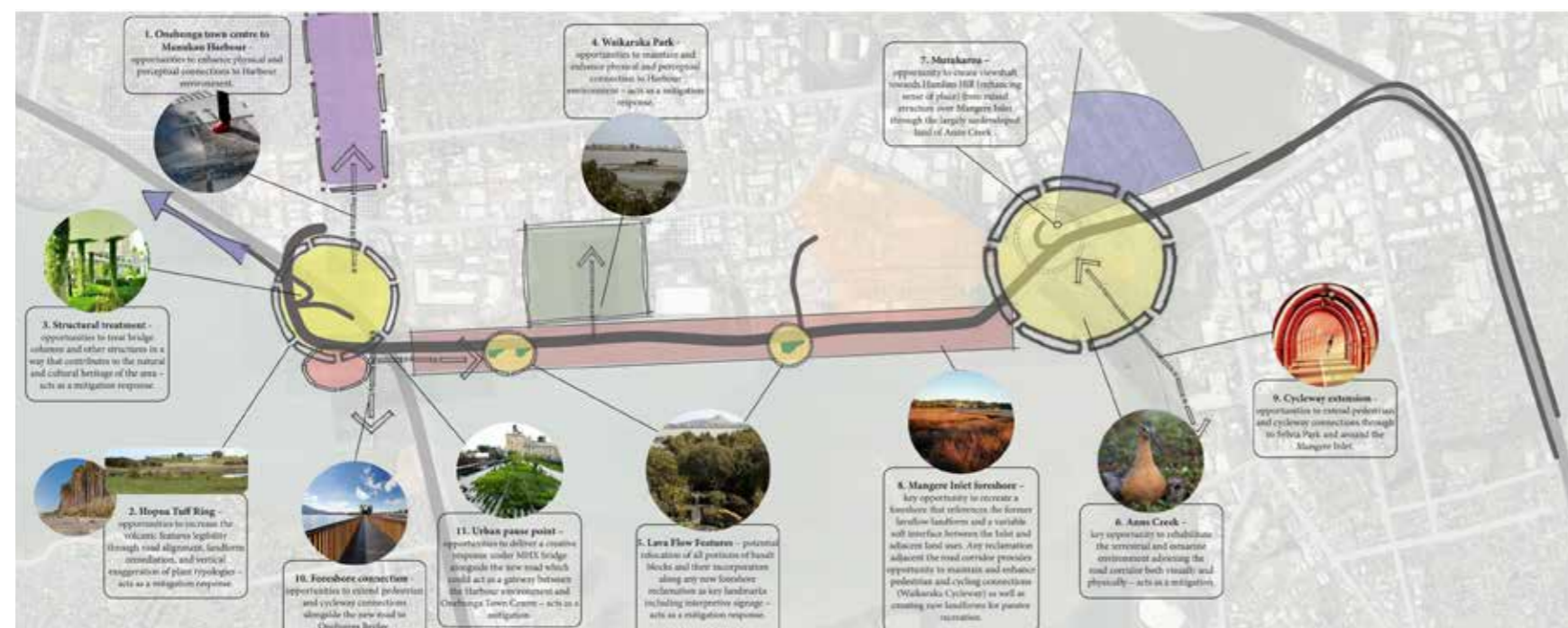


Figure 14. Alignment character areas



Potential opportunities and key moves identified in the Detailed Business Case, preceding this Project. These informed the ULDF analysis and concepts

KEY

- Proposed EWL alignment
- Interpret original shoreline
- 'Green the edge'
- Interpret portage routes - along Karetu, crossing Otahuhu
- Protect remnant lava flows
- New seamless ped / cycle connection
- Meander / outlook areas
- Capture elevated views
- Protect views to maunga
- Stitch into local road network
- Link Onehunga to foreshore & port / enhance streetscape & intersections
- Retain / extend urban grain
- Protect areas of ecological significance / create new habitat for threatened species
- Improved water quality
- Create roosting places for birds
- Highlight form of tuff ring
- Sensitive design of:
 - large retaining walls
 - underside of ramps
 - overbridges
 - ped / cycle bridges



Figure 15. Summary Opportunity Analysis

PLACES	KEY OPPORTUNITIES IDENTIFIED BY		KEY DESIGN RESPONSES	ULDF SECTION	OUTSIDE SCOPE / FOR FUTURE
	DETAILED BUSINESS CASE previous project	MANA WHENUA this project			
ONEHUNGA TO THE HARBOUR [Sector 1]	<p>Enhance physical and perceptual connections between the town centre and the harbour</p> <p>Extend pedestrian and cycleway connections alongside the new road to [New] Old Māngere Bridge</p> <p>Balance access needs of local Onehunga community with through traffic</p> <p>Reduce noise and visual impacts</p>		<ul style="list-style-type: none"> Streetscape upgrade of Onehunga Harbour Road / Onehunga Mall; land bridge (local road) to Port over trenched EWL Replacement pedestrian/cycle bridge on axis with Old Māngere Bridge, connects east-west and north-south Local traffic on Onehunga Mall separated from through traffic on Galway Street; removal of traffic signals on ramps for seamless movements 	<p>4.3.2 Local roads</p> <p>4.3.6 Pedestrian and cycle underpasses</p> <p>4.3.7 CPTED</p> <p>5.1 Neilson Street Interchange</p>	
HŌPUA A RANGI TUFF CRATER [Sector 1]	<p>Increase the legibility of the volcanic feature through road alignment, landform remediation, vertical exaggeration of plant typologies</p>	<p>Enhance ecological value of marshland within the tuff ring</p>	<ul style="list-style-type: none"> Use artwork (on public land) to celebrate and express Te Hōpua a Rangi Landscape treatment - ecological area is extended / enhanced Design and detailing of structures 	<p>4.1.4 Landscape structure</p> <p>5.1 Neilson Street Interchange</p>	<p>Recommended: boardwalk access integrated with signage masterplan to enable appreciation of ecological and cultural value</p>
MĀNGERE INLET [Sector 2]	<p>Waikaraka Park and Cemetery - maintain and enhance physical and perceptual connections to the Māngere Inlet</p>	<p>Integrate with Waikaraka Park upgrade</p>	<ul style="list-style-type: none"> Extend Alfred Street and Captain Springs Road connections alongside park to foreshore, tying in former dead ends and pedestrian desire lines Locate Alfred Street pedestrian / cycle bridge to not interrupt views out from the Cemetery 	<p>4.3.2 Primary Urban Arterial</p> <p>4.2.4 Shared paths</p> <p>5.2 Māngere Inlet Foreshore</p>	
	<p>Lava flow features - potentially relocate basalt; incorporate lava flows as key features along any new foreshore reclamation, including interpretive signage</p>	<p>Avoid / preserve lava flows and respond to them</p>	<ul style="list-style-type: none"> Protect remnant lava flows by pulling in any walkways towards the shore and/or using boardwalks to minimise touching them 	<p>4.1.5 Landscape features</p> <p>5.2 Māngere Inlet Foreshore</p>	
		<p>Restore the mauri to support collection of kai from harbour [and Ōtāhuhu Creek]</p> <p>Contain contaminated discharges from land to water</p>	<ul style="list-style-type: none"> Project alignment and embankment design collects leachates and treats stormwater 	<p>4.2 Restore the whenua</p> <p>4.2.4 Stormwater wetlands and ponds</p>	
	<p>Māngere Inlet foreshore - recreate a foreshore that references the former lavaflow landform and variable soft interface between the Inlet and adjacent land uses</p>		<ul style="list-style-type: none"> Interpret the former shoreline through a naturalised edge that includes headlands and outcrops of varying height and form, and integrates stormwater treatment; and creates new roosting or foraging areas for threatened species 	<p>4.2.1 Embankment and naturalised coastal edge</p> <p>4.2.2 Formed banks</p> <p>5.2 Māngere Inlet Foreshore</p>	<p>Recommended: signage masterplan including identification of original shoreline, historic maps / photographs along foreshore path</p>
	<p>Reclamation - maintain and enhance pedestrian and cycling connections as well as creating new landforms for passive recreation</p>		<ul style="list-style-type: none"> Coastal path includes places for pedestrians to stop, look out and appreciate the inlet from the foreshore 	<p>4.3.4 Shared paths</p> <p>4.3.5 Pedestrian paths</p> <p>5.2 Māngere Inlet Foreshore</p>	
	<p>Extend pedestrian and cycleway connections through to Sylvia Park and around the Mangere Inlet</p>		<ul style="list-style-type: none"> Project has direct multiple connections including: bidirectional cyclepath on outer edge of embankment between Onehunga and Sylvia Park, connecting into Manukau Harbour foreshore shared path; coastal path / boardwalk on outer embankment; shared path along inner edge servicing Waikaraka Cemetery and Park. 	<p>4.3.4 Shared paths</p> <p>4.3.5 Pedestrian paths</p> <p>4.3.6 Pedestrian and cycle underpasses</p> <p>4.3.7 CPTED</p>	

Table 1: Opportunities

PLACES	KEY OPPORTUNITIES IDENTIFIED BY		KEY DESIGN RESPONSES	ULDF SECTION	OUTSIDE SCOPE / FOR FUTURE
	DETAILED BUSINESS CASE previous project	MANA WHENUA this project			
ANNS CREEK [Sector 3]	Rehabilitate terrestrial and estuarine environment both physically and visually	Identification and recognition of importance of Anns Creek	<ul style="list-style-type: none"> Integrated ecological mitigation and landscape planting 	4.2.5 Planting 5.3 Anns Creek	Recommended: Signage masterplan including ecology to increase public appreciation of Anns Creek
MUTUKĀROA [Sector 4]	Create [new] viewshaft from raised structure over Māngere Inlet	Improved linkages and access Minimise visual impact on Mutukāroa	<ul style="list-style-type: none"> New shared path runs alongside but on opposite side of Sylvia Park Road. Linear open space ('portage link') located between rail line and Sylvia Park Road alongside shared path is located opposite Mutukāroa to keep open views. and designed to strengthen visual connection. 	4.1.1 Bridges 4.2.3 Hard landscape 5.4 Sylvia Park	
MUTUKĀROA / ŌTĀHUHU [Sector 4 / Sector 5]		Recognise / re-establish / name Ōtāhuhu and Karetu portages	<ul style="list-style-type: none"> Express / interpret the historic portage routes in different ways to reflect how the project intersects with them: along the Karetu portage a 'linear landscape' and across the Ōtāhuhu portage opening up of the waterway and replacing the culvert with a new bridge at Ōtāhuhu Creek 	4.1 Iwi artist strategy 5.4 Sylvia Park 5.5 State Highway 1	Recommended: Signage masterplan to highlight portage routes Landscape design to reflect former portage - through a 'living environment'
ŌTĀHUHU [Sector 5]		Community [and school] involvement in ecological mitigation			Recommended: Mana Whenua to input to detailed design (post consenting); and community enabled to participate in implementation
	Improved pedestrian and cycle connections at Princes Street across SH1 for access to schools and recreation areas		<ul style="list-style-type: none"> Cycle and pedestrian connections across all legs of intersections and Princes Street overbridge alignment less convoluted New bridge for pedestrians and cyclists over Ōtāhuhu Creek is a new community connection 	4.3.4 Shared paths 5.5 State Highway 1	Extension of Greenway to connect across Ōtāhuhu Creek and complete Harbour circuit
PROJECT-WIDE		Recognise culturally significant waahi tapu sites, urupā including at Te Apunga o Tainui / TipTop corner	<ul style="list-style-type: none"> Sites have been mapped in the ULDF and will be updated and continue to be designed in collaboration with Mana Whenua 	4.1.2 Retaining walls and noise barriers 5.4 Sylvia Park	
		Manage weed infestation			Management Plans as part of detailed design
		Re-use materials where possible	<ul style="list-style-type: none"> Any basalt removed to be re-used, where possible 	5.4 Sylvia Park 5.5 State Highway 1	
		Use indigenous vegetation, eco-source and optimise biodiversity; Mana Whenua have input to species selection	<ul style="list-style-type: none"> Planting palette uses local indigenous species 	4.2.5 Planting	Recommended: Mana Whenua to input to detailed design (post consenting)
	Treat bridge columns and other structures to contribute to natural and cultural heritage of the area	Involvement in design of landmark features, at cultural sites of significance, treatment of bridges	<ul style="list-style-type: none"> Hierarchy of structures identifies sensitive / visible areas where collaborative design with Mana Whenua is required by way of a cultural framework 	4.1.1 Bridges 4.1.2 Retaining walls and noise barriers 4.1 Iwi artist strategy	
	Recognise need for and support capacity building for Mana Whenua to have a role in implementation				By way of Condition / agreements



3 VISION + DESIGN THEMES

3 URBAN AND LANDSCAPE DESIGN VISION

3.1. A holistic vision

East West Link has been developed by an integrated team with a 'whole of place' approach. This means that the design vision and 'big' themes (in this section), strategies (in Section 4) and sector-specific outcomes (in Section 5) are inter-related. For example, a rehabilitated inlet can fulfil both cultural and ecological objectives; an attractive foreshore path can highlight the area's history and landscape as well as connect destinations. The themes are like lenses through which to understand the area and develop strategies to interpret it through the urban and landscape design.

The design themes and accompanying strategies draw strongly on the Auckland Design Manual's Te Aranga principles and on commentary provided by Mana Whenua during the ULDF process.

The design themes are:

- ▶ Respect the place
- ▶ Restore the whenua
- ▶ Reconnect the people.

The urban and landscape vision is to:

- ▶ Restore, rehabilitate and reconnect with the landscape in its deepest sense.

The landscape of the project area is dominated by water. Waterways were strategic transportation routes from earliest Māori occupation: a communications network, a source of food, a link between settlements, trading routes, a path to war. Movement in the project area was east-west as well as west-east, linking the Manukau and Waitemata harbours via the Tāmaki River, and beyond to the north-south routes to Waikato, Wairoa, Waiuku, Whangaparoa, Kaipara and the islands of the Hauraki Gulf. The early Tāmaki isthmus has been described as a "natural Venice where canoes must have been as numerous and as necessary as gondolas¹", whose "great facility of internal water communications by the Kaipara and its branches to the northward; and the Manukau and Waikato to the southward²" led Governor William Hobson to locate the country's capital.

Land tracks or portages were an important part of the network. Many were developed as roads during European settlement and have helped shape movement and connections today. Sylvia Park Road and part of Bowden Road follow the Karetu Portage; present-day Portage Road, Ōtāhuhu, follows approximately the line of the Ōtāhuhu portage. These traces remind us of the continuity of human habitation and of the importance of the east-west connections.³

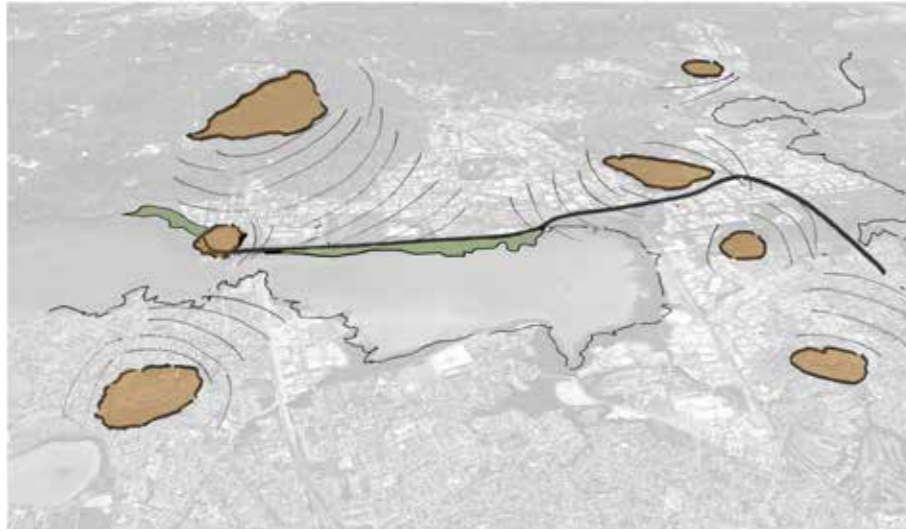
1 Hooker, Brian: Portages of early Auckland – to and from the Waitemata Harbour: The hub of an ancient communications network (citing Fisher), 1997.

2 Holloway, K.M: Maungarei – an Outline History of the Mt Wellington, Panmure and Tāmaki Districts, Mt Wellington Borough Council, Auckland, 1962.

3 Text by Lynne Hancock, prepared at Mana Whenua request to summarise the significance of the east west link as an idea relating to travel, communication and settlement.

3.2. Design themes and strategies

The following design themes are concepts developed to aid discussion and assist in conveying the underlying urban and landscape design narrative.



3.2.1. Respect the place

Celebrate culture

There is a profound connection between Mana Whenua and the project area. The natural resources of waters, foreshore and hinterland, harvested sustainably, supported successive generations of tribal groups as they established deep and lasting relationships to the landscape. In recent times development and industrialisation have degraded the Coastal Marine Area and surrounding lands, changed the coastal geomorphology and caused a loss of access to the previously abundant fresh food resource of the land, the inland creeks and the waterways. However, the area remains of high cultural value, meaningful for its role in sustenance, commerce, transport and communication for Māori over many hundreds of years.

For Mana Whenua, the area is more than its physical or present form. It binds past, current and future generations through significant events, landscape features and special places that hold and tell the stories of tradition, identity, spirituality and culture. This bond, this connection, is the source of mana for iwi and hapū. Recognition and acknowledgment of iwi and their history in this place is key to the urban and landscape design and process.

Interpret the heritage

Just as recognition of Mana Whenua cultural values and stories is a key objective for the urban and landscape design, so understanding the succeeding layers of history is also important in forming design strategies.

Onehunga is one of the earliest European settlements in Auckland. On the 1859 Hochstedder map that illustrates the volcanic landscape, Onehunga and what is now Auckland's downtown CBD have the only formed streets and blocks shown on the isthmus – and Onehunga covers more ground. From the 1840s onwards, Onehunga played an important role in the development of Auckland and in New Zealand's military, trade, transport and civic history. This history is only partially visible today through the surviving street pattern, historical buildings and remnants of built heritage, and could be much more widely known and appreciated.

Respond to the landscape

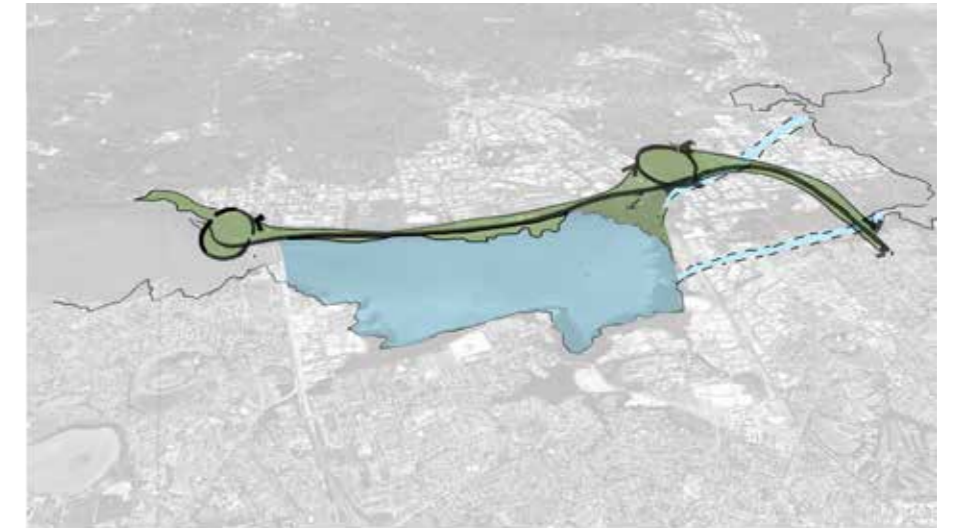
Views towards the maunga are an important part of understanding the underlying landscape. “He rima matatihi” – the five mountain peaks – Mutukāroa, Maungakiekie, Māngere Mountain, Ōtāhuhu and Rarotonga, watch over the inlet and tell of cultural occupancy, land use and transformation. They 'frame' the landscape and define the skyline.

The Hōpua a Rangi Tuff Ring, Pike's Point and areas within Anns Creek are just a few examples of visible geomorphic rock and lava flow outcrops that penetrate the coastal landscape, and that contribute to the ecology and the landscape character of the area. Effort should be made to preserve and highlight these historical features through design.

Acknowledge the present and future urban form

The project traverses a range of land uses and includes areas in transition or that are expected to change over time. The access, size and shape of useable land parcels has been an important consideration for the route alignment. The project design enables Council aspirations for the place, in particular a re-imagined Onehunga Port with a mix of commercial, retail and residential uses and enhanced open space along Ōtāhuhu Creek; as well as supports existing functioning of industry, in particular locating the on-ramps from Sylvia Park Road to SH1 centrally so as not to isolate the businesses that front the road.

3.2.2. Restore the whenua



The landscape of the project area is dominated by water. Many waters – the arteries of Papatūānuku – come together or are touched by the project: Māngere Inlet / Te Tapotu o Tainui; branches of the Tāmaki River; Manukau Harbour; the Tāmaki estuary. Waterways were strategic transportation routes as well as providing a rich source of kai. On land, the maunga and other landmarks guided voyagers along the portages and between settlements. Volcanic soils rich in nutrients contributed to the 'food basket'. The land held (and still holds in memory and as physical traces) pā, kainga, wāhi tapu and urupā. Linking land and water, the Karetu and Ōtāhuhu portages are at the heart of cultural narratives.

Mana Whenua groups of the project area have identified that:

- The earth is a living entity, and all living entities on the earth have a mauri or life force: the land, forests, mountains, sky, ocean and waterways
- All living things share a natural balance, an 'inter-connectedness and oneness' of which humanity is only a part. These values, passed from generation to generation, are a significant part of the intangible heritage of Māori and overall culture of New Zealand
- The health and biodiversity of water bodies underpins cultural wellbeing, by enabling sustainable food cultivation that in turn supports customary and social uses, and that
- The mana of a people is demonstrated by the health of their environment. Actively preserving and protecting the mauri of the waterways and the land as kaitiaki is both a right and a responsibility, manifested through rangatiratanga, the ability of Mana Whenua to govern and manage within their homeland.

The ideas of restoration, rehabilitation and regeneration in the context of this design theme are broad and far-reaching. They refer to the 'whole landscape' with the full range of cultural, historical and social meanings attaching to it. The well-being of being of the whenua – the water and land – includes how it is perceived, used and valued.

Rehabilitate Māngere / the inlet

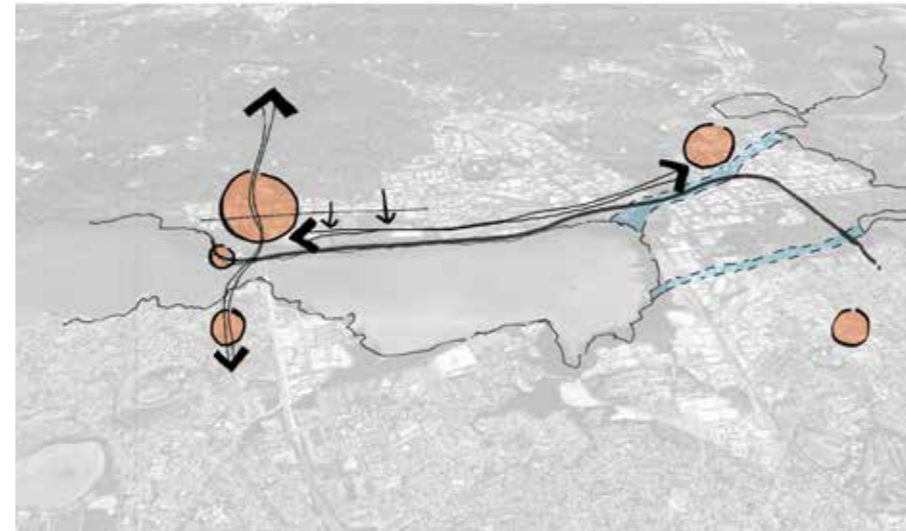
'Rehabilitate' here is a broad strategy, like that of the Māngere Inlet Environmental Strategy, to "return the mana to the inlet". It derives from an acknowledgment that, for iwi:

"Water is the life giver of all things, a fundamental taonga for Māori generally and for Mana Whenua collectively, who maintain cultural, historical and spiritual links with the moana, harbours, rivers, springs, wetlands and streams."

Regenerate Ōtāhuhu / the corridor

"The land is the source of life to us. It is a gift from the creator that nourishes, supports and teaches us. The land with all its realms connects us with our past and our ancestors, with the present, and with the future as a legacy to hold in trust. The land carries with it a deep sense of belonging and identity. As tangata whenua, we have been inherently charged with upholding our guardianship obligations from birthright, passed down through many generations from our many ancestors."

3.2.3. Reconnect the people



People to place

The concept of a 'link' in itself speaks of the connections and relationships that are embedded within a Māori world view, where all natural resources share a common genealogy; all things are connected; and where these connections are:

"not only between people but also between the spiritual world and the natural world. Relationships extend from the deities to whānau, to hapū, to iwi, to fauna and to flora. Respect and protection for these is therefore paramount to achieving positive outcomes." (Ngāti Paoa, 2016)

The area has been a significant meeting point across culture – for Māori and Pakeha – as it has been within the history of different iwi. The Project affords opportunities to reconnect relationships that have been lost or diminished over time, through providing access to the landscape around the corridor: Manukau Harbour, Māngere Inlet, Anns Creek, Ōtāhuhu Creek. The corridor is crossed or edged by nationally, regionally and locally significant pathways, meaning it that can also draw new groups of people into and through the area.

Harbour to harbour

The first connections in the area were by water and the waka portage routes that still underlie the main road networks. These east-west connections were succeeded by historic ferry links between Onehunga, Māngere Bridge and Ihumatao within the Manukau (and to places beyond). The project runs along the approximate route of part of the Karetu portage, along Sylvia Park Road between Great South Road and the Mt Wellington Highway. This is important because it offers the opportunity for landscaped areas, shared paths and directional and/or information signage to highlight and interpret the portage route, thereby adding interest and richness to the walking and cycling journey.

Ōtāhuhu Creek is traversed by SH1 in the southern part of the project and represents part of the Ōtāhuhu portage. A future regional network of paths envisaged by Auckland Council – the Greenways – includes a path along the northern edge of the creek, continuing over SH1 to reinstate an east-west connection from the Tāmaki estuary to the Māngere Inlet. The Project is providing a new, wider and higher bridge over Ōtāhuhu Creek which will, for the first time in many years, allow water passage (on the mid tide) beneath the bridge along the traditional route of the waka portage.

Land to water

Early maps show a regular, fine-grained street and block grid laid over the undulating landscape, not yet well connected to the surrounding areas but linked to the harbour and 'pointing' towards the water. The main axes were Onehunga Mall and Queen (now Church) Street (north-south and west-east respectively). This grid is still understandable today and shows how the road connections developed in relation to the Manukau, the Māngere inlet and the natural harbour of the Hōpua tuff ring. As the area has developed and become more heavily trafficked, the links between land and water have been weakened or severed. Strengthening visual and/or physical connections along north-south roads (Onehunga Mall in particular) can help reconnect the town with the coastal features and 'green edge' that once defined it. It will also create opportunities to link into walking and cycling paths along the Māngere Inlet and beyond, to / through Onehunga Port, the Onehunga Foreshore and the wider regional network.

Neighbourhood to neighbourhood

Linkages between the 'attractors' that draw people into and through the area are important because they support a connected, accessible, well used and vibrant place: connectivity is intrinsic to urban amenity and sustainability. The highway network, major arterials and rail corridors support movement along them but not always between and within neighbourhoods; and noise, vibration, pollution and view impacts can further undermine a sense of place.

Neilson Street currently severs Onehunga town centre from some of its businesses and residents; Sylvia Park Mall Shopping Centre is not readily accessed by bicycle or on foot. The project will result in reduced traffic on Neilson Street and a dedicated shared path directly connecting to Sylvia Park Mall Shopping Centre. It includes a new overbridge for local traffic between Onehunga Town Centre and the Port, in support of Panuku's aims for a new mixed use neighbourhood at the wharf. These are important because they can support 'placemaking' initiatives by Council. SH1 divides neighbourhoods along the Ōtāhuhu land bridge (Panama Road to Princes Street). The Project maintains east-west local connections, and in the case of Princes Street simplifies and makes safer the pedestrian and cycle links.

The urban and landscape design strategy is to enhance and create new locating views of the neighbourhoods and surrounding landscape, and improve the local streetscape where the project crosses it.



4 CORRIDOR STRATEGIES

4 CORRIDOR STRATEGIES

This section of the ULDF takes the vision and design themes and turns them into urban and landscape design strategies. It deals with those elements of the motorway and arterial road design that will be viewed by people travelling through the East West Link and connecting into the state highway network, and which therefore need to have a consistent treatment that reinforces a sense of continuity through the journey. These elements are often divided broadly into 'hard' (structures) and 'soft' (planting).

For the East West Link project, to reinforce the 'big' design themes that will deliver the urban and landscape vision, the corridor strategies are grouped to relate to those themes.

Over-arching DESIGN THEME	CORRIDOR-WIDE STRATEGY	CORRIDOR-WIDE OUTCOMES SOUGHT FOR:
Respect the place	Showcase the cultural and physical context	Bridge design and the wider bridge environment
		Retaining walls and noise barrier design
		Highway furniture: barriers, gantries and lighting design
		Cut and fill slopes - treatment and management
		Landscape features
Restore the whenua	Rehabilitate the inlet and foreshore	Iwi artist strategy
		Embankment and naturalised coastal edge - treatment and management
		Formed banks
		Hard landscape
		Stormwater wetlands and ponds - design and management
Reconnect the people	Link communities and destinations	Planting
		SH1 motorway integration
		Urban arterial integration
		Local roads integration
		Shared paths integration
		Pedestrian paths integration
		Pedestrian and cycle underpass design
		Crime Prevention Through Environmental Design (CPTED) principles

4.1. Respect the place: showcase the cultural and physical context

Well designed corridor elements can contribute to a project to showcase the natural and physical context. The East West Link design is to achieve this both generally through the design of clean, simple and understated structures, which enable focus to be placed on the surrounding environment and not on the structure itself; and through the well-designed structures, which may make reference to an important cultural or physical component of Onehunga, Māngere Inlet and the Ōtāhuhu land bridge. The landscape design aims to protect the values of distinctive natural features, recognise and highlight built landmarks, restore and reconnect ecological corridors.

The over-arching design principles for this outcome are to:

- Create a travel experience that relates to the sequence of character areas that the EWL passes through
- Locate / co-locate and design structures to make a positive contribution when seen close up by pedestrians and cyclists, and from distant viewpoints on land and water
- Support and enable a public art / cultural framework to be developed to tell the multiple stories of the place for pedestrians and cyclists at key locations
- Acknowledge and celebrate the important landscape features along the corridor and capitalise on views
- Design a coastal edge treatment that interprets the form of the early shoreline and contributes to the urban ecology (that is, the relation of living organisms with each other and their surroundings in the context of an urban environment)
- Optimise amenity both for people within the corridor and for those living and working alongside it
- Locate and design connections into the local street network to reinforce the legibility and accessibility of the urban environments.

4.1.1. Bridges and the bridge environment

The project contains a number of bridges as the proposed alignment navigates its interface with established movement networks, natural and cultural landscapes. Most of these structures are large and therefore likely to be dominant features in the landscape. Particularly sensitive or highly visible areas include bridge structures proposed in the vicinity of:

- The Hōpua a Rangī tuff crater and Onehunga Port
- Anns Creek
- Sylvia Park Road / State Highway 1
- Ōtāhuhu Creek.

These 'key' structures, including the underpass environment they create for other traffic where EWL crosses over, should respond to cultural design narratives. Figure 16 shows where bridges, large retaining walls and noise barriers will be located. These structures through their design and architecture can contribute to the sense of place. The accompanying table (Table 2) explains why and how particular structures require particular treatment in detailed design.

Bridging the Gap provides guidance for the design of road bridges (within Section 4.12 and Appendix 5). Building upon this guidance, the required outcomes for the Project are that all bridges on EWL:

- Maximise opportunities to create new outward views of the urban or natural landscape (i.e. to the Māngere Inlet, ecologically sensitive areas and the dynamic volcanic landscape) - this includes the design of railing and barriers (considering views from vehicles and for pedestrians and cyclists)
- Achieve a slender form with a horizontal emphasis and balance of structural elements to not fight with the landscape, particularly along the foreshore
- Land so as not to obscure or block pedestrian and cycle desire lines, particularly into the local road network and on Sylvia Park road along the (approximate) historic Karetu portage route opposite Mutukāroa.
- Maximise the distance between spans where crossing over areas of high ecological value within Anns Creek to minimise the bridge footprint
- Are designed as a whole composition, including the abutments, whose form, scale, and finish that can be appreciated by people walking, cycling and driving on the local road and spaces leading up to and around the bridge and corridor, as well as users of the EWL itself. This includes:
 - Designing the underside of the structure and its integration with columns and abutments equally with the side elevation where this is visible to people on the local road and pedestrian/cycle path networks (notably the SH20 overbridge, Panama Bridge and Princes Street bridge)
- Maximise a sense of openness beneath bridge structures for users passing underneath.
 - Acknowledging space constraints, ground conditions and the different urban setting along the EWL alignment, partial spill-through abutments (i.e. a combination of angled and vertical abutments) are appropriate on SH1.
 - Vertical (closed) abutments are acceptable in highly 'structured' areas but where these occur the width of the corridor between should be maximised. Provide simple and elegant junctions between bridge elements to minimise visual clutter

- Have a level of architectural treatment in keeping with the visibility and / or significance of the area where the bridge is located (refer accompanying table). Where these areas are of special significance to Mana Whenua, such treatment is to reference cultural narratives.
- Incorporate required safety structures, lighting and signage into the whole design of the bridge, rather than being additional clip-on structures
- Use a simple and coherent palette of materials. Hybrid structures are not preferred and if proposed, must demonstrate how the overall composition achieves coherence
- Design the surfaces and spaces beneath the structures to facilitate ease of maintenance and reduce opportunities for litter trapping or graffiti
- Minimise on-going maintenance and any associated effects on the environment, particularly the sensitive ecological areas (e.g. from washing, painting etc). This is a key consideration in materials selection (if steel or hybrid steel / concrete structures are proposed).

The table below identifies those bridges which should have special consideration at detailed design, and why. Reasons include visibility, locations marking special places or entries to neighbourhoods – or a combination. Mana Whenua considerations, for example location in areas of cultural sensitivity and the potential to contribute to a narrative about the area through design and/ or artwork, have also guided this identification and should continue to guide design decisions in detailed design.

4.1.2. Pedestrian and cycle bridges

Bridges are very important to the whole pedestrian and cycle experience and, because they span over the road and are seen by people travelling on the EWL, will come to be identified with EWL and define its character.

Bridging the Gap provides specific guidance in Section 4.8. In addition to that and the guidance for bridges in general in Section 4.1.1 above, the following outcomes are required:

- Align, 'land' and design pedestrian and cycle bridges to:
 - be universally accessible,
 - make or retain, not sever, connections to the local road network and strong desire lines, particularly the north-south connection from Māngere Bridge to Onehunga, and between the Māngere Inlet foreshore and Onehunga
 - be generous in width and have a sense of openness at the approaches
 - take advantage of views, particularly over the Inlet and towards the maunga, to help orient people in the landscape
 - enable access to recreational assets: parks, the foreshore, sports fields
 - provide a positive experience in and of themselves, to encourage walking and cycling for health and enjoyment.
- Locate pedestrian and cycle bridges to avoid impacts on views to and from special places (e.g. the Waikaraka Cemetery).



Westlink Interchange - elegant, simple curves create a sense of lightness



Onehunga Bay Foreshore pedestrian bridge - a combination of vertical and sloped abutments, and sculptural piers, is a strong feature and creates a good under-bridge environment for the motorway and path network



Heerhugowaard Cycle Bridge, Delft - touches the ground lightly with a sleek underside, slender deck and open balustrades, and sculptural piers



Light and transparent footbridge that integrates structure, screens and balustrading - a key feature is the gentle outward slope of the timber posts



Newmarket viaduct - parapet design results in a fine horizontal line through the landscape



Jim Stynes Bridge, Melbourne - a positive experience for pedestrians and cyclists as the generous walkway / cycleway extends, casual surveillance is optimised, and interest provided through feature walls and elements



Onepoto pedestrian bridge, Auckland - a clear approach, feature lighting, and high quality materials make this useable night and day



Integrated lighting with the balustrade creates a safe environment and a sleek appearance



Open abutments integrated with the landform, and a unified appearance given by the parapet texture which relates to the pier form



This shared path bridge (Pacific Highway NSW Australia) is a guiding precedent for the Alfred Street pedestrian / cycle bridge in its sinuous form, the materials palette, how it touches the ground lightly, integrates lighting with structure, and combines accessibility with simplicity



Bridge number on map	Location	Type and form	Connecting?	Particular / aesthetic treatment?	Design considerations
1	SH20 Neilson Street Interchange	skewed motorway overbridge	Vehicles travelling west on EWL, then south onto SH20; also vehicles travelling south on SH20 then east onto EWL	no	This bridge will be visible to SH20 motorway users but will be partially screened for southbound traffic by the new Onehunga Foreshore Bridge which is considered to be a 'gateway' structure. For northbound traffic this overbridge should be subservient to the landscape (ie. the tuff ring) rather than draw attention to itself. A simple, horizontal treatment for the bridge itself is considered appropriate given its context and skewed geometry. Attention should however be given to the pier design so that they are consistent with, even though they do not have to mirror, the SH20 context
2	Onehunga Wharf	EWL overbridge (future land bridge)	Wharf area with Onehunga town centre via enhanced local road / shared path network	yes	Design quality is to reflect the importance of this future mixed use area: the land bridge will be a major connector between Onehunga town centre and the Panuku development, serving a new residential community and supporting access to waterfront activities. It must be generous in width, with on-bridge paths and street furniture to a high quality. Under the bridge retaining walls may reference the future 'neighbourhood gateway' above
3	Onehunga Harbour Road	replacement cycle / pedestrian bridge (over EWL)	Old Māngere Bridge, Te Araroa National Walkway, Onehunga Foreshore with Māngere Inlet shared path	yes	Critical for this bridge is its alignment for CPTED and legibility (clearly linking places); because it connects to the existing MHX underpass and to the [New] Old Māngere Bridge along a strong pedestrian and cycle desire line (between Māngere and Onehunga), it needs to optimise long, clear forward views while minimising detours. The existing pedestrian bridge (to be replaced) sets the minimum standard expected for the quality and amenity of the pedestrian / cycle experience. Lightness above the parapet (to maximise views and support casual surveillance for a sense of safety) is important. The design below the parapet may draw on the concept of sculpted piers that is also a feature of the recently constructed Onehunga Foreshore pedestrian bridge.
4	Alfred Street	cycle / pedestrian bridge (over EWL)	EWL shared path into Onehunga	yes	This bridge should be designed as part of a family with the Onehunga Harbour Road pedestrian/cycle bridge (no. 3), with an even greater emphasis on its form and appearance, because of its visibility at all scales (from people on the cycle and pedestrian paths underneath it, to drivers on the EWL, to long views from the [New] Old Māngere Bridge. This bridge will be a strong feature on the Māngere Inlet foreshore and therefore likely to become a recognisable landmark structure for the project. The design may draw on the concept of sculpted piers that is also a feature of the recently constructed Onehunga Foreshore pedestrian bridge. It must be located and designed to minimise visual impact on the Waikaraka Cemetery (views towards and outwards from it) and to land lightly on the outer (coastal) edge of the EWL.
5	Anns Creek Viaduct west	viaduct	EWL from foreshore through Anns Creek across rail line	yes	This bridge rises to cross the railway line and will be visible from the shared path. The piers should be spaced as widely as possible to minimise 'landing' in the Coastal Marine Area. Consider long views, including oblique views from the Old Māngere Bridge, as well as for pedestrians and cyclists on the foreshore network
6	Anns Creek Viaduct east	viaduct	EWL through rail land to Great South Road	no	Not visible due to limited use of adjacent area
7	Sylvia Park on-ramp	elevated ramp over motorway	EWL eastbound to SH1 southbound over rail corridor SH1	yes	Large, elevated ramps will be highly visible from a distance (as well as close up) and will potentially interrupt a PAUP viewshaft to Mutukāroa (regional open space) as well as the outlook from it. The western end of the ramps runs along (and lands on) the approximate route of the Karetu portage. Consult with iwi about potential cultural interpretation in the design.
8	Sylvia Park off-ramp	elevated ramp over motorway	SH1 northbound to EWL westbound		
9	Panama Road	motorway (SH1) overbridge	Replacement bridge connecting Panama Road over SH1	no	Design the bridge to fit with other bridges along the Southern Motorway Corridor (for continuity, not to stand out)
10	Ōtāhuhu Creek	new separate bridge structures either side of SH1	Full culvert replacement and separate bridge (pedestrian/cycle link) connection over the Creek	yes	Capitalise on importance of location crossing Ōtāhuhu Creek (and portage) with a design for the underside that facilitates cross-SH1 connections and integrates pier design, ecology and landscape design, in consultation with iwi
11	Princes Street	skewed motorway (SH1) overbridge	New (realigned) bridge connecting Princes Street over SH1	no	Design the bridge to fit with other bridges along the Southern Motorway Corridor (for continuity, not to stand out)
The following bridge is existing and will be widened. It does not require particular treatment but the design should respond to the existing bridge form					
a	Great South Road rail overbridge				

Table 2: Bridge location, form and design considerations

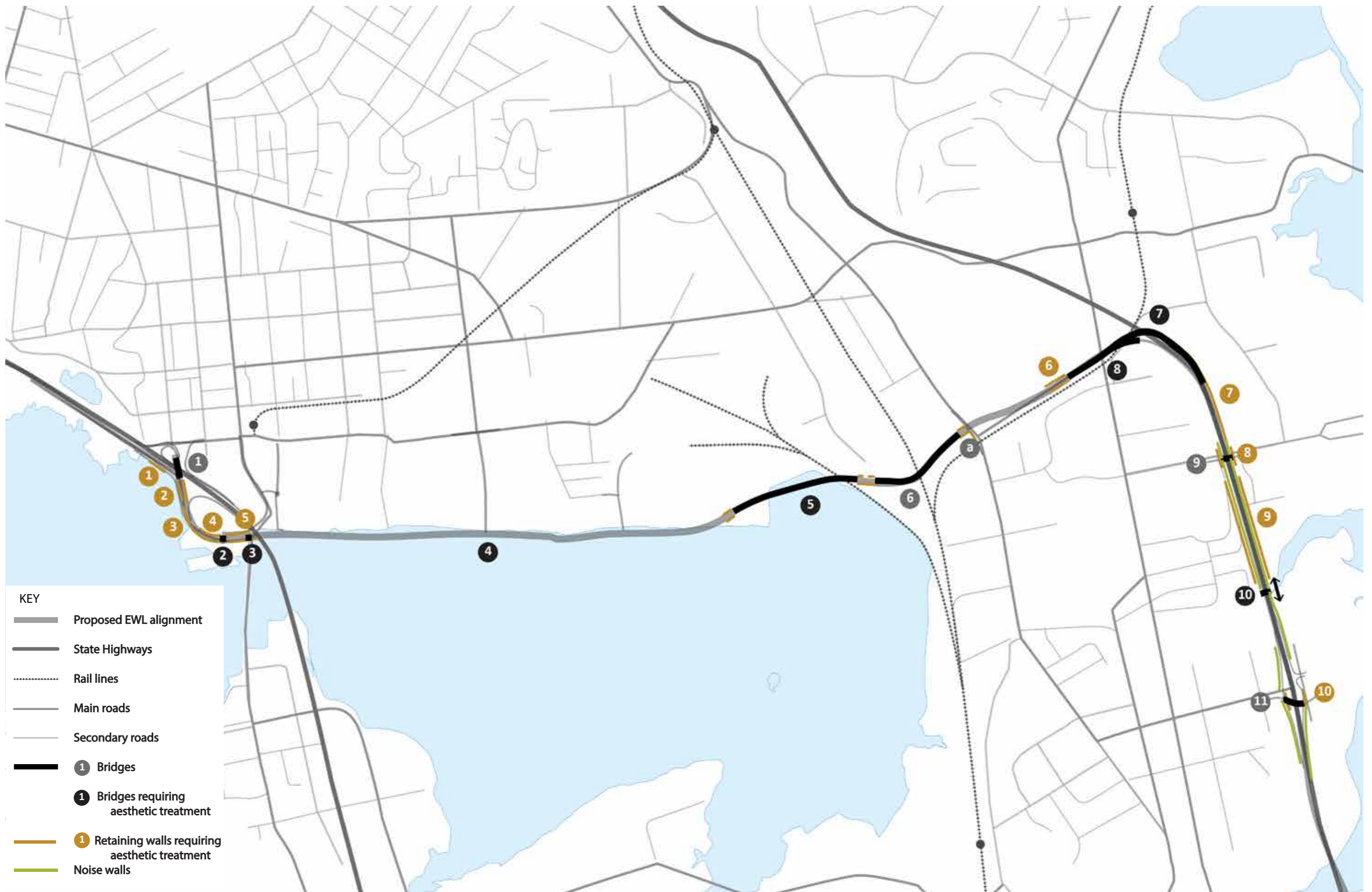


Figure 16. Bridges and retaining walls

4.1.3. Retaining walls and noise barriers

A number of retaining walls are required throughout the route. Many are large with exposed faces that will be visible not only from users of the EWL itself, but also from surrounding local roads, pedestrian / cycle movement networks, private properties and areas of public open space (such as Waikaraka Park, Gloucester Park, and Māngere Inlet). The detailing of these structures therefore needs to be context appropriate, responding to the speed in which users pass or interface with the structure.

Bridge the Gap provides guidance for the design of retaining walls within Section 4.13 and noise barriers in Section 4.15. Building upon this, the required outcomes for the Project are that all retaining walls and noise barriers:

- Complement the over-arching family of highway structures – along the EWL itself and those along State Highways 20 and 1 in the vicinity of EWL connections
- Are designed to integrate with landscape plans / planting schemes to soften the appearance of the structures and to deter graffiti
- Use a neutral colour palette or one that reflects the local area (i.e. use of dark colours to ground the structure and reference the underlying basaltic volcanic landscape). If colour palettes join, ensure a smooth transition of colours.

In addition, retaining walls will:

- Incorporate elements of artistic / cultural expression where appropriate for those structures most visible from key points along the alignment (such as around the Hōpua Tuff Ring and shared path)
- Be designed to reduce any ability for them to be climbed.

Figure 16 and the accompanying table (Table 3) identifies those retaining walls which should have special consideration at detailed design. This could be for reasons of visibility, location in areas of cultural sensitivity, place markers (where EWL intersects with neighbourhood nodes) and proximity to walking and cycling paths – or a combination of these conditions. The table is intended to highlight where aesthetic treatment (materiality, texture, colour) can contribute positively both to the experience of users of EWL, whether vehicles, cyclists or pedestrians and its neighbours.

The required outcomes for all noise barriers are that they:

- Moderate their visual impact through (in order of priority): softening them with planting within the corridor, including on the vertical face using climbing plants, limiting their height, and / or setting them atop bunds where space permits
- Are designed to be 'two-sided', that is, to be viewed from either elevation. Design each side appropriately for its context: larger patterning is appropriate for the fast-moving road environment; finer detail is appropriate alongside shared paths or facing residential areas
- Are of materials appropriate to the neighbouring land use: in particular where they are doubling as boundary fences in areas not immediately adjacent to the motorway corridor, consider timber
- Should noise barriers be required in locations where they have significant visual impact, for example if they obscure important views from public spaces (for example views towards the Manukau) or visually sever areas of cultural and landscape significance (for example the Hōpua Tuff Ring), use transparent materials
- Avoid overshadowing impacts on neighbouring properties
- Avoid impeding sightlines so as to maximise opportunities for passive surveillance
- Provide a strong top edge and avoid irregular stepping

- Step or angle down in height towards the Ōtāhuhu Creek along SH1, on all approaches, so that the height of the bridge barrier (1.1m) is achieved at the land edge of the waterfront esplanade, to open out views towards and into the creek corridor and its banks
- Are discontinuous on high bridges over local roads, where additional structure above the existing barrier would exacerbate the sense of a compressed, dark, unsafe and isolated environment.



Mackays to Peka Peka - a sculptural undulating effect that picks up the shape of hills beyond



Fanshawe St on-ramp, Auckland - abstracted flax pattern co-designed with iwi art collective



Pacific Highway, NSW - heavier patterning at the base grounds the wall in the landscape



Integrated planting design (Hobsonville Rd / SH16) - climbers where space in front is limited



Southern Motorway, Christchurch - pattern of light and shade visually breaks down large walls



Kirkbride Road / State Highway 20, Auckland - fine detail on noise wall alongside shared path



Gillies Ave - SH1 off-ramp, Auckland - effective use of colour and simple pattern repeat



Westhaven Drive, Auckland - texture scaled to local road environment

Retaining wall	Wall number on AEE plan set	Location	Max height & approximate length (m)	Design considerations
1	S1/RW2	Coastal edge of EWL westbound link to SH20 overbridge	2.0 x 100m	Visible alongside the shared pedestrian / cycle path; while not overly high, the design of this wall should consider the slow speed/human scale and coastal environment.
2	S1/RW8 and RW9	SH20 overbridge approach embankment, SW and SW sides	8.0 x 100m and 140m respectively	These retaining walls needs to be experienced as part of a seamless SH20 experience for motorway users, consistent with other treatments. Its height and length, and angle of view from northbound travellers on SH20, make SW8 particularly visible.
3	S1/RW4	Between Orpheus Drive and motorway loop	5.0 x 160m	RW4 is a long wall that wraps around the outside of the Hopua a Rangi tuff crater. It will be highly visible both at a distance and close up (to users of the continuous foreshore path network) and will significantly change the physical appearance of the edge and increase the scale of the 'hard' infrastructure. Treatment of the wall, along with the local road, is important to address this impact and to create a positive experience. Integration of Mana Whenua narratives / artistic themes is encouraged through collaborative design, given the cultural significance of the Hopua tuff crater. Similarly, involvement of the local community and stakeholders is important to represent the multi-layered history of the area.
4	S1/RW10 and RW11	Western end of port access land bridge	4.0 x 120m	These walls also follow the curve of the tuff ring. RW10 will be visible along the edge of Onehunga Port and sensitive design treatment is needed as part of a holistic design of the landscape and connections. Integration of Mana Whenua narratives / artistic themes is encouraged through collaborative design, along with local community and stakeholder involvement.
5	Trench	Trenched EWL alongside Onehunga Port	8.0 x (up to) 420m	The trench marks the transition between the foreshore urban arterial and the SH20 motorway environment. It also edges the tuff ring and passes under the Onehunga Port land bridge. The trench wall panel design is to reference its context and the significance of this place where north-south and east-west connections come together.
6	S4/RW1 and S4/RW2	SH1 off ramp western end	4.0 x 140m	Where the ramps 'land' along the route of the Karetu Portage, care must be taken that any retaining walls reflect the significance of the area. The retaining walls in this location should be designed in collaboration with Mana Whenua. These walls will also block (existing) views to Mutukāroa when traveling along Sylvia Park Road in a westerly direction.
7	S5/RW6-7	SH1 southbound between Tip-Top corner and Panama Road	4.0 x 100m 3.5-4.5 x 400m	Retaining is required with widening of the corridor for the new ramps from EWL to SH1, as the road cuts further into the bank and close to the existing building. This is a highly visible area that is also significant for the underlying basalt, visual impacts on Tip-Top corner, and an Urupā whose extent is unknown. The retaining wall in this location should be designed in collaboration with Mana Whenua to reflect the importance of the site and to enable iwi artistic interpretation.
8	S5/RW8 and RW9/10	Panama Road Bridge	4.0 x 45m	Visible from SH1 (high speed environment) and will be seen from above when walking over Panama Bridge. Design these walls together to create a consistent under bridge environment; and care needs to be taken to integrate the retaining and noise wall design
9	S5/RW12 and RW16/17	Along State Highway 1, both sides	1 - 4.0 x 500m	Design consideration is due to the underlying rock structure (basalt), the length of these walls and the need to integrate their design with the noise walls above. Design of the retaining walls should be of the extent of the elevation along both sides of SH1 – that is, lower walls should not be seen as 'leftover' areas but as part of a whole composition.
10	S5/RW27, RW29 and 30	Princes Street Bridge	7.0 – 8.0 x 40m (varies)	Visible from SH1 (high speed environment) and also visible from SH1 / Princes Street on-ramp. Consider abutment design on surrounding SH1 network; and treat walls either side of SH1 as a pair to bring coherence to what is a complex and asymmetrical under-bridge environment.

Table 3: Retaining wall location, dimensions and design considerations

4.1.4. Highway Furniture

The most important aspect in the design of highway furniture is the need to create a 'whole of journey' experience so as not to detract from the surrounding cultural and physical context. There are different contexts within the EWL project (see Figure 14). In the motorway context, consistency in the design of lighting, gantries, signage, barriers and medians should reflect the design of other structures, and also link in with the wider Auckland Regional network. In the (coastal / industrial) arterial and local road context the elements should reflect the urban character. For shared paths and walkways the 'human' scale and detailing should create a high amenity environment.

Bridging the Gap provides guidance for the design of highway furniture within Section 4.16. Building upon this, the required outcomes for the Project are that highway furniture in general:

- Forms a coordinated palette through consistency of materials and finishes, which reinforces the design of other project structures (such as bridges, retaining and noise walls). This means that:

Barriers and Medians

- Complement one another and fit within the wider family of highway furniture while responding to the different alignment roading characters (highway, coastal arterial, industrial arterial, and local roads - see Figure 14). Provide clean, continuous lines that follow the road alignment
- Maximise openness to visually connect to the surrounding landscape, by:
 - using railings atop solid barriers on overbridges, where safety permits
 - having a planted median with no median barrier along the foreshore to enable views out to the Māngere Inlet.

Lighting, Poles and Gantries

- Minimise visual clutter, for example by:
 - minimising the number of elements, and combining them within one structure where possible
 - using a consistent spatial layout and height
 - minimising the scale of gantries and signs, particularly where they will be visible from the pedestrian and cycle network
 - using a consistent and modest materials palette so that these structures are recessive, blending in rather than standing out
- Locate these structures so as not to impede significant views; however, do not use feature bridges as de facto signage gantries
- Consider locating road lighting centrally (within the median) to reduce light spill and dominance of infrastructure on neighbouring properties
- Use sustainable LED lighting systems.

Bridging the Gap also directs that design should consider all user groups, their speeds of travel and experiences along the project corridor. This means that the design should respond to the different conditions along EWL, such that:

- The palette of highway furniture is refined in those areas with high pedestrian and cycle use, where the project ties in to existing and future town centres, and in areas of particular visibility or sensitivity. In particular, quality bench seats, bollards, bins and lights (not Oclytes) are required.

4.1.5. Cut and Fill Slopes

In certain locations along the project corridor, the EWL road alignment will require earthworks in the form of cut and fill slopes. The main area of cut and fill is where EWL ties into the landform on the northern side of the Māngere Inlet embankment. Consistent with Bridging the Gap, the required outcomes are that all cut and fill slopes:

Inland

- Are designed to be as natural as possible. This is particularly the case where EWL along the foreshore stitches back into the local road network, where the shared path also connects and where landforming around the interchanges and bridges can mitigate the apparent scale of the structures
- For cut batters, where the underlying rock conditions are robust, leave the rock face exposed. Where the underlying rock conditions are less stable, re-vegetate the cut slope
- Minimise the visual impact of cut slopes through blending the top edge to soften the edge profile
- Are a maximum 1V:3H slope to support planting, or where they are to be grassed are a maximum 1V:4H slope
- Re-vegetate slopes using a planting palette that supports and strengthens the cut or fill slope and also ties in with the adjacent landscape character
- Grade fill slopes to seamlessly tie in to adjoining landforms and minimise encroachment into areas of significant ecological or landscape value.



Hobsonville, Auckland - fill slopes shaped back into the contours

Coastal Edge

A naturalised coastal edge will be created as part of this project (refer Section 4.2.1). Variations in form, gradient / slope, edge treatment and materiality will provide varied ecological habitat and a unique user experience.

4.1.6. Landscape features

The existing context contains areas identified within the Proposed Auckland Unitary Plan as outstanding natural features (Hōpua Tuff Ring, parts of Anns Creek) and significant ecological areas (part of the crater within the Hōpua Tuff Ring, parts of Anns Creek, eastern Māngere Inlet). Where the project interfaces with these locations, the required outcomes are that the landscape design:

- Avoids effects on the values of distinctive natural features
- Highlights natural and built landmarks
- Seeks to repair (where practicable) visual and physical connections in the landscape that have been damaged or lost
- Contributes to the legibility of the form of the Hōpua a Rangi tuff crater, for example by highlighting its circular form and raised outer rim with tree planting
- Avoids the remnant basalt rock outcrops in the Māngere Inlet where possible and strengthens them against erosion
- Optimises open views from the EWL to the Māngere Inlet from vehicles and for pedestrians and cyclists by:
 - having no median barriers along the foreshore section
 - where side barriers are required, minimising their solid area to enable views over them
 - having a high degree of transparency to any fences to shared paths and coastal paths
- Enhances the existing vegetative sequence with diverse plantings
- Uses similar planting palettes to visually link the Anns Creek landscape that is currently severed by the rail corridor.

The project sits within an existing network of streets and open spaces. It is important that it is 'stitched in' to these areas in positive ways. The recommended outcomes are that:

- Street tree planting on local roads is retained and continued into the project area
- Pedestrian orientated streets have a high quality of both hardscape and softscape (design, materials and finish)
- Connections are enhanced and supported from the wider residential context, for example by landscape markers within the street network that signify the route from the town centre to the Hōpua tuff crater / Gloucester Park, the foreshore and Onehunga Port.



PORTAGE

Portage or portaging is the practice of carrying water craft or cargo over land, either around an obstacle in a river or between two bodies of water



LAVA FLOW

A lava flow is a moving outpouring of lava created during a non-explosive eruption. When it has stopped moving lava solidifies to form igneous rock. Lava can flow great distances before cooling and solidifying.



TUFF RING

A tuff ring is a broad flat centre formed by a phreatomagmatic eruption. Tuff rings have low rims and slopes of 3 to 12 degrees



MAUNGA

The mountains nearby are Māngere, Rarotonga, Mutukāroa and Ōtāhuhu. Together they surround and look over the Inlet

These landscape features informed the over-arching design themes and recognising their importance underpinned the landscape strategy



Hōpua a Rangī tuff crater - circular form visible from above



Street tree planting along Hugo Johnston Drive softens the interface with industrial properties and creates a pleasant streetscape environment



Example of a high quality local road landscape treatment



Māngere Inlet outcrops



Mosaic of lava shrubland and saltmarsh, Anns Creek



Example of a high quality streetscape palette (hardscape / softscape)

4.2. Restore the whenua: rehabilitate the inlet and foreshore

This section of the ULDF addresses corridor elements and project initiatives that will contribute to a design that assists in the rehabilitation of land and water in a broad sense and the protection of habitat where possible.

The over-arching design principles for this outcome are to:

- Take an 'ecological design' approach that integrates landscape and ecological mitigation and design responses.
- Minimise permanent habitat loss.
- Avoid and minimise loss of rare ecosystem types and habitats for threatened and at risk species.
- Avoid habitat fragmentation / barriers.
- Avoid loss of, and enhance or create, habitat connectivity.
- Enhance existing habitats and ecosystems – particularly habitat sequences.
- Create safe habitats, especially for Threatened or At Risk species - through limiting public access in certain areas.
- Improve water and sediment quality – including kai moana and mauri.
- Recreate habitats no longer present and ecosystem types that were unique to the area (such as sequences of saltmarsh edges, mangroves)
- Increase biodiversity – include investigating options for re-introducing locally appropriate plants (a minimum of 1% of plant numbers in all planting shall comprise species with regional and / or at threat status, as per NZTA's P39 Standard Specification).

4.2.1. Embankment and naturalised coastal edge

The urban and landscape vision is for rehabilitation of the values associated with the Inlet and foreshore. The construction of the roading embankment and naturalised coastal edge will assist in this.

The placement of the EWL road alignment along the north-eastern edge of the Māngere Inlet (partially on existing land and partially atop a constructed embankment) will provide a more direct connection and alleviate congestion issues for vehicles. Importantly, it will also

- Assist in creating a structure which will attenuate leachate and aim to naturally remove contaminants prior to discharge
- Be designed to sit higher than the existing foreshore level to assist in the protection of the foreshore from future climate change impacts.

The function of the naturalised coastal edge is three-fold. It will:

- Provide opportunities through its form and landscape treatment to reinstate a more natural coastal edge (and potentially provide ecological habitat)
- Create a landscaped space in which stormwater management can occur
- Provide a location for a pedestrian walkway - where people are able to meander along the foreshore and have opportunities to interact with the coast.

The required outcomes are that the embankment and naturalised coastal edge:

- 'Naturalises' the seaward side of the bund and embankment, including variability of gradients rather than 'mono-slopes'
- Boldly interprets the shape of the original Onehunga shoreline in the horizontal plane
- Provides a platform from which views of the Māngere Inlet and surrounds are maximised for pedestrians and cyclists
- Provides opportunities for pedestrians to physically connect with the Māngere Inlet.



Te Papapa shoreline 1949, showing former variations along shoreline and 'islands' in Inlet - an inspiration for the EWL coastal edge concept

4.2.2. Formed banks

Reclamation of land in order to accommodate the road embankment and a naturalised coastal edge will have ecological consequences through permanent removal of existing marine, terrestrial and avian habitat. The project proposes to create safe habitats for threatened or at-risk species through the construction of formed banks along the new coastal edge within the Māngere Inlet. These areas will recall the former and existing shell banks visible within Māngere Inlet (see images below). The required outcomes are that:

- Reclamation provides areas of physical separation from people / dogs to create potential habitat for Threatened and At Risk shorebirds
- Formed banks on the naturalised foreshore will provide areas of physical separation from people / dogs through path location and landscaping.



Existing shell banks and outcrops, Māngere Inlet



Existing shell banks, Māngere Inlet: inspiration for the new shoreline

4.2.3. Stormwater Management: Wetlands / Treatment Facilities

EWL affords an opportunity to provide additional stormwater treatment for the wider catchment as well as treating the stormwater runoff from the impervious surfaces of the Project. The stormwater strategy comprises two approaches: one for the Māngere Inlet foreshore and one for the remaining areas. Generally, the approaches draw on Bridging the Gap design guidance for stormwater management devices (within Section 4.17). The required outcomes are that stormwater wetlands:

- Use appropriate planting to not only contribute to water and sediment quality, but provide ecological habitat and provide visual amenity to road and walkway users and surrounding land uses
- Optimise the natural appearance of the wetlands through form, planting and edge treatment
- Are designed to maintain a dominantly aerobic wetland environment for plant establishment and biological function
- Delineate deeper from shallower water (for example by fencing) to minimise potential drowning hazards
- Integrate maintenance access into their design.

Māngere Inlet

Currently, eleven stormwater catchments discharge into the Māngere Inlet via industrial land, without treatment. The unique aspect of the works on the foreshore is that the stormwater treatment areas located between the road embankment and the outer coastal edge structure will treat more than the new road itself. Noting that the final design is subject to the support of Auckland Council as the future asset owner, the current proposal for the stormwater treatment areas caters for the runoff from several hundred hectares of roads, roofs and sites upstream of the new road in Onehunga and Penrose; an area significantly greater than the new road surface. To achieve this,

- Integrate stormwater treatment within the naturalised coastal edge and road construction, and with the landscape planting strategy by means of a combined wetland and biofiltration system to create a 'treatment train' (refer indicative diagram below).

Balance of Project area

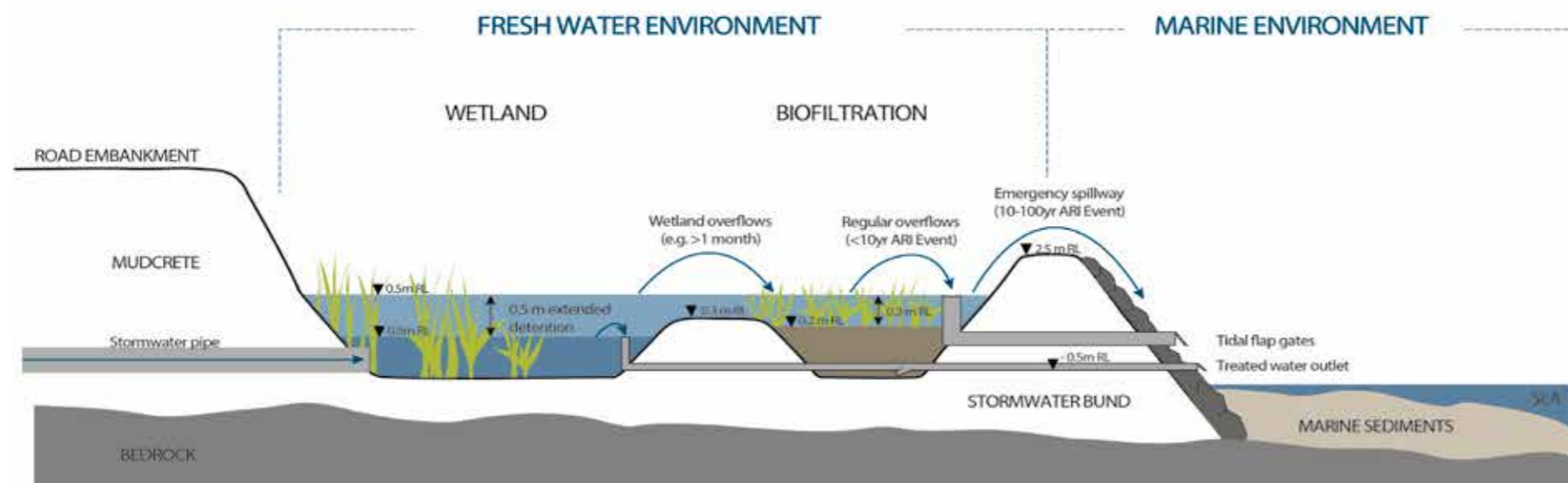
Several other stormwater treatment wetlands will be required along the project corridor in order to treat the stormwater captured by the impervious structural elements of the project:

- Use constructed wetlands or other vegetated systems as a first consideration. If not possible, use proprietary underground stormwater treatment systems.

Design of culverts and headwalls

There are existing culverts that the Project proposes to enlarge, as well as providing some new culverts for stream outfall and flood overflow. The most visible will be between Neilson Street and SH20, which will require a new headwall. The required outcomes for these structures are:

- Minimise culvert length
- Enable fish passage in freshwater streams if required by ecological assessment (the four streams in the Project are Miami, Southdown Reserve, Anns Creek and Clemow)
- Replant stream margins upstream and downstream of culverts, to the extent that the planting has been disturbed
- Where headwalls are cast in situ, slope / taper them off into the adjacent ground level and use planting to soften their appearance and integrate them with the surrounding wetland
- Design landscape and select species so as not to impede access requirements or result in a maintenance issue from leaves dropping into the culvert (i.e. use non-deciduous plants)
- Provide for access to the culvert for maintenance, noting that where an inlet screen is required, e.g. north of Panama Road bridge, this access must be for a service vehicle. Elsewhere foot access is appropriate. In all instances integrate the access requirements with the landscape design.



Stormwater treatment train proposed for the Project (schematic diagram for reference only - details to be confirmed during detailed design)



Maungarei Springs, Auckland



Hobsonville Point Park, Auckland



Barry Curtis wetland, Auckland



Barry Curtis wetland, Auckland

4.2.4. Hard Landscape / Streetscape

The 'hardscape' of any project has a significant impact on how people experience the place. For EWL, materials selection should follow the same principles as the soft landscape: that is, it should respond to the character of the area and the type of use. Materials should be robust and low-maintenance. The outcomes that are sought to provide a high-amenity experience are:

Onehunga (urban area)

- Shared paths that reference the Onehunga Mainstreet and provide continuity of materiality, for example an exposed aggregate finish with black oxide.
- Patterning of the surface of the shared path to help delineate separate areas for cyclists and pedestrians in order to promote safety
- Pedestrian footpaths as per current Auckland Transport design standards that continue and reinforce the urban framework
- Asphalt road surfacing and concrete finishes consistent with the local streetscape, to visually support an extend the Onehunga urban area.

Coastal edge

- Boardwalks along the Manukau Harbour edge and Māngere Inlet
- A distinction between the shared path and the coastal path treatments to reflect the path hierarchy and the different user and speed environment (that is, more direct and faster cycling versus meandering walking)
- A fully accessible surface that allows all users to enjoy the foreshore area.

Sylvia Park Road

- Materials that draw attention to the importance of the portage narrative, for example concrete banding that increases in intensity opposite Mutukāroa.
- Basalt rock walls incorporated along streetscape (whether as low fences, that are a continuation of the Anns Creek and Māngere Inlet foreshore design, and that also reference the underlying basalt at Tip Top Corner.

SH1 Corridor

- Concrete retaining walls and concrete noise walls where these are integral. Timber is not considered appropriate on SH1 as the environment is heavily trafficked and high speed
- Shared path and pedestrian connections across Panama Road and Princes Street that tie into the existing networks
- Changes in surface colour and/or texture to mark decision points in the shared path / cycle network (for example if access can be provided from the (proposed) new bridge down to the Greenway along Ōtāhuhu Creek).

Refer also to Sections 4.3.4 (Shared Paths) and 4.3.5 (Pedestrian Paths)

4.2.5. Planting

Consistent with Bridging the Gap principles and the NZTA Landscape Design Principles, the planting strategy for the Project reflects the different landscape character areas that the alignment passes through – broadly the Māngere Inlet and the Ōtāhuhu land bridge, and within them the patterns of vegetation from the maunga towards the inlet, and along the SH1 corridor. Mana Whenua involvement is expected in future detailed landscape plans. The required outcomes are:

- Establish planting that is reflective of its urban ecology - specific ground conditions, ecotone and character context, not only for survival but so that key 'place-making' and wayfinding is reflected through the landscape
- Retain and enhance areas of mature native bush and significant mature specimens, by integrating these into the landscape concept
- 'Crime Prevention through Environmental Design' (CPTED) should be integrated into species selection including height of planting to ensure that spaces are safe for the public
- Plant boldly in scale with the landscape. Use broad patterns and a restricted palette of visually dominant species (avoid 'fruit salad' planting with random mixes of species, and smaller areas of planting)
- A terrestrial ecological corridor connecting Hōpua Tuff Ring and Mutukāroa should be reinforced by the selection of tree and shrub species. Seek opportunities to provide restorative and ecological planting interventions along the length of the alignment which are tailored to encourage bird and insect movement
- Highlight the Hōpua tuff crater by continuing the specimen Pohutukawa tree species around the entire ring. The salt meadow in the floor must be enhanced in both size and extent of planting to reflect its saline nature
- Local roads are to integrate trees, landscape planting and surface material selection to indicate higher amenity pedestrian street environments, which connect these to Onehunga Town Centre
- Configure stormwater treatment wetlands to a natural appearance, confirming and embedding within the surrounding landscape. Optimise the natural appearance by riparian and margin vegetation and by manipulating the edge profile
- Wetlands should include shallow and vegetated wetland edges that represent a naturalised edge, and can remove the need for fences to prevent accidental access
- Planting is to be coordinated with ecological assessments and vegetation maps to ensure certain species have been integrated.

NZ Transport Agency (NZTA) provides detailed guidance on landscape within their standard specification (NZTA: P39 Standard Specification for Highway Landscape Treatments). This includes, but is not limited to, the following items:

- Quality Control; Inspections and Reporting
- Site Preparation
- Plant Pest Control and Animal Pest Control
- Plant Propagation
- Topsoil Supply

- Planting
- Hydro-seeding grassed (& specialist) surfaces
- Irrigation (Design and Build)
- Defects Liability
- Maintenance

Building on the guidance contained within the P39 Specification, Project-specific guidance for East West Link planting is detailed below:

Coastal exposure

- The design of pedestrian areas and planting species selection addresses natural hazards such as flooding and coastal erosion as well as factors associated with climate change and sea level rise
- Salt sea spray and salinity have been considered when selecting plant species along the foreshore environment
- Tolerance to a westerly / south-westerly prevailing wind has been considered when selecting plant species
- Pioneer plants are recommended to be introduced where required to establish protection for other species
- Species selection reflects the difference between the natural and altered landscapes (for example along the coastal foreshore, within urban and industrial areas, around Anns Creek or along the motorway environment).

Working within Significant Ecological Area's - SEA

- Areas outlined for ecological mitigation are required to refer to the ecological assessment and vegetation maps as a definitive guideline.
- When working in significant ecological areas an ecologist must be engaged and consulted prior to works commencing on site.
- Any consent conditions must be adhered to and should be reviewed with the ecologist prior to commencing works on site
- An appropriate methodology for pruning and/or weed clearance must be signed off by an ecologist prior to commencing works on site

Planting palettes

The tables and images following (Figures 17-20) illustrate the proposed planting palettes for the different landscape zones identified. This is a starting point and the palette is to be developed in consultation with Mana Whenua.

PRELIMINARY PLANT SPECIES LIST

		HOPUA A RANGI TUFF CRATER				FORESHORE				MT WELLINGTON AND SH1						
		Vertical tuff ring		Streetscape		Bund		Industrial edge		Anns Creek		Sylvia Park		SH1 area noise walls		
		Feature specimen tree	Internal tuff ring floor	Onehunga Mall Road	Galway Street	Bund planting	East West Link	Embankment edge	Captain Springs Road	Hugo Johnston Drive	between paths	Great South Road	Sylvia Park Road	SH1 Intersections	Behind noise walls / screening	
BOTANICAL NAME	COMMON NAME															
TREES	Alectryon excelsus	Titoki			X				X	X		X	X	X		
	Coryline australis	Cabbage tree	X	X		X	X	X				X				
	Corynocarpus laevigatus	Karaka		X				X								
	Leptospermum scoparium	Manuka		X		X	X					X			X	
	Metrosideros excelsa	Pohutukawa	X		X	X	X	X	X	X	X					
	Melicytus ramiflorus	Mahoe		X		X	X	X		X						
	Myoporum laetum	Ngaio		X				X		X		X	X	X		
	Rhopalostylis sapida	Nikau Palm	X	X						X				X	X	
	Sophora chatamica	Coastal Kowhai	X													
	Vitex lucens	Puriri			X	X			X	X	X		X	X	X	
SHRUBS AND GRASSES	Anemanthele lessoniana	Wind Grass			X	X			X	X		X	X			
	Apodasmia similis	Oioi		X	X	X		X	X	X	X	X	X	X	X	
	Athropodium cirratum	Renga Renga Lily									X					
	Carex secta	Purei		X	X	X		X	X	X	X	X	X	X	X	
	Chionochoa flavicans	Miniature Toetoe						X	X							
	Coprosma acerosa	Hawera			X	X				X		X	X			
	Coprosma repens	Taupata		X						X						
	Coprosma robusta	Karamu		X						X						
	Corokia cotoneaster	Korokio		X						X						
	Dodonaea viscosa	Ake Ake		X										X	X	
	Ficinia nodosa	Knobby club-rush		X	X	X		X	X	X	X					
	Griselinia littoralis	Kapuka			X	X			X	X		X	X	X	X	
	Hebe stricta	Koromiko			X	X			X	X		X	X			
	Libertia grandiflora	NZ Iris			X	X			X	X		X	X			
	Muehlenbeckia complexa	Pohuehue		X							X					
	Olearia solandri	Coastal tree daisy		X												
	Pomaderris kumeraho	Kumarahou		X					X					X	X	
	Phormium tenax	Harakeke Flax		X					X		X	X		X	X	
	Pittosporum crassifolium	Karo												X	X	
	Pittosporum tenuifolium	Kohuhu											X	X	X	
	Pseudopanax lessonii	Houpara											X	X	X	
	Tecomanthe speciosa	Three Kings Vine										X		X	X	
Xeronema callistemon	Poor Knights Lily			X	X			X								

Figure 17. Planting palette table: terrestrial zones

PRELIMINARY PLANT SPECIES LIST

HOPUA A RANGI TUFF CRATER



Alectryon excelsus
Titoki



Cordyline australis
Cabbage tree / Ti kouka



Metrosideros excelsa
Pōhutukawa



Vitis lucens
Puriri



Anemanthele lessoniana
Wind grass



Apodasmia similis
Jointed wire rush / Oioi



Carex secta
Purei



Coprosma acerosa
Hawera



Ficinia nodosa
Isolepis nodosa
Figure 18. Planting palette: terrestrial zones



Griselinia littoralis
Kapuka



Hebe stricta
Koromiko



Libertia grandiflora
NZ Iris



Sarcocornia quinqueflora
Glasswort



Selliera radicans
Remuremu



Xeronema callistemon
Poor Knights Lily

PRELIMINARY PLANT SPECIES LIST

MĀNGERE INLET FORESHORE



Cordyline australis
Cabbage tree / Ti kouka



Metrosideros excelsa
Pōhutukawa



Vitex lucens
Puriri



Anemanthele lessoniana
Wind grass



Apodasmia similis
Jointed wire rush / Oioi



Carex secta
Purei



Chionochloa flavicans
Miniature Toetoe



Coprosma acerosa
Hawera



Ficinia nodosa
Knobby club-rush



Griselinia littoralis
Kapuka



Pomaderris kumarahou
Kumarahou



Phormium tenax
Harakeke Flax



Xeronema callistemon
Poor Knights Lily

PRELIMINARY PLANT SPECIES LIST

MT WELLINGTON AND SH1



Alectryon excelsus
Titoki



Leptospermum scoparium
Manuka



Metrosideros excelsa
Pōhutukawa



Vitex lucens
Puriri



Apodasmia similis
Jointed wire rush / Oioi



Arthropodium cirratum
Renga Renga Lily



Carex secta
Purei



Chionochloa flavicans
Miniature Toetoe



Dodonia viscosa
Ake Ake



Griselinia littoralis
Kapuka



Meuhlenbeckia complexa
Puhuehue



Phormium tenax
Harakeke Flax



Pittosporum tenifolium
Kohuhu



Pseudopanax lessonii
Houpara

PRELIMINARY PLANT SPECIES LIST

		WETLAND PLANTING					RIPARIAN		SALINE	
		Stormwater wetlands			Bioretention planting		Freshwater		Saline	
		Deep marsh	Shallow marsh	Ephemeral	Mix 1 - Amenity	Mix 2 - Large screening	Mix 1 - Waitemata	Mix 2 - Manukau	Salt Marsh	Coastal bank
BOTANICAL NAME	COMMON NAME									
TREES	<i>Coryline australis</i>	Cabbage tree	X	X	X	X	X	X	X	X
	<i>Rhopalostylis sapida</i>	Nikau Palm				X	X	X	X	X
	<i>Leptospermum scoparium</i>	Manuka					X	X	X	X
	<i>Metrosideros excelsa</i>	Pohutukawa				X	X			X
	<i>Sophora chatamica</i>	Coastal Kowhai					X			X
	<i>Vitex lucens</i>	Puriri					X			
SHRUBS AND GRASSES	<i>Apodasmia similis</i>	Oioi			X	X	X	X	X	X
	<i>Astelia banksii</i>	Wharawhara				X		X		X
	<i>Austroderia fulvia</i>	Toetoe					X			X
	<i>Baumea articulata</i>	Jointed twig rush	X							
	<i>Bolboschoenus caldwellii</i>	Purua grass		X						
	<i>Bolboschoenus fluviatulis</i>	Kukuraho	X							
	<i>Bolboschoenus medianus</i>	Purua grass	X							
	<i>Carex germinata</i>	Rautahi		X	X	X				
	<i>Carex lessoniana</i>	Rautahi								X
	<i>Carex secta</i>	Purei						X	X	
	<i>Carex flagellifera</i>	Glen murray tussock				X	X			X
	<i>Carex virgata</i>	Swamp sedge		X	X	X				
	<i>Cyperus ustulatus</i>	Giant umbrella sedge		X	X	X	X			
	<i>Coprosma repens</i>	Taupata						X		X
	<i>Cotula coronopifolia</i>	Bachelors button							X	X
	<i>Disphyma australe</i>	Horokaka							X	X
	<i>Eleocharis acuta</i>	Common spike-rush		X						
	<i>Eleocharis sphacelata</i>	Kutakuta	X							
	<i>Ficinia nodosa</i>	Knobby club-rush				X			X	X
	<i>Isolepis inundata</i>	Swamp club-rush		X						
	<i>Isolepis cernua</i> var. <i>cernua</i>	Slender clubrush		X	X				X	X
	<i>Juncus australis</i>	Wiwi		X	X					
	<i>Juncus edgariae</i>	Wiwi			X					
	<i>Juncus krausii</i>	Wiwi		X	X					
	<i>Juncus pallidus</i>	Giant rush			X					
	<i>Juncus procerus</i>	Tall rush								X
	<i>Muehlenbeckia complexa</i>	Pohuehue				X				
	<i>Phormium tenax</i>	Harakeke Flax						X		X
	<i>Plagianthus divaricatus</i>	Salt marsh ribbonwood							X	
	<i>Samolus repens</i> var. <i>repens</i>	Sea primrose							X	
	<i>Sarcocornia quinquefolia</i>	Glasswort							X	
	<i>Selliera radicans</i>	Remuremu							X	
	<i>Thyridia repens</i>	Native musk							X	
	<i>Typha orientalis</i>	Raupo	X	X						

Figure 19. Planting palette table: wetland and riparian zones

PRELIMINARY PLANT SPECIES LIST

WETLAND PLANTING



Cordyline australis
Cabbage tree / Ti kouka



Leptospermum scoparium
Manuka



Sophora chathamica
Kowhai



Apodasmia similis
Jointed wire rush / Oioi



Astelia banksii
Wharawhara



Austroderia fulvida
Toetoe



Baumea articulata
Jointed twig rush



Bolboschoenus caldwellii
Salt club-sedge / Purua grass



Bolboschoenus fluviatilis
Kukuraho



Bolboschoenus medianus
Purua grass



Carex germinata
Rautahi



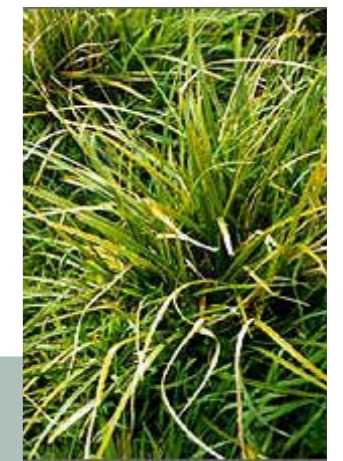
Carex lessoniana
Rautahi



Carex testacea
Speckled sedge



Carex virgata
Swamp sedge



Cyperus ustulatus
Giant umbrella sedge



Eleocharis acuta
Common spike-rush



Eleocharis sphacelata
Kutakuta



Ficinia nodosa
Isolepsis nodosa



Isolepsis inundata
Swamp club-rush



Juncus edgariae
Edgar's rush / wiwi



Juncus krausii
Wiwi



Juncus pallidus
Giant rush



Juncus procerus
Tall rush

Figure 20. Planting palette: wetland and riparian zones

PRELIMINARY PLANT SPECIES LIST



Meuhlenbeckia complexa
Puhuehue



Phormium tenax
Harakeke Flax

RIPARIAN PLANTING



Cordyline australis
Cabbage tree / Ti kouka



Rhopalostylis sapida
Nikau Palm



Leptospermum scoparium
Manuka



Metrosideros excelsa
Pōhutukawa



Sophora chathamica
Kowhai



Vitex lucens
Puriri



Apodasmia similis
Jointed wire rush / Oioi



Astelia banksii
Wharawhara



Austroderia fulvida
Toetoe



Carex secta
Purei



Coprosma reptans
Taupata



Phormium tenax
Harakeke Flax

PRELIMINARY PLANT SPECIES LIST

SALINE PLANTING



Cordyline australis
Cabbage tree / Ti kouka



Rhopalostylis sapida
Nikau Palm



Metrosideros excelsa
Pōhutukawa



Apodasmia similis
Jointed wire rush / Oioi



Austroderia fulvida
Toetoe



Carex secta
Purei



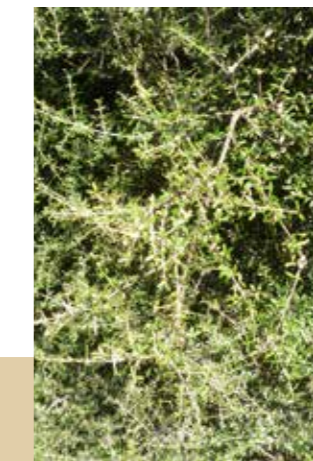
Coprosma reptans
Taupata



Ficinia nodosa
Isolepis nodosa



Phormium tenax
Harakeke flax



Plagianthus divaricatus
Salt marsh ribbonwood



Sarcocornia quinquefolia
Glasswort



Selliera radicans
Saltmarsh ribbonwood

4.3. Reconnect the People: link communities and destinations

A key objective of the EWL is to improve travel times and travel time reliability between businesses in the Onehunga–Penrose industrial area and between State Highways 1 and 20. In conjunction with the creation of this new limited access arterial connection, the project also provides an opportunity to connect harbour to harbour, land to water and neighbourhood to neighbourhood. This can be achieved through improved pedestrian, cycle and local connectivity within (and surrounding) the project area. This section of the ULDF addresses corridor elements and project initiatives that will contribute to a design that assists in linking communities and destinations.

The over-arching design principles for this outcome are to:

- Protect and strengthen existing (and proposed) local, regional and national pathways through the creation of safe, legible and easily accessible linkages
- Create or extend clear, direct and continuous connections along and across the corridor to support movement choice and wayfinding for local road users, pedestrians and cyclists
- Design a self-explaining road environment where destinations are easily identified and comfortably accessed and there is a clear awareness of user speed
- Capitalise on connections to the wider landscape context
- Ensure infrastructure is accessible for all users.

The following section details how the design will achieve these principles with reference to the following elements:

- Access to recreation and parking
- State Highway 1
- Primary Urban Arterial
- Local roads
- Shared paths
- Pedestrian paths
- Pedestrian and cycle underpasses
- Crime Prevention Through Environmental Design (CPTED).



Figure 21. The shared coastal edge – artist's impression indicative of the general arrangement (courtesy Isthmus).

4.3.1. Access to recreation and parking

The Project alignment is well positioned in terms of facilitating connections to existing recreation attractors:

- Onehunga Town Centre and Maungakiekie / One Tree Hill to the north
- Taumanu Reserve / Onehunga Bay to the west
- Māngere Bridge Town Centre and Māngere Mountain to the south
- Ambury Regional Park to the south-west
- Mutukāroa / Hamlins Hill and Sylvia Park to the east
- Ōtāhuhu / Mount Richmond, Ōtāhuhu Creek and Ōtāhuhu Town Centre to the south-east

The proposed new foreshore along northern Māngere Inlet, as proposed by the Project, may also represent a recreation attractor in its own right in years to come.

Retaining and enhancing access to, and connection between, these recreation nodes is an important consideration for the Project. Figure 22 illustrates the desire lines between recreational destinations that the Project is facilitating, as well as those it could support in the future. It also shows the location of existing parking facilities, which can be used as entry points to this network.

The required outcomes are that access to recreation and parking:

- Connects with and supports easy access to the walkways / cycleways that link recreation nodes.
- Supports increased occupancy rates of currently under-utilised car parking facilities in the area
- Provides safe environments to leave vehicles unattended.

Some areas for parking and access to the recreational facilities fall outside the scope of this Project. There is nevertheless opportunity for signposting within the local road environment and supplementary information on Auckland Transport / Auckland Council websites and pamphlets to support increased use of these areas; and for the provision of locator maps within the parking facility to enable easy connections to surrounding recreation nodes.

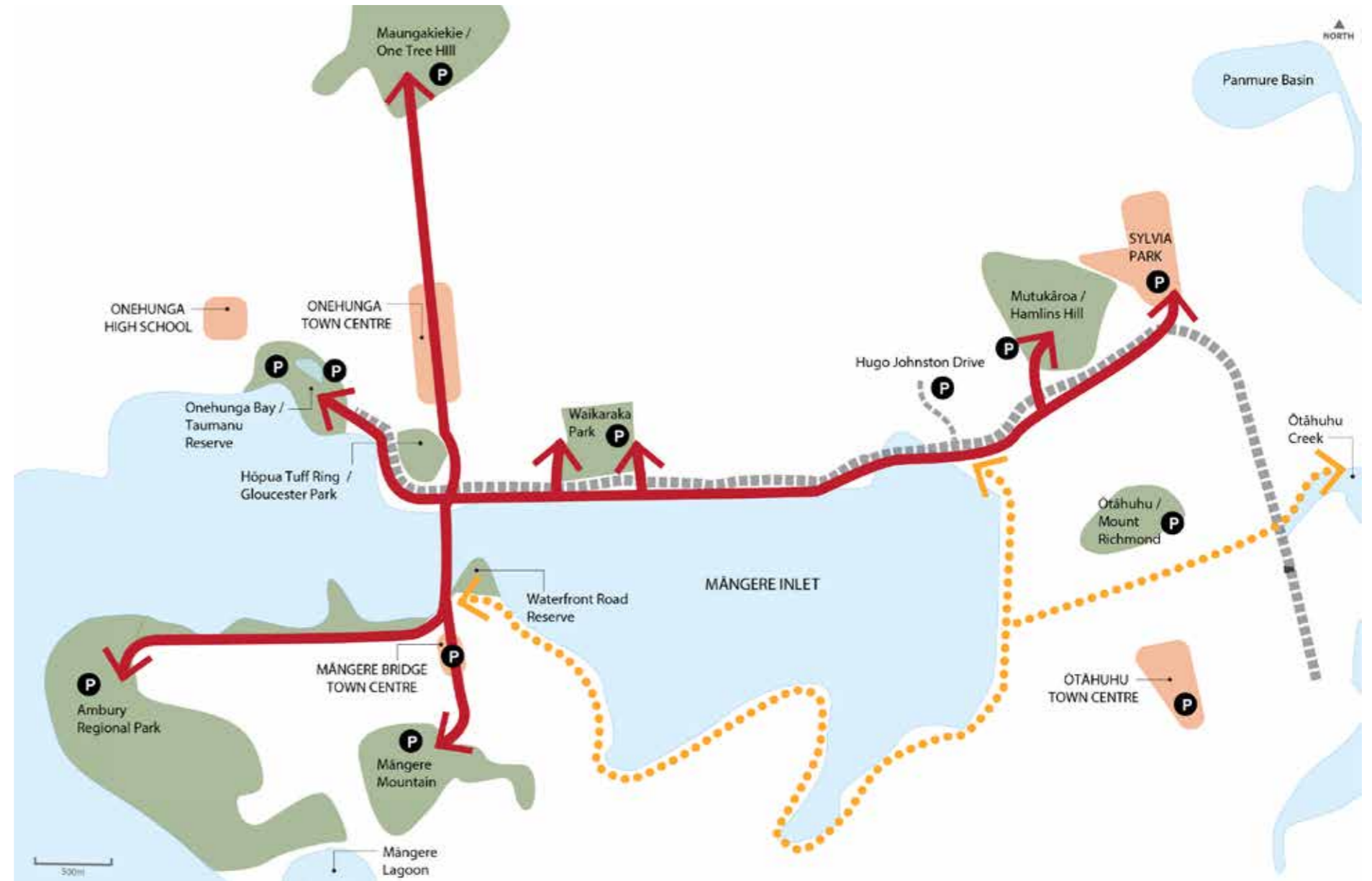


Figure 22. Supported links to existing recreational destinations

- Desire lines the Project is facilitating
- Future desire lines the Project could support
- Ⓟ Parking facility
- Commercial / community hub
- Public open space
- Proposed EWL Alignment

4.3.2. State Highway 1

The eastern section of the project sees the EWL alignment connect in to State Highway 1 in the vicinity of Te Apunga o Tainui / Tip Top Corner, with some widening of State Highway 1 required. State Highway 1 is a heavily trafficked and high speed environment. The required outcomes are that modifications to State Highway 1:

- Seamlessly tie in with the style of surrounding structures and highway furniture
- Provide a green edge to the corridor where possible through a planted buffer between the highway edge and the retaining / noise walls along property boundaries.

4.3.3. Primary Urban Arterial

The East West Link connection is a primary urban arterial road. As defined in NZTA's urban design guidelines 'Bridging the Gap', urban arterial roads have high traffic volumes, cross many intersections and are used by a mixture of transport modes traveling at different speeds. The required outcomes are that the EWL primary arterial:

- Is multi-modal, addressing the needs of all road users including pedestrians and cyclists
- Provides regular dedicated crossings to connect local roads and key attractors
- Provides footpaths on both sides of the road providing access to the surrounding environment and not precluding future changes in land use
- Has an open character, softened by median planting (no central barriers). Consider street trees including on the Inlet side, between Onehunga Port and Captain Springs Road
- Provides dedicated or shared cycle lanes, separated from vehicle traffic.

4.3.4. Local Roads

The project interfaces with a number of different local roads as it moves from east to west. Some of these local roads will be significantly altered as part of this project, while others may undergo only minimal enhancements. The required outcomes are that local roads:

- Reconfigure local street connections compromised or severed by the corridor to either maintain current egress / access or create a new secondary local network
- Maintain walking, cycling and local road access to destinations including schools, shops, civic and community facilities, recreational activities, parks and reserves
- Design for wayfinding by drawing on visual cues in the natural and built environment, particularly at decision points – avoid detours / changes in direction
- Maintain and/or strengthen existing street tree planting where space permits, alongside the shared path
- Along the western side of Onehunga Mall north of Gloucester Park use different species from those used to mark the shape of the tuff ring which is proposed to be planted all around the outer rim (refer Section 5.1 plans).

4.3.5. Shared Paths

A number of shared paths or co-located pedestrian and cycle paths are proposed as part of the project. These are illustrated in Figure 23 and include:

- An expanded shared path network along the foreshore to create a continuous and direct linkage between Onehunga Bay, lower Onehunga Mall, the Onehunga Port to Hugo Johnston Drive. This shared path along the foreshore will comprise of a 3m cycleway plus a 1.8m separated footpath. Figure 21 visualises the new coastal edge.
- This connection will then continue alongside the EWL corridor (as a 3m shared path) past Mutukāroa, beneath SH1 to Sylvia Park Mall Shopping Centre - linking with the bus connection to Sylvia Park Mall Shopping Centre (being constructed under the AMETI project). Providing improved safety and accessibility for cycling and walking between Māngere Bridge, Onehunga and Sylvia Park is a key project objective.
- A shared path to the north of the proposed alignment will connect Galway Street / Onehunga Bay Road to Waikaraka Park. This will be a 3m shared path.
- A proposed new bridge across Ōtāhuhu Creek, to the east of the SH1 bridge in this location, will provide for future pedestrian and cycling and will connect the residential communities on Mataroa Road and Dees Place.

Section 7 of 'Technical Report 1 - Traffic and Transport Assessment' provides a closer look at the proposed walking and cycling connections within each sector.

Bridging the Gap provides guidance for the design of pedestrian paths and crossings (Sections 4.5 and 4.6 of BtG) and cycle lanes and paths (Section 4.7 of BtG) and NZTA provides a new online tool (NZTA Cycling Network Guidance). Building upon these, the required outcomes are that shared paths generally:

- Maintain (and preferably increase) the number of connections between the Māngere Inlet and the local street network
- Are as direct, convenient to use, safe, and as smooth and continuous as possible
- Are wide enough to reduce the potential for conflicts between users and/or a perception that passing space is inadequate, both at grade and on overbridges
- Maximise forward visibility and minimise hazards for cyclists, pedestrians and riders on shared paths and through underpasses
- Connect to existing local and regional open space and cycling networks
- Minimise the potential for conflicts between pedestrians and cyclists on shared paths and crossings of footpaths and separated cycle paths, and between cyclists and vehicles at intersections
- Prioritise convenience for pedestrians and cyclists, for example by:
 - avoiding grade changes when crossing the road, and
 - making routes as simple, direct, and close to desire lines as possible to reflect preferred directions of travel
 - signalised intersections
- Optimise comfort and accessibility through appropriate gradient changes, generous provision of facilities and separation from traffic

- Connect into local road networks (at Hugo Johnston Drive, Great South Road) and/or extend local road facilities (Panama Road, Princes Street)

Along the foreshore of Māngere Inlet, EWL will replace the existing Waikaraka cycle path. This new pedestrian and cycle path is higher than the coastal path (refer Section 4.3.5) and will overlook Māngere Inlet and the foreshore. It should have a character and promenade-like quality that conveys that the inlet is 'worthy of respect', and reinforces the urban setting between Captain Springs Road and Onuhunga Port.

Accordingly, the required outcomes for the section of the cycle path and pedestrian path along the foreshore are:

- Generous width
- Quality wall and/or handrail details, seating, lighting and paving
- Artworks including interpretive signage.

Consider also whether street trees may be possible.



In recreating the shared path underneath the Manukau Harbour Crossing, provide an open and pleasant experience for path users

4.3.6. Pedestrian paths

Section 4.5 of Bridging the Gap provides guidance for the design of pedestrian paths.

Footpaths

The required outcome for any pedestrian path is that it:

- Optimises comfort and accessibility through appropriate gradient changes, generous provision of facilities and separation from traffic
- Prioritises convenience for pedestrians when crossing intersections, for example by minimising detours and providing pedestrian crossings across all legs of signalised intersections
- Is of generous width, and not 'hard up' against large edges (whether highway structures or other built or natural features), so that there is enough space to feel comfortable passing others in either direction
- Is as direct, and close to desire lines as possible to reflect and/or reinforce preferred directions of travel.

Coastal path

A new 4m walkway is proposed along the outer edge, providing a high-amenity coastal experience, opportunities to interact with the Inlet and locations where people might stop to take in the view. This path will comprise of a combination of boardwalk and gravel - depending on location over water or land. While the shared path connection is designed to be continuous and direct, this coastal path will be a slower-speed environment which meanders around and engages with the re-created / naturalised foreshore. It is likely that people will use both the shared path and the coastal path as a circuit - and experience them as a pair.

The required outcome for the coastal path is that it:

- Provides a continuous public space link along the Onehunga Foreshore
- Is carefully located and designed, in the detailed design phase, to consider impacts on bird foraging areas
- Capitalises on the beauty of the natural landscape (whether through experiencing it as a Nature Trail (with emphasis on the unique geology and ecology of the area - i.e. Te Hōpua a Rangi / Anns Creek) and / or a Heritage Trail (with emphasis on the Maori and European heritage and history - i.e. portage routes and pa sites / heritage buildings), and / or through the unique views across the Māngere Inlet.

4.3.7. Pedestrian and cycle underpasses

While at-grade connections are preferred for pedestrians and cyclists (as they often provide a more direct route and one that is perceived to be safer) there are areas of the project where people move under structures (Anns Creek, Hugo Johnston Drive and SH1 (new ramps and the motorway itself to connect to Sylvia Park). The design guidance in Section 4.9 of Bridging the Gap is a basis for the following required outcomes for EWL, whose underpasses:

- Are integrated with the wider pedestrian and cycle network and with adjacent land uses
- Are located to tie in with pedestrian / cycle desire lines
- Provide a straight route to maximise forward visibility (both within the underpass itself and also along the approaches). Where this is difficult to achieve (as exemplified by the existing underpass underneath the Manukau Harbour Bridge and potentially likely at Hugo Johnston Drive), design treatment that clearly signals where to go and enlivens the approach to make it appear inviting and safe is essential. This could include entry portals, signage and lighting, change in materials, and views to the wider area
- Are as wide and as high as possible to maximise light penetration, visibility and amenity. Box culverts are not acceptable; full spill through abutments or paths passing between widely-spaced columns or piers of elevated bridges are preferred
- Provide good lighting, particularly towards the centre where light penetration is poorer
- Use robust, long-life and vandal-proof materials
- Contain surface treatments (where appropriate) as part of a highway furniture and / or signage palette to reflect the special character of the place. Such treatments should be designed collaboratively with the local community and iwi groups.

4.3.8. Crime Prevention Through Environmental Design (CPTED)



Lower Onehunga Mall / SH20 Underpass: a change of direction is signalled by the entry portal / decorative screen to improve the approach



'Landing' the replacement pedestrian / cycle bridge over EWL to tie in with the existing underpass beneath MHX should create as open, clear and inviting an approach as possible

Personal safety is important to consideration as it encourages walking, cycling and public transport usage. Real and perceived crime risks can deter people from using certain facilities, taking particular routes or being in various locations. CPTED is an important consideration of any new development and for the EWL it is of particular importance with regard to how the project interfaces with the public realm and the movement of pedestrians and cyclists through the project corridor.

Section 4.11 of Bridging the Gap provides guidance for addressing CPTED. Building upon this, and in order to provide an environment that addresses key CPTED principles, the following are required project outcomes:

- Optimised physical and visual connections between the (lower) coastal path and the (more elevated) pedestrian and cycle (commuter) path along the EWL, to not only create movement choice for pedestrians but a sense of shared use and enjoyment of the public realm
- Regular opportunities to 'exit' both the commuter path and walkway networks in case of emergency (this will be of particular importance for the coastal path)
- A high quality, high amenity environment that landscape design will draw people to and through the local and regional walking and cycling network, thereby activating public connections and spaces: Gloucester Park, the connection to Onehunga Port, Old Māngere Bridge, the Māngere Inlet foreshore and links into Waikaraka Park and Cemetery, Anns Creek, Mutukāroa, Ōtāhuhu Creek and the Greenway, Bedingfield Memorial Park
- Landscape planting that:
 - softens the corridor while still enabling passive surveillance and good forward sightlines for pedestrians and cyclists (key to this will be the development of a maintenance strategy)
 - deters vandalism of potentially targeted areas through creating physical and visual barriers to restrict access.
- A hard landscape materials palette that uses different materials to delineate the public and private realms
- A signage strategy to clearly link key destinations and assist in the legibility of the proposed shared path network, through provision of:
 - directional details and time and distance to destinations to ensure clarity of route for path users
 - interpretive signage to describe the cultural, historical, natural and built characteristics of this dynamic environment – helping to tell the story of the area.
- A lighting strategy that:

- enables the use of such parts of the shared path network that are required after dark and that discourages the use of areas that are not intended to be used
- increases opportunities for passive surveillance of these areas from adjacent land uses or passing vehicles
- provides a consistent level of illumination so as to avoid the creation of pools of light or dark that can potential areas of isolation or entrapment.

- Design of retaining walls edging public spaces, shared paths and cycleways to minimise their size and their apparent scale. Where large retaining walls are unavoidable, they are to be designed and detailed to be visually interesting for pedestrians and cyclists, including referencing cultural narratives in places of significance for iwi.



Clear delineation of direction of travel, transparent fences that allow overlooking of the shared path, and planting that softens the edge without blocking views or causing obstruction



Interpretive signage - Onehunga Bay Foreshore



Interpretive signage example



Taumanu / Onehunga Bay Foreshore Reserve - the new shared path should connect seamlessly with it to encourage extended walks around the Inlet



Orpheus Drive, Onehunga - planting alongside the shared path softens the edge and creates a greater sense of space - an exemplar for the new path



Westhaven Promenade, Auckland - exemplar boardwalk and 'view experience' for its simple coherent materials palette and integrated lighting



Elevated shared path suitable for sensitive ecological areas



Coastal walkway example - character for meandering coastal path that also provides lookouts and separation from planting and people / animals

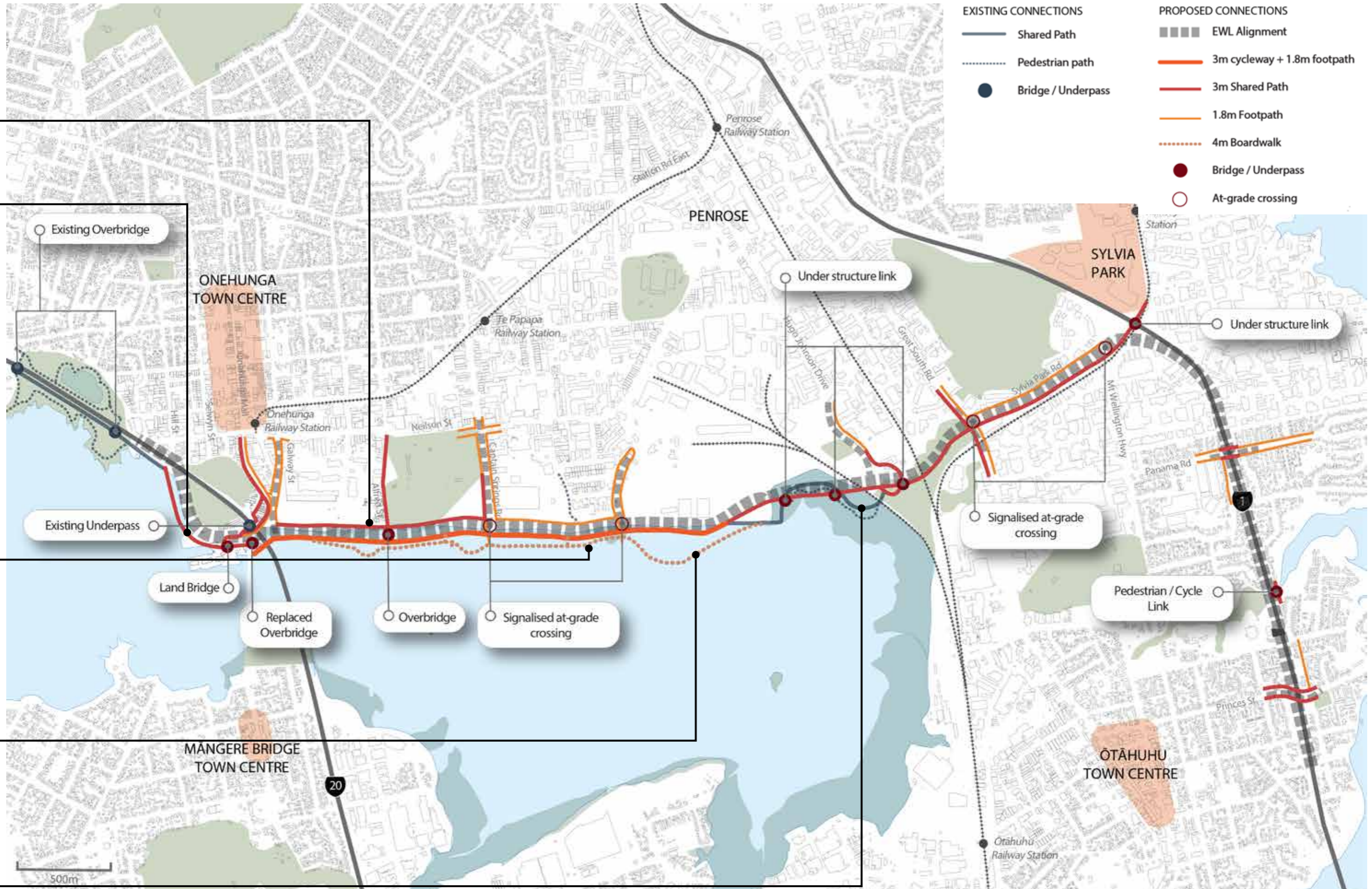


Figure 23. Proposed walking and cycling connections



5 SECTOR-SPECIFIC OUTCOMES

5 SECTOR-SPECIFIC OUTCOMES

This section supplements the corridor-wide strategies. It provides a level of detail 'down' from Section 4 and includes place-based outcomes for areas with particular sensitivities. The Project is divided into six sectors, which are used in the ULDF for consistency with the AEE plan set (see Figure 24):

- Neilson Street Interchange
- Māngere Inlet Foreshore
- Anns Creek
- Sylvia Park
- State Highway 1 (SH1)
- Local Roads (this includes discrete locations).

The relevant urban and landscape-related characteristics of each sector are summarised in this section. Accompanying plans, sections and other drawings illustrate the concepts, not the final detail: they are intended to provide clarity about the required outcomes (what is important and why) with flexibility (how they might be achieved). Where there are future opportunities that are beyond the scope of this project but support the vision and would enhance the outcome (for example for cultural theming by Mana Whenua of special places), these are identified in a separate box.



Figure 24. Key to sectors



Figure 25. Onehunga and Nelson Street – artist's impression (courtesy ASAP imagenZ)

5.1. Sector 1 Neilson Street Interchange



This area is the most complex in terms of the relationship between the urban and natural (albeit modified) setting.

Design drivers

Onehunga town centre and rail station are immediately north of Neilson Street, edging the project. Current streetscape amenity along Neilson Street and the southern part of Onehunga Mall (towards the port) is poor, characterised by heavy traffic, light industrial uses, variable quality and width of footpaths, and poor sightlines as a result of the road's alignment.

Design outcomes sought

- An enhanced streetscape along Onehunga Mall / Onehunga Harbour Road including at the Neilson Street intersection, with a slower speed, 'human scale' environment.
- Matters to consider include:
 - Narrowing of the carriageway to provide an extended pedestrian and cycle realm, including build outs at the intersection
 - Planting of street trees along both sides to soften the industrial 'feel' and support a future shared street character. Spacing of trees should not preclude the future provision of on-street parking
 - Landscape treatment of the plaza in front of Onehunga Rail Station to visually connect across Neilson Street.

Design drivers

Walking and cycling connections between Old Māngere Bridge, Orpheus Drive shared path, the port area, and to Onehunga Mall are somewhat fragmented. Orpheus Drive and the existing shared path go under SH20 (the shared path also goes over Orpheus Drive). The existing pedestrian / cycle underpass has been treated with entry portals, decorative and open screening towards the inlet, and patterning of the interior, to make it as pleasant as possible; but given the indirect approaches, low height and compressed width, it does not provide an optimal pedestrian and cycling experience.

Part of the project includes Te Araroa (the New Zealand trail) which links the Onehunga foreshore across Old Māngere Bridge to Ambury Regional Park. A future rail alignment is proposed to cross Māngere Inlet, connecting Auckland CBD with Auckland airport in the vicinity of Galway Street.

Design outcomes sought

- Direct and clear north-south and east-west connections that stitch in seamlessly to the wider walking and cycling network around the foreshore, to the Onehunga town centre and over the Māngere Inlet.
- Consider:
 - Minimising detours and complex movements
 - Aligning the connections at both ends of the replacement pedestrian / cycle bridge over Onehunga Harbour Road – both vertically and horizontally – to minimise changes in grade and direction for bridge and path users. In particular, the experience should be continuous from the replacement Old Māngere Bridge

- Designing the replacement pedestrian / cycle bridge near the Manukau Harbour Crossing, especially the piers, to relate both to the existing bridge and to the recent Onehunga Foreshore bridge
- No new underpasses are proposed in this Sector. Underpasses are not preferred. If they are unavoidable, design them with clear forward sightlines on approach and through them, minimise their length, and make them high and wide as possible (minimum internal dimensions 4.5 x 4.5m)
- Providing wayfinding signage and lighting.

Design drivers

The Hōpua tuff ring has been highly modified, first by reclamation and then the construction of SH20 (which bisects it), save for a small area on the north-west side with a stand of pōhutukawa and macrocarpa trees. It is difficult now to 'read' its form in its entirety. Nevertheless, it remains very significant to Mana Whenua and the wetland (south-west 'half') has ecological value.

Design outcomes

- Minimisation of physical intrusion into the tuff ring.
- Enhancement of the ecological area (southern part) as a wetland, with public access by way of paths and boardwalks to allow for viewing and appreciation of the landscape
- Reinforcing the circular form of the tuff ring through landscape treatment
- Consider selective removal of trees along SH20 so that the whole tuff ring can be seen and understood.

Design drivers

The areas around old Māngere Bridge, and the adjacent Onehunga foreshore, are important for recreation, including boating and fishing.

There is a small remnant of the former tidal indents immediately east of the Hōpua a Rangi tuff crater (one of only two along the foreshore), with a remnant salt marsh and colonising mangroves.

Design outcomes sought

- Maintain access to, and visibility of, Old Māngere Bridge as a recreation destination as well as a link across the harbour
- Minimise intrusion into remnant ecological nodes (by structures as well as people)

Mana Whenua considerations

Mana Whenua would like to see the importance of this location (particularly adjacent to Te Hōpua a Rangi) highlighted through the design and detailing of structures, the articulation of connections and nature of landscape treatment.

- The design of the land bridge is seen as an opportunity, both for incorporation of artistic / sculptural elements and also to act as a 'green' connection between the tuff ring and Māngere Inlet (i.e. through planting / landscaping on this structure).
- Large / visible retaining walls in this location were also seen as an area of opportunity for Mana Whenua involvement.
- Interpretive signage along the pathways in this sector could help to tell the stories of the place and highlight the areas historical, cultural and environmental significance. This could include a future boardwalk in the tuff crater.
- The ecological value of the existing marshland within the tuff ring to be enhanced
- Recognising the importance of water and its movement (stormwater, groundwater, coastal marine area) - through enhanced management of contaminants entering Māngere Inlet in this location

Design drivers

High retaining walls will be required with potential impacts on outlook, views and the pedestrian and cycling experience. In particular, retaining walls along Orpheus Drive will also create a 'harder' edge between the land and the water which will be visible from a distance as well as along the local and regional walking/cycling network.

Design outcomes sought

- Consistency and sequencing of the structures designs around Orpheus Drive to reinforce a continuous, linked shared path experience along the foreshore. These walls are to be designed collaboratively with Mana Whenua or their nominated representative.
- Consider:
 - Retaining wall designs and pavement treatment (materials and colours) that relate to the cultural and geological history (former open connection between tuff ring and harbour)
 - Applying a finer scale of detailing and quality of finish to respond to the close proximity of people walking and cycling past the walls.
 - Reducing the apparent scale by planting in front where space permits
 - 'Green' walls that reference the outer rim of the Hōpua tuff ring
 - Designs that reference the original openness of the tuff ring to the Manukau Harbour.

Design drivers

The open setting for the heritage-listed Aotea Sea Scout Hall is reduced by the proximity of the Project and the vertical retaining walls across Orpheus Drive that will front it. The building will remain visible from Onehunga Beach and Port, and along the Harbour shared path, but direct 'approach' views from the road will be lost. There are limited opportunities for design, within the space available

Design outcomes sought

- Continuing access from Orpheus Drive, with sufficient curtilage for parking to support ongoing use of the building
- Retention of uninterrupted views towards the building from public areas along the Harbour edge
- Acknowledgement and interpretation of the history of the building. Consider:
 - Design treatment of the retaining walls immediately opposite to acknowledge or recall the history of the building
 - Interpretive signage as part of a coastal signage masterplan

Design drivers

The recent Onehunga Foreshore project has created a new parkland and naturalised shoreline, connecting it back into the community, and buffering people from motorway traffic. This sets the context for the design of the public realm adjacent.

Design outcomes sought

- Design of the shared path, walkways and lookout areas as a continuation of the foreshore path network

Design drivers

Onehunga Port – particularly the silos – is a landmark from Māngere Bridge. It is in transition and is envisioned by Panuku as a new mixed use neighbourhood, whose connections to Onehunga town centre, rail station, and to the open space and shared path network will be critical to its success. The EWL trench cuts the ground connection from the Port to The Landings, which was built to be close to the wharf. The proposed landbridge will be highly visible when driving through the EWL trench but also offers the opportunity to re-link The Landings (and the tuff crater behind it) to the Port.

Design outcomes sought

- A gateway structure to Onehunga Port, to signal both the East West Link for drivers entering it from SH20, and that it is the new entry to a future neighbourhood
- A bridge with generous visual and physical connections across the EWL trench.
- Consider:
 - Design treatment of the portals and trench walls to create a positive experience for EWL users
 - Locating the bridge and any retaining in relation to future circulation routes and developable land within the current port area (detailed design to be undertaken in collaboration with Panuku)
 - A streamlined, horizontal bridge form integrating parapet, barriers and underside
 - Flexibility, such that the bridge may be widened in the future to create a land bridge.

Design drivers

There is potential for changing character along Onehunga Mall as the connection between the existing town centre and the future Onehunga port neighbourhood is strengthened (for example to include smaller scale and more diverse commercial uses).

Galway Street will be extended to connect to the EWL, adding road infrastructure near the existing Manukau Harbour Crossing that will modify the currently low and flat foreshore character.

Design outcomes sought

- Minimise encroachment into the saltmarsh area
- Minimise the visual intrusiveness of the Galway Street connection
- Consider:
 - Using landforming to tie / connect the alignment in the landscape.

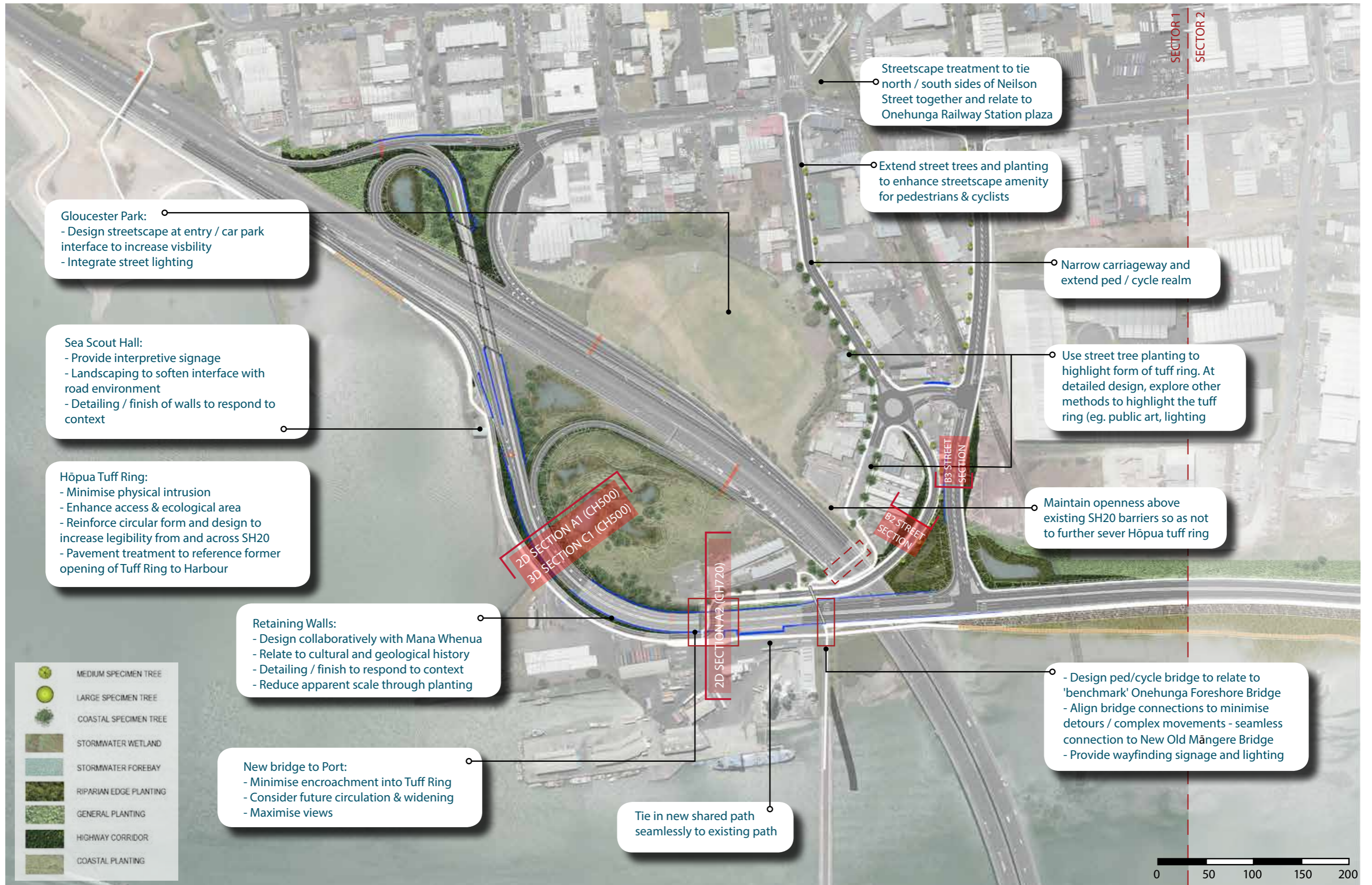


Figure 26. Sector 1: Nelson Street Interchange: plan



NEILSON STREET INTERCHANGE - 2D SECTION (A1) CH500
SCALE 1: 500

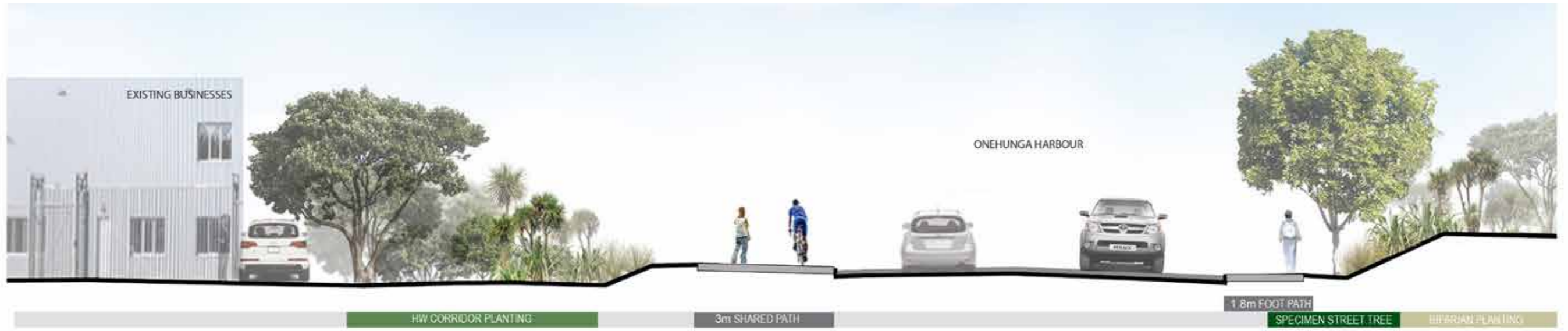
- ① Gloucester Reserve
- ② Existing saltmarsh to be extended
- ③ Specimen trees
- ④ 3m shared path
- ⑤ Manukau Harbour



- ① Gloucester Reserve
- ② EWL Eastbound
- ③ EWL Westbound
- ④ Orpheus Drive
- ⑤ 3m shared path
- ⑥ Onehunga Foreshore

NEILSON STREET INTERCHANGE - 3D SECTION (C1) CH500

Figure 27. Sector 1: Nelson Street Interchange sections at CH500: 2D section A1 and 3D section C1



ONEHUNGA HARBOUR ROAD - LOCAL STREET SECTION (B2)
SCALE 1:20

Figure 28. Sector 1: Onehunga Harbour Road: B2 Street Section



- ① Existing building
- ② 1.8m footpath
- ③ Onehunga Harbour Road
- ④ 3m shared path
- ⑤ Existing Gloucester Park carpark
- ⑥ Gloucester Park

ONEHUNGA MALL ROAD - 3D SECTION (C2)

Figure 29. Sector 1: Neilson Street Interchange section on Onehunga Mall: 3D section C2



Figure 30. Sector 1: Lower Galway Street: B3 Street Section

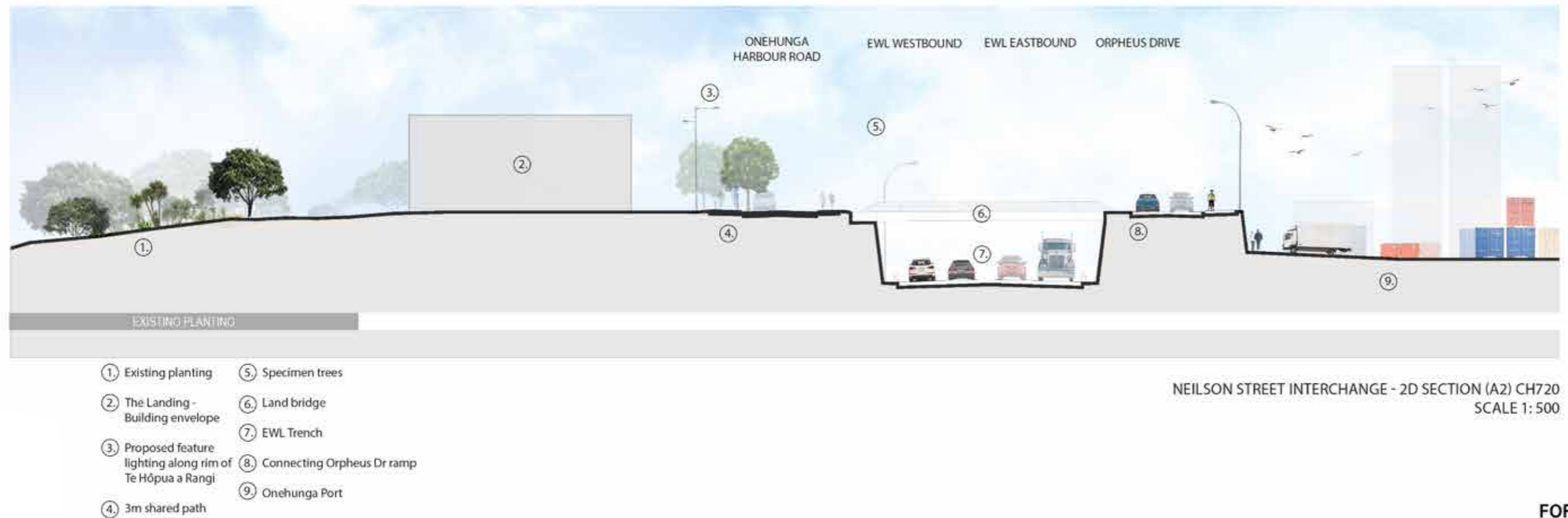


Figure 31. Sector 1: Neilson Street Interchange section at CH720: 2D section A2

FOR CONSEI

5.2. Māngere Inlet Foreshore



Mana Whenua considerations

Mana Whenua would like to see the importance of this foreshore location highlighted through:

- Recognising the importance of water and its movement (stormwater, groundwater, coastal marine area, rainwater, aquifer, overland flow paths) - through enhanced management of contaminants entering Māngere Inlet in this location
- Acknowledging the historical coastal edge and the extent of past / Project reclamation - what has been done and what stories can be told for these changes (i.e. interpretive signage) and how the design can bring these stories to life
- Avoiding and preserving remnant lava flows and promoting a design which is responsive to these
- Promoting ecological outcomes:
 - acknowledging the importance of place for avifauna - what are the stories of this place for valued bird species and what opportunities are there for the people to appreciate these stories
 - promoting pest management as a means of respecting the ecological place
 - the holistic view of restoring the mana of the Māngere Inlet through a 'restorative natural highway'

Design Drivers

Māngere Inlet is the central element of the landscape upstream of Māngere Bridge. The eastern view over Māngere Inlet is one of the memorable waymarks on the trip between Auckland and the airport.

The distinctive volcanic cones of Māngere to the south, Maungakiekie (One Tree Hill) to the north, and Ōtāhuhu (Mt Richmond) to the east, and also by Mutukāroa (Hamlins Hill) stand out above the relatively subdued urban landscape and form an attractive backdrop to the inlet. Expansive views including these cones are currently available to users of the foreshore shared path.

Design outcomes sought

- Retaining views for pedestrians and cyclists from the foreshore.
- Consider:
 - Locating the primary shared path, and recreation paths on the outer edge so views are not obscured by embankment and/or highway elements
 - Providing 'pause points' where people can look out over the inlet
 - Creating views for road passengers by minimising visual obstruction, for example through the use of wire rope rather than solid barriers.

Design drivers

Before reclamation straightened its edge, the inlet had an intricate volcanic shoreline comprising lobes of lava protruding into the tidal mudflats. There are two small remnants of the former tidal indents along the foreshore, at Pikes Point and at the termination of Victoria Street.

Design outcomes sought

- A naturalised edge to the inlet through varying the profile of the embankment and outer bund
- A range of formed edges and banks to provide safe habitat for threatened and at risk shorebirds.
- Matters to consider include:
 - Varying sizes and shapes, low profile and 'natural' appearance
 - Range of locations including separation from coastal paths / boardwalks to protect birds from the risk of predators (including people and dogs).
- Minimising intrusion on the remnant lava flows, for example by pulling the recreational paths into the shoreline and/or putting them on boardwalks

Design drivers

In this sector Miami Stream appears as a degraded waterway because of its artificial perimeter, the rubbish evident within the inlet, and the surrounding industrial activities. There is a walkway connecting Miami Parade along the stream edge to the foreshore.

Design outcomes sought

- Re-purposing the Miami stream as a stormwater wetland (subject to landowner agreement) together with rehabilitating riparian planting
- Retaining and enhancing the Miami Parade walkway connection to the path running along the inside of the embankment (no connection to the outside of the embankment is envisaged here).

Design drivers

Ngārango o Tainui, the small island in the south-east corner of the inlet, and a long shell bank nearby, provide roosting for wading birds.

The foreshore reserve edges the Waikaraka Cemetery and the backs of industrial buildings and the containers of the inland port. It has a straight edge lined with rip rap, and is mostly mown grass with fringes of weeds. However, the shared path is quiet, relatively flat and open, and offers a direct visual relationship to the inlet and wider landscape.

Design outcomes sought

- Protecting and isolating breeding and roosting areas for water birds

Design drivers

Waikaraka Cemetery is located along the foreshore on one of the few pieces of original (not reclaimed) land. The park is used as a sports ground and speedway. The Waikaraka Shared Path passes through the southern edge of the cemetery along a cemetery access road. Stone walls surround much of the park and cemetery and are a listed heritage item. The Project retains these walls, together with hedges and mature pohutukawas along the edge. A large area of (currently undeveloped) land is located to the east of the cemetery, purchased by Council for additional sportsfields.

Access to and along the foreshore is currently from Old Māngere Bridge and the path around Orpheus Drive, and via 'low key' entries at the ends of terminating north-south streets each side of Waikaraka Cemetery (Alfred Street and Captain Springs Road). The project will need to reinstate these connections.

Design outcomes sought

- Maintaining pedestrian and cycle connections to Alfred Street and Captain Springs Road that visually and physically link the local roads to the foreshore.
- Designing the Alfred Street pedestrian / cycle bridge to minimise visual impact on (views from and to) the Waikaraka Cemetery; and paying particular attention to its design because of its visibility on the foreshore – close up from the shared path and footpaths, by EWL users, and at a distance (for example from the Old Māngere Bridge)
- Introducing a new (vehicular) connection into the inland port.

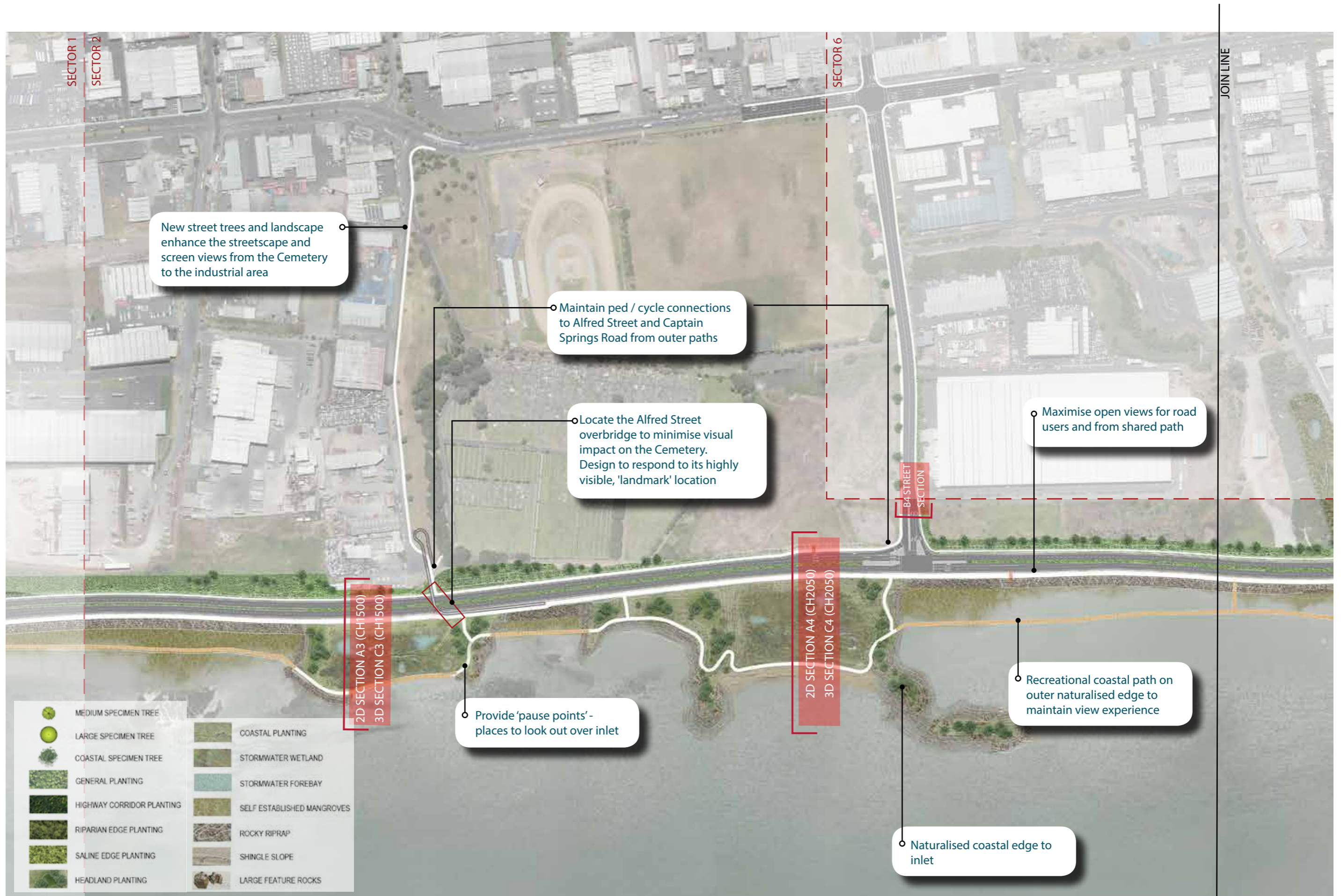


Figure 32. Sector 2: Māngere Inlet Foreshore plan





Figure 33. Sector 2: Māngere Inlet Foreshore section at CH1550: 2D section A3

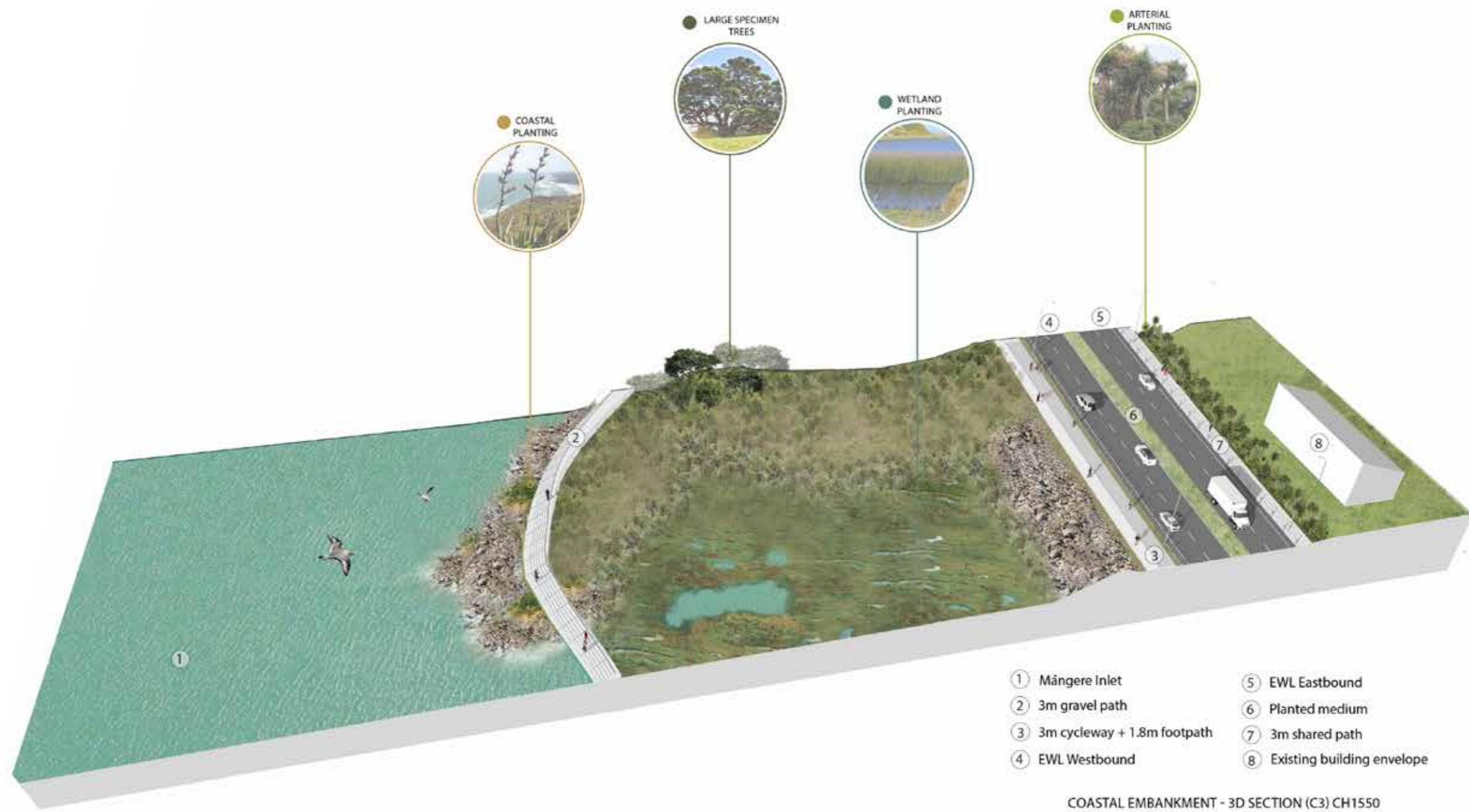
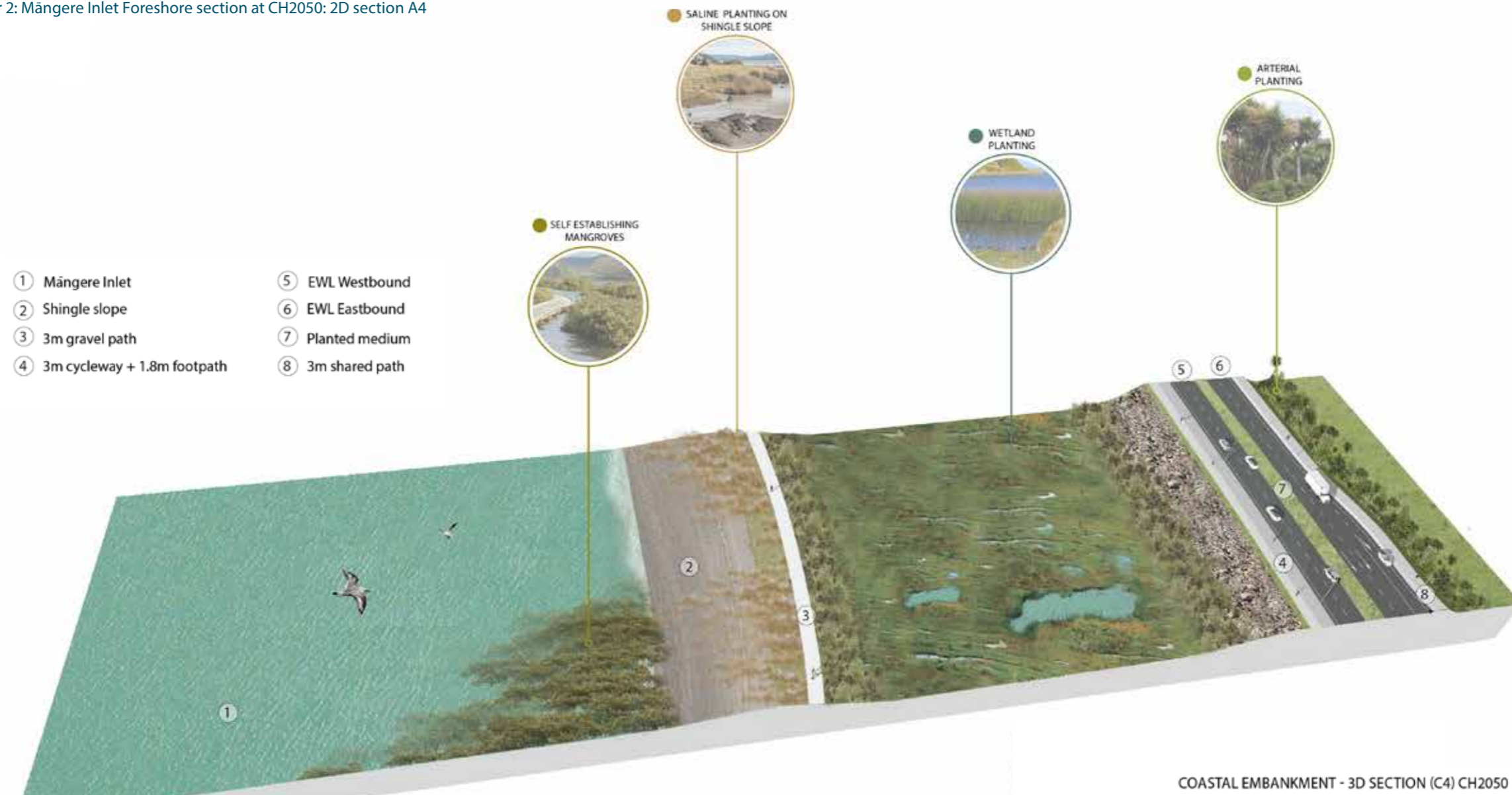


Figure 34. Sector 2: Māngere Inlet Foreshore section at CH1550: 3D section C3



PIKES POINT - 2D SECTION (A4)
SCALE 1:500

Figure 35. Sector 2: Māngere Inlet Foreshore section at CH2050: 2D section A4



COASTAL EMBANKMENT - 3D SECTION (C4) CH2050

Figure 36. Sector 2: Māngere Inlet Foreshore section at CH2050: 3D section C4

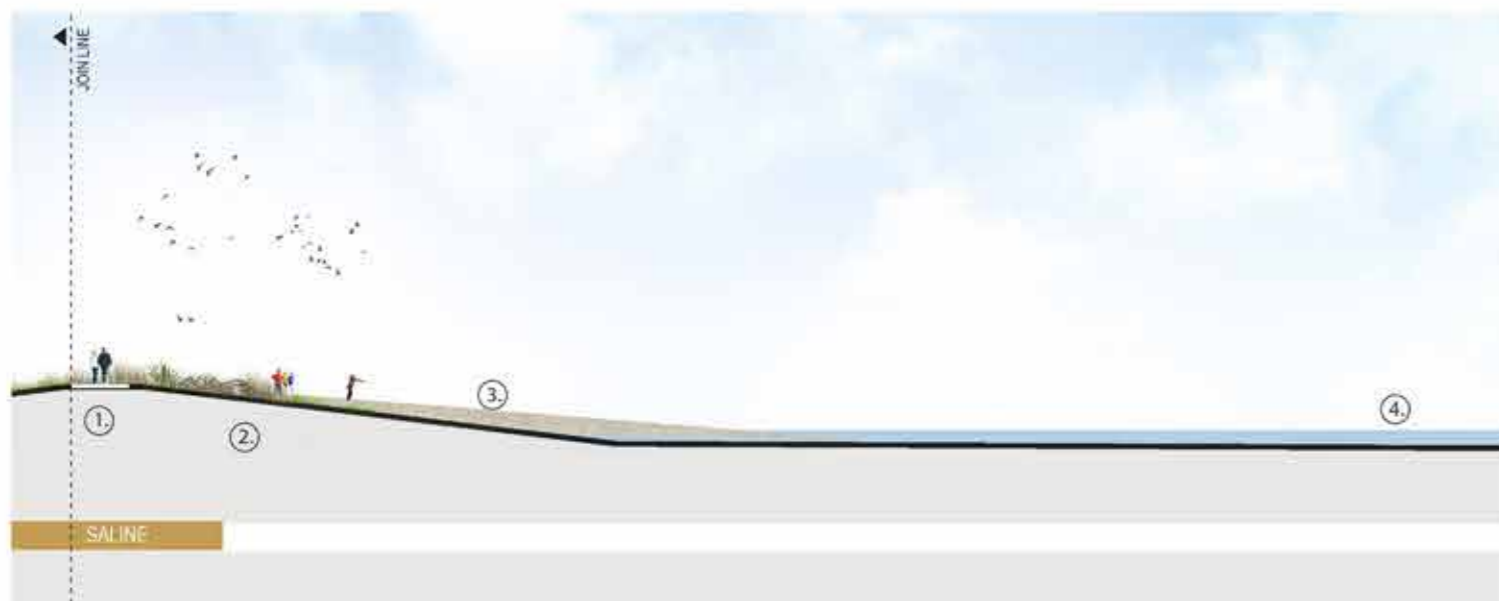


Figure 37. Sector 2: Lower Captain Springs Road: Street Section B4



COASTAL EMBANKMENT - 2D SECTION (A5) 2950
SCALE 1:500

- ① 3m shared path
- ② 3m cycleway + 1.8m footpath
- ③ Embankment
- ④ Stormwater wetland
- ⑤ 3m gravel path
- ⑥ 2.5m high RL bund



COASTAL EMBANKMENT - 2D SECTION (A5) 2950
SCALE 1:500

- ① 2.5m heigh RL bund
- ② Dotterel habitat
- ③ Shingle foreshore
- ④ Mangere Inlet

Figure 38. Sector 2: Māngere Inlet Foreshore section at CH2950: 2D section A5

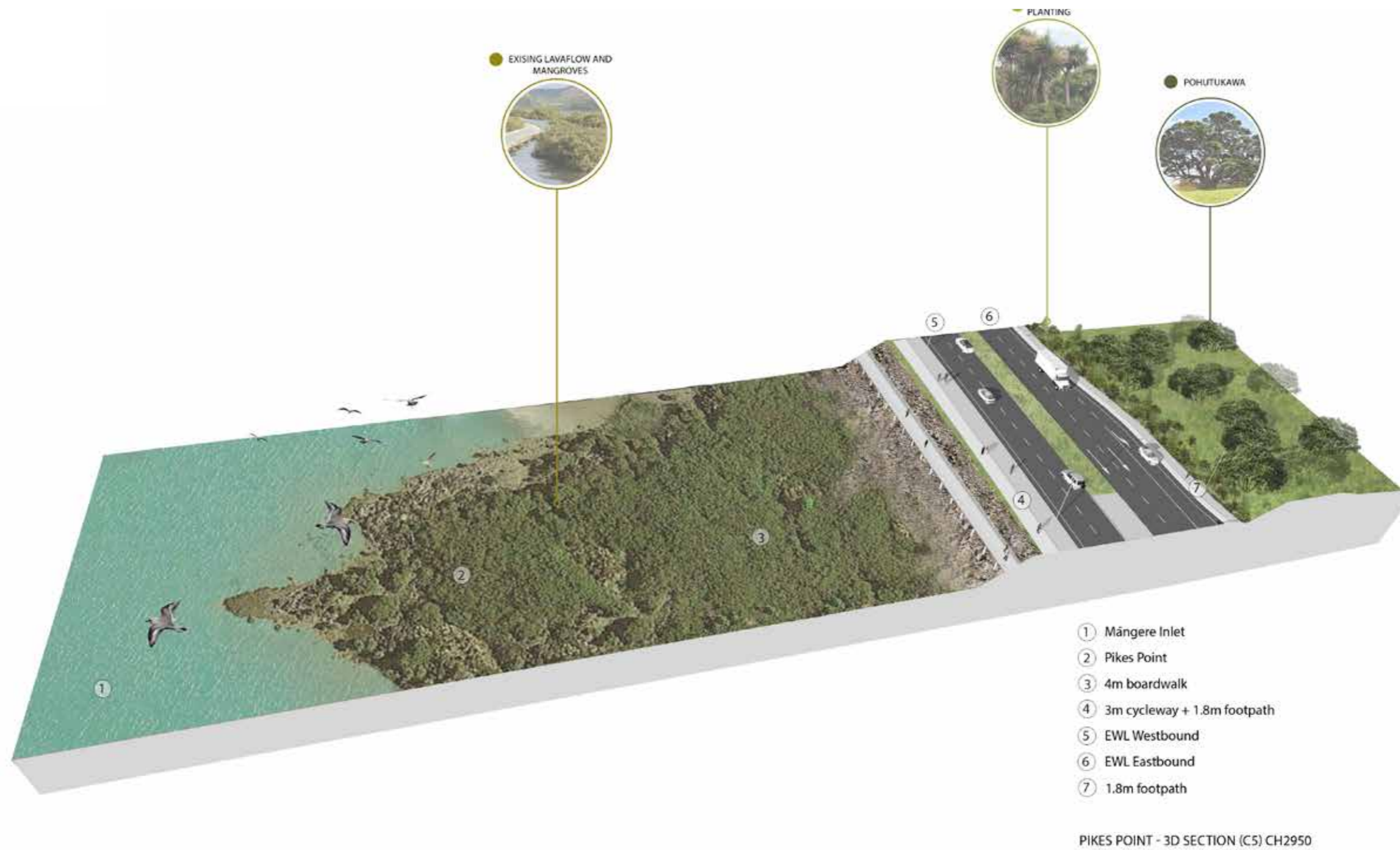


Figure 39. Sector 2: Māngere Inlet Foreshore section at CH2950: 3D section C5



COASTAL EMBANKMENT - 2D SECTION (A6) 3450
SCALE 1:500

- ① 3m cycleway + 1.8m footpath
- ② Embankment
- ③ Stormwater wetland
- ④ 4m boardwalk
- ⑤ Coastal planting



COASTAL EMBANKMENT - 2D SECTION (A6) 3450
SCALE 1:500

- ① Pohutukawa planting
- ② Low coastal planting
- ③ Elevated 6.5m RL headland
- ④ Māngere Inlet

Figure 40. Sector 2: Māngere Inlet Foreshore section at CH3450: 2D section A6

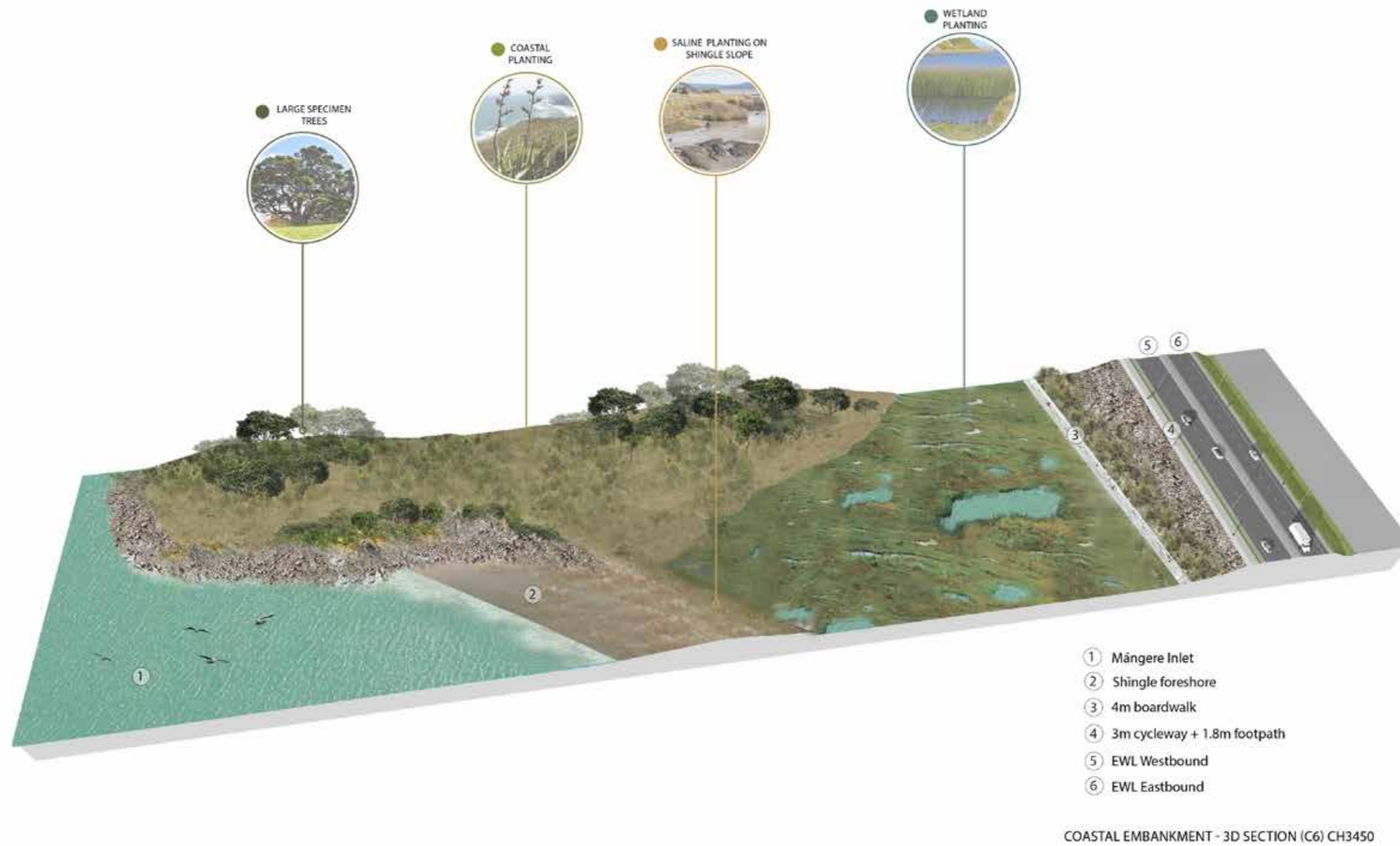


Figure 41. Sector 2: Māngere Inlet Foreshore section at CH3250: 3D section C6

5.3. Anns Creek



Design drivers

Anns Creek was formerly part of a much more extensive swampy area that flanked the south-east side of Mutukāroa (Hamlins Hill) and that was part of the Karetu portage. Today mangroves wrap around the foreshore edge and provide the foreground for elevated views over the inlet.

The rock features at Anns Creek are different in appearance from the other lava features around the Māngere Inlet, and contain a mix of distinctive and sometimes rare indigenous plants.

This is a particularly sensitive ecological area, where the EWL skirts the edge of the coastal marine area (CMA), with potential effects on habitat (birds, lizards and invertebrates) and plants.

Design outcomes sought

- ▶ Minimised intrusion into the Coastal Marine Area, for example by reducing the number, size and location of piers and carefully locating them
- ▶ Location of piers to minimise footprint in sensitive areas
- ▶ Protected terrestrial habitat with retention and extension of areas of mangroves and shrublands
- ▶ Visually reconnected landscapes severed by road and rail infrastructure

Design drivers

Walking and cycling access is from the end of Hugo Johnston Drive and via a bridge over the rail corridor offering extensive views over the Māngere Inlet towards the west. There is a choice of routes – a more direct, wide, flat shared path or a meandering walkway closer to the water's edge which is enclosed by mangroves that mostly obscure views of the water.

Design outcomes sought

- ▶ Continued choice of more direct or more meandering routes towards the water's edge
- ▶ Removal / selective pruning of vegetation between the two paths, providing increased visual connection (for casual overlooking and a sense of safety) as well as an area of useable open space for sitting / viewing
- ▶ Well-designed connections back to Hugo Johnston Drive, particularly where the shared path crosses under EWL:
 - by creating as much space above and to the side of the path as possible
 - by designing the underside of the viaduct with an uncluttered, open and light appearance to pedestrians and cyclists
- ▶ Retaining / replacing street tree planting to the west side of Hugh Johnston Drive to keep the relatively low-key, small-scale character.

Mana Whenua considerations

Mana Whenua would like to see the importance of this ecologically diverse location highlighted through:

- ▶ Determining what is iconic and endemic in the area and recognising and providing for this through landscape treatment (localised eco-sourcing and optimising biodiversity) to enhance the size and quality of these areas
- ▶ Giving consideration to the naming of this area and acknowledging the significance of this location as the former Karetu portage route
- ▶ Interpretive signage to help tell the story of this area - how it has survived and thrived despite years of industrial activity
- ▶ Promoting opportunities to increase the 'restorative rehabilitation' aspect of the Project (while Mana Whenua acknowledge that the Project can not provide complete remediation to this area, they would like to see the Project promote wider opportunities to 'clean up' the Anns Creek area)



Figure 42. Anns Creek – artist's impression (courtesy ASAP imageNZ)

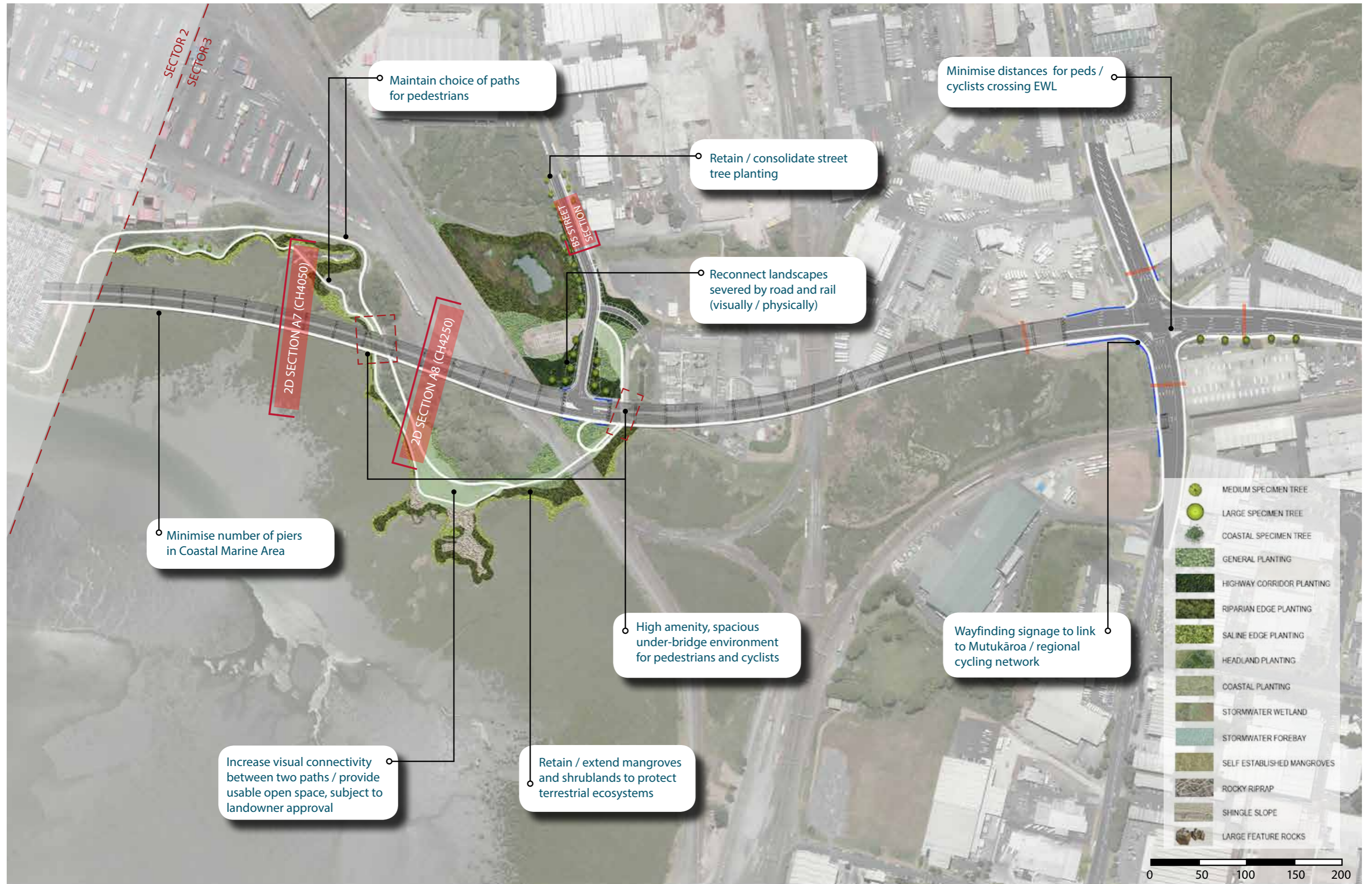


Figure 43. Sector 3: Anns Creek: plan



Figure 44. Sector 3: Anns Creek section at CH4050: 2D section A7

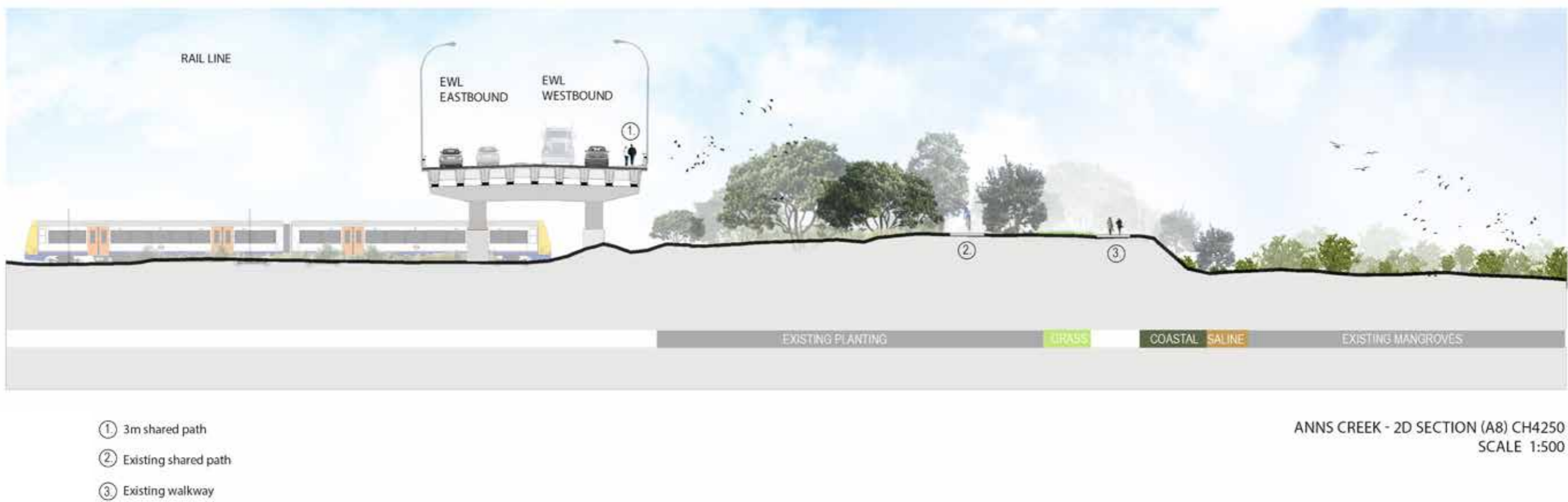


Figure 45. Sector 3: Anns Creek section at CH4250: 2D section A8



Figure 46. Sector 3: Hugo Johnston Drive: Street Section B5

5.4. Sylvia Park



Design drivers

The project follows Sylvia Park Road between Great South Road and SH1. On the northern side of the road are industrial buildings and the tall towers of the Otāhuhu – Henderson 220kV transmission line, with Mutukāroa (Hamlins Hill) rising up behind them.

There are also industrial land uses on the southern side: car showrooms are interspersed with vehicle servicing, areas of car parking and large 'shed' type buildings. These sites are required for widening Sylvia Park Road to accommodate the project, and removal of the buildings will leave the rail corridor exposed behind a strip of land alongside the road corridor.

Mutukāroa is important for culture, recreation and as a landmark. Its steep southern flank edges Sylvia Park Road although this is fenced off and it is not readily apparent that there is pedestrian access (from Great South Road). It has a strong presence both locally and from a distance. EWL ramps rising to cross over and connect with SH1 will interrupt views towards it, and are likely to impact on views from the upper slopes out over the landscape.

Mutukāroa was formerly occupied as a settlement overlooking the Kāretu portage, and both the hill and the portage are very significant to Mana Whenua as well as being archaeological sites. EWL in this sector runs along the approximate route of the portage.

Design outcomes sought

- Recognition and highlighting of the Kāretu portage and associated settlement on Mutukāroa.
- Matters to consider include:
 - Designing a new linear 'portage link' / green corridor alongside the shared path at the base of Mutukāroa along the former Kāretu portage route
 - Appropriate naming by Mana Whenua of landscape features and structures
 - Visual separation / screening of the rail corridor and a buffer between the shared path and road traffic
 - Wayfinding signage that links the shared path into the wider regional network (including to Mutukāroa Regional Park).

Design drivers

The walking / cycling environment is poor. There are grassed berms with pockets of low planting and some trees in the front setbacks but footpaths are narrow and discontinuous.

Design outcomes sought

- Continuation of the shared path along the southern side of Sylvia Park Road, separated from the railway line and buffered from the busy road through landscape treatment
- High amenity pedestrian and cycle connection to Sylvia Park Rail Station. Consider:
 - creating as much space above and to the side of the shared path as possible, particularly where it crosses under SH1 and the new ramps
 - designing the underside of the ramps with an uncluttered, open and light appearance
 - minimising crossing distances (for example though providing islands between through and turning lanes)
- Landscape treatment that allows for long clear sightlines for shared path users.

Mana Whenua considerations

Sylvia Park Road: Mana Whenua would like to see the importance of this culturally significant location highlighted through:

- Minimising the visual impact of structures on Mutukāroa.
- Acknowledging the significance of the former Kāretu portage which ran through this area through:
 - Mana Whenua involvement in the design and detailing of retaining wall structures
 - improving pedestrian / cycle linkages
 - providing appropriate landscape treatment
 - encouraging public enquiry into mana whenua values through design (why are these trees planted here? what are they referencing?)

Te Apunga o Tainui / Tip Top corner: Mana Whenua would like the project to respect the importance of the culturally significant location (Te Apunga o Tainui, waahi tapu site) through:

- Avoiding and minimising disturbance where possible
- Undertaking works in a manner that acknowledges and respects the waahi tapu of this area (establishing management, engagement and monitoring protocols for detailed design and site / construction management)

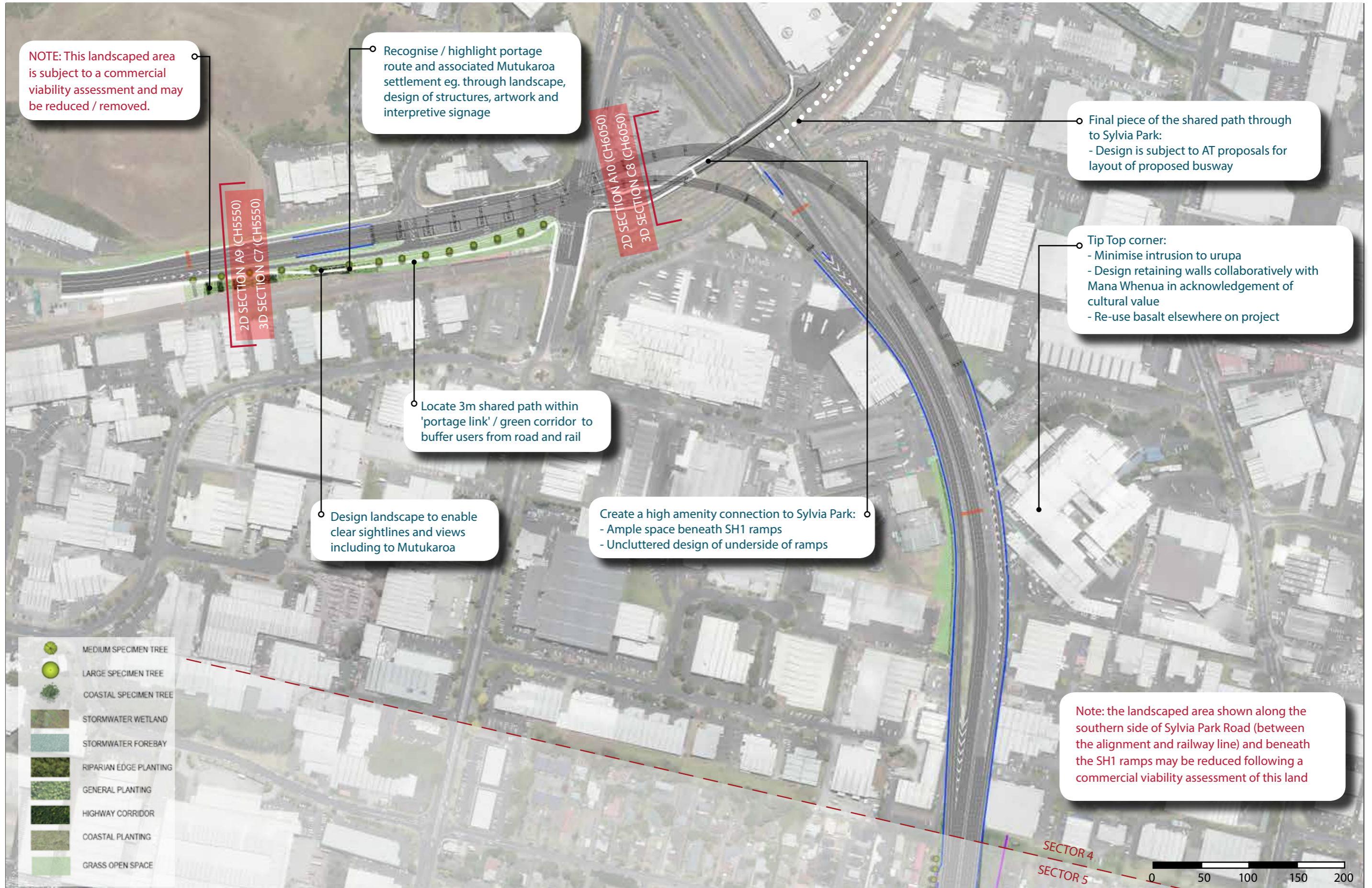


Figure 47. Sector 4: Sylvia Park plan



- ① 1.8m footpath
- ② Specimen tree
- ③ 3m shared path
- ④ Mounding
- ⑤ Railway line
- ⑥ Commercial property - building envelope

- PLANTED MOUND
- LANDSCAPE SCREEN PLANTING
- LOW LANDSCAPE PLANTING

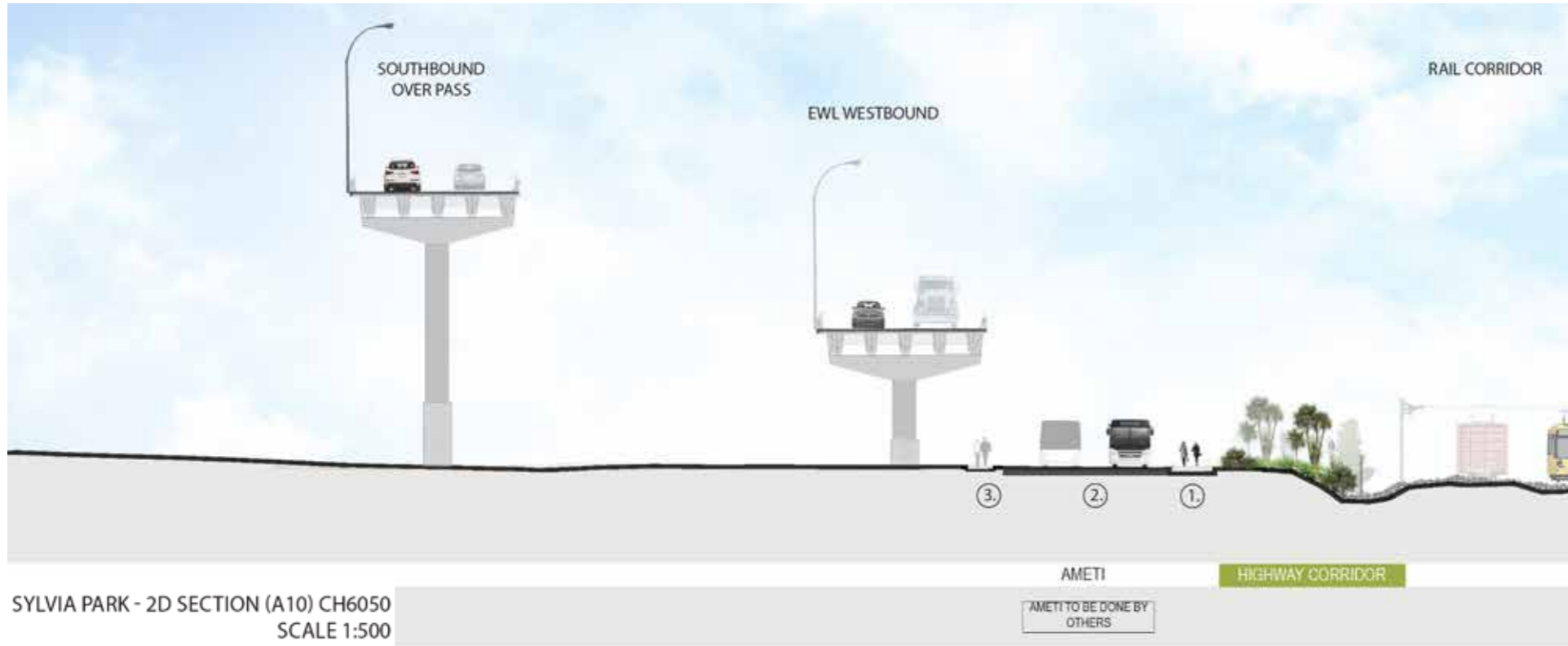
SYLVIA PARK - 2D SECTION (A9) CH5500
SCALE 1:500



- ① Mutukaroa - Hamlin Hill
- ② 1.8 m footpath
- ③ EWL Eastbound
- ④ EWL Westbound
- ⑤ 3m shared path
- ⑥ Existing Rail Corridor

Note: the landscaped area shown along the southern side of Sylvia Park Road (between the alignment and railway line) and beneath the SH1 ramps may be reduced following a commercial viability assessment of this land.

Figure 48. Sector 4: Sylvia Park sections at CH5500: 2D section A9 and 3D section C7



- ① 3m shared path
- ② Ameti project (To be done by others)
- ③ 1.8m footpath

SYLVIA PARK - 2D SECTION (A10) CH6050
SCALE 1:500



- ① EWL Eastbound / SH1 on-ramp
- ② EWL Westbound / SH1 off-ramp
- ③ 3m footpath
- ④ AMETI - (To be done by others)
- ⑤ Existing Rail Link

SYLVIA PARK - 3D SECTION (C8) CH6050

Figure 49. Sector 4: Sylvia Park sections at CH6050: 2D section A10 and 3D section C8

5.5. State Highway 1 (Southern Motorway)



Design drivers

- Te Apunga o Tainui / Tip Top Corner is a sensitive area for landscape and cultural reasons. It is situated at the toe of the lava flow from the scoria cones (now quarried and built over) of Te Apunga o Tainui / MacLennan Hills, and it is also a site of cultural archeological and cultural significance, with an urupa in this area.

Design outcomes sought

- Minimised intrusion into site and resulting size of retaining walls required
- Re-use of basalt removed as part of road widening elsewhere on the project
- Recognition and highlighting of the urupa, for example by designing retaining walls and any associated landscape treatment in conjunction with Mana Whenua

Design drivers

From Te Apunga o Tainui / Tip Top Corner to Panama Road the land uses are industrial and the blocks, lots and buildings are typically large; from Panama Road south the existing State Highway bisects established residential neighbourhoods. The driver's experience is generally of houses 'turning their backs' on the motorway, or screened by fences, noise walls and vegetation.

EWL involves widening SH1. Sloping banks with generally well established vegetation soften the current motorway environment. Much of this planting will be lost and replaced with vertical retaining and noise walls, resulting in a 'harder' edge.

Design outcomes sought

- Consistent designs for the retaining and noise walls
- Minimised visual impact of large structures when viewed from both SH1 and from neighbouring properties.
- Matters to consider include:
 - Incorporating low bunds and planting in front of walls where space permits
 - 'Green' walls with vertical planting to soften their appearance
 - Safety in Design: materials selection and design treatment to deter graffiti.

Design drivers

There are two overbridges in this sector: Panama Road bridge which will be widened, and the Princes Street overbridge which will be replaced with the reconfiguration of the interchange. The interchange is currently convoluted and not easy for pedestrians and cyclists to traverse (wide roads, narrow paths, poor sight lines).

Design outcomes sought

- Walkway linking Princes Street (west of interchange) with Todd Place retained to support a connected walking and cycling network
- Clear, direct and safe pedestrian and cycle movements through the interchange on all legs
- Minimised land take for the corridor, and maximised opportunities for re-use of land around the interchanges.
- New open space that is connected to the existing open space network and provides for useable areas (rather than 'leftover' spaces)
- Maximised openness beneath bridge structures: the order of preference is spill-through abutments, then partial spill through, then closed abutments.

Design drivers

- The project crosses Ōtāhuhu Creek. This waterway was the best known portage between the Waitemata and Manukau Harbours in early times, most famously linked to the Tainui waka. The creek therefore is of great cultural significance even though today its appearance is degraded in the area of SH1 and it is not a notable marker along the journey, nor is its former use apparent.

Design outcomes sought

- Enable future continuation of 'Greenways' walking route following the line of Ōtāhuhu Creek
- North-south neighbourhood connection (walking and cycling) alongside SH1 linking Mataroa Road and Deas Place
- Rehabilitated riparian edge (with selective removal of mangroves)
- Facilitated movement along the Ōtāhuhu Creek corridor under the new widened bridge
- Recognition and highlighting of the importance of the portage
- Views out for drivers on SH1 crossing the Ōtāhuhu Creek.

Mana Whenua considerations

Mana Whenua would like to see the importance of this culturally significant location highlighted through:

- A design which acknowledges the former Ōtāhuhu portage and re-establishes access to, and visibility of, Ōtāhuhu Creek
- acknowledging the importance of place for avifauna - what are the stories of this place for valued bird species and what opportunities are there for the people to appreciate these stories

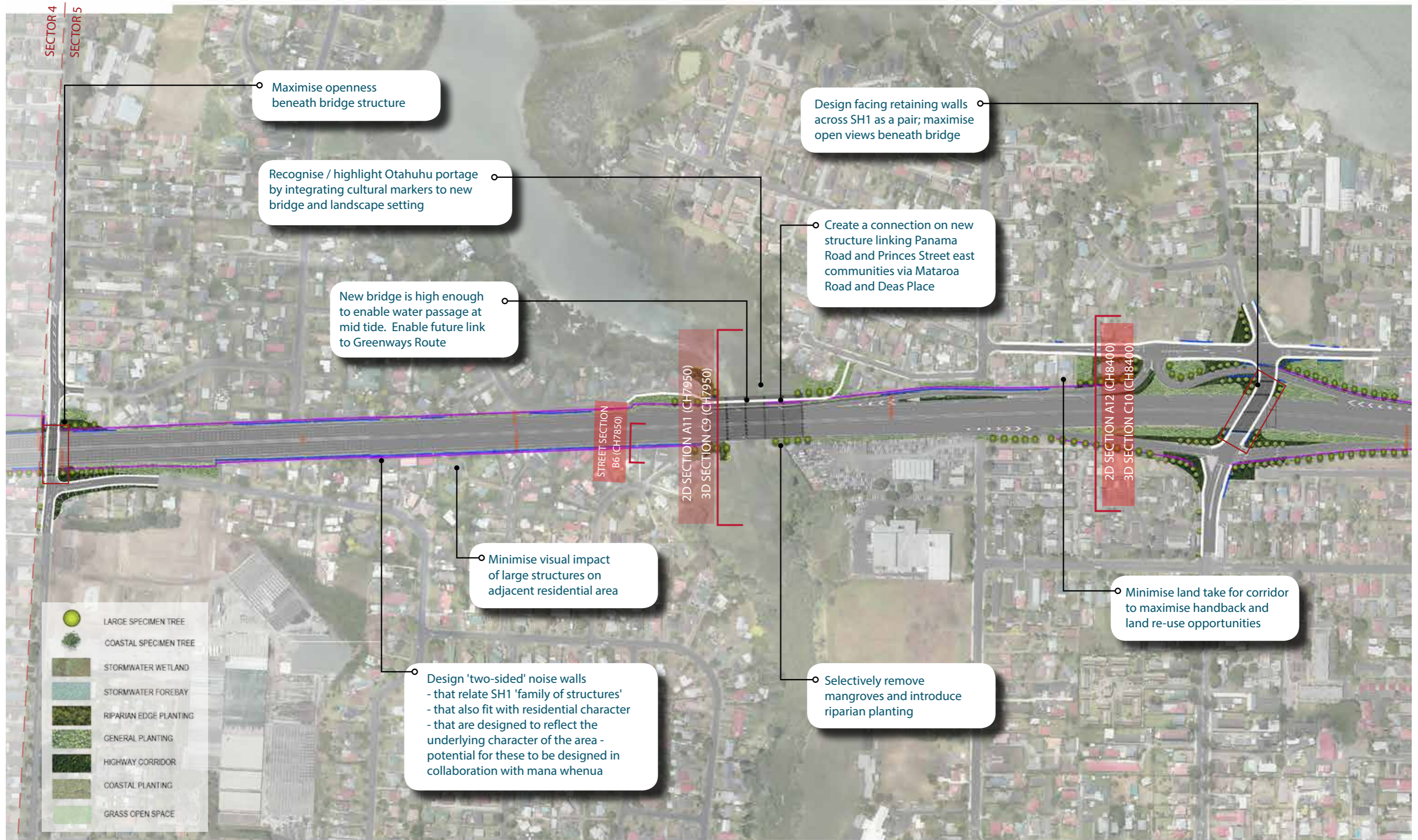
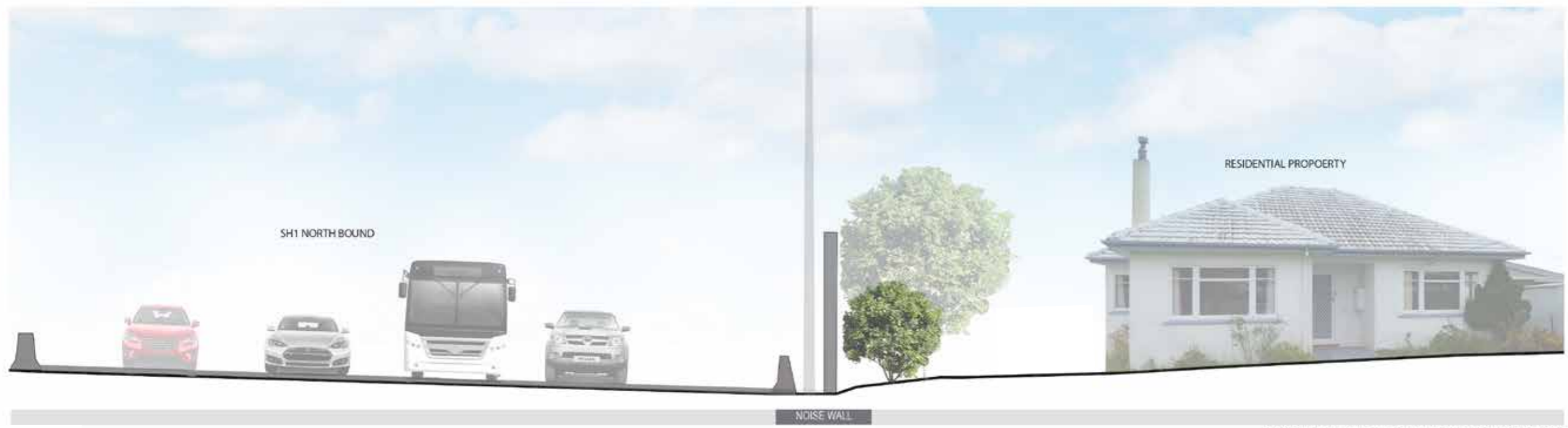


Figure 50. Sector 5: State Highway 1 (Southern Motorway) plan



STATE HIGHWAY 1 - HIGHWAY SECTION (B6) SCALE 1:20

Figure 51. Sector 5: State Highway 1 (Southern Motorway) sections at CH7850: Street Section B6



SH1 - 2D SECTION (A11) CH7950
SCALE 1:500



POHUTUKAWA



RIPARIAN PLANTING



- ① Otāhuhu Creek
- ② Existing Mangroves
- ③ Proposed bridge - can accommodate pedestrians and cyclists
- ④ SH1 Southbound
- ⑤ SH1 Northbound

SH1/OTAHUHU CREEK - 3D SECTION (C9) CH7950

Figure 52. Sector 5: State Highway 1 (Southern Motorway) sections at CH8000: 2D section A11 and 3D section C9



Figure 53. Sector 5: State Highway 1 (Southern Motorway) section at CH8400: 2D section A12

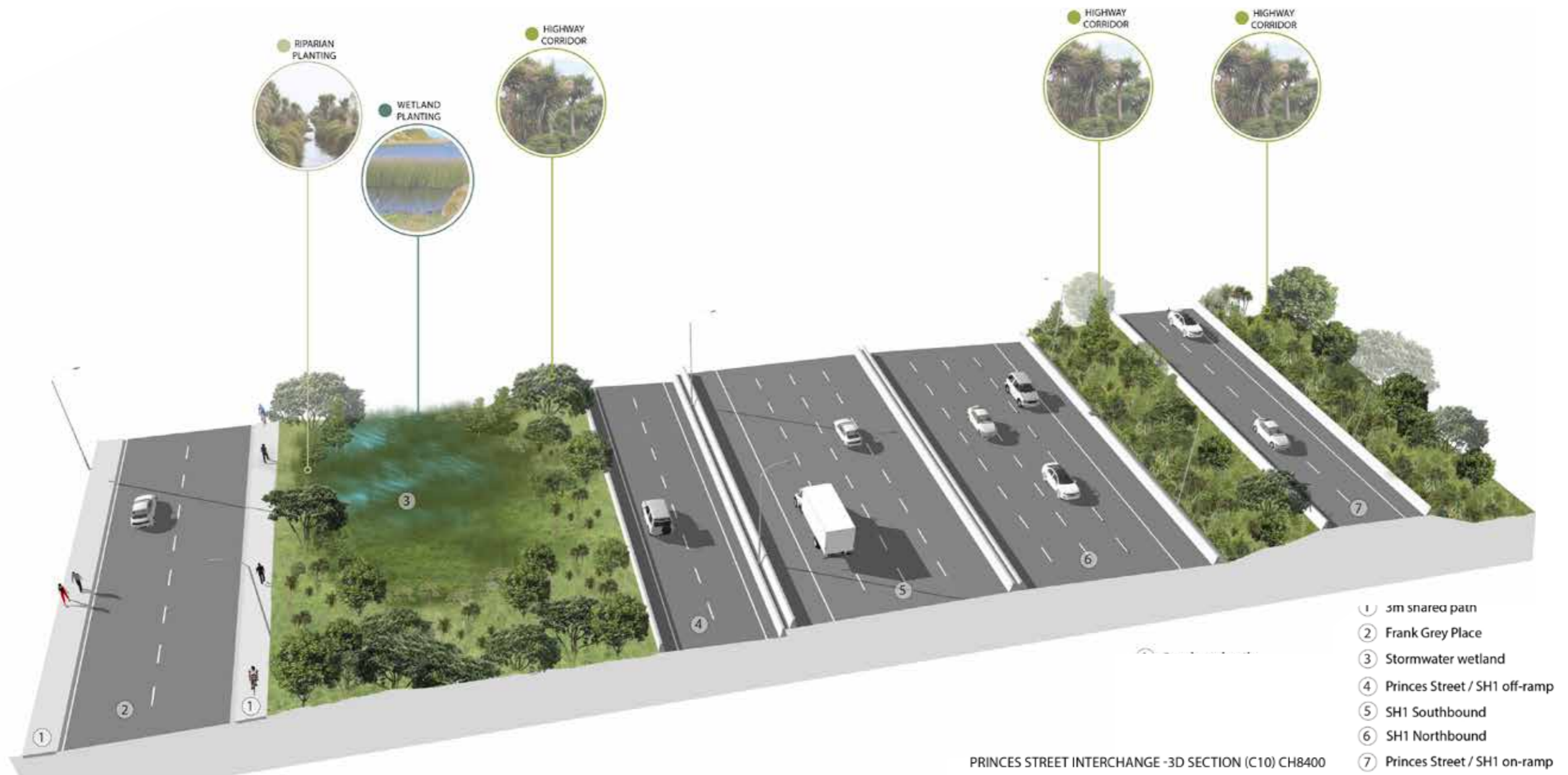


Figure 54. Sector 5: State Highway 1 (Southern Motorway) section at CH8400: 3D section C10

5.6. Local roads



Design drivers

The two sides of Captain Springs Road have contrasting characters: Waikaraka Park to the west, and 'boxy' industrial land uses to the east. The deep setback from the road to the low stone (heritage) fence bounding the park, and the widely spaced buildings on the other side, contribute to a sense of openness. There are no footpaths: there are scattered groups of mature trees set in the grass verges, more on the park side but some fronting the buildings.

At the intersection of Neilson Street and Captain Springs Road the stone park wall is close to the existing road carriageway which presents some challenge to introducing a high amenity shared path. There is currently no footpath along the front of Waikaraka Park (on Neilson Street) and only one north-south pedestrian crossing, on the east side of the intersection.

Design outcomes sought

- Maintaining the 'green' edges of grass verges and trees along both local roads
- Minimising crossing distances for pedestrians crossing Neilson Street
- Sufficient space on footpaths and/or shared paths for pedestrian safety

Design drivers

The cluster of Miami Parade, Angel, Pukemiro and Edinburgh Streets is dominated by heavy industry and heavy vehicles. The exception to their almost overwhelmingly functional character is Miami Parade north of Pukemiro Street, where mature trees are spaced along a very deep grass verge.

The intersection of Great South Road and Church Street is very wide (up to 8 forward lanes plus turning lanes) and with a level of noise, vibration and fumes when clogged with traffic that makes it extremely unpleasant for pedestrians (and also for people in vehicles with the windows open).

Design outcomes sought

- Maintaining the 'green' edges of grass verges and trees along both local roads.



Figure 55. Sector 6: Local Roads plan

APPENDIX: Te Aranga principles

MANA WHENUA ENGAGEMENT WITH THE URBAN AND LANDSCAPE DESIGN AND DESIGN FRAMEWORK

Māori Values Assessments, provided by iwi to the Project team, informed the following summary of common objectives and principles that will sit above and inform the urban and landscape design principles. The summary was presented and workshopped through subsequent hui and was a key input to the design process. Above all, the core principles fed directly into the three urban and landscape themes: respect the place; restore the whenua; reconnect the people.

Overall principles and approaches agreed with Mana Whenua on this Project

While each MVA is a “unique cultural lens”, all iwi have in common the following interests:

- The recognition and acknowledgment of the iwi and its history in Tāmaki Makaurau
- The opportunity to exercise their role as kaitiaki
- The ability to protect and preserve their interests, resources and taonga.

Cultural values

Mana Whenua and especially kaitiaki have a deep and specific relationship with the natural environment – the mana of a people is demonstrated by the health of their environment. Kaitiaki is a right, but it is also a responsibility for tangata whenua, and is manifested through:

- Rangatiratanga, the ability of Mana Whenua to govern and manage within their homeland.
- Kaitiakitanga, the active preservation and protection of resources so as not to compromise mauri (the life essence).

Core principles

- The earth is a living entity. All living entities have a mauri or life force. Māori are connected to the land, forests, mountains, sky, ocean and waterways.
- All living things share a natural balance, an ‘interconnectedness and oneness’ akin to a web of which humanity is only a part. These values, passed from generation to generation, are a significant part of the intangible heritage of Māori and overall culture of New Zealand.
- Each whanau or hapū are kaitiaki for the area over which they hold Mana Whenua, that is, their ancestral lands and seas.

Te Aranga Principles

This table reproduces in full the Te Aranga Principles set out in the Auckland Design Manual (http://www.aucklanddesignmanual.co.nz/design-thinking/maori-design/te_aranga_principles) for Auckland Council.

Te Aranga principles were an important head of consideration and on this Project were integrated from the start, such that mitigation and key design moves can be aligned with the appropriate principle. This was to strengthen the basis of the design response and also to ‘ground’ the urban and landscape design in its cultural as well as environmental context. The table also captures place-specific opportunities (against the Te Aranga principles) identified through Mana Whenua engagement and mapped by them onto the project area, as well as waahi tapu noted in MVAs. It was developed with Mana Whenua in the early stages of the project (as a precursor to the vision and corridor-wide design guidelines) and continued to be used by the urban and landscape designers to guide the whole Project design.

NGA HUA / outcome	AHUATANGA / attributes	HE TAUIRA / application	EWL-specific opportunities
MANA – Rangatiratanga authority			
The status of iwi and hapū as Mana Whenua is recognised and respected	<p>Recognise Te Tiriti o Waitangi / The Treaty of Waitangi and the Wai Ko Aotearoa Tēnei framework for Treaty Partnerships in 21st Century Aotearoa New Zealand as the basis for all relationships pertaining development</p> <hr/> <p>Provide a platform for working relationships where manawhenua values, world views, tikanga, cultural narratives and visual identity can be appropriately expressed in the design environment</p> <hr/> <p>High quality Treaty-based relationships are fundamental to the application of the other Te Aranga principles</p>	<ul style="list-style-type: none"> • The development of high level Treaty based relationships with Mana Whenua is essential prior to finalising design approaches and will maximise the opportunities for design outcomes • Important to identify any primary Mana Whenua groups as well as wider Mana Whenua interests in any given development 	<ul style="list-style-type: none"> • Put cultural protocols in place • Continued engagement through Project

NGA HUA / outcome	AHUATANGA / attributes	HE TAUIRA / application	EWL-specific opportunities
WHAKAPAPA – Names and naming			
Māori names are celebrated	<p>Recognise and celebrate the significance of Mana Whenua ancestral names</p> <p>Recognise ancestral names as entry points for exploring and honouring tūpuna, historical narratives and customary practices associated with development sites and their ability to enhance sense of place connections</p>	<ul style="list-style-type: none"> Mana Whenua consultation and research on the use of correct ancestral names, including macrons Recognition of traditional place names through signage and wayfinding Use of appropriate names to inform design processes 	<ul style="list-style-type: none"> Identification and naming of the original shoreline of Māngere Inlet Identity and recognition of ‘Anns Creek’ and Miami Stream Te Hōpua a Rangi Recognition of portage sites and significance to Mana Whenua in project design and treatment, and re-establishment and naming of portages within project scope: <ul style="list-style-type: none"> Otāhuhu Portage - Tauōma portage between Manukau harbour and Tāmaki River Te Pae o Kawaka between Hauraki and Manukau Harbours Karetu portage towards Panmure Basin along new cycleway to Sylvia Park Potential recognition of other culturally significant sites and linkages between foreshore and these sites (e.g. Onehunga Spring, wahi tapu sites in the vicinity of the Tip Top site etc). Likely urupā within Hamlins’s grant, Mutukāroa and near Neilson Street
TAIAO – The natural environment			
The natural environment is protected, restored and/or enhanced	<p>Sustain and enhance the natural environment</p> <p>Local flora and fauna which are familiar and significant to Mana Whenua are key natural landscape elements within urban and / or modified areas</p> <p>Natural environments are protected, restored or enhanced to levels where sustainable Mana Whenua harvesting is possible</p>	<ul style="list-style-type: none"> Re-establishment of local biodiversity Creating and connecting ecological corridors Planting of appropriate indigenous flora in public places, strategies to encourage native planting in private spaces Selection of plant and tree species as seasonal markers and attractors of native bird life Establishment and management of traditional food and cultural resource areas allowing for active kaitiakitanga 	<ul style="list-style-type: none"> Respect Anns Creek Acknowledge godwit / kuaka flight path Naturalise the foreshore – soften the coastal edge Enhance ecological value of marshland within Hopua tuff ring Integrate the Project with others eg. Waikaraka Park upgrade Avoid remnant lava flows as a priority (eg. At Pikes Point) Manage weed infestation within the corridor
MAURI TU – Environmental health			
Environmental health is protected, maintained and/or enhanced	<p>The wider development area and all elements and developments within the site are considered on the basis of protecting, maintaining or enhancing mauri</p> <p>The quality of wai, whenua, ngāhere and air are actively monitored</p> <p>Water, energy and material resources are conserved</p> <p>Community wellbeing is enhanced</p>	<ul style="list-style-type: none"> Daylighting, restoration and planting of waterways Contaminated areas of soil are remediated Rainwater collection systems, grey-water recycling systems and passive solar design opportunities are explored in the design process Hard landscape and building materials which are locally sourced and of high cultural value to Mana Whenua are explored in the design process 	<ul style="list-style-type: none"> Restore the mauri of Māngere Inlet – future collection of kai from the harbour, flows of Otahuhu creek Contamination bund to contain discharges from land to Māngere Inlet Investigate potential for wetlands to treat stormwater alongside SH1 Stormwater mitigation integrated with Miami Stream and with the opening up of Sylvia Park Road Improve containment within / relating to Kiwirail environmental footprint Daylight Ann’s Creek at Kiwirail and Hugo Johnson Drive Use indigenous vegetation, eco-source and optimise biodiversity throughout the project Recognise the productive fertile (volcanic) soils that are a taonga

NGA HUA / outcome	AHUATANGA / attributes	HE TAUIRA / application	EWL-specific opportunities
MAHI TOI – Creative expression			
Iwi / hapū narratives are captured and expressed creatively and appropriately	<p>Ancestral names, local tohu and iwi narratives are creatively reinscribed into the design environment including: landscape; architecture; interior design and public art</p> <p>Iwi / hapu mandated design professionals and artists are appropriately engaged in such processes</p>	<ul style="list-style-type: none"> Mana Whenua assist in establishing design consortia which are equipped to translate iwi/hapū cultural narratives into the design environment Civic / shared landscapes are created to reflect local iwi/hapu identity and contribute to sense of place Iwi/hapū narratives are reinscribed in the environment through public art and design 	<ul style="list-style-type: none"> Noise walls and landmark features at entrance to Onehunga Cultural design at cultural sites of significance Treatment of bridges Treatment of shared path including information signage
TOHU – The wider cultural landscape			
Mana Whenua significant sites and cultural landmarks are acknowledged	<p>Acknowledge a Māori world view of the wider significance of tohu / landmarks and their ability to inform the design of specific development sites</p> <p>Support a process whereby significant sites can be identified, managed, protected and enhanced</p> <p>Celebrate local and wider unique cultural heritage and community characteristics that reinforce sense of place and identity</p>	<ul style="list-style-type: none"> Recognition of tohu, including wāhi tapu, maunga, awa, puna, mahinga kai and ancestral kainga Allows visual connection to significant sites to be created, preserved and enhanced Wider cultural landmarks and associated narratives able to inform building / spatial orientation and general design responses Heritage trails, markers and interpretation boards 	<ul style="list-style-type: none"> Recognise / celebrate portages Map, acknowledge and protect where possible waahi tapu sites Respond to Panama Road lava flats and the Rarotonga (Mt Smart) Improve legibility of Te Hōpua a Rangi Preserve / lava flows to coastal environment Improved linkages from this area and access to Mutukāroa – and minimise visual impact on it Recognise / re-establish other culturally significant sites and linkages between them and the foreshore (e.g. Onehunga Springs) Acknowledge the whole of Māngere inlet as a taonga
AHI KĀ – The living presence			
Iwi / hapū have a living and enduring presence and are secure and valued within their rohe	<p>Mana Whenua live, work and play within their own rohe</p> <p>Acknowledge the post Treaty of Waitangi settlement environment where iwi living presences can include customary, cultural and commercial dimensions</p> <p>Living iwi/hapu presences and associated kaitiaki roles are resumed within urban areas</p>	<ul style="list-style-type: none"> Access to natural resources (weaving species, mahinga kai, waterways, etc) facilitates, maintains and /or enhances Mana Whenua ahi kā and kaitiakitanga Civic/iwi joint venture developments ensure ahi kā and sense of place relationships are enhanced Iwi/private sector joint venture developments enhance employment and ahi kā relationships 	<ul style="list-style-type: none"> Community [and school] involvement in ecological mitigation at Otāhuhu Tangata whenua have a role in methodology for clearing vegetation, around whole of life Mana Whenua input into plant selection Recognise need for and support capacity building for Mana Whenua to have a role in implementation Use the Māngere inlet as a place of learning, and study the potential of mahinga kai as remediators

