

Eastern Busway 2

Assessment of Effects on the Environment

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List of Abbreviations and Definitions

Abbreviation and definitions	Description
AEE	Assessment of Effects on the Environment
AC	Auckland Council
AT	Auckland Transport
AUP(OP)	Auckland Unitary Plan (Operative in part) 2016
BPO	Best Practicable Option
bgl	Below Ground Level
CCP	Communication and Consultation Plan
CEMP	Construction Environmental Management Plan
CLMP	Contaminated Land Management Plan
CMA	Coastal Marine Area
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
EB1	Eastern Busway 1 (Panmure to Pakuranga)
EB2	Eastern Busway 2 (Pakuranga Town Centre)
EB3 Commercial/ EB3C	Eastern Busway 3 (Pakuranga Creek to Botany)
EB3 Residential/ EB3R	Eastern Busway 3 (SEART to Pakuranga Creek)
EB4	Eastern Busway 4 (Botany Town Centre Station)
EBA	Eastern Busway Alliance
ESCP	Erosion and Sediment Control Plan
HNZPT	Heritage New Zealand Pouhere Taonga
HNZPTA	Heritage New Zealand Pouhere Taonga Act 2014
HRP	Habitat Restoration Plan
km	Kilometre(s)
LMP	Lizard Management Plan
m	Metre(s)
m ²	Square Metre(s)
m ³	Cubic Metre(s)
MCA	Multi Criteria Analysis
MSE	Mechanically Stabilised Earth (Wall)
NDC	Network Discharge Consent
NES-CS	Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011
NES-ETA	Resource Management (National Environmental Standard for Electricity Transmission Activities) Regulations 2009
NES-FW	Resource Management (National Environmental Standards for Freshwater) Regulations 2020
NPS-ET	National Policy Statement for Electricity Transmission
NPS-FM	National Policy Statement for Freshwater Management 2020

NPS-UD	National Policy Statement for Urban Development 2020
NZCPS	New Zealand Coastal Policy Statement 2010
NoR	Notice of Requirement
PWA	Public Works Act 1981
RTN	Rapid Transit Network
RRF	Reeves Road Flyover
RMA	Resource Management Act 1991
SAR	Scheme Assessment Report
SCR	Site Completion Report
SEART	South Eastern Arterial Highway
UDLP	Urban Design and Landscape Plan

Executive Summary

Auckland Transport (AT), with its delivery partner, Eastern Busway Alliance (EBA), has sought resource consent and prepared a Notice of Requirement for the Eastern Busway Stage 2 (EB2). EB2 is located at Pakuranga Town Centre and encompasses works on Ti Rakau Drive, Pakuranga Road, Reeves Road, Cortina Place and the South-Eastern Highway (SEART). EB2 forms part of the wider Eastern Busway Project (the Project), a multi-stage transport project being undertaken between Panmure and Botany to improve the transport networks across southeast Tāmaki Makaurau Auckland. The Project will help address network congestion, provide improved transport choices, address network safety issues and support the urban intensification of Tāmaki Makaurau Auckland.

These works will involve an extension of the existing Panmure to Pakuranga busway, with the construction of a new Pakuranga Bus Station. EB2 also involves the construction of the Reeves Road Flyover (RRF), as well as modifications to the SEART off-ramp at Ti Rakau Drive. Lastly, local walking, cycling and stormwater infrastructure will be upgraded.

A range of specialist reports support this application package. The application package is also accompanied by a proposed set of conditions which adequately mitigate the effects on the environment. These conditions include the use of a variety of construction phase management plans, the use of urban design protocols, significant areas of landscaping and accidental discovery protocols. Draft management plans have also been provided, with these plans demonstrating how the effects of EB2 will be addressed during both its construction and operational phases.

This AEE considers EB2 against the relevant statutory tests and documents. This includes national policy statements, national environmental standards and the Auckland Unitary Plan (Operative in Part) (AUP(OP)). The AEE concludes that the Project will deliver significant benefits to Auckland, including supporting the intensification of Tāmaki Makaurau Auckland's existing urban area. Overall, the AEE finds that the Notice of Requirement (NoR) and resource consents sought for EB2 are consistent with these documents.

Lastly, it should be recognised that the Project will deliver lasting benefits to Pakuranga Town Centre, southeast Tāmaki Makaurau Auckland and the wider region. This is through increased efficiency in traffic movements, supporting modal shift towards public and active transport, increased pedestrian and cyclist connectivity, improved road safety and reduced greenhouse gas emissions from transport.

Given the above, this AEE supports approval of the resource consents and recommends that AT can confirm the Notice of Requirement (NoR).

1 Introduction

Chapter Summary – This chapter provides a brief overview of the Eastern Busway Project, including staging and location. It also details the content and structure of this AEE.

1.1 Overview of the Project

The Eastern Busway Project (the ‘Project’) is a package of works focusing on promoting an integrated, multi-modal transport system to support population and economic growth in southeast Auckland. This involves the provision of a greater number of improved public transport choices and aims to enhance the safety, quality and attractiveness of public transport, and walking and cycling environments, and includes:

- 5km of two-lane busway
- A new bridge for buses across Pakuranga Creek
- Improved active mode infrastructure (walking and cycling) along the length of the busway
- Three intermediate bus stations
- Two major interchange bus stations.

The Project forms part of the Auckland Manukau Eastern Transport Initiative (AMETI), which includes a dedicated busway and bus stations between Panmure, Pakuranga and Botany town centres. The dedicated busway will provide an efficient rapid transit network (RTN) service between the town centres, while local bus networks will continue to provide more direct local connections within the surrounding areas. The Project also includes new walking and cycling facilities, as well as modifications and improvements to the road network.

AMETI includes the following works which do not form part of the Project:

- Panmure Bus and Rail Station and construction of Te Horeta Road (completed)
- Eastern Busway 1 (EB1) – Panmure to Pakuranga (completed).

The Project consists of the consenting packages noted in Table 1-1.

Table 1-1 Eastern Busway Consenting Packages

Consenting Packages	Description
Extension of William Roberts Road	Extension of William Roberts Road from the south of Reeves Road, connecting with Cortina Place and Ti Rakau Drive.
Main Construction Yard	Establishment of a Construction Yard at 169 – 173 Pakuranga Road.
Eastern Busway 2 (EB2)	Pakuranga Town Centre, including Reeves Road Flyover (RRF) and Pakuranga Bus Station.
Eastern Busway 3 Residential (EB3R)	SEART to Pakuranga Creek, including Edgewater and Gossamer Bus Stations.
Eastern Busway 3 Commercial (EB3C)	Pakuranga Creek to Guys Reserve, including two new bridges, an offline bus route through Burswood and a new station at Burswood.
Eastern Busway 4 (EB4)	Guys Reserve to a new bus station in the Botany Town Centre, including a link road through Guys Reserve.

Figure 1-1 below provides an overview of the Project area.



Figure 1-1 Extent of the Project, Pakuranga to Botany

1.2 Strategic Context

The Project is recognised across a number of strategic documents. A detailed summary of the key strategic documents is provided in Section 11.5.

In particular it is noted that the Auckland Regional Land Transport Plan 2021-2031 (RLTP) states that public transport needs to be faster and more reliable if it is to absorb a greater share of future trips and act as a catalyst for intensive development in centres, and rapid and frequent services need to extend more widely across the region.¹ The Project is included in the RLTP in AT’s Capital Programme.

The Regional Public Transport Plan (RPTP) sets out the changes that are planned for Tāmaki Makaurau Auckland’s public transport system. The RPTP identifies the expansion of the RTN through the completion of the Project as a key project.

¹ RLTP, p.38

1.3 Eastern Busway 2

EB2 is the subject of this assessment of environmental effects (AEE). EB2 commences from the intersection of William Roberts Road and Pakuranga Road (connecting with EB1) and traverses west to the Ti Rakau Drive / Reeves Road / SEART intersection (EB3R).

EB2 will improve public transport reliability and usability through the provision of dedicated bus lanes and the new Pakuranga Bus Station. This infrastructure investment will reduce delays caused by bus services being caught in general traffic congestion, while the new bus station will provide greater comfort than present for waiting or transferring passengers.

EB2 will improve safety by simplifying intersections and the provision of extra crossings to the town centre (including more regular crossing intervals). New cycle lanes and footpaths will make it possible to walk or cycle off-road, improving accessibility and safety around the town centre. These cycle lanes will connect to the cycle lanes provided as part of EB1.

Key elements of EB2 include:

- Pakuranga Station - the key station for Pakuranga/Howick users of the busway leading to the Panmure Station and Botany
- The Reeves Road Flyover - provides for local traffic to bypass the heavily congested Pakuranga Road and Ti Rakau Drive route to the Pakuranga Highway/South-Eastern Highway (SEART) via an overpass between SEART and Pakuranga Road (north).

An overview of the proposed works is shown in Figure 1-2 below. A detailed description of the design, operation and construction of EB2 is provided in Section 4.

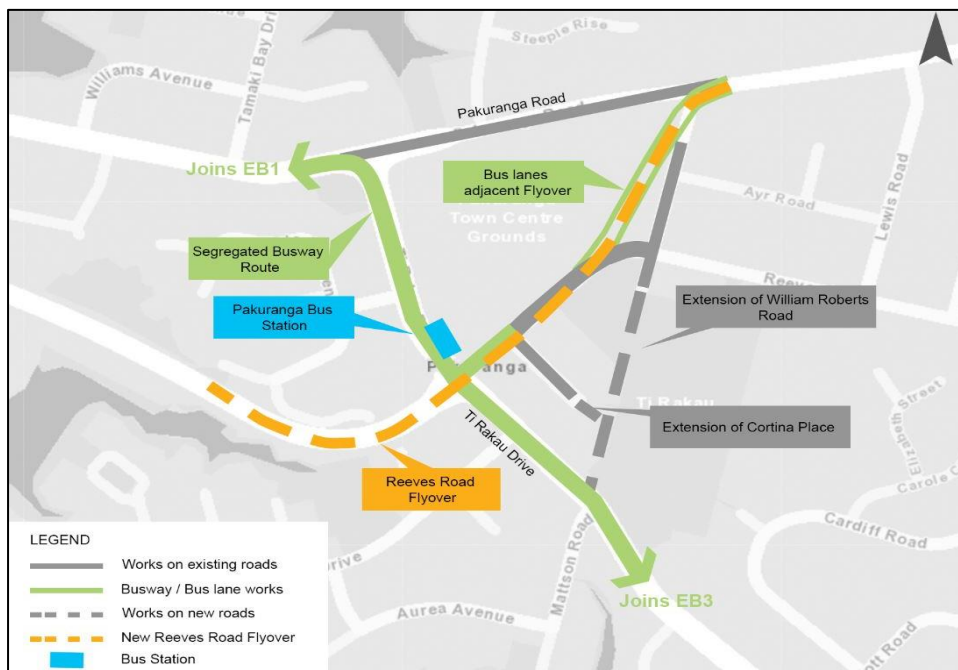


Figure 1-2 EB2 Overview

1.4 Purpose of this AEE

This AEE has been prepared in support of the NoR and associated regional resource consents for the construction and operation of EB2. The AEE addresses the statutory requirements of the Resource Management Act 1991 (the RMA) to enable the confirmation of the NoR and approval of the resource consents. In addition, this AEE has been prepared in sufficient detail to avoid the need for an outline plan (as per section 176A of the RMA).

A copy of the NoR and associated land requirement plans are provided as Appendix 1: Notice of Requirement and Appendix 2: Land Requirement Plans.

1.5 AEE Structure

The contents of each section of this AEE is summarised in Table 1-2 below.

Table 1-2 AEE Structure

AEE Section	Contents
1. Introduction (this section)	<ul style="list-style-type: none"> Introduces the wider Project and provides a summary of EB2 Summarises the strategic context of the Project Outlines the purpose and structure of this AEE Outlines the overall suite of documents and supporting information for this AEE.
2. Background	<ul style="list-style-type: none"> Outlines AT's functions and obligations Provides an overview of the history of AMETI works.
3. Project Necessity and Objectives	<ul style="list-style-type: none"> Sets out the need for the Project through a problem description. Outlines the objectives for the Project and the specific objectives for EB2.
4. Description of Proposal	<ul style="list-style-type: none"> Describes the construction and operation activities, including maintenance requirements for EB2.
5. Alternatives	<ul style="list-style-type: none"> Sets the assessment process employed to assist various design options for the Project Set outs the various design options that formed the assessment of alternatives Sets out the scoring and conclusions of the option assessment.
6. Existing Environment	<ul style="list-style-type: none"> Describes the environment for EB2 as it currently exists Outlines the relevant existing resource consents that have not yet been implemented relevant to the site.
7. Reasons for Application	<ul style="list-style-type: none"> Provides the regulatory framework that EB2 will be assessed against. Outlines the resource consents sought and the permitted activities.
8. Consultation	<ul style="list-style-type: none"> Describes the consultation and engagement undertaken up to lodgement. Details the partnership with mana whenua.
9. Assessment of Environmental Effects	<ul style="list-style-type: none"> Summarises the key environmental effects and the recommendations from each supporting technical report for EB2.
10. Statutory Assessment	<ul style="list-style-type: none"> Assesses EB2 and its effects against the relevant regulatory framework.
11. Conclusion	<ul style="list-style-type: none"> Sets out final conclusions and recommendations of the report.

1.6 Supporting Documents

A wide range of supporting assessments and reports have been attached to this AEE. To summarise, these documents are:

- An Alternatives Assessment
- A Stormwater Effects Assessment
- A Terrestrial and Freshwater Ecological Effects Assessment
- An Open Spaces Effects Assessment
- A Marine Ecology and Coastal Avifauna Effects Assessment
- A Natural Character, Landscape and Visual Effects Assessment
- An Erosion and Sediment Control Effects Assessment
- A Contaminated Land Effects Assessment
- An Archaeological Effects Assessment
- An Arboricultural Effects Assessment
- An Air Quality Effects Assessment
- An Integrated Transport Assessment
- A Construction Noise and Vibration Effects Assessment
- A Noise and Vibration Operational Effects Assessment
- A Social Impacts Assessment
- Construction Methodology
- A Groundwater Permitted Activity Assessment.

Also attached to this AEE are a number of draft management plans, which are proposed to mitigate and manage the potential adverse effects of the planned works. The draft management plans which are provided with this AEE are:

- A Construction Environmental Management Plan (CEMP)
- An Erosion and Sediment Control Plan (ESCP)
- A Construction Traffic Management Plan (CTMP)
- A Construction Noise and Vibration Management Plan (CNVMP)
- A Lizard Management Plan (LMP)
- A communication and consultation plan (CCP)
- A Chemical Treatment Management Plan associated with land disturbance.

In addition to the draft management plans above, are further management plans and reports that are required as part of the proposed conditions set (Appendix 3: Proposed Conditions Set) but are yet to be drafted. These proposed documents are:

- An Urban Design and Landscape Plan (UDLP)
- A Habitat Restoration Plan (HRP)
- A Site Completion Report associated with the potential disturbance of contaminated material.

A suite of proposed conditions is recommended to address the potential environmental effects of the works. These conditions are provided as Appendix 3: Proposed Conditions Set.

2 Background

Chapter Summary – This chapter details the roles and responsibilities of Auckland Transport and how they relate to the Eastern Busway Project. The chapter also discusses the Project’s history, including previous stages between Panmure and Pakuranga.

2.1 Auckland Transport

AT is a Council-Controlled Organisation (CCO) of Auckland Council (AC) responsible for managing and controlling Auckland’s transport system in accordance with the Local Government (Auckland Council) Act 2009 (LGACA). AT’s purpose, as set out in section 39 of the LGACA, is ‘to contribute to an effective, efficient and safe Auckland land transport system in the public interest.’

Sections 45 and 46 of the LGACA outline AT’s functions and powers in respect of the land transport system and AT’s role as the Road Controlling Authority (RCA). AT is also deemed a Requiring Authority as a network utility operator under section 167 of the RMA for transport purposes (LGACA Section 47).

In addition, AT is responsible for preparing the RLTP for Tāmaki Makaurau Auckland in accordance with section 13(2)(a) of the Land Transport Management Act (LTMA) 2003 and section 45(a) of the LGACA.

2.2 AMETI History

AMETI has a relatively long history of development, with various forms and options considered. The following sections provide a brief overview of the historical development of AMETI (including its predecessor the Eastern Transport Corridor). It also includes background information on the options and development for AMETI EB2 and EB3R.

2.2.1 Eastern Suburbs Transport Corridor Planning 1955 – 2004

The need for better access between Tāmaki Makaurau Auckland’s south-eastern suburbs and Central Business District (CBD) has been recognised for more than six decades and various investigations have been undertaken in that time, including:

- South-Eastern Motorway, Auckland Regional Planning Authority (Technical Advisory Committee), 1955
- Eastern Corridor, Auckland Regional Authority, 1975
- Eastern Highway designation rolled over into the 1993 Proposed Auckland City District Plan – Isthmus Section. A public challenge eventually led to an Environment Court order in April 1997, preventing the corridor being used as a motorway
- 2002 - Auckland City Council commissioned new studies and investigated future transport demands and broader solutions including a multi-modal transport corridor from Tāmaki Drive through to the Pakuranga Highway
- 2004 - Eastern Transport Corridor (ETC) Recommended Options Report. This report identified the preferred option, as a 27km multi-modal expressway extending from the CBD to Manukau City and included bus lanes between Panmure to Pakuranga

(along Lagoon Drive, Panmure Bridge and Pakuranga Road) now constructed as EB1. It also included bus lanes between Pakuranga and Botany.

2.2.2 AMETI Eastern Busway 2006 – 2014

In 2006, AMETI was initiated as a tripartite partnership between ACC, MCC and the Auckland Regional Transport Authority (ARTA). The partners determined that transport demand management (TDM) and public transport should be given priority, with improvements to address any increase in general traffic demands. Key outcomes during this phase of works included:

- Scheme Assessment Report (SAR) for Package 4 of the AMETI project (now EB2 and EB3) - 2010.
- AMETI became the responsibility of Auckland Transport following the Auckland Local Government Amalgamation in October 2010
- New Zealand Transport Agency (NZTA) approved funding for the construction of AMETI Package 1 - Panmure Stage 1 (Panmure bus/rail Station and Te Horeta Road) - 2011
- In 2012, a work stream was initiated spanning the Panmure to Botany corridor (including EB2 and EB3), which culminated in the AMETI Bus Corridor Optimisation (Project Business Case, Scope and Timing) Report 2014
- Further refinements to the Pakuranga to Botany section of AMETI (now EB2 and EB3) were undertaken during 2010-2013. In particular, the strategic direction for the delivery of bus priority infrastructure along the Panmure to Botany corridor, as part of AMETI, shifted from kerbside “bus lane” facilities to that of a “segregated urban busway” to increase the frequency and reliability of buses.

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AMETI became the responsibility of AT following the Auckland Local Government Amalgamation in October 2010.

In November 2011, the New Zealand Transport Agency (NZTA) approved funding for the construction of AMETI Package 1 - Panmure Stage 1 (Panmure bus/rail Station and Te Horeta Road).

In 2012, a work stream was initiated spanning the Panmure to Botany corridor (including EB2 and EB3), which culminated in the AMETI Bus Corridor Optimisation (Project Business Case, Scope and Timing) Report 2014 (discussed further below in Section 2.2.3).

Further refinements to the Pakuranga to Botany section of AMETI (now EB2 and EB3) were undertaken during 2010-2013, to align with the evolving strategic objectives and direction of transport infrastructure in Auckland. In particular, the strategic direction for the delivery of bus priority infrastructure along the Panmure to Botany corridor, as part of AMETI,

shifted from kerbside “bus lane” facilities to that of a “segregated urban busway” to increase the frequency and reliability of buses.

2.2.3 AMETI Eastern Busway 2014 – 2018

The AMETI “Bus Corridor Optimisation (Project Business Case, Scope and Timing) - Version 5, Final” was finalised by the AT AMETI Project Optimisation Group in 2014. The purpose of the report was to provide NZTA with further information on the strategic planning context, the proposed timing and sequencing and provide the business case for the remaining public transport elements of the AMETI works. The AMETI Bus Corridor Optimisation Report 2014 concluded that a busway (in the form of a RTN between Panmure and Botany) was the most appropriate way to deliver a public transport solution along the AMETI corridor. The AMETI Bus Corridor Optimisation Report 2014 is a key document, together with the SAR (2014) which led to endorsement of AMETI by NZTA in July 2014.

Aurecon and GHD prepared the “AMETI Package 04: Pakuranga Road, Ti Rakau Drive and Reeves Road SAR” in 2014, which built upon previous investigations to determine the preferred transport network configuration, the footprint for land acquisition and costs and effect of the scheme. The preferred option for AMETI Package 04 (now referred to as EB2 and EB3) included:

- The RRF
- A busway in a dedicated corridor on the north side of the road between Panmure and Pakuranga and in the centre of the corridor between Pakuranga and Botany Town Centre
- Improvements to Pakuranga Town Centre including a bus station and access road reconfiguration
- Improvements to local road connections to the corridor
- Cycleways along the length of the corridor
- Enhanced footpaths and berm spaces.

This was followed by a number of detailed studies of alternatives for the RRF and Pakuranga Town Centre busway in 2014 and 2015 to determine the preferred option. These included:

- Reeves Road Option Evaluation Workshop Report (Beca) 2014
- Specimen Design Options Report (Beca) 2014
- Reeves Road Option Evaluation Workshop Report (Beca) 2014
- Reeves Road Prefeasibility Assessment – Modelling and Economics (Beca) 2014
- Pakuranga Advanced Evaluation (Beca) 2014
- Gossamer Drive to Highbrook Drive Link Review 2014
- AMETI Pakuranga Town Centre Alternative Busway Options – Scoping Study (Beca) 2015.

In April 2016, the AMETI “Delivery Strategy Review (Panmure-Pakuranga-Botany Corridor)” by AT, NZTA and AC, considered options for sequencing and timing of AMETI to deliver its outcomes as early as possible and present good value for money.

The preferred sequencing was identified as:

- Panmure to Pakuranga Busway (EB1)

- The RRF, along with Pakuranga Town Centre Busway and Bus Station (EB2, previously known as Stage 2b, Package 1)
- Pakuranga to Botany Busway (EB3, previously known as Stage 2b, Package 2).

In 2016 AT released the AMETI Programme Update. This provided a historical equivalent of an updated Programme Business Case for AMETI. It summarised the business case framework, updated the strategic case and fit of the proposed works to the 2016 organisational and policy context, using an updated evidence base (where relevant), and provided a summary of the process of arriving at this preferred programme. In addition, the following reports were undertaken and provided an assessment of further options and an update of the early SARs.

- AMETI Pakuranga Bus Station Options Report (Aurecon) July 2017
- AMETI Eastern Busway 2 (Pakuranga Town Centre) - Scheme Assessment Update (Beca) drafted 2017/finalised 2018
- AMETI Eastern Busway 3 - Further Options Assessment (Tonkin and Taylor) drafted 2017/finalised 2018
- AMETI Eastern Busway 3 - Scheme Assessment Update Report (Tonkin and Taylor) drafted 2017/finalised 2018.

This resulted in a preferred Option for EB2 and EB3 and the development of concept plans.

AT engaged AECOM in November 2017 to undertake the specimen design, route protection and consenting for EB2 and EB3. As part of this process the following reports were prepared based on the SAR and options reports undertaken between 2014 – 2018:

- AMETI Eastern Busway 2 and 3 - Scheme Design Review Report (AECOM) March 2018
- AMETI Eastern Busway 2 and 3 - Pakuranga Creek Bridge Condition Assessment (AECOM) May 2018
- AMETI Eastern Busway 2 and 3 - Specimen Design Philosophy Statement (AECOM) June 2018
- AMETI Eastern Busway 2 and 3 - Eastern Busway 3 Commercial Section – Further Options Assessment (AECOM) August 2018
- AMETI Eastern Busway 2 and 3 - Addendum to the Eastern Busway 3 Commercial Section (AECOM) June 2018
- AMETI Eastern Busway 2 and 3 - Eastern Busway 2 Further Options Assessment (AECOM) August 2018.

The purpose of these reports was to consider alternatives with the aim to increase efficiencies of the preferred options. The purpose of these reports was to develop the concept design and form the preliminary specimen design for AMETI EB2 and EB3.

Throughout the development and review of the concept design for EB2, an alternative location and design of the Pakuranga Bus Station was developed and the alignment of the RRF was confirmed, as described in Section 4.2.1 of this report. The review of EB3 also confirmed the preferred alignment and determined that a new replacement Ti Rakau Drive Bridge is required.

The AMETI “Bus Corridor Optimisation (Project Business Case, Scope and Timing) - Version 5, Final” was finalised by the AT AMETI Project Optimisation Group in 2014. The purpose of the report was to provide NZTA with further information on the strategic planning context, the proposed timing and sequencing and provide the business case for the remaining public transport elements of AMETI’s planned works. The AMETI Bus Corridor Optimisation Report 2014 concluded that a busway (in the form of a RTN between Panmure and Botany) was the most appropriate way to deliver a public transport solution along the AMETI corridor. The AMETI Bus Corridor Optimisation Report 2014 is a key document, together with the SAR (2014) which led to endorsement of AMETI by NZTA in July 2014.

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- The RRF
- A busway in a dedicated corridor on the north side of the road between Panmure and Pakuranga and in the centre of the corridor between Pakuranga and Botany Town Centre
- Improvements to Pakuranga Town Centre including a bus station, and access road reconfiguration
- Improvements to local road connections to the corridor
- Cycleways the length of the corridor
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This was followed by a number of detailed studies of alternatives for the RRF and Pakuranga Town Centre busway in 2014 and 2015 to determine the preferred option. These included:

- Reeves Road Option Evaluation Workshop Report (Beca) 2014
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- AMETI Pakuranga Town Centre Alternative Busway Options – Scoping Study (Beca) 2015.

In April 2016, the AMETI Delivery Strategy Review (Panmure-Pakuranga-Botany Corridor) by AT, NZTA and AC, considered options for sequencing and timing of AMETI works to deliver AMETI’s sought outcomes as early as possible and present good value for money.

The preferred sequencing was identified as:

- Panmure to Pakuranga Busway (EB1)
- The RRF, along with Pakuranga Town Centre Busway and Bus Station (EB2, previously known Stage 2b, Package 1)
- Pakuranga to Botany Busway (EB3, previously known as Stage 2b, Package 2).

In 2016 AT released the AMETI Programme Update. This provided a historical equivalent of an updated Programme Business Case for AMETI. It summarised the business case framework, updated the strategic case and fit of the programme to the 2016 organisational and policy context, using an updated evidence base (where relevant), and provided a summary of the process of arriving at this preferred approach. In addition, the following reports were undertaken and provided an assessment of further options and updated the early SARs.

- AMETI Pakuranga Bus Station Options Report (Aurecon) July 2017
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- AMETI Eastern Busway 3 - Scheme Assessment Update Report (Tonkin and Taylor) drafted 2017/finalised 2018.

This resulted in a preferred Option for EB2 and EB3 and the development of concept plans to be developed at the Specimen Design stages of the Project.

AT engaged AECOM in November 2017 to undertake the specimen design, route protection and consenting for EB2 and EB3. As part of this process the following reports were prepared based on the SAR and options reports undertaken between 2014 – 2018:

- AMETI Eastern Busway 2 and 3 - Scheme Design Review Report (AECOM) March 2018
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Throughout the development and review of the concept design for EB2, an alternative location and design of the Pakuranga Bus Station was developed and the alignment of the RRF was confirmed. The review of EB3 also confirmed the preferred alignment and determined that a new replacement Ti Rakau Drive Bridge is required.

The scope and key outcomes of these reports are outlined further in the Assessment of Alternatives provided in Section 5 of this AEE.

2.3 AMETI Stages

2.3.1 Historic Staging

AMETI was originally divided into six packages of works. One package (package 5) was comprised of ongoing traffic modelling for the programme as a whole. Initially four packages of physical works were proposed. This was separated into sub-projects for staged implementation over the Panmure, Pakuranga, Botany, Mt Wellington and Sylvia Park areas. The initial packaging and stages of AMETI was:

- Stage 1 – Panmure
- Stage 2A – Panmure to Pakuranga Busway
- Stage 2B – Pakuranga to Botany Busway, Sylvia Park Bus Improvements, Mt Wellington Highway Improvements
- Stage 3 – AMETI Road Extension.

In June 2016 the AT Board via the Delivery Strategy Document updated the project staging to be as follows:

- Stage 1 – Panmure Station, AMETI link Road
- Stage 2A – Panmure Roundabout to Panmure Bridge, Panmure Bridge, Pakuranga Road busway
- Stage 2B – Pakuranga Busway Station, RRF, Pakuranga to Botany Busway, Pakuranga Creek Bridge
- Stage 3 – Morrin to Merton, Quarry Link Road and four-laning of AMETI Link Road
- Stage 4 – Sylvia Park Bus Improvements.

2.3.2 Current Staging

The current AMETI schedule of works involves the stages and projects were previously outlined in Table 1-1 Eastern Busway Consenting Packages.

2.4 Project Delivery Partner

The construction of the Eastern Busway is being delivered by an alliance. AT is working with Fletcher, ACCIONA, AECOM and Jacobs on the Pakuranga to Botany section under the auspices of the EBA.

3 Project Necessity and Objectives

This chapter details the key drivers for the Project and the overarching objectives driving these responses.

3.1 Problem Description

As noted by the Auckland Plan 2050 (the Auckland Plan), Tāmaki Makaurau Auckland’s population is projected to grow over the next 30 years by 760,000 people, with a total regional population of 2.4 million anticipated. This growth will occur across the region, both in existing urban locations, new urban neighbourhoods, some rural areas and outlying settlements. Southeast Tāmaki Makaurau Auckland, which has many established urban centres and suburbs, will be a focus of much of this growth. This growth will occur through the redevelopment and intensification of land uses, which will see increases in apartment buildings, terraced housing and infill subdivision.

One consequence of this population growth is the increased pressure put on infrastructure networks, whether they be utilities, parks or transport. The focus of the EB2 package of the Project is on the transport network present within Pakuranga Town Centre and its immediate surrounds. At present, there is heavy pressure on the existing roads, particularly Pakuranga Road and Ti Rakau Drive, to connect the southeast suburbs to the Auckland motorway network and the Isthmus. Pakuranga Town Centre is a location where these heavy traffic flows are concentrated given the terminus of SEART and its arterial road connections. This congestion affects the efficient functioning of the regional road network and impacts the region’s economic wellbeing, while also being detrimental to the amenity values and functioning of Pakuranga Town Centre itself. Without investment in the transport network, these existing issues would be aggravated by the projected growth, with the current network unable to provide additional capacity.

A key measure to alleviate congestion is the promotion of both public and active transport modes². However, limited bus infrastructure exists at Pakuranga Town Centre, which impacts both the efficiency of bus services and passenger comfort. No dedicated bus lanes are provided through Pakuranga Town Centre, resulting in buses being caught in general traffic congestion and experiencing service delays. The Town Centre’s bus stops are also outdated and in the case of the Brampton Court stop, located in an area with limited passive surveillance or amenities for waiting passengers. These factors hamper the rate of public transport patronage growth. With the completion of the Project, a reliable public transport based 40-minute journey time between Britomart and Botany Town Centre will be provided for, a travel time reduction of 20 minutes. The Project is expected to lead to an increase in public transport trips from 3,700 to 18,000 per day by 2028, representing a mode share increased from 7% to 28%.

The existing transport network is also currently inefficient for both cyclists and pedestrians, due in part to the previous prioritisation of private motor vehicle movements. Currently, poor pedestrian linkages exist across Ti Rakau Drive, Pakuranga Road and Reeves Road for movements to, from and through the Town Centre. These linkages are limited to a small

² Active transport modes are walking and cycling (i.e. without a motor vehicle).

number of both signalised and unsignalised crossings, with subsequent long wait times for crossings.

In addition, while the western periphery of the Town Centre meets the cycle lanes provided as EB1, no dedicated cycle lanes are provided within the Town Centre or at its other margins. As such, cyclists are required to either travel in road lanes with general traffic and/or on footpaths. This current arrangement is unsatisfactory given the potential for clashes between cyclists and other transport modes. As a consequence of the current poor active transport mode infrastructure, there is limited potential for uptake of walking and cycling which then drives greater use of motorised transport modes (and associated congestion).

Finally, an overarching issue caused by the above issues is the greenhouse gas emissions associated with Tāmaki Makaurau Auckland’s transport sector. Transport accounts for 43.6% of the region’s greenhouse gas emissions, with 86% of these emissions arising from road transport³. An important mitigation response to this issue is achieving modal shift from private motor vehicle use to increases in both public and transport modes’ patronage. The Project is a critical part of achieving modal shift, particularly through its planned improvements in bus and active transport infrastructure and is projected to reduce the region’s carbon emissions by 9,929 kg per day by 2028.

3.2 Eastern Busway Project Objectives

Given the above, the Project (including EB2) has been developed to address the above issues through meeting the following objectives:

1. Provide a multi modal transport corridor that connects Pakuranga and Botany to the wider network and increases access to a choice of transport options
2. Provide transport infrastructure that integrates with existing land use and supports a quality, compact urban form
3. Provide transport infrastructure that improves linkages, journey time and reliability of the public transport network
4. Contribute to accessibility and place shaping by providing better transport connections between, within and to the town centre
5. Provide transport infrastructure that is safe for everyone
6. Safeguard future transport infrastructure required at (or in vicinity of) Botany Town Centre to support the development of a strategic public transport connection to Auckland Airport.

Further assessment of EB2 against these objectives is provided as part of the “Assessment of Alternatives” in Section 5 of this AEE. However, to summarise, EB2 has been designed to address these objectives both within the localised and broader network-wide contexts.

³ The greenhouse gas emission values have been referenced from “Auckland’s Climate Plan” published by Auckland Council (2020).

4 Description of the Activity

EB2 consists of the construction and operation of a dedicated busway and associated works within the Pakuranga Town Centre, including the following:

- *Provision of a dedicated bus facility including a major bus station within the Pakuranga Town Centre that links with EB1 (completed) and EB3R (design and consenting phase)*
- *Provision of facilities for buses, general traffic, pedestrians and cyclists along Ti Rakau Drive*
- *The RRF will assist in the relief of heavy traffic flows on Ti Rakau Drive and Pakuranga Road*
- *Provision of facilities for general traffic, pedestrians and cyclists along Pakuranga Road*
- *Improvements to active transport cross-connectivity between Pakuranga Town Centre and the surrounding land uses*
- *Improvements to the safety of the existing transport environment for all users*
- *New landscaping and stormwater infrastructure.*

4.1 Overview

EB2 comprises of a dedicated urban busway within Pakuranga Town Centre, including the new Pakuranga Bus Station, the RRF, pedestrian and cycling facilities, associated changes to the road network and ancillary works.

The description of the proposal has been split into two sections:

- Design and operation
- Construction.

A full set of the proposed plans is provided in Appendix 4: Proposed Plans.

4.2 Design and Operation

EB2 is located within Pakuranga Town Centre and its surrounds as shown in Figure 4-1, with EB2's footprint shown by purple infill. Other Project packages are shown by the figure, including EB3R (yellow fill) and the William Roberts Road extension (dark pink fill). The various components of EB2's operation are detailed in the following sub-sections.



Figure 4-1 Location of Works for EB2

4.2.1 Busway and Pakuranga Town Centre Bus Station

A segregated dedicated two-way busway is proposed along Ti Rakau Drive to provide prioritised access for bus services between Pakuranga and Botany. The busway has been designed to integrate with the existing EB1 busway, which runs between Pakuranga and Panmure town centres. This involves the widening of Ti Rakau Drive to accommodate two new segregated bus lanes, which will run along the north-eastern side of the road corridor (Figure 4-2). These bus lanes will partially occupy land currently used for amenity landscaping and car parking for Pakuranga Plaza. Ancillary to these station works will be the provision of new median barriers, lane changes and new road signs.

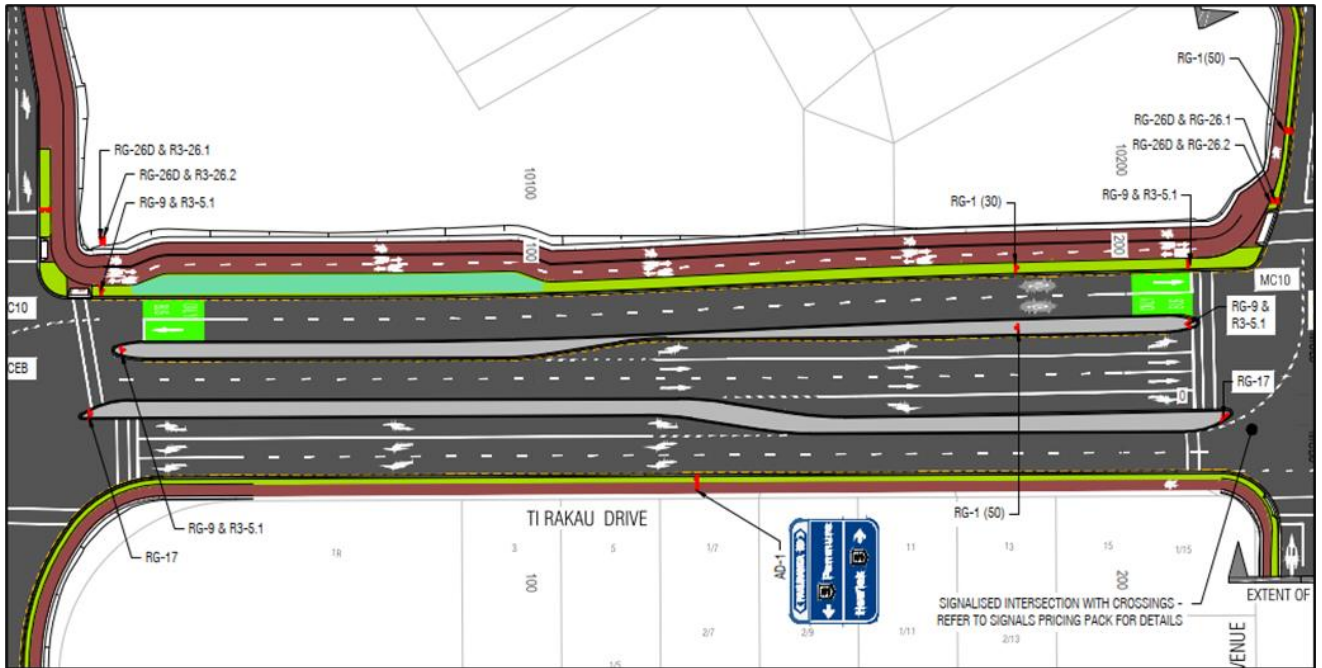


Figure 4-2 EB2 Proposed Layout - Pakuranga Road to Aylesbury Street

From Aylesbury Street, the bus lanes will enter Pakuranga Bus Station. Again, the bus station itself is located on the north-eastern side of Ti Rakau Drive and partially occupies land used for amenity landscaping and car parking associated with Pakuranga Plaza. It also occupies 26 Ti Rakau Drive, with the remainder of that site largely occupied by bike storage facilities and a “kiss and ride” facility. This arrangement is shown in Figure 4-3 below.



Figure 4-3 EB2 Proposed Layout - Pakuranga Bus Station

The bus station includes separate platforms for west-bound and east-bound services. The platforms include standard street furniture, such as shelters, seating, rubbish bins and smart information boards. The bus shelters are single storey, modular structures that will be constructed from a mix of wood panelling, steel roofing and glazed panels (Figure 4-4). The bus station will also feature CCTV and a PA system to monitor passenger safety.



Figure 4-4 Exert of the Front Elevation of East Bound Platform - Pakuranga Bus Station

The bus station will provide bicycle storage. This storage will be located facing Reeves Road, at the south-eastern corner of the station complex. The bicycle storage will initially provide for a series of fixed ground-level bike stands but is future proofed for dual height bike stands should storage demand require it.



Figure 4-5 Bicycle Storage – Pakuranga Bus Station

The bus station will integrate with the wider walking and cycling improvements of EB2. This includes a direct connection to a new bi-directional cycle path beside the east-bound bus lane and signalised pedestrian crossings to both sides of Ti Rakau Drive.

A kiss and ride will enable the drop off of passengers from private and ride share vehicles. The kiss and ride will be accessed from both Aylesbury Street and Reeves Road on an extended Cortina Place, with 5 short-term parking spaces provided for motor vehicles.

The other change associated with Pakuranga Bus Station is the demarcation of Aylesbury Street from car parking for Pakuranga Plaza. This will include new traffic signals at the intersection of Ti Rakau Drive, new road surfacing and an extension of Cortina Place between Reeves Road and Aylesbury Street. These new roading arrangements are also shown in Figure 4-2 and Figure 4-3.

4.2.2 Reeves Road Flyover (The RRF)

The RRF is the largest infrastructure component to the EB2 package. It will involve the visually most significant change to the road network layout at Pakuranga Town Centre, noting that such structures are largely a permitted activity by the AUP(OP), as detailed in Section 7.2.1 of this AEE⁴

Currently, traffic from the east is channelled down both Pakuranga Road and Reeves Road towards SEART during the morning peak, with similar traffic flows in reverse during the evening peak. This peak time traffic pattern results in significant traffic congestion on Pakuranga Road, Reeves Road and Ti Rakau Drive, impacting on travel times and affecting the region's economic wellbeing. Outside these peak times, the traffic volumes on these roads remains high, resulting in diminished amenity for the surrounding sites and poor connectivity within the town centre.

The RRF directly addresses the peak flow movements and will provide a seamless road connection between Pakuranga Road (at the previous Pakuranga Road/Williams Roberts Road intersection) and SEART. This will reduce peak flows at street level and assist the functioning of the busway along Ti Rakau Drive. In addition, by reducing street level traffic flows, the RRF assists in restoring the town centre's amenity values and improving the ability of both pedestrians and cyclists to move more easily through the area.

Moving in a west to east direction, the RRF commences within the current footprint of SEART opposite Paul Place Reserve. Given its footprint, the current eastbound lanes for SEART will be moved northwards into land currently occupied by Paul Place Reserve, the road reserve of Seven Oaks Drive and several residential properties. The NoR for EB2 includes land within both Paul Place Reserve, Seven Oaks Drive and residential sites. This relocation of SEART's eastbound lanes will include a new off-ramp onto Ti Rakau Drive. This roading arrangement is shown in Figure 4-6 and (left) Figure 4-7. The transition between SEART and the RRF will be constructed using engineered fill and a mechanically stabilised earth (MSE) wall, where the RRF begins an upwards grade to allow its main road deck to clear Ti Rakau Drive and Reeves Road.

⁴ The RRF is a road network activity and is provided for as a permitted activity within road corridors as a permitted activity by Rule E26.2.3.2(A67).

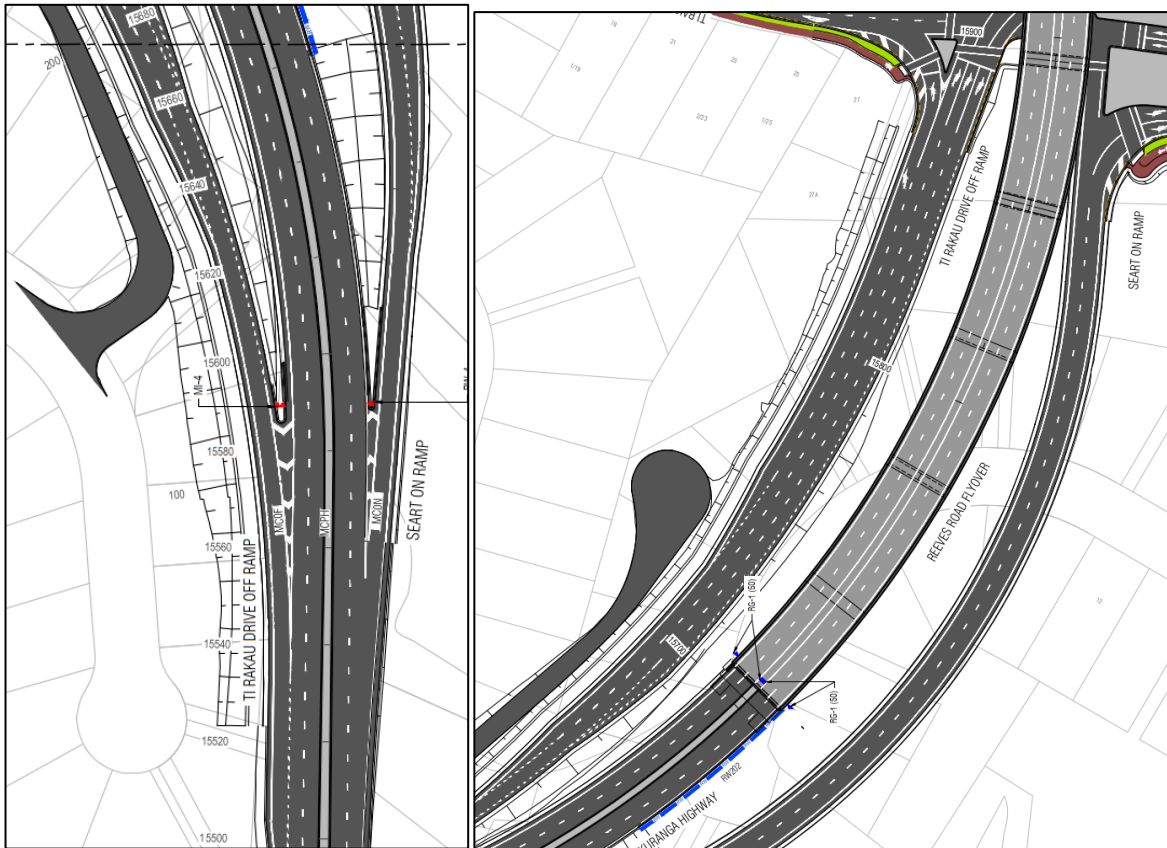


Figure 4-6 SEART Approach to the RRF (left)

Figure 4-7 Commencement of the RRF and New SEART Off-Ramp (right)



Figure 4-8 3D Render of the RRF crossing Ti Rakau Drive looking East towards the SEART/Ti Rakau Drive/Reeves Road Intersection

The RRF crosses Ti Rakau Drive and runs along Reeves Road upon a series of concrete piles. These piles are typically 3m in diameter, reach a depth up 20m below ground level (bgl) and support a road deck approximately 18.4 m wide (excluding side barriers). The road deck contains four traffic lanes, each of which is approximately 3.2m wide. A raised median strip

will separate opposing traffic lanes, while street lighting on frangible (impact absorbing) poles will be installed at regular intervals. The outside edges of the RRF will be delineated with TL5 barriers. A three-dimensional render of the RRF crossing Ti Rakau Drive is provided as Figure 4-8, while a cross-section of the RRF's standard arrangement is provided as Figure 4-9.

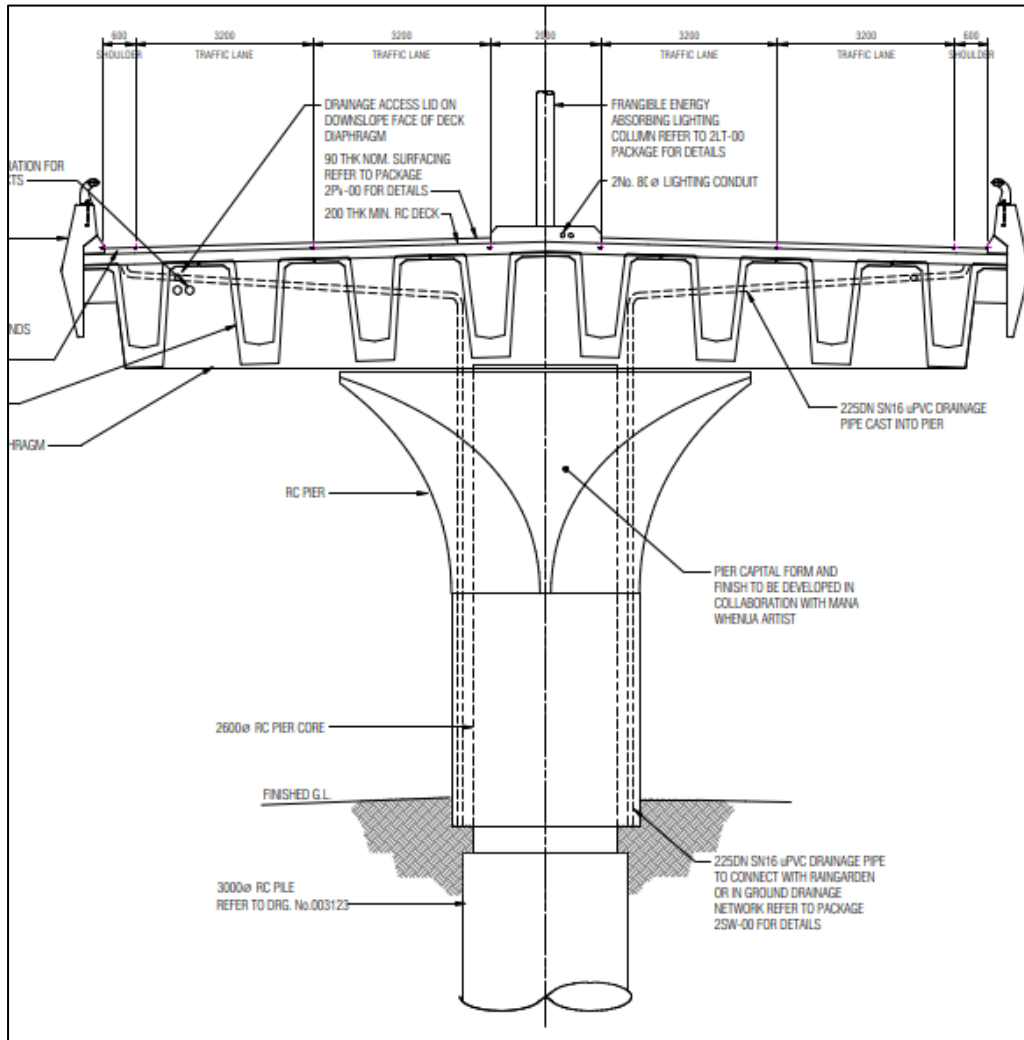


Figure 4-9 Typical Cross Section of the RRF

Moving further east, the RRF returns to close to ground level and runs parallel to the current William Roberts Road alignment on a base of engineered fill and shorter piles. It then connects to Pakuranga Road at a new signalised intersection. To accommodate this new intersection, William Roberts Road North is converted into a cul-de-sac, with a new turning head provided immediately to the east of the new RRF/Pakuranga Road intersection. This new roading arrangement is shown in Figure 4-10.

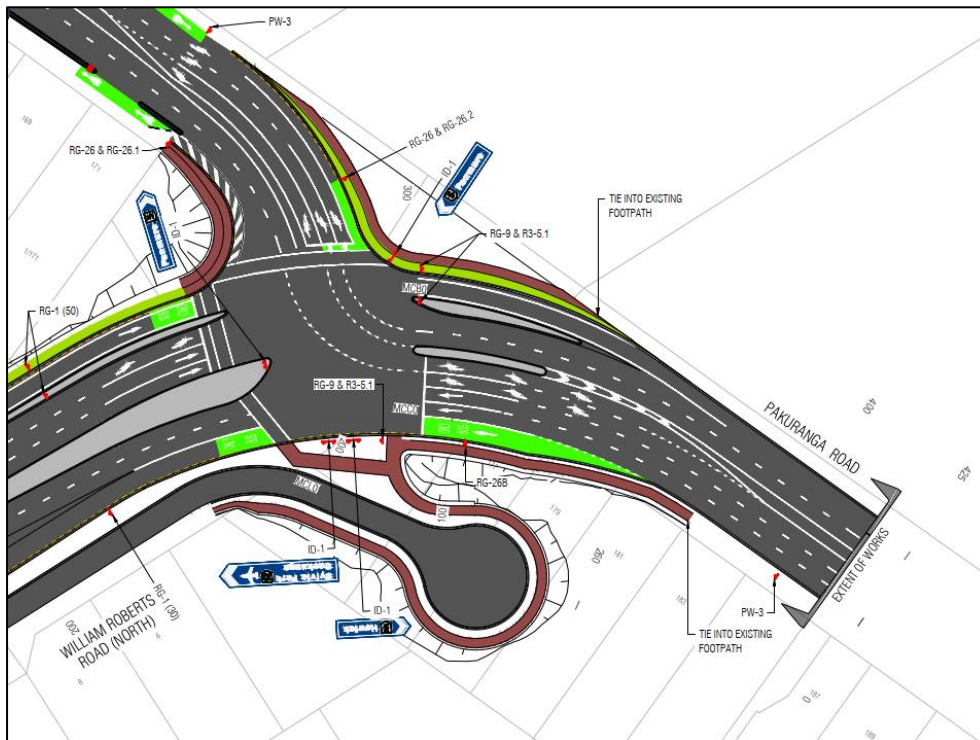


Figure 4-10 the Intersection of the RRF and Pakuranga Road

At surface level beneath the RRF, general traffic lanes will be provided on Reeves Road on the east-bound side, with the west-bound lanes closed to general traffic between Cortina Place and Ti Rakau Drive. However, these westbound lanes will be retained for use by bus services and cyclists.

4.2.3 Walking and Cycling Facilities

A variety of improvements are proposed to support active transport modes to, from and around Pakuranga Town Centre. These include the provision of a bi-directional cycle path beside the east-bound bus lanes along Ti Rakau Drive, uni-directional cycle paths along both sides of Reeves Road, upgraded footpaths within EB2's public road corridors and improved pedestrian linkages across Reeves Road. Pakuranga Bus Station will provide cycle storage within a new shelter.

These improvements will be supported by signalised pedestrian crossings, which will provide for the safe movement of pedestrians across Ti Rakau Drive, Pakuranga Road and Reeves Road. Raised crossings and speed tables will be installed at the intersection of Cortina Place and Reeves Road, as well as at the intersection of Reeves Road and Ti Rakau Drive. These raised crossings and speed tables will assist drivers in recognising that they are entering a lower speed environment that will have higher numbers of pedestrians and cyclists.

These upgraded footpaths and cycle lanes will directly connect with the same facilities constructed as part of EB1, enabling the safe and legible movement of pedestrians and cyclists from Pakuranga Road onto Ti Rakau Drive.

4.2.4 Associated changes to the Road Network

Associated changes to the road network are required to accommodate the dedicated busway, the RRF, walking facilities, and to maintain or provide access to properties. The changes to the road network include:

- Closure of William Roberts Road at Pakuranga Road
- Extension of Cortina Place to meet the extended William Roberts Road
- Realigning Aylesbury Street with Palm Avenue
- Side street tie in works at Palm Avenue, Reeves Road and Ayr Road.

These road network changes will enable the safe movement of pedestrians, cyclists and vehicles to and from Ti Rakau Drive and the side streets identified above. These roadworks will be consistent with AT’s own design guidelines and subject to a safety review as part of the design process.

4.2.5 Landscaping

A range of landscaping is proposed across EB2, as shown in the proposed landscape drawings (Appendix 5: Landscape Drawings). This landscaping has been designed to address the visual and ecological effects of EB2.

The landscaping will be a mix of trees (45L to 160L), shrubs and groundcover, with planting locations influenced by the primary purpose of the landscaping, the provision of safe traffic movements within road corridors and long-term maintenance. The typical arrangement of landscape planting is shown in Figure 4-11 below.

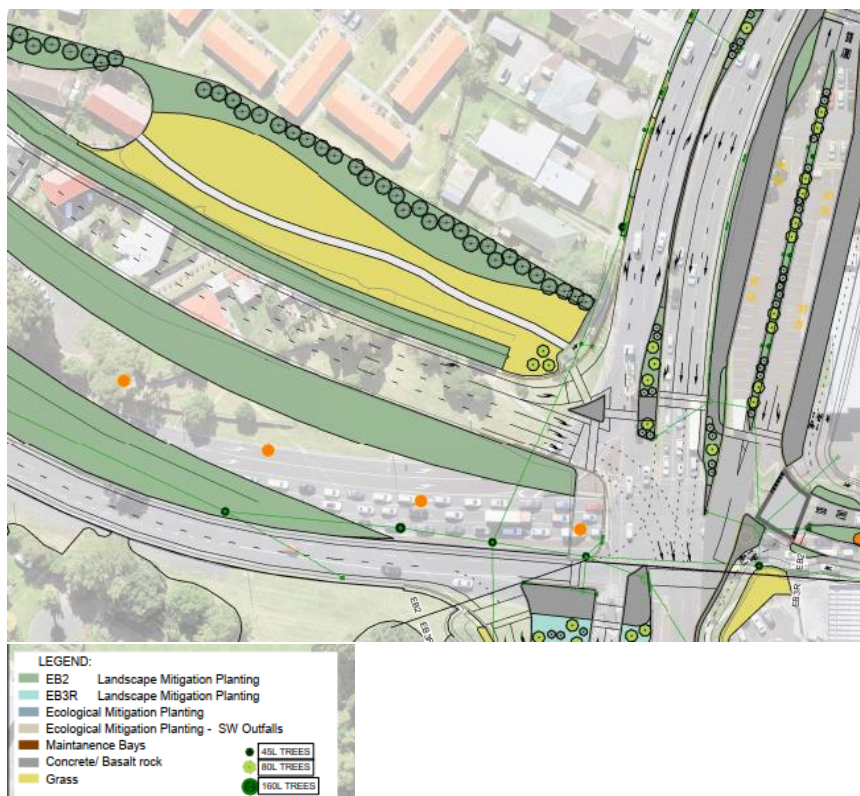


Figure 4-11 Exert of Landscape Plans

4.2.6 Stormwater Management

As detailed in the Stormwater Effects Assessment (Appendix 6: Stormwater Effects Assessment), the EB2 works will involve new and upgraded stormwater infrastructure that will be built and operated in accordance with Council's own Healthy Water's (Healthy Waters) network discharge consent (the NDC). The Project's stormwater design has sought compliance with existing AT standards, the requirements of the NDC and the aspirations of mana whenua. The stormwater design has had to consider the existing hydrological characteristics of the Project area, including the presence of both 1 in 100 ARI flood plains and overland flow paths.

In a practical sense, this design approach has used a best practicable option (BPO) method in determining the stormwater attenuation and treatment methods employed by EB2. In addition, the stormwater upgrades follow, where practical, AT's adopted "maintenance-led" approach to the Project. This involves providing stormwater infrastructure which reduces life-time maintenance/operational costs.

Given the brownfield location for EB2, there are a number of constraints which have impacted the stormwater design, including:

- The presence of major underground utilities
- Topography, particularly the low points along Ti Rakau Drive and Reeves Road
- Limited opportunities for adjustment of the proposed vertical alignment within road corridors
- Capacity issues, as current assets are designed for a 2-Year ARI event.

Taking into consideration the above-mentioned philosophy and constraints, a range of responses are proposed to address EB2's stormwater flows. These works include the construction of new stormwater catchpits, pipes, treatment devices and outfalls. Improvements will be made to existing assets, including outfalls. While the specific stormwater design responses are discussed in significant detail in the Stormwater Effects Assessment, the following provides a brief summary of the design's main elements.

The EB2 footprint will rely on three existing outfalls and two new outfalls, as shown in Figure 4-12⁵. These outfalls all discharge directly to several small branches of the Tāmaki River.

⁵ Outfall MCC_108673 will not receive any stormwater from the Project works, although its location is shown on this figure for completeness.

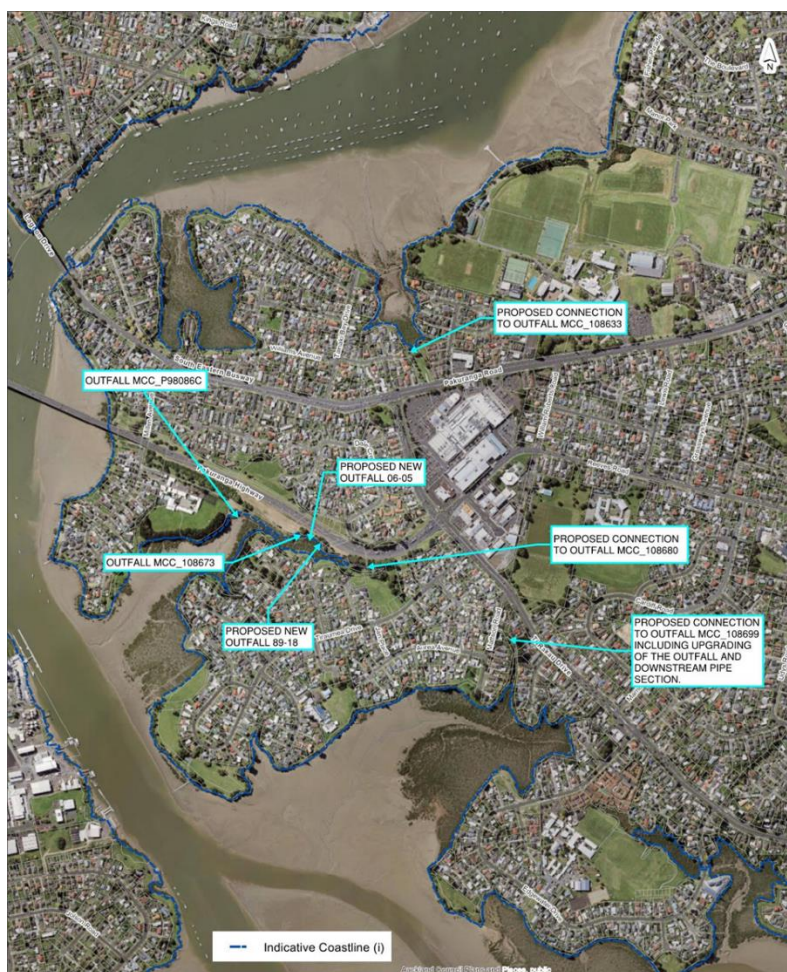


Figure 4-12 EB2 Stormwater Outfalls (Existing and Proposed)

The two new outfalls⁶ will be constructed immediately south of SEART, with their location dictated in part by the need to avoid the Transpower underground electricity transmission cables running along the SEART corridor.

Table 4-1 Summary of Outfalls proposed to receive discharges from EB2 stormwater networks

Outfall	Existing Outfall	Discharges to CMA	Works in CMA	Comment
Outfall MCC_108633	✓	✓	✗	Connection point is in Bus Stop Reserve, approximately 60 m upstream of the outfall. The existing outfall is approximately 1 m from the AUP(OP) indicative CMA boundary. The Project works are not within the CMA.
Outfall 06-05	✗	✓	✓	New outfall and pipe to be constructed approximately 24 m southeast of MCC_108673. The proposed outfall invert level is RL0.73 m which is very close to CMA bed level. The proposed outfall is either on or within the AUP(OP) indicative CMA boundary. The outfall requires CMA bed channel lowering works and erosion and scour protection. The Project works are within the CMA.
Outfall 89-18	✗	✓	✓	New outfall and pipe to be constructed approximately 53 m southeast of MCC_108673. The proposed outfall invert level is RL0.58 m which is very close to CMA bed

⁶ Outfalls 06-05 and 89-18.

Outfall	Existing Outfall	Discharges to CMA	Works in CMA	Comment
				level. The proposed outfall is either on or within the AUP(OP) indicative CMA boundary. The outfall requires erosion and scour protection within the CMA and potentially CMA bed channel lowering. The Project works are within the CMA.
Outfall MCC_108699	✓	✓	✗	The connection point is the last manhole before the outfall. The outfall and the downstream section of pipe is to be upgraded. The outfall is approximately 133 m clear of the AUP(OP) indicative CMA boundary. The Project outfall works are not considered to be within the CMA.
Outfall MCC_108680	✓	✓	✗	The final detailed design is proposed to include modifications to reduce the number of complex and high-risk crossings of the Transpower high voltage cable (critical infrastructure) by stormwater pipes. This will require some project stormwater from westbound lanes of Ti Rakau Drive and the busway to be discharged to this network and some of the network's catchment on the eastern side of Ti Rakau Drive being diverted to another network during larger rainfall events (i.e. part of the peak during larger events will be diverted away from the wetland).

The typical arrangement for these outfalls is shown in Figure 4-13. Generally, the outfalls will feature a culvert discharging via a wingwall. Discharged stormwater will flow downwards across rip rap (or similar), before passing into the CMA. The outfalls have been designed to minimise scouring during storm flows and will be landscaped to integrate into the surrounding coastal landscape.

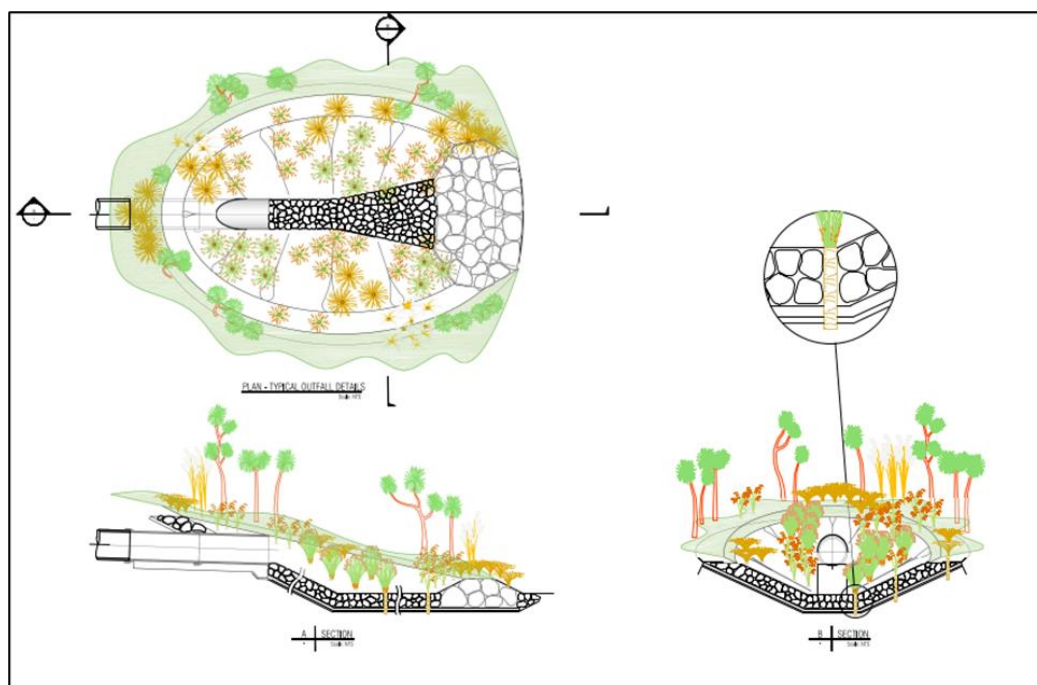


Figure 4-13 Typical Outfall Arrangement

Upstream stormwater works include new pipework and the upgrading of existing stormwater infrastructure to address new stormwater volumes. These works are detailed in Table 4-2.

Table 4-2 Stormwater Network Improvements

Network Name/Location	Details
Existing Outfall MCC_108633 within Bus Stop Reserve.	<p>This new network, which connects to an existing outfall, services a catchment covering the Pakuranga area including:</p> <ul style="list-style-type: none"> • Ti Rakau Drive from Pakuranga Road to and including realigned Aylesbury Street to the adjacent Countdown and half of the kiss and ride area • The intersection of Reeves Road and Pakuranga Road including the RRF eastern abutment • The northern section of William Roberts Road North.
Existing Outfall MCC_108673	<p>Modification of some of the existing drainage upstream of the SEART crossing to retain existing connections from the upstream residential catchment.</p> <p>The 900 mm pipe is not proposed to be upgraded as it has been confirmed that a Transpower high voltage cable joint bay has been built over the pipe. A separate pipe crossing further to the east is now proposed (refer to outfall 06-05).</p>
New Outfall (Outfall 06-05) east of MCC_108673	<p>A new network and outfall for the following areas:</p> <ul style="list-style-type: none"> • Approximately 90 m section of SEART near the RRF abutment • The SEART off-ramp • Approximately 80 m section of the SEART on-ramp • The westbound lanes of SEART, from the Millen Avenue overbridge to the location of the new pipe crossing, serviced by a swale which terminates at the new outfall (06-05) • The eastbound lanes of SEART from the Millen Avenue overbridge to the location of the new pipe crossing.
New Outfall (Outfall 89-18) further east of outfall 06-05	<p>This new stormwater network services the following areas:</p> <ul style="list-style-type: none"> • The southern section of William Roberts Road North • RRF western abutment • RRF • Reeves Road • Most of the SEART on-ramp (approximately 320 m) • Part of Ti Rakau Drive from immediately after the realigned Aylesbury Street/Palm Street to immediately before Mattson Road.
Existing Outfall MCC_108680	<p>A modification to the existing outfall and stormwater network that currently serves residential land south of the SEART, as well as commercial sites between Reeves Road, William Roberts Road and Cortina Place. The network also serves parts of Ti Rakau Drive, Reeves Road, a small section of William Roberts Road and Cortina Place⁷.</p>

⁷ The land serviced by this outfall and network includes parts of the EB3R area.

Network Name/Location	Details
	The design removes Reeves Road, William Roberts Road, part of Cortina Place and part of Ti Rakau Drive from this existing network.
Existing Outfall MCC_108699	<p>The design proposes an independent network that services:</p> <ul style="list-style-type: none"> • William Roberts Road from Ti Rakau Drive up to the Pakuranga Rugby League Club driveway entrance (in Ti Rakau Park) • A section of Ti Rakau Drive from Williams Roberts Road to approximately adjacent 94 Ti Rakau Drive.

Three types of stormwater treatment will be provided, these being:

- Green infrastructure (i.e. swales and bio-retention raingardens) where feasible (i.e. adjacent to ramps, within residual land and some in the busway medians where the width permits)
- Stormwater360 VortCapture™ (or similar approved) gross pollutant traps designed to remove 50% of total suspended solids (TSS) are proposed at the downstream end of each network at each outlet within the road or other locations convenient for maintenance access
- Discretionary targeted treatment of high use roads and carparks, new and redeveloped imperviousness surfaces where necessary to achieve desired reductions of existing contaminant loads. These works will follow the stormwater design philosophy and will be subject to ongoing discussions between mana whenua, Healthy Waters and EBA.

The stormwater treatments for EB2 are summarised in Table 4-3 Summary of Proposed EB2 Stormwater Devices

Table 4-3 Summary of Proposed EB2 Stormwater Devices

Outfall	Treatment Devices	Comment
Outfall 06-05	GPT	GPT for EBA stormwater.
Outfall 89-18	GPT and Raingardens	Raingardens for Reeves Road, RRF and some parts of Ti Rakau Drive (busway and west bound traffic) with a GPT for the entire catchment.
Outfalls MCC_108680	GPT	GPT is designed to remove 50% TSS and is treating both the existing and Project stormwater.
Outfall MCC_108699 ⁸	GPT	GPT is designed to remove 50% TSS and is treating both the existing and Project stormwater.
Outfall MCC_108633	GPT and raingarden	Raingarden only treats small part of catchment (short section of Ti Rakau Drive). GPT treats Project stormwater and designed to removal 50% TSS. Existing network is treated by existing GPT.

⁸ Works to this outfall network are also addressed by EB3R's resource consent application package.

Further detail of the stormwater design, including the location of stormwater works is in Appendix 6: Stormwater Effects Assessment.

4.2.7 Lighting

The EB2 works will feature a mix of lighting types and designs appropriate to location and purpose. All new street lighting will meet AT roading standards and AUP(OP) lux standards. Lighting will be provided around the RRF to minimise potential entrapment areas beneath the structure.

4.2.8 Noise Walls

An assessment of EB2’s operational noise effects has been undertaken and is provided as Appendix 7: Operational Noise and Vibration Effects Assessment. As is described later in this report, noise walls are proposed at 2 Dale Crescent (Figure 4-14) and 23B Dale Crescent (Figure 4-15) to address operational noise effects. These noise walls will be 1.8m high above ground level and be constructed from materials compliant with mitigation requirements of NZS 6806 “Acoustics - Road-traffic noise - New and altered roads”.



Figure 4-14 Noise Wall at 2 Dale Crescent



Figure 4-15 Noise Wall at 23B Dale Crescent

4.3 Construction

The following sub-sections address the methodology employed for the construction of EB2. A detailed methodology is provided as Appendix 8: Construction Methodology and has been summarised below.

4.3.1 Methodology Development

The EB2 construction methodology has been developed through a series of multi-disciplinary exercises and reviews. A number of key drivers have focused the methodology's development, including:

- Construction effects on surrounding properties and businesses
- Seasonal influences on construction
- Optimising construction to meet planned programme delivery dates
- Construction cost
- AT's own construction guidelines and standards.

4.3.2 Management Plan Approach

The construction methodology will employ a number of management plans. These management plans follow those employed for the EB1 works, thereby ensuring familiarity and continuity of construction management for both key stakeholders and the general public. These plans are detailed in Table 4-4.

Table 4-4 Construction Related Management Plans

NoR Related Management Plans	Resource Consent Related Management Plans
Construction Environmental Management Plan (CEMP)	
Community Consultation Plan (CCP)	Lizard Management Plan (LMP)
Construction Noise and Vibration Management Plan (CNVMP) and associated site-specific schedules	Contaminated Land Management Plan (CLMP)

NoR Related Management Plans	Resource Consent Related Management Plans
Construction Traffic Management Plan (CTMP) and associated site-specific plans (ssCTMPs)	Site Specific Erosion and Sediment Control Plans (ssESCPs)
Tree Protection Management Plan (TPMP)	Chemical Treatment Management Plan
Urban Design and Landscape Plan (UDLP)	Habitat Restoration Plan

Copies of most of these management plans have been provided with this AEE. The proposed conditions detail the objectives of each plan, the content required and how the plans relate to each other. In addition, the conditions provide a certification process for the finalisation of the Project’s management plans following the confirmation of the designation and the granting of resource consents.

The CEMP (Appendix 9: Construction Environmental Management Plan) will act as an overarching management plan, with all other management plans sitting beneath it. The management plan framework is shown in Figure 4-16.

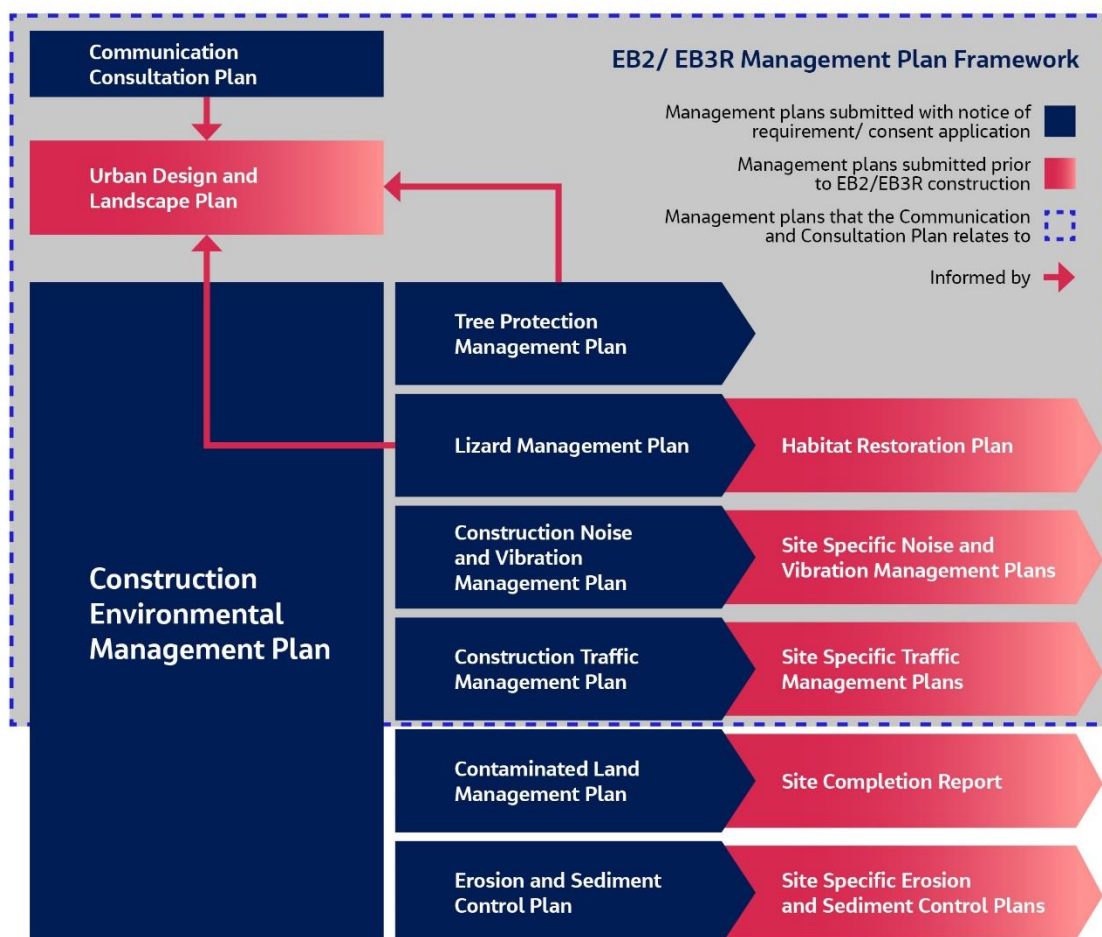


Figure 4-16 Eastern Busway Management Plan Framework

4.3.3 Construction Programme

An indicative programme has been prepared for the whole project. As detailed in Section 1 of this AEE, EB2 is one of four proposed packages across the entire Project footprint. The programme, as shown in Figure 4-17, shows EB2 construction occurring over a period of 46 months (4 years) with works commencing in late 2022.

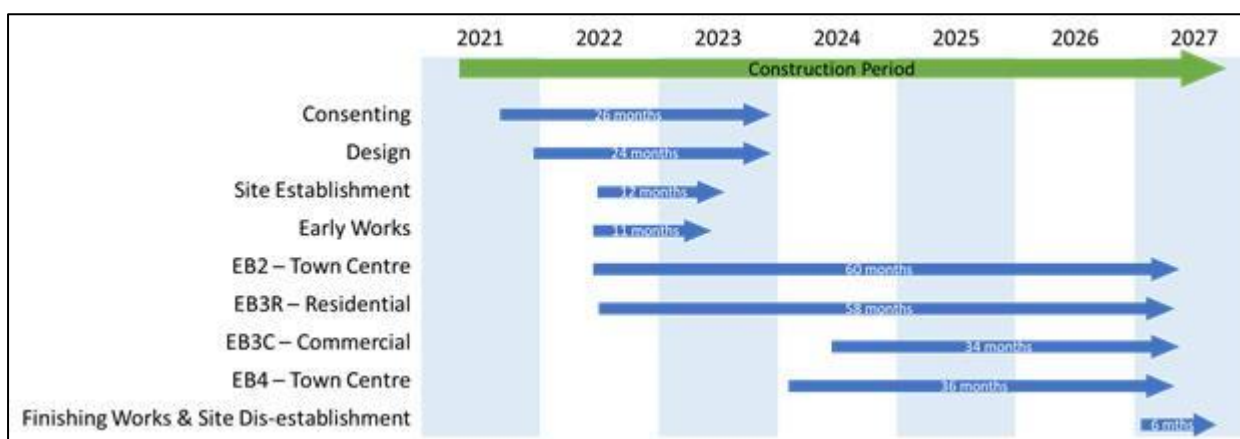


Figure 4-17 Indicative Construction Programme

4.3.4 EB2 Construction Phasing

The construction of EB2 will be broken down into several phases. These phases include works to extend William Roberts Road, which is addressed by a separate resource consent application (AC Reference: LUC60401706). The phases for EB2 are⁹:

- Early Works -
 - Construction of William Roberts Road and Cortina Place extensions¹⁰
 - Utility relocations¹¹.
- Phase One -
 - SEART off-ramp construction
 - Construction of new widening within ‘offline’ areas¹²
 - RRF bridge structure construction.
- Phase Two Construction works to ‘online’ central areas in -
 - Central Ti Rakau Drive, between Pakuranga Road and Reeves Road
 - Central Ti Rakau Drive, between Reeves Road and EB3 boundary.
- Phase Three Construction works to ‘online’ outside areas –
 - Westbound Ti Rakau Drive, between Pakuranga Road and Reeves Road
 - Eastbound Ti Rakau Drive, between Reeves Road and EB3 boundary
 - Construction of Reeves Road / Pakuranga Road Intersection and re-configuration of Pakuranga Road.

Each of these phases will involve a range of typical construction management practices, including traffic management and communication with surrounding businesses and residents. Communication will include details of the timing of works, what (if any) night works are happening, contact details for EBA and temporary site access arrangements. These measures are also included as part of the draft CTMP (Appendix 10: Construction Traffic Management Plan), the Communication and Consultation Plan (CCP) (Appendix 11:

⁹ It should be noted that these constructions phase may overlap.

¹⁰ The extensions of William Roberts Road and Cortina Place are subject to a separate resource consent application (Council Reference: LUC60401706).

¹¹ The utility relocations undertaken as early works are permitted activities and include new combined service ducts, electricity distribution line relocations and relocation of telecommunication fibers.

¹² “Offline areas” refers to works occurring outside current road alignments.

Communication and Consultation Plan) and the proposed conditions (Appendix 3: Proposed Conditions Set).

4.3.5 Construction Access and Parking Arrangements

The construction phase of EB2 will require temporary access for construction activities and surrounding sites. Large infrastructure projects can cause disruption and the construction methodology has been designed to maintain access at all times for both businesses and residents to the extent practicable. The Integrated Transport Assessment (ITA) (Appendix 12: Integrated Transport Assessment) details the various construction access arrangements for EB2 works and surrounding sites. This includes access arrangement changes for several sites within the EB2 works area, including:

- 3 Reeves Road (Gull Service Station)
- 11 Reeves Road (Eastside Pups Dog Grooming and Day care)
- 7 Aylesbury Street and 2R Ti Rakau Drive (The Warehouse and Pakuranga Library)
- 13 Reeves Road (Te Tuhi)
- 141 Pakuranga Road (GAS Service Station).

The construction access arrangements for each of these of sites is detailed below.

4.3.5.1 3 Reeves Road (Gull Service Station)

Access to this service station will be closed during construction, with permanent access also severed given planned dedicated bus lanes on Reeves Road. The service station forms part of a larger site (Figure 4-18) which will retain access from Cortina Place. Discussions are ongoing with the site owner regarding future access arrangements.



Figure 4-18 3 Reeves Road and Gull Service Station (red outline)

4.3.5.2 11 Reeves Road (Eastside Pups Dog Grooming and Day Care)

Works on Reeves Road require the closure of vehicle crossings. Alternative access will be provided via 2 Cortina Place once demolition/deconstruction at 2 Cortina Place is completed. The manoeuvring width between parking spaces to the rear of the property is approximately 8.4m and will be sufficient to accommodate a two-way temporary access, while not affecting on-site parking. This arrangement is shown in Figure 4-19.



Figure 4-19 Construction Access for 11 Reeves Road

4.3.5.3 7 Aylesbury Street and 2R Ti Rakau Drive (The Warehouse and Pakuranga Library)

At present, The Warehouse service entrance is located off Reeves Road, while its undercover carpark is accessed from both a private access road and Reeves Road (Figure 4-20). Pakuranga Library also has a service entrance off Reeves Road, adjacent to the

Warehouse's access.



Figure 4-20 Current Access Arrangements to The Warehouse and Associated Tenancies

During the initial stages of the RRF construction and Reeves Road closure (from June 2023 to April 2024¹³) access will be maintained through the work site to The Warehouse's service entrance. However, the undercover carpark access from Reeves Road will be closed with the secondary entrance from the private access road retained. This arrangement is shown in Figure 4-21. Similarly, the service entrance for Pakuranga Library will also remain open.

¹³ These periods are indicative. EBA is reviewing the design and construction methodology to accelerate construction where practicable.

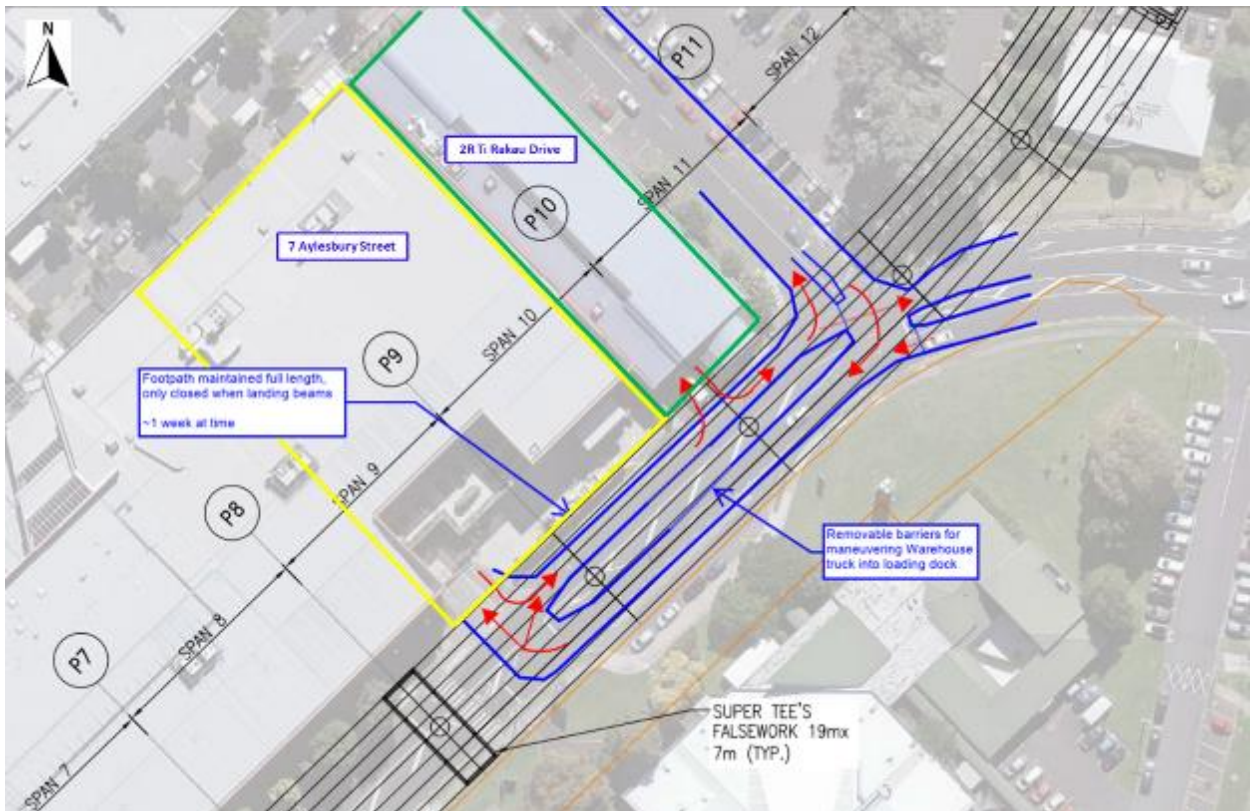


Figure 4-21 Temporary Access Arrangements for The Warehouse, Pakuranga Library and Associated Tenancies

Consideration has been given as to how these service entrances can be operated safely during construction. At present, The Warehouse’s goods access is left-in left-out only, with trucks accessing the site via Reeves Road from the south and exiting to the north. Trucks will access the site from the north on Reeves Road, execute a U-turn and return northbound on Reeves Road towards William Roberts Road during construction.

Removeable barriers will be installed in the median and the existing masonry wall on the property boundary will be removed (if required) to accommodate this manoeuvre. The wall will be reinstated after construction finishes on Reeves Road.

Access to the service entrance of the Pakuranga Library will be from the north on Reeves Road, executing a U-turn manoeuvre at the undercover carpark access. During construction, this access will provide for left-in left-out movements only. Given the nature of the service access and its size, it is expected that a low number of vehicles would require access to this entrance during construction.

4.3.5.4 13 Reeves Road (Te Tuhi).

The main access to the property off Reeves Road will cannot be maintained during the Reeves Road closure. A temporary indented drop-off area will be provided on the western side of William Roberts Road, with a temporary walkway leading around the property to the main entrance (Figure 4-22).

The drop-off will result in the temporary loss of approximately one off-street parking space to the rear of the property and three on-street parking spaces on William Roberts Road. It is

expected that the remaining 12 off-street parking spaces on the property would be sufficient during construction.

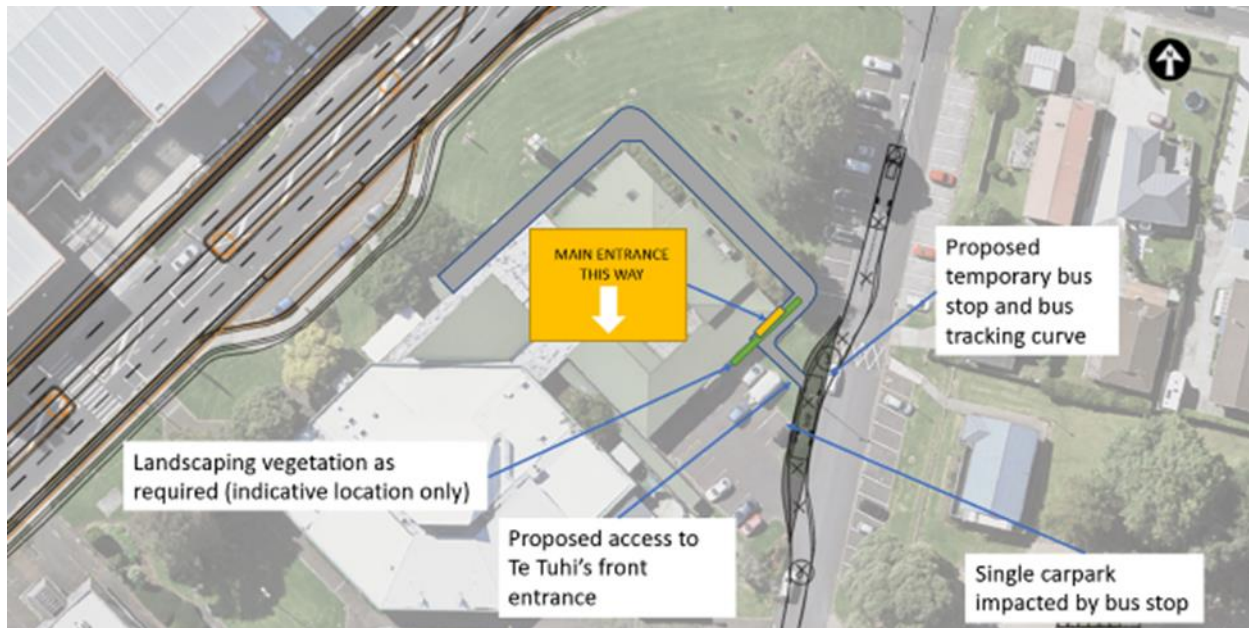


Figure 4-22 Construction Access Arrangements for 13 Reeves Road

4.3.5.5 141 Pakuranga Road – GAS Service Station

Longitudinal drainage works are proposed along Pakuranga Road, including along the front boundary of 141 Pakuranga Road. These works will involve the temporary closure of sections of the westbound kerbside lane. In order to maintain the operation of the GAS service station, access to this site and to Pakuranga Plaza will be provided via Brampton Court (i.e. the rear of the service station). The site's exit via Pepler Street will be maintained at all times via steel plating across the drainage works' trench. In addition, EBA have stated that they will liaise with the GAS service station operator to provide continued access for fuel delivery tankers while works are occurring.

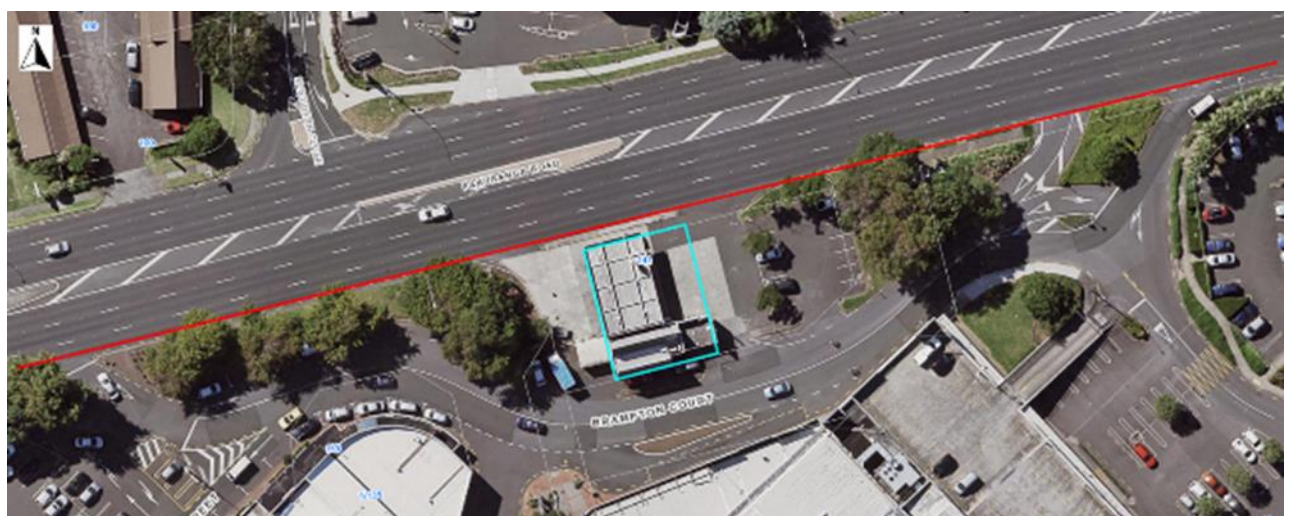


Figure 4-23 Pakuranga Road Longitudinal Drainage Works and GAS Service Station (blue outline)

4.3.5.6 Summary of Site Access Arrangements

The access arrangements proposed in the ITA will be further developed as part of the finalised CTMP and engagement with the individual owners/occupiers.

4.3.6 General Construction Activities and Hours

A range of general construction activities, including early enabling works will be undertaken as part of EB2. These early works will include¹⁴:

- Site investigations and data collection of the existing ground levels & features, pavements, traffic services, lighting, signage, ITS & signal systems, drainage, soil types, potential contaminated lands, and ground water
- Investigation, location, and protection of existing network utility services
- Property surveys of existing houses, buildings, and structures
- Removal of buildings and houses as required
- Site establishment activities in preparation of the main construction works.

In general, construction works will take place between 0700 and 1800 Monday to Friday, as well as 0700 to 1500 on Saturdays. It should be noted that construction shift arrivals and departures will occur outside of these hours, as will the setup and pack up of construction traffic management measures (e.g. road cones and temporary barriers).

The exception to the standard work hours for EB2 is occasional works during night-time, Sundays and public holidays. These work times, while limited, will be necessary where works could cause significant congestion, disruption to local businesses/residents or safety risks to EBA workers if they were carried out during the day on weekdays. These night works are detailed further in Table 4-5.

Table 4-5 Summary of Nightworks

Activity	Equipment Used	Duration at any One Location
Setting out hard barrier lines and general TTM	Traffic management plant/equipment, hiabs, loader, hand tools (fixing pins), generators, lighting towers	0-2 weeks
Tree removal	Tree felling plant/equipment, trucks, lighting towers	0-2 weeks
Demolition of street furniture, retaining wall, barriers	Excavator, saw cutting equipment, trucks	0-2 weeks

¹⁴ In general, these early works are permitted activities under the RMA.

Activity	Equipment Used	Duration at any One Location
Temporary pavement construction, removal of islands, grass medians	Profiler (milling machine), asphalt paver, trucks, bob cat, excavator, compaction equipment (rollers 7-12 tonne roller), saw cutters	0-2 weeks
Asphalt paving (general) including maintenance	Profiler, asphalt paver, trucks, bob cat, sprayer truck, excavator, compaction equipment (rollers 7-12 tonne roller), grader 12ft, saw cutters - floor saw, demo saw, tower lights, generators	0-4 weeks
Maintenance activities	Sweeper trucks, vacuum combi units (catch pit clearing etc), tractor and broom, handheld pneumatic drills and tools, generators, tower lights	0-1week
Island construction - placing precast	Loader, hiab, excavator, hand tools, generators, tower lights	0-4weeks
Road markings	Marking truck	0-1 week
Concrete pours (pier piles, abutment piles, crossheads, decks, pile caps if required, and lean mix subbase pavement)	Concrete trucks, pump, concrete placing equipment (screeds, vibrators, floats), hand tools, generators, tower lights	0-2 weeks (continuously, staged intermittently over the 2023 to 2026)
Barrier installation	Hiabs, cranes, loaders, trucks	0-6 months
Beam erection	Gantry, cranes, jinkers, loaders, hand tools, tower lights	0-1 week
Beam erection	Gantry, cranes, jinkers, loaders, hand tools, tower lights	0-12 months intermittent (not continuous)
Road crossings - utilities and stormwater	Saw cutter - floor saw and demo saw, excavator, compaction equipment up to 2t, trucks, hydroexcavator, generators, lighting towers	0-2 weeks
Cut-ins and cut-overs	Small to medium mobile crane, excavator 20t, welders, watercarts, hand tools, generators, lighting towers	0-1 week

Activity	Equipment Used	Duration at any One Location
Traffic signals, street lighting, ITS, signal loop relocations	Hiab, small mobile crane, excavator, compaction equipment up to 2t, saw cutting - floor saw and demo saw	0-2 weeks
General long weekend BLITZ works - ducting, stormwater, pavement etc	Profiler, asphalt paver, trucks, bob cat, excavators, compaction equipment (rollers 7-12 tonne roller), saw cutters - floor saw and demo saw, generators, lighting towers	0-4 weeks
Relocation of houses	House removal truck (low loader), generators, lighting towers, hand tools	0-1 week

Any night works will be managed through the CTMP, CNVMP, CCP and site-specific measures. This includes clauses of those management plans that require engagement with neighbouring residents and businesses. Further discussion of these matters is provided in Section 9.

4.3.7 Construction Yards and Offices

The Project's construction will be based around a primary construction yard, with a number of smaller secondary sites located within the EB2 area. The primary yard will be located at 169 – 173 Pakuranga Road on land that will be occupied by the RRF/Pakuranga Road intersection at the Project's completion¹⁵. As this site is subject to a resource consent application (AC Reference: LUC60403744) further detail can be found in that specific application.

The primary construction yard will feature staff ablutions, spoil storage, aggregate silos and four parking spaces. The remainder of the site will be either asphalted or gravelled to provide storage areas for construction materials and equipment. The site will be occupied until it is required for the completion of the RRF.

In addition to the primary construction yard, three site offices will be employed within the EB2 area. The first of these is located at 5 Reeves Road and acts as an office for EBA staff (Figure 4-24). This site will be accessed directly off Reeves Road and use the existing two-storey commercial building for general EBA office activities.

¹⁵ The western half of the site will be returned to owner for redevelopment.

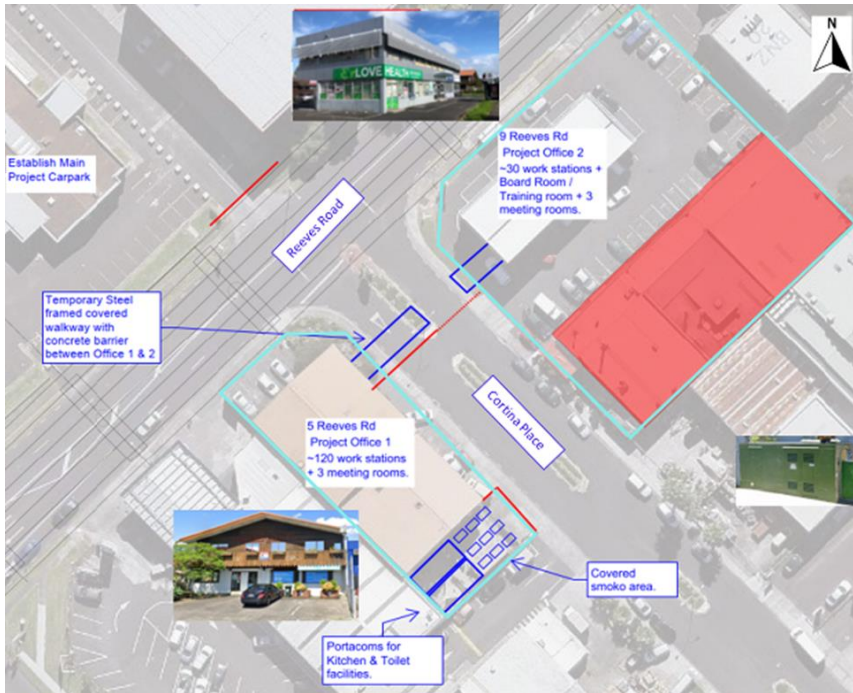


Figure 4-24 Location of Reeves Road Satellite Offices¹⁶ 5 Reeves Road will also be used to house a bentonite/polymer slurry plant, which will produce bentonite/polymer for the RRF’s construction (Figure 4-25). The plant will consist of 40 FT containers, pumps and valves which are approximately 36m by 14m. There will be several Jinker Carrying Super Tee’s required for the functioning of the plant. The plant will include a sediment tank and desander that removes impurities from the bentonite so that material can be recycled and used again. The plant will operate for approximately nine months, commencing July 2023.

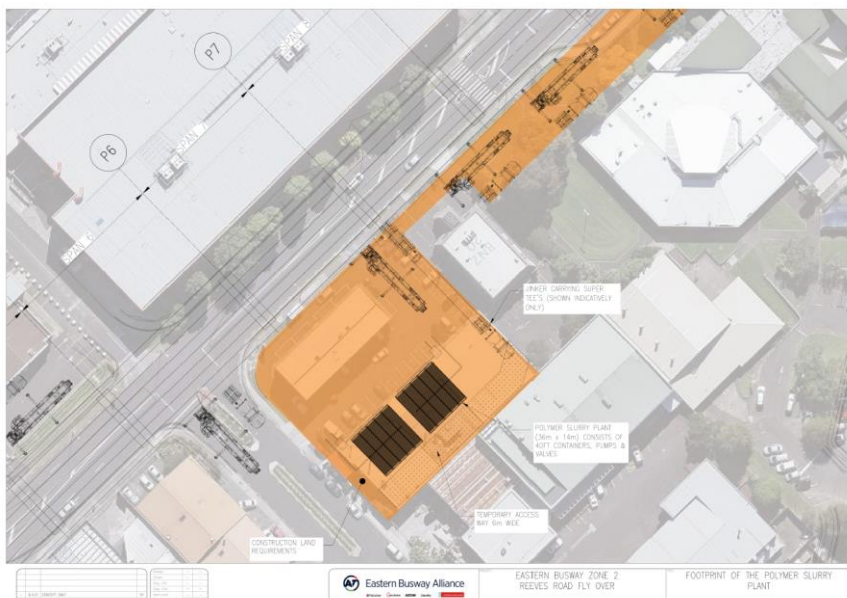


Figure 4-25 Bentonite/Polymer Plant Layout

The second of these offices will be located at 9 Reeves Road (Figure 4-24) and will also be used for office-based activities.

¹⁶ The area highlighted in red features a building which will be demolished during EB2’s works.

The third of these offices will be located at 14 Seven Oaks Drive (Figure 4-26), which is located immediately to the north of SEART. This site will act as a satellite office and will use the existing house and driveway off Seven Oaks Drive until the site is cleared for the new SEART off-ramp.



Figure 4-26 Location of Seven Oaks Drive Site Office

A construction support site will also be established off Pennell Place (Figure 4-27). This site will be used to support the construction of the RRF. In particular, it will be used to receive and pre-assemble the special gantry crane to be used to lift and position the RRF’s beams. It will also provide parking on site for specialist personnel and deliveries. The Pennell Place site will be occupied for approximately two years and two months. The retired flag poles which border Pennell Place will be removed prior to construction works commencing.



Figure 4-27 Secondary Site off Pennell Place

The final construction support site for EB2 will be located at 12 Bolina Crescent. This site will support works to SEART, including construction of the two new stormwater outfalls.



Figure 4-28 Secondary Site at 12 Bolina Crescent

4.3.8 Site Clearance

EB2 will require the removal through demolition and/or deconstruction of approximately 50 dwellings and 3 commercial premises.

Existing houses will be uplifted and removed for reuse wherever practicable. Where it is not possible to undertake relocation, EBA will seek to undertake deconstruction as opposed to demolition. Deconstruction will enable the recycling of building materials (e.g. window frames and roofing), with demolition used as the last practicable option.

In all instances, site clearance is subject to control under the CEMP, CTMP and CNVMP. Dust control will also be employed to minimise dust generation during any demolition or deconstruction activities.

4.3.9 Earthworks

A range of earthworks is proposed including those for site clearance, underground utilities, road batters and the RRF. While land disturbance has been minimised, wherever possible, EB2 will require approximately 35,000 m² of land disturbance. The volumes of fill and spoil generated by these works is provided in Table 4-6.

Table 4-6 Summary of Earthworks for EB2

Area	Cut Material m ³	Fill Material m ³	Earthworks Area m ²	Estimated Earthworks Duration
SEART Off Ramp	4,000	4,400	17,000	14 days

Area	Cut Material m ³	Fill Material m ³	Earthworks Area m ²	Estimated Earthworks Duration
RRF abutment ramps (north and south) and William Roberts Road cul-de-sac	15,675	15,900	13,000	74 days
Ti Rakau Drive Widening, Pakuranga Plaza (Including Milling Operations)	11,800	400	5,000	15 days
Main Site Construction Yard	0	200	N/A	N/A
Trenching Operations	Cut to fill trenching operations estimated 8,825	1,100	N/A	Trenching operations sequenced throughout project
Total	30,000	22,000	35,000	103 days

All earthworks will be subject to the Project’s ESCP (Appendix 13: Erosion and Sediment Control Plan), which has been prepared in accordance with Auckland Council’s Guidance Document 05 “*Erosion and Sediment Control Guide for Land Disturbing Activities in the Auckland Region*” (GD05). The erosion and sediment controls for EB2 is further discussed in Section 9.4.4, with the related proposed conditions provided in Appendix 3: Proposed Conditions Set.

There may be the need to manage potential ground contamination and ensure that any imported fill is brought in from appropriate sources. As detailed in Section 6.8 and the Contaminated Land Effects Assessment (Appendix 14: Contaminated Land Effects Assessment), there are potential sources of ground contamination within the EB2 area. These sources include old commercial sites in Cortina Place and service stations. Given this, the earthworks for EB2 will also be subject to the draft CLMP (Appendix 15: Contaminated Land Management Plan), which has been prepared in compliance with relevant New Zealand standards. The proposed condition set (Appendix 3: Proposed Conditions Set) includes appropriate soil testing, reporting and certification of its disposal.

An accidental discovery protocol will be employed to address the disturbance of any previously unknown contamination or archaeological material.

4.3.10 Vegetation Alteration and Removal

A range of vegetation alterations and removal will be necessary for EB2's construction. An Arboricultural Effects Assessment has been undertaken for EB2 (Appendix 16: Arboricultural Effects Assessment) which has identified the following tree works that require resource consent, recognising that no works are proposed to notable trees¹⁷.

Table 4-7 Tree Works Requiring Resource Consent

	Remove	Retain	Total
Road Reserve	50	130	180
Reserve	11	55	66
Joint/Unclear	N/a	3	3
Total	61	188	249

Table 4-8 Tree Works That Do Not Require Resource Consent

	Remove	Retain	Total
Road Reserve	12	10	22
Reserve	3	1	4
Private (Residential Zone)	162	155	317
Joint/Unclear	N/a	1	1
Total	177	167	344

In addition to the above tree removals, vegetation clearance will be required for the new and upgraded stormwater outfalls, as shown in

Table 4-9.

Table 4-9 Summary of Vegetation Clearance for Stormwater Outfalls

Outfall Reference	Vegetation Clearance Required (m ²) – Within the CMA	Vegetation Clearance Required (m ²) - Outside the CMA
P98086C	800	N/a
New outfalls 06-05 and 89-18. MCC_108673	3,462	370
MCC_108699	N/a	750
Total	4262	1120

¹⁷ Notable trees are identified in the AUP(OP) and discussed further in Section 6.14.

These vegetation works will be subject to a range of controls and mitigation. Works on trees will be subject to the draft TPMP (Appendix 17: Tree Protection Management Plan), as required by AT's proposed conditions (Appendix 3: Proposed Conditions Set), which include:

- Undertaking most rootzone works with hand-held tools (e.g. spades, hydro excavation)
- Minimising the removal of roots greater than 35 mm in diameter where practical
- Wrap tree roots in protective materials until the worked area is backfilled
- Minimising vehicle movements within root zones, unless temporary load bearing surfaces have been installed
- Avoiding tree removals during bird nesting seasons and/or undertaking bird nesting surveys of affected trees prior to their removal.

The EB2 stormwater works will require a broad range of vegetation to be cleared to both enable the construction of the new and upgraded stormwater assets. This clearance will involve mature trees, mangroves within the CMA and terrestrial undergrowth.

This vegetation clearance will be off-set by a variety of mitigation plantings, as shown in the proposed landscape drawings. 1.15 ha of ecological mitigation planting will be undertaken in the EB2 area, as detailed in Section 9.4.5 and the proposed conditions. The purpose of this mitigation planting is to provide replacement habitat for native species and in particular, native reptiles. This planting forms part of the Project's Lizard Management Plan (LMP) (Appendix 18: Lizard Management Plan), as does lizard capture and relocation. Landscape specific measures in the LMP include:

- Detail of the restoration required at each site to replace and enhance lizard habitat including the planting design (including vegetation to be retained), and supplementary refuges
- Details of fencing to protect and demarcate plantings (where appropriate)
- A programme of establishment and post establishment protection and maintenance of plants (fertilising, weed removal/spraying, replacement of dead/poorly performing plants, watering to maintain soil moisture, maintenance programme)
- A requirement to maintain plantings for 10 years
- Details of the proposed plant species, plant sourcing (locally Eco Sourced native pioneer species that are adapted to the Auckland environment are preferred in the first instance), plant sizes at time of planting, density of planting and timing of planting.

It is noted that the restoration planting will also be subject to a habitat restoration plan, as detailed in the proposed conditions.

4.3.11 Piling

As detailed in the Groundwater Permitted Activity Assessment (Appendix 19: Groundwater Permitted Activity Assessment) the construction of the RRF will require piling to ensure its structural stability. In order to avoid dewatering, drilling fluids will be used to maintain hydrostatic pressure and avoid groundwater infill of the piles. As such, dewatering will not be required nor any diversions of groundwater flows.

5 Assessment of Alternatives

5.1 Introduction

This section provides an overview of the alternatives considered for the Project, with a focus on EB2.

Figure 5-1 provides a summary of the historical considerations and the alternative assessments undertaken, and sections 5.3 to 5.5 details the key option evaluation and Multi-Criteria Analysis (MCA) processes undertaken including the assessment criteria and project objectives considered.

Section 5.3 provides a summary of the Historic Options development and provides details of the Options Assessments undertaken in 2018 which identified the RRF and busway on Ti Rakau Drive as the preferred options along with the location of the bus station within the Pakuranga Town Centre and proposed bus routes connecting Ti Rakau Drive with Pakuranga Road via Reeves Road.

Section 5.4 and 5.5 provides a summary of the options assessment undertaken by EBA and how the historic options assessment was considered and how the further options and design elements have been considered. A detailed Options Assessment report is attached at Appendix 20: Options Assessment.

This section identifies the preferred option for EB2 and demonstrates that the preferred option is reasonably necessary for achieving the Project objectives, as set out in Section 2 of this AEE.

5.2 Statutory Requirement to Consider Alternatives

5.2.1 NORs

Section 171(1)(b) of the RMA requires that when considering a NoR (and any submissions received), the territorial authority (in this case, AC) must, subject to Part 2 of the RMA, consider the effects on the environment of allowing the requirement. In so doing it must have particular regard to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if:

- *The requiring authority does not have an interest in the land sufficient for undertaking the work; or*
- *It is likely that the work will have a significant adverse effect on the environment.*

While much of the work will be undertaken within Council owned land, road reserve under the management of AT, and on land acquired by AT over a number of years, AT does not own all of the land required for undertaking the work and therefore does not have an interest in all of the land sufficient for undertaking the work. The properties which AT does not have an interest in are outlined in Section 6.6 of this report and the NoR.

The effects of EB2 on the environment are considered in Section 11 of this AEE, with overall effects on the environment considered to be acceptable. It is therefore likely that the work will not have a significant adverse effect on the environment for the purposes of s 171(1)(b).

Given that AT does not have an interest in all of the land required for undertaking the work, consideration has been given to alternative sites, routes, or methods of undertaking the work.

5.2.2 Resource Consents

Schedule 4 of the RMA requires that an assessment of alternatives is undertaken in specific instances, namely:

- *Where it is likely that an activity will result in any significant adverse effect on the environment, alternative locations or methods for undertaking the activity must be described (Clause 6(1)(a)); and*
- *Where the activity includes the discharge of any contaminant, any possible alternative methods of discharge, including discharge into any other receiving environment must be described (Clause 6(1)(d)(ii)).*

As noted in Section 11 of this AEE, EB2 will not result in any significant adverse effects to require a description of alternative locations or methods under clause 6(1)(a).

The latter consideration aligns with the requirement under section 105, under which the consent authority in considering an application for a discharge or coastal permit must, in addition to the matters in section 104(1), have regard to any possible alternative methods of discharge, including discharge into any other receiving environment.

For the resource consent applications (including discharge permit applications), the available choice of locations or methods is constrained by the location of the proposed RRF for which the designation is sought and for which extensive consideration of the route has been undertaken and by the location of existing infrastructure and the CMA. As such, the alternatives to be considered in relation to both the designations and resource consents must align. Detail on the proposed methods for discharges are contained within the Stormwater Effects Assessment and the Contaminated Land Effects Assessment (Appendix 6: Stormwater Effects Assessment and Appendix 14: Contaminated Land Effects Assessment) supporting this AEE.

5.3 AMETI Historic Options Development

As outlined at section 2.2, AMETI Programme History, of this report the Project has a relatively long history of development with various forms and options considered. Section 2.2 provides a summary of the 'Eastern Transport Corridor Planning 1955 – 2004', 'AMETI Eastern Busway 2006 – 2014' and the 'AMETI Eastern Busway 2014 – 2018'. Figure 5-1 provides an overview of the exhaustive investigations undertaken since 2014, while Table 5-1 provides a summary of the identified outcomes from these investigations.

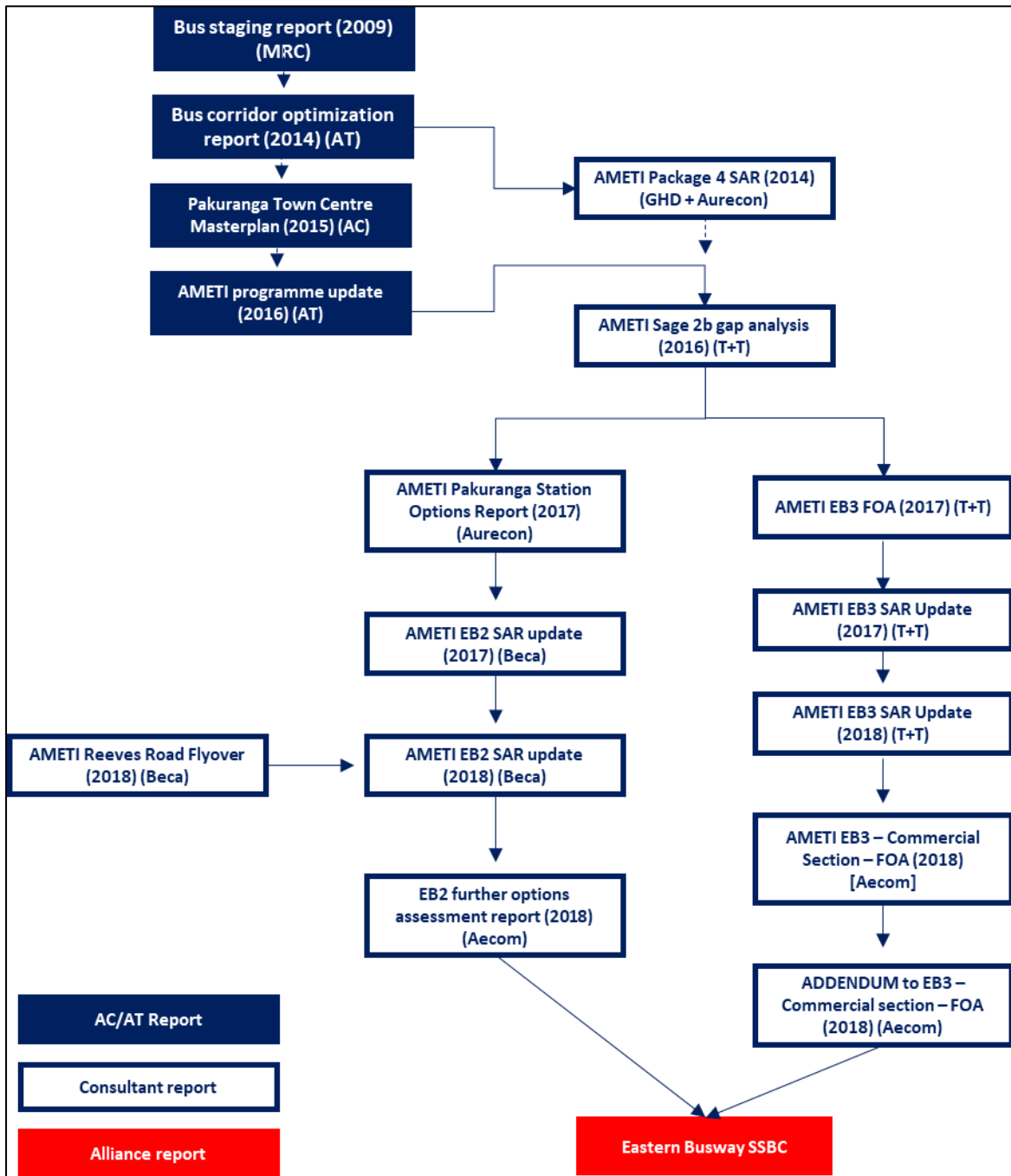


Figure 5-1 Previous investigations

Table 5-1 Summary of previous investigations

Investigation	Outcome
Bus Staging Report (2009)	Identification of the form and function of the wider Auckland Rapid Transit Network.
AMETI Bus Corridor Optimisation Report (2014)	Development of the AMETI programme (including development of the 'do minimum' scenario) and initial programme cost estimate.
AMETI Package 4 Scheme Assessment Report (2014)	Developed the original scheme design and updated cost estimate. The preferred Option included: the RRF; a dedicated busway in the centre of the corridor between Pakuranga and Botany Town Centres; and improvements to Pakuranga Town centre, including a bus station and access road reconfiguration.
Pakuranga Town Centre Masterplan (2015)	AC prepared masterplan outlining the vision for the development of Pakuranga Town Centre
AMETI Programme Update (2016)	Update to the AMETI project including development of programme problem and benefit statements and project objectives
AMETI Stage 2b GAP Analysis Report (2016)	Review of previous SAR and identification of aspects requiring further investigation
AMETI Pakuranga Bus Station Options Report (July 2017)	Development of 4 options for the development of the Pakuranga Bus Station. The Technical Preferred Option is Option 2 ("lollipop" roundabout design)
AMETI Eastern Busway 2 (Pakuranga Town Centre) - Scheme Assessment Update 2017	SAR update to reflect further option development and assessment undertaken.
AMETI Eastern Busway 3 - Further Options Assessment (March 2017)	Development and assessment of 28 shortlist options for EB3. Identification of a Technical Preferred Option for each section. This process identified the Ti Rakau Drive Busway with RRF and a bus station in Pakuranga Town Centre as the preferred option.
AMETI Eastern Busway 3 - Scheme Assessment Update Report (May 2018)	Updated SAR based on 2017 FOA. SAR documents construction considerations and specialist assessments.
AMETI Eastern Busway 2 (Pakuranga Town Centre) - Scheme Assessment Update (May 2018)	SAR update included the identification and assessment of 21 longlist and 6 shortlist options. Identification of an emerging option being the Ti Rakau Drive Busway with RRF and a bus station at Pakuranga Town centre.
AMETI Reeves Road Flyover - Specimen Design Value Engineering Report (Feb 2018)	Identification and assessment 6 options for the design and construction of the RRF. Identification of an emerging option
AMETI Eastern Busway 2 - Further Options Assessment (Aug 2018)	Additional analysis and MCA assessment of EB2 options identified in May 2018 FOA for determining the preferred bus route around the town centre, with minor alterations made to previous options. Separate MCA on bus station location based on locations proposed in the 3 shortlist options for bus routes. Technical preferred option is Option 3
Eastern Busway 3 Commercial Section - Further Options Assessment (Aug 2018)	Development and assessment of 3 shortlist options for EB3C to reduce impact on adjoining commercial properties. Option 1 is a refinement of the Technical preferred option in the 2018 EB3 SAR whilst options 2

Investigation	Outcome
	and 3 are elevated structures. Option 1 identified as the emerging option (note: this FOA was for EB3C).
ADDENDUM to Eastern Busway 3 Commercial Section - Further Options Assessment (2018)	Updates project risks, costs and consenting requirements for EB3C.

The following discussion provides more detail on two of the key investigations undertaken in 2018 as set out in the table above. Following the identification of the Ti Rakau Drive Busway with RRF and a bus station in Pakuranga Town Centre as the preferred option in 2017, in 2018 additional FOAs were undertaken using the MCA process to consider if further improvements to bus travel times, efficiency and reliability of the network, and better urban outcomes for the Pakuranga Town Centre could be achieved. These were:

- The AMETI Eastern Busway 2 (Pakuranga Town Centre) Scheme Assessment update (May 2018) involved a Further Options Assessment (FOA) and is summarised at Section 5.3.1. The preferred option from this Assessment was that the Ti Rakau Drive Busway with the RRF be taken forward for development (i.e. the scheme described in this AEE).
- In addition, the AMETI Eastern Busway 2 Further Options Assessment August 2018 (Aug 2018 FOA) report further developed the Ti Rakau Drive Busway with RRF and a bus station in Pakuranga Town Centre. This Further Options Assessment considered alternative bus services arrangements, different traffic lane configurations and bus station configuration. The Aug 2018 FOA is summarised at section 5.3.2

5.3.1 AMETI Eastern Busway 2 (Pakuranga Town Centre) Scheme Assessment Update – (May 2018)

The May 2018 FOA¹⁸ reviewed the work undertaken by AT up to and prior to 2018 and undertook a further evaluation of options through an MCA process. The short-listed options (SLP 1 – 6) considered were:

- SLP1 - A dedicated busway crossing the Ti Rakau Drive/ Pakuranga Road intersection at grade
- SLP2 - A Busway along Ti Rakau Drive including a Reeves Road tunnel for traffic
- SLP3 - A Busway along Ti Rakau Drive including a RRF for traffic
- SLP4 - A Grade separated Ti Rakau Drive Busway tunnel/trench from Pakuranga Road to Mattson Road
- SLP5 - A dedicated two-way busway along the northern side of Pakuranga Road that continues through to a new signalised intersection of Pakuranga Rd with Steeple Rise and the busway (botany buses travel along William Roberts Road
- SLP6 - A dedicated busway along the northern side of Pakuranga Road through a tunnel which exits at the intersection of Steeple Rise and Pakuranga Road (Botany buses travel along William Roberts Road).

Options SLP1, 4, 5 and 6 were not carried forward as they did not meet with or scored poorly against the project objectives.

¹⁸ AMETI Eastern Busway 2 (Pakuranga Town Centre) Scheme Assessment Update (May 2018) including May 2018 Further Options Assessment – This report includes the Project Objectives and Assessment Criteria considered in the Further Options Assessment.

Both Option SLP2 and SLP3 scored well in relation to operational transport benefits, and therefore transport related objectives, which was considered as being critical for a transport project. Key transport objectives for the Project relate to integrated transport infrastructure, improved linkages, and better transport connections.

Overall, the benefits of the tunnel Option (SLP2), relative to the flyover option (SLP3) include:

- Better scores in relation to the built environment
- Fewer permanent effects associated with activities/ use
- Better public space outcomes
- Less visual impact.

However, relative to the viaduct option (SLP3), the construction of a tunnel (SLP2) was assessed as resulting in greater construction effects, including:

- Traffic impacts
- Greater impacts on below ground services
- Greater technical risks
- Increased stormwater and air quality impacts
- Long term impacts on groundwater
- Greater cultural heritage impacts due to the greater volume of earthworks.

On balance, the positive and adverse effects of both the tunnel and viaduct option were considered to be similar overall, albeit with slight differences. The May 2018 FOA noted that it was difficult to demonstrate the value of investing in the additional cost (approximately \$200M) for the tunnel option as the overall benefits and disbenefits of both options were assessed as being largely comparable. For this reason, the May 2018 FOA determined that the preferred option was SLP3 - Ti Rakau Drive Busway with the RRF and a bus station in Pakuranga Town Centre (PTC).

The preferred option also included the preferred bus station location identified within the AMETI Pakuranga Bus Station Options Report (July 2017) shown in Figure 5-2 below.



Figure 5-2 May 2018 FOA preferred scheme

5.3.2 AMETI Eastern Busway 2 - Further Options Assessment August 2018 (Aug 2018 FOA)

The AMETI Eastern Busway 2 Further Options Assessment August 2018 (Aug 2018 FOA) report further developed the Ti Rakau Drive Busway with the RRF and a bus station in Pakuranga Town Centre. It also assessed alternative bus services arrangements, different traffic lane configurations and a revised bus station configuration.

During this process a number of concerns and opportunities associated with the 2017 Scheme Design and May 2018 FOA were identified, including:

- A lack of cycling facilities surrounding the bus station and Pakuranga/Ti Rakau Intersection;
- Buses mixing with general traffic along Pakuranga Road and passing through multiple new signalised intersections without priority
- The efficiency of the roundabout (lollipop) bus station configuration with bus movements, and impact on the Ti Rakau / Pakuranga intersection
- Bus passenger ride quality and system legibility (i.e. customer experience)]
- The spacing of bus station/stops and area of bus patrons coverage (notably the relative closeness of the preceding minor station in EB1 at Williams Avenue)
- The complexity and size of SEART/Ti Rakau Drive intersection
- Opportunities to better align road sections with the outcomes sought by the newly adopted AT Roads and Streets Framework in terms of place making and prioritisation of modes to give more balanced and place making focussed outcomes
- The use of the space under RRF.

Three key potential improvements were identified for assessment to address the above

concerns:

- Re-routing Howick bus services at the new Pakuranga Road / Pakuranga Highway (i.e. the RRF) intersection along bus only lanes adjacent to the proposed flyover, but following the terrain, then traveling along Reeves Road at grade and ultimately joining the busway at Ti Rakau Drive
- The re-prioritisation of the proposed Reeves Road / Pakuranga Road intersection
- Replacement of the Scheme Design lollipop station with a linear station in a new location.

The proposed change in bus route considered on the Aug 2018 FOA are shown in Figure 5-3 below.



Figure 5-3 Proposed change in bus route August 2018

Figure 5-3 above shows the “lollipop” scheme design with buses accessing a bus station on Ti Rakau Drive from Pakuranga Road (in yellow) and buses accessing a station on Ti Rakau Drive from Reeves Road (in yellow).

Two alternative options (Options 2 and 3) were developed and carried forward for assessment with the scheme design through an MCA process. Option 2 and Option 3 both provided bus movements onto Reeves Road via a ramp from Pakuranga Road (and vice versa). Option 2 provided a station location with opposed platforms further to the west of the lollipop station (between the revised Aylesbury Street intersection and Pakuranga Road). Option 3 provided a station location with opposed platforms further to the east of the lollipop station (between the revised Aylesbury Street intersection and Reeves Road).

These alternative options direct bus movements onto Reeves Road via a ramp from Pakuranga Road (and vice versa). This removes buses from the section of Pakuranga Road between Ti Rakau Drive and William Roberts Road which enables reducing road width and giving more emphasis to active modes between the new SEART and amended (and now smaller) Ti Rakau Drive intersections. Traffic movement between the RRF and Pakuranga Road is prioritised to allow better flow and optimisation of general traffic on the RRF and bus lanes.

The key attributes of the Scheme Design (May 2018 FOA), against which Options 2 and 3 were assessed, included:

- Bus route travelling along Pakuranga Road
- “Lollipop” (roundabout) station design
- Moderate additional potential bus patronage coverage
- Significant loss of car parks in Pakuranga Town Centre

- Lack of walking or suitably protected cycling facilities around the Town Centre.

All options scored positively in relation to Project objectives, in particular those relating to providing a multi modal transport corridor, improving linkages, integrating with existing land uses and accessibility. The key differences between Option 2 and Option 3 compared to the Scheme Design included:

- Buses directed adjacent to (along William Roberts Road) and under the RRF
- Linear bus station
- More central station location and greater potential bus patronage coverage (Option 3)
- Reduced transport function for Pakuranga Road between Ti Rakau Drive and RRF connection with Pakuranga Road and between Pakuranga Road and William Roberts Road (extension) along Ti Rakau Drive frontage
- Option 2 has a moderate loss of car parks in Pakuranga Town Centre and requires partial property acquisition of privately owned property
- Option 3 has a minor loss of car parks in Pakuranga Town Centre and a potential full property acquisition of privately owned property Ti Rakau Drive depending on platform layout; and
- Better walking and cycling facilities.

The proposed bus route provided by Option 3 was preferred in the Aug 2018 FOA as this option was assessed as providing a 2 - 4 minute reduction of bus travel times from Howick and Botany to Panmure as well as improving the reliability of buses. Taking buses underneath RRF was also assessed as providing activation and passive surveillance of Reeves Road beneath the RRF. A further consideration was that the redirection of buses would improve the ride quality for passengers by removing the roundabout (lollipop) in the Scheme Design.

Moving the bus station from the northwest corner of the town centre to a central location was also considered to create a more even distribution of bus stations and a greater walking and cycling catchment along the proposed busway by bringing the bus station even closer to community, education and recreational facilities.

After the completion of the Aug 2018 FOA, the AMETI Eastern Busway Specimen Design 2018 progressed a design based on a Ti Rakau Drive Busway with a RRF (the May 2018), with bus lanes alongside the RRF connecting Reeves Road to Pakuranga Road and a bus station near the corner of Ti

Rakau Drive and Reeves Road in Pakuranga Plaza (the Aug 2018 FOA) and as shown at Figure 5-4.

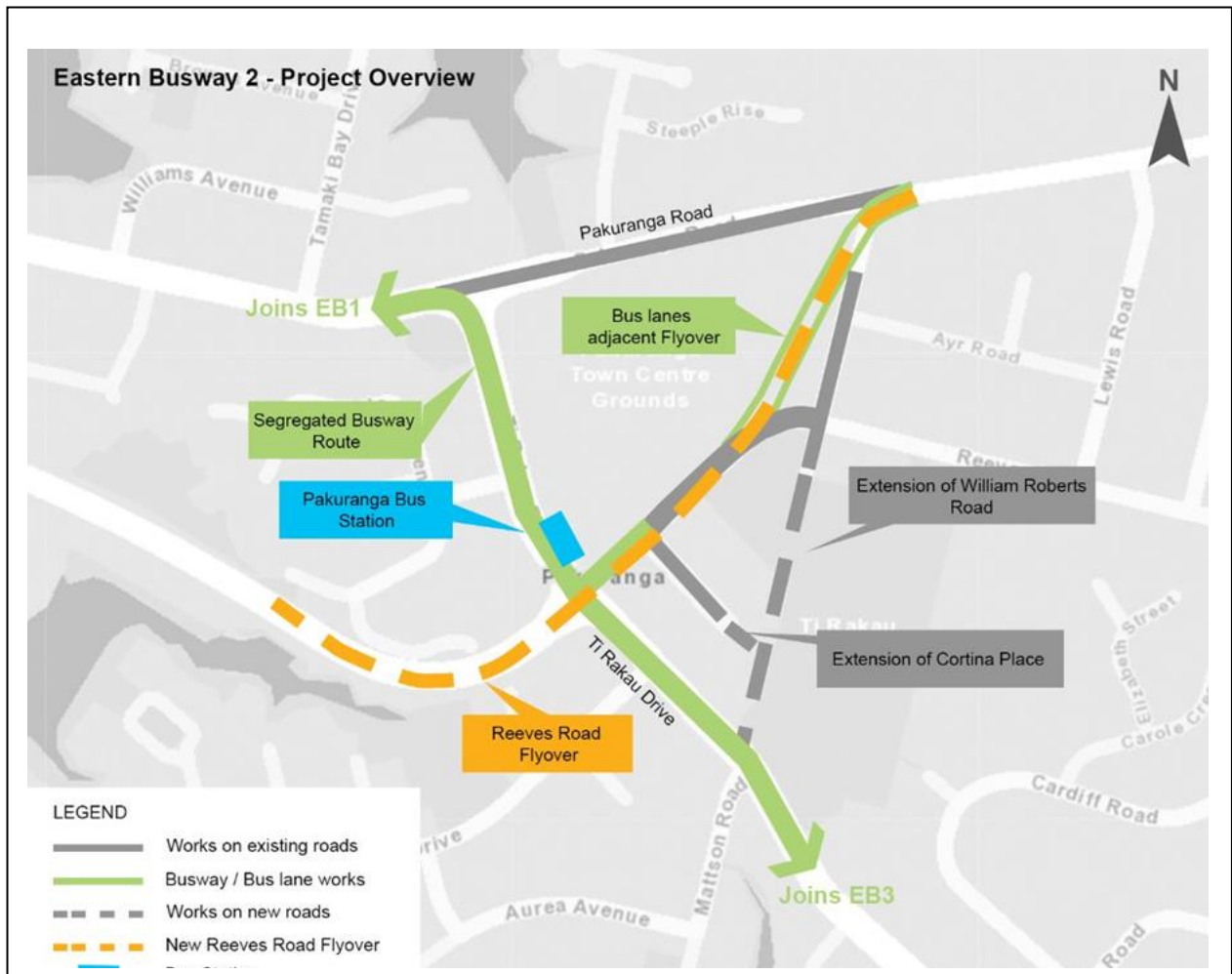


Figure 5-4 AMETI Eastern Busway 2 Specimen Design 2018

5.4 EBA Assessment Process 2020 – Reeves Road Flyover

Following the establishment of the EBA in 2020, the AMETI Eastern Busway Specimen Design 2018 (2018 Specimen Design) was reviewed and retested. Alternative options were developed for the refinement of the RRF and the Pakuranga Bus Station. This process is summarised in the following two sub-sections and is set out in more detail in Appendix 20: Options Assessment to this AEE.

The following provides an overview of the assessment process that has been undertaken by EBA in relation to the RRF. The diagram below outlines the process followed.

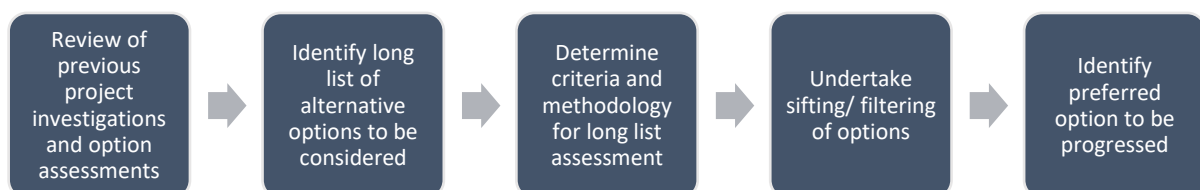


Figure 5-5 EBA RRF assessments

5.4.1 Long List Considerations/ Sifting of Options

Firstly, EBA undertook a review of previous investigations and option assessments as set out above. The purpose of the review was to assist in developing a range of long list options for the RRF. A total of 20 options (plus the specimen design) were identified for consideration as part of the long list assessment. All 20 options were derived from the 2018 Specimen Design and were assessed against the criteria in Table 5-2 and Table 5-3. The long list and assessment are summarised in Table 5-5.

The first filter used the scoring scale as shown in Table 5-2 below.

Table 5-2 Scoring Scale

First Filter Scoring Scale	
	Strongly meets criteria
	Meets criteria with some impacts
	Does not meet criteria

The second filter was applied to those options considered viable to rank in terms of affordability and busway alignment acceptance criteria. Any criteria given an amber in the first filter was given a score of 0. For both the affordability and busway alignment criteria, the remaining options were given a score between 1 and 5, with 1 given to options that are considered to least meet the criteria, and 5 given to the options which most strongly meet the criteria.

The scoring scale used for the second filter is shown in Table 5-3 below.

Table 5-3 Scoring scale

Second Filter Scoring Scale	
0	Meets criteria with some impacts
1	Contributes
2	Moderate contribution
3	Moderate to strong contribution
4	Strong contribution
5	Strongest contribution

The assessment criteria used is provided in Table 5-4.

Table 5-4 Assessment Criteria

Assessment Criteria	
1	Does it achieve an acceptable busway alignment/ system?
2	Does the option significantly improve affordability?
3	Does the option provide a safe environment for all users?
4	Does this option have a lesser degree of difficulty for statutory approvals?
5	Is the station located to support integration with Pakuranga Town Centre?
6	Does it provide an acceptable urban design outcome for Reeves Road?
7	Does it minimise impacts on Transpower/ Watercare assets?

The assessment criteria applied was derived from the Project objectives and environmental factors. The weighting in the second filter in relation to busway alignment (criteria 1) and affordability

(criteria 2) was considered to be a good measure to ensure that the preferred option would be workable and could be implemented within the Project's affordability requirements.

A total of 21 options were assessed using the two-step filter process and are described in Table 5-5.

Table 5-5 Long List Assessment

Options discounted by first filter		
Option	Name/ option description	Reason not taken forward
0	Specimen Design Northern side-running busway on Ti Rakau Drive adjacent to Aylesbury Street, with off-street separated bi-directional cycle facilities on northern verge. Station located in line of sight of Aylesbury Street central town centre spine. Cycle facilities down William Roberts Road.	Does not meet assessment criteria 2.
1	Bus station located south (west) of Ti Rakau Drive Busway on southern side of Ti Rakau Drive with bus station located between Pakuranga Road and Pakuranga Highway. Station located south of Ti Rakau Drive.	Does not meet assessment criteria 1 and 5
2	Bus station located at the north-eastern side of the town centre Bus station located behind town centre and Pennell Place on north-east side.	Does not meet assessment criteria 1, 2 and 5
4	Bus Station located west (citybound) from 26 Ti Rakau Dr – busway on northern side or centre Specimen Design Station location shifted to the west towards Pakuranga Road.	Does not meet assessment criteria 2 and 4
5	Position bus station east of Aylesbury Street. Bus Station located to the east of Aylesbury Street.	Does not meet assessment criteria 2, 4 and 5
6	Position bus station at corner of Reeves Road and Cortina Place Bus Station located at the corner of Reeves Road and Cortina Place.	Does not meet assessment criteria 2 and 5
7	Central elevated bus station on Ti Rakau Drive, west of 26 Ti Rakau Drive Central elevated bus station on Ti Rakau Drive, to the west of 26 Ti Rakau Drive to eliminate the RRF.	Does not meet assessment criteria 1
8	Reeves Road cut and cover tunnel under Pakuranga Road Reeves Road provided in cut and cover tunnel under Pakuranga Road.	Does not meet assessment criteria 2 and 7
10	Two-lane Reeves Road at grade Reeves Road to remain as is with 2 lanes in Reeves Road for general traffic. Eliminates the RRF from Specimen Design.	Does not meet assessment criteria 1
11	Four lane Reeves Road at grade with elevated station Elevated bus station in front of 26 Ti Rakau Drive. At grade four lane Reeves Road.	Does not meet assessment criteria 2
12	Four lane Reeves Road at grade with at grade station Reeves Road at grade, with four general traffic lanes. Bus station provided at grade.	Does not meet assessment criteria 1 and 5
13	Cycle facilities through Cortina Place including extension through park	Determined to be a design feature to be developed and refined during value engineering. Not progressed as an option.

Options discounted by first filter		
	Divert bi-directional cycleway through Cortina Place and extending through Ti Rakau Park to link with Ti Rakau Drive east of Ti Rakau Park.	
14	Millen Diversion Busway linking Ti Rakau Drive to SEART and then connecting through Millen Avenue to Pakuranga Road just south of Panmure Bridge.	Does not meet assessment criteria 1, 2 and 5
16	RRF with steel structure RRF with steel structure in lieu of concrete structure proposed in Specimen Design.	Does not meet assessment criteria 1
17	Eliminate cycle facilities on William Roberts extension Specimen Design without cycle facilities on William Roberts Road extension.	Does not meet assessment criteria 2
18	Dedicated Freight Lane Dedicated freight lanes along Ti Rakau Drive.	Does not meet assessment criteria 1, 2, 4 and 5
19	Shift station south away from 26 Ti Rakau Drive with busway alignment on northern side Shift busway alignment including station south to remove impact to properties on northern side of Ti Rakau Drive with busway alignment on northern side of alignment.	Does not meet assessment criteria 2
20	Eel Station Specimen Design with 'eel' station configuration.	Does not meet assessment criteria 2

5.4.2 Second Filter

As noted above, the second filter assessed the remaining options in relation to assessment criteria 1 and 2.

Option 3, Option 9 and Option 15 were taken forward in the second filter with Table 5-5 presenting the outcome for the remaining options.

Table 5-6 EB2 Long List Second filter assessment

Second filter assessment				
Option	Name and description	Score	Ranking	Reason
3	Bus Station located under RRF Bus station located under RRF, in vicinity of Cortina Place and Reeves Road intersection.	4	3	This option scored 4 for alignment, but 0 for improved affordability. Benefits of this option include more activated area under RRF, however, may potentially have passive surveillance issues with the location being away from the main town centre spine. Option may have potential property access impacts on Reeves Road, including the Warehouse loading dock. May need to provide circulation for Warehouse loading dock and other properties. May also serve property access along Reeves Road and for 26 Ti Rakau Drive. Overall, trade-offs in property costs compared to specimen design. Integrating station or commercial space into Reeves Road structure potentially reduces impact of flyover structure.

Second filter assessment			
			Option considered worthy of further development as part of Value Engineering (VE) of station location.
9	<p>Two-lane RRF</p> <p>Specimen Design with two lane RRF structure.</p>	9	<p>2</p> <p>This option scored 4 for alignment and 5 for improved affordability.</p> <p>The reduction in structure size will provide a cost reduction compared to the specimen design. Property impacts may be reduced due to the flyover fitting within the existing legal road width.</p> <p>Traffic modelling has noted some issues with the reduction in lane widths for the specimen design, further modelling is required to check that this option has sufficient capacity.</p> <p>Need to assess the footprint of the intersection and the associated impacts it may have.</p>
15	<p>Straighten RRF + 60kph Design Speed</p> <p>Straighten RRF by decreasing speed environment for western approach including measures such as active speed management through central planted median, ITS and speed enforcement measures. Reduces posted speed to 70-75km/h compared to 90km/h in Specimen Design.</p>	10	<p>1</p> <p>This option scored 5 for alignment and improved affordability.</p> <p>Option achieves savings through removing barriers and improving sightlines and therefore reducing structural size. The affordability savings in physical structure, property and construction are achieved.</p> <p>This option may have an impact upon Transpower asset, further review of this would need to be undertaken.</p> <p>The design does result in a larger radius curve on the flyover/ bridge, which may require wider shoulders to accommodate sightlines. This would result in property acquisition as the footprint would extend beyond the existing road corridor, however reduced impacts on Reeves Road properties.</p> <p>This option is to be progressed as part of the Value Engineering (VE) for RRF.</p>

Based on the application of the second filter, Option 15 is provided with the highest ranking.

Based on the above, **Option 15** RRF - +60kph design speed was recommended and approved to be taken forward for further consideration for design refinement and value engineering.

The geometric alignment of Option 15 was also seen as closely resembling the SLP-3 considered in the May 2018 FOA and that considered in the Aug 2018 FOA. Option 15 is slightly narrower in width than that considered previously but was essentially on the same geometric alignment as previous options. For this reason, no further MCA was considered necessary for the RRF and previous assessments could be relied upon.

5.5 EBA Assessment Process 2020 – Pakuranga Bus Station

The diagram below outlines the assessment process undertaken by the EBA in 2020 for the Pakuranga Bus Station. This process is set out in greater detail in Appendix 20: Options Assessment to this report.



Figure 5-6 EBA Pakuranga Bus Station Assessments

5.5.1 Pakuranga Bus Station Long List Options

EBA considered a range of options as part of the development of the long list for Pakuranga Bus Station. A total of 17 options were developed for consideration. The 2018 specimen design was used as a starting point for the development of 17 long list options. The long list options were assessed against a number of factors to determine the options to be refined and taken forward to the short list.

The long list options were developed with the following considerations:

- Where possible, the AT Public Transport Interchange Design Guidelines and ATCOP Section 20 Public Transport Buses have been adopted
- Capacity requirements used are based on those outlined in the EB2 Draft Specimen Design Traffic Modelling Report (20 Sept 2019)
- Operational and maintenance requirements have not been considered in detail for the options developed.

The following matters were considered when assessing the long list options:

- The impact upon open space within the EB2 area, with specific consideration to the Ti Rakau Corner Reserve
- Integration with Pakuranga Town Centre
- Integration with EB1
- Position of bus stations in relation to busway alignment
- Impacts upon residential properties
- Land take requirements.

The assessment of the long list result in six options being taken forward to be assessed via MCA.

5.5.2 Pakuranga Bus Station – Short List Options

The following provides an overview of the short list alternative options assessed by EBA. All of the options have the following common features:

- Three bus bays provided at each platform
- Kiss and ride facility provided on Aylesbury Street
- All options require land take from Pakuranga Town Centre (car parking area) and 26 Ti Rakau Drive, with the exception of Option J. Note that the extent of land take varies between the options
- All options are designed on the assumption that the busway in EB3 Residential (to the east of Pakuranga) will be central running along Ti Rakau Drive
- For all options, Aylesbury Street would be realigned, creating a 4-way intersection with Ti Rakau Drive and Palm Avenue.

The MCA assessment was undertaken, with technical assessors providing an assessment of each option in relation to specific criteria. The criteria used is consistent with the criteria used in previous option assessments.

Option A

This option would place the bus station on the north side of Ti Rakau Drive, between Reeves Road and Aylesbury Street. The bus station platforms would be parallel with each other.

The position of this bus station is situated more centrally within the town centre and has better alignment with Aylesbury Street.

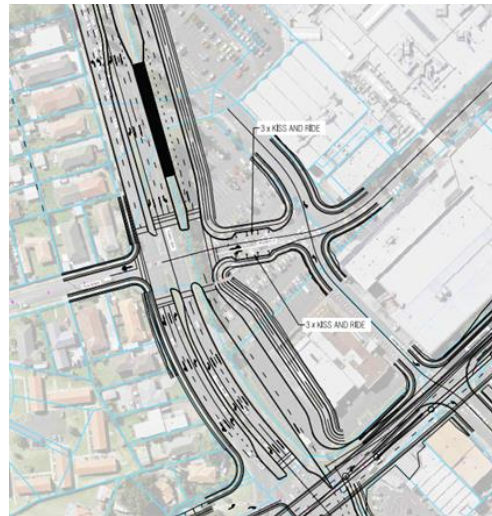
This option would require 6849m² of land area outside of the existing road corridor.



Option B

This option would separate the bus station platforms, with Aylesbury Street positioned between them. The city-bound platform would be positioned to the west of Aylesbury Street, with the Botany-bound platform positioned to the east of Aylesbury Street.

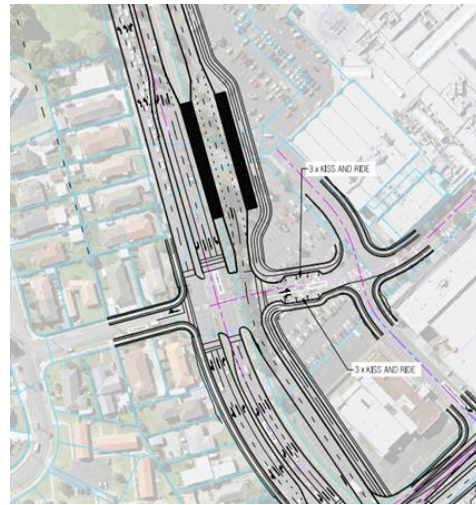
This option would require 8016m² of land area outside of the existing road corridor.



Option G

This option would place the bus station to the west of Aylesbury Street, with parallel platforms. The station is positioned further from the core of the town centre. The busway to the east of the platforms would be situated to the north of Ti Rakau Drive, moving to the centre of the road at the intersection with Reeves Road.

This option would require 7719m² of land area outside of the existing road corridor.



Option H

This option would place the bus station to the west of Aylesbury Street, with non-parallel platforms. The city-bound platform would be positioned further west, closer to the intersection with Pakuranga Road. The Botany-bound platform would be positioned adjacent to Aylesbury Street. This station arrangement moves the bus station further from the core of the town centre.

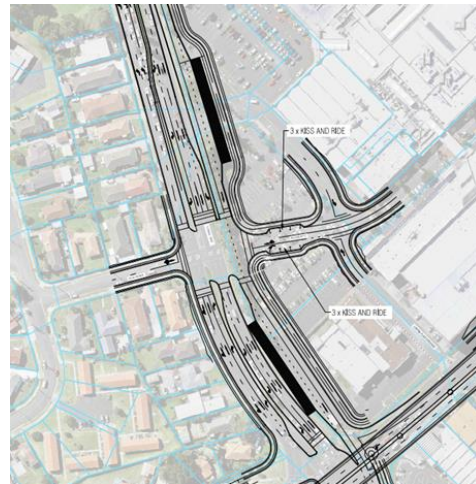
This option would require 7195m² of land area outside of the existing road corridor.



Option I

This option is similar to Option B, but the position of the city-bound, and Botany-bound platforms have been switched.

This option would require 6515m² of land area outside of the existing road corridor.



Option J

This option is similar to Option I in terms of the proposed arrangement of bus station platforms, however the alignment of the busway is shifted to the west, avoiding commercial properties (26 Ti Rakau Drive).

The alignment will require acquisition of residential properties located on the west side of Ti Rakau Drive.

This option would require 6121m² of land area outside of the existing road corridor.



The preferred option identified as part of this process was **Option A**, which provides a bus station on the north side of Ti Rakau Drive, in the vicinity of 26 Ti Rakau Drive.

Option A was favoured by the EBA for a variety of reasons, primarily associated with its location and platform layout. The station is located close to the spine of the town centre and in the optimum location to provide the best walk-up catchment. Furthermore, the design is based on opposing platforms, which create a more legible station, and which is more compact in footprint.

5.6 Summary and conclusion

The consideration of alternatives for the AMETI programme has occurred over a long period of time, with multiple assessments of alternatives occurring at different stages throughout the life of the project. This assessment of alternatives has been thorough and has provided AT with information which has assisted it in identifying the preferred alignment and feasible design and construction options for the Eastern Busway 2 and which meet the project objectives and the requirements of s171(b) of the RMA. An assessment of s171(b) is provided at Section 11.6 of this report.

The ETC Recommended Options Report 2004 considered 48 (programme) options and confirmed the alignment of the project corridor. It also confirmed the project as being multi modal with a busway being part of the preferred option.

From 2006 – 2014 the focus changed, with options considered that sought to prioritise public transport. As part of the Recommended Options Report 2007 a total of 64 programme options were considered for the AMETI programme. This included a two-stage approach, with Stage 1 involving a fatal flaw analysis, and Stage 2 involving an in-depth analysis of the options through a MCA process. The preferred option included the RRF and a quality transport network with bus lanes. In 2008 it was identified that there was a need for greater public transport provision to address growth, mode share and accessibility and as a result the RTN (in the form of an urban busway) between Pakuranga and Botany, formed part of the scope of the AMETI programme.

Between 2014 – 2016 the preferred sequencing and timing for delivery was confirmed by AT.

In 2017 FOAs were undertaken for AMETI EB2, the Pakuranga Bus Station and AMETI EB3. Each of the FOAs involved an MCA to determine the preferred option.

In 2018 additional FOAs were undertaken using the same MCA process to consider if further improvements to bus travel times, efficiency and reliability of the network, and better urban outcomes for the Pakuranga Town Centre could be made. This resulted in the determination for the preferred options for EB2 and EB3, set out in the 2018 Specimen Design, which involved some minor amendments to AMETI EB2 including a change in the location of the Pakuranga Bus Station and bus routes.

Following the establishment of the EBA in 2020, the Specimen design was reviewed and retested. Alternative options were developed for the refinement of the RRF and the Pakuranga Bus Station. This alternatives assessment involved considering 21 alignment options and 6 bus station options against the project objectives and assessment criteria. The assessment was undertaken, with technical assessors providing an assessment of each option in relation to specific criteria. The criteria used was consistent with the criteria used in previous option assessments. This options assessment process is set out in more detail in Appendix 20: Options Assessment.

6 Existing Environment

EB2 is predominantly located adjacent to and within Pakuranga Town Centre. The town centre is a retail and commercial hub with (mostly) one to two storey buildings, big-box retail and a mall surrounded by car parking areas. Arterial roads; Ti Rakau Drive, Reeves Road, William Roberts Road and Pakuranga Road border the town centre.

Following is a description of the existing environment of Pakuranga Town Centre and its surrounds. The various technical assessments, including landscape and terrestrial ecology (Appendix 21: Natural Character, Landscape and Visual Effects Assessment and Appendix 22: Terrestrial and Freshwater Ecological Effects Assessment), provide significant detail regarding the context of EB2 with respect to each discipline.

6.1 Wider Setting

EB2 is located within Pakuranga, a suburb in the southeast of Tāmaki Makaurau Auckland. Pakuranga is a residential suburb, which is connected to the wider region by the South-Eastern Highway (SEART), Pakuranga Road and Ti Rakau Drive (Figure 6-1). It takes its name from Te Pakūranga-rā-hihi, which translates to “battle of the sunlight or battle of the sun’s rays”. This legendary battle occurred at Ōhūiarangi / Pigeon Mountain and was caused by a forbidden love by two patupaiarehe (fairy people of the forest).

This suburb is orientated around Pakuranga Town Centre, which includes a mall (Pakuranga Plaza), a small commercial area around Cortina Place/Reeves Road, several community facilities, parks and important road corridors.

To the west and south of Pakuranga is the Tāmaki River, a large tidal waterbody which runs from Waitematā Harbour southwards to Ōtāhuhu / Papatoetoe. The Tāmaki River has experienced degradation from historic land clearance and urban development, but is still an important waterbody for mana whenua, native species, and recreational users. Further southeast or east are the suburbs of Botany, Pakuranga Heights and Burswood. Each of these suburbs were developed during the mid to late 20th century.

Suburban Auckland continues north and east from Pakuranga with the suburbs of Howick, Bucklands Beach, Farm Cove, Eastern Beach, Highland Park, Cockle Bay and Half Moon Bay. The majority of these areas are of a similar age to Pakuranga, with most development occurring in the mid to late 20th century.

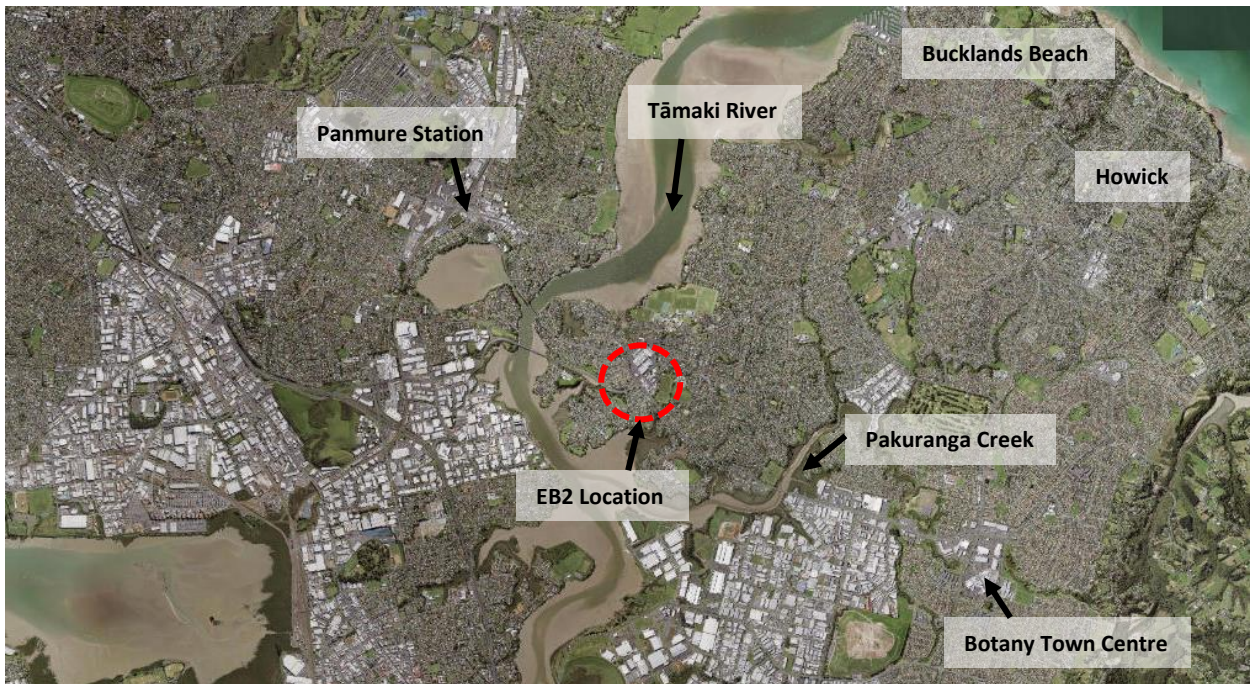


Figure 6-1 General Location of EB2

6.2 General Site Characteristics

Pakuranga Town Centre is a commercial hub for southeast Tāmaki Makaurau Auckland and is focused on the intersections of Ti Rakau Drive/Pakuranga Road and Ti Rakau Drive/SEART. The town centre features an older suburban mall, with large areas of at-grade parking. The mall itself is generally between one and two storeys in height, with a small tower block located in its north-west corner (Figure 6-2). The car park is intersected by several public roads¹⁹, which have been overlaid with the current car park arrangement.



Figure 6-2 View of Pakuranga Plaza from North

Sitting between the Pakuranga Plaza and Reeves Road is another commercial development, which contains The Warehouse, smaller retail premises and Pakuranga Library (Figure 6-3). This development features undercover parking, which is used by the Pakuranga Night Market weekly on Saturday nights.

¹⁹ Aylesbury Street, Brompton Court and Pennell Place.



Figure 6-3 View towards The Warehouse and Pakuranga Library from Reeves Road

Moving further east is Cortina Place, currently a cul-de-sac predominately featuring light industrial and retail operations (Figure 6-4). It is also noted that within Cortina Place is the Pakuranga Mosque, a medical clinic and a funeral director. To the north-east of the town centre and Cortina Place is the Pakuranga Leisure Centre and Te Tuhi, a contemporary art gallery in premises owned by AC.



Figure 6-4 View East down Cortina Place

Also present are large areas of low to medium density housing, focused off Ti Rakau Drive and Pakuranga Road. This housing includes blocks of flats and detached dwellings. These dwellings are one to two storeys in height, with some off-street parking (Figure 6-5). It should be noted that the residential sites facing Ti Rakau Drive are zoned Business – Mixed use in the AUP(OP), with non-residential activities occurring at some of these sites.



Figure 6-5 Typical Housing on Ti Rakau Drive

There are several AC reserves present within the immediate area. The largest of these is Ti Rakau Park (27R William Roberts Road) (Figure 6-6). Ti Rakau Park primarily functions as sports fields, hosting both cricket and rugby league during their respective playing seasons. The park also features a clubroom, parking and a mixture of mature vegetation. Also present in the park is a Transpower New Zealand (Transpower) support tower for high voltage electricity transmission.



Figure 6-6 View of Ti Rakau Park from Ti Rakau Drive

Smaller reserves include Bus Stop Reserve (96R Pakuranga Road)²⁰, Ti Rakau Corner Reserve (1R Ti Rakau Road) and Pandora Place Esplanade Reserve (35R Pandora Place). These smaller reserves primarily provide a visual amenity function, although Bus Stop Reserve does connect to the Pakuranga Rotary Walkway, a walkway runs along the banks of the Tāmaki River to Half Moon Bay.

The topography of the area largely consists of gently sloping hills in the east, which run down in a westward direction towards the Tāmaki River. There are no significant steep slopes or other types of unstable geology. The landform features a number of estuarine mangrove lined creeks, all of which discharge into the Tāmaki River. It is noted that no maunga or other significant landscape features are within EB2’s footprint.

6.3 Property Information and Zoning

The construction, operation and maintenance of EB2 is within the road corridor, reserve land and through a number of residential and commercial properties. Table 6-1 provides the property, zoning and overlay information within the site. Copies of these properties’ Records of Title are provided as Appendix 23: Records of Title.

Table 6-1 Site information

Property address	Legal Description	Type of Ownership	AUP(OP) Zoning
1/183, 185, 3/183, 4/183 Pakuranga Road	LOT 5-6 DP 40172, FLAT 1 DP 113712, FLAT 2 DP 205526, FLAT 3, CARPORT 3 and 5 DP192118, FLAT 4, CARPORT 4 DP 192118	Private	Residential – Terrace Housing and Apartment Buildings
10 Aylesbury Street	LOT 1 DP 158869	Private	Business – Town Centre
11 Reeves Road	LOT 19 DP 52255	Private	Business – Town Centre
13R Reeves Road	LOT 22 DP 52255	Public	Open Space – Community
140S Pakuranga Road	PT LOT 1 DP 37727, LOT 2 DP 37727, LOT1 DP 39094, PT LOT 12 DP 14882, LOT 67DP 138440, PT ALLT 281 PAROPAKURANGA	Private	Special Purpose Zone
167 Pakuranga Road	LOT 1 DP 53672	Private	Business – Town Centre

²⁰ Bus Stop Reserve is also known as Rotary Reserve.

Property address	Legal Description	Type of Ownership	AUP(OP) Zoning
1,2,3/169 Pakuranga Road	LOT 1 DP 47230, FLAT 1, 2 & 3 DP 70609	Private	Business – Town Centre
1,2,3/171 Pakuranga Road	LOT 2 DP 47230, FLAT 1, 2 & 3 DP 68355	Private	Business – Town Centre
1,2,4/173 and 173C Pakuranga Road	LOT 3 DP 47230 UNIT A, B, 1C, 1D, DP 86456, AU 1, 2, 3, 4 DP 86456	Public	Business – Town Centre
1R Dale Crescent	Section 33 SO 70581 and Part Lots 37-41 SO 70581	Public	Residential – Mixed Housing Urban
2 & 4 Seven Oaks Drive	Part Lot 31 & 32 DP 48712, SO 70581	Public	Residential – Mixed Housing Urban
27R William Roberts Road	LOT 1 DP 51777 Allotment 322, 323, 324 Psh of Pakuranga LOT 101, 102 & 103 DP 52151	Public	Open Space – Sport and Active Recreation
2R Ti Rakau Drive	LOT 12 DP 55286, LOT 3 DP 55286, LOT 2 DP 53672, LOT 4 DP 55286	Public	Business – Town Centre
7 Aylesbury Street	Unit A, B, C, D, E, F, G, H, I, J, K, L, M, N Lot 2 DP 158869	Private	Business – Town Centre
96R Pakuranga Road (Bus Stop Reserve)	PT LOT 5 DP 52174	Public	Open Space – Conservation
26 Ti Rakau Drive	LOT 1 DP 156314	Private	Business – Town Centre
2 William Roberts Road	LOT 1 DP 69718	Public	Business – Mixed Use
2A William Roberts Road	LOT 2 DP 69718	Public	Business – Mixed Use
3 William Roberts Road	LOT 4 DP 47230	Public	Business – Town Centre
5, 1/5, 2/5 William Roberts Road	LOT 2 DP 82843, LOT 2 DP 82843 FLAT 1 DP	Public	Business – Town Centre

Property address	Legal Description	Type of Ownership	AUP(OP) Zoning
	89655 and FLAT 2 DP 89655		
7 William Roberts Road	LOT 1 DP 203448	Public	Business – Town Centre
7A William Roberts Road	LOT 2 DP 205609	Public	Business – Town Centre
7B William Roberts Road	LOT 3 DP 205609	Public	Business – Town Centre
9 William Roberts Road	LOT 5 DP 47230	Public	Business – Town Centre
11 William Roberts Road	PT LOT 6 DP 47230	Public	Business – Town Centre
13 William Roberts Road	LOT 1 DP 60995, PT LOT 12 DP 47230	Public	Business – Town Centre
15, 1/15, 2/15 William Roberts Road	PT LOT 2 DP 60995, PT LOT 2 DP 60995, FLAT 1 DP 103942 and FLAT 2 DP 103942	Public	Business – Town Centre
17 William Roberts Road	LOT 2 DP 103948	Public	Business – Town Centre
19 William Roberts Road	LOT 1 DP 103948	Public	Business – Town Centre
177 Pakuranga Road	LOT 2 DP 40172	Public	Business – Mixed Use
179 Pakuranga Road	LOT 3 DP 40172	Public	Business – Mixed Use
181 Pakuranga Road	LOT 4 DP 40172	Public	Business – Mixed Use
187 Pakuranga Road	LOT 1 DP 200020, 1/2 SH LOT 3 DP 200020	Public	Residential – Terrace Housing and Apartment Buildings
187A Pakuranga Road	LOT 2 DP 200020, 1/2 SH LOT 3 DP 200020	Public	Residential – Terrace Housing and Apartment Buildings
2 Cortina Place	LOT 17 DP 52255, LOT 18 DP 5225	Public	Business – Town Centre

Property address	Legal Description	Type of Ownership	AUP(OP) Zoning
5 Reeves Road	LOT 3 DP 52255	Public	Business – Town Centre
19 Dale Crescent	PT LOT 36 DP 52096	Public	Residential – Mixed Housing Urban
19A Dale Crescent	SEC 35 SO 52258	Public	Residential – Mixed Housing Urban
21 Dale Crescent	LOT 35 DP 52096	Private	Residential – Mixed Housing Urban
6 Seven Oaks Drive	PT LOT 30 DP 48712	Public	Residential – Mixed Housing Urban
8, 1/8, 2/8 Seven Oaks Drive	LOT 29 DP 48712, LOT 29 DP 48712, FLAT 1 DP 106707 and FLAT 2 DP 161861	Public	Residential – Mixed Housing Urban
10, 1/10, 10A Seven Oaks Drive	LOT 28 DP 48712, LOT 28 DP 48712, FLAT 1 DP 120510 and FLAT 2 DP 129251	Public	Residential – Mixed Housing Urban
12 Seven Oaks Drive	LOT 27 DP 48712	Public	Residential – Mixed Housing Urban
14 Seven Oaks Drive	LOT 26 DP 48712	Public	Residential – Mixed Housing Urban
16 Seven Oaks Drive	LOT 2 DP 192836	Public	Residential – Mixed Housing Urban
18 Seven Oaks Drive	LOT 24 DP 48712	Public	Residential – Mixed Housing Urban
25, 1/25, 2/25 Ti Rakau Drive	LOT 24 DP 51939, PT LOT 32 DP 14882, LOT 24 DP 51939, FLAT 1 DP 60195, PT LOT 32 DP 14882 and FLAT 2 DP 60195	Public	Business – Mixed Use
27 Ti Rakau Drive	LOT 1 DP 206887	Public	Business – Mixed Use
27A Ti Rakau Drive	LOT 2 DP 206887	Public	Business – Mixed Use

Property address	Legal Description	Type of Ownership	AUP(OP) Zoning
12 Bolina Crescent	LOT 44 DP 48712	Public	Residential – Terrace Housing and Apartment Building

The following table sets out the relevant AUP(OP) zoning:

Table 6-2 AUP(OP) Zoning Details

Zone	Locations
Unzoned – Road	All roads
Business - Mixed Use	Ti Rakau Drive, along western side to SEART, and sections of Pakuranga Road and William Roberts Road
Business - Town Centre	Block encompassing Pakuranga/Ti Rakau/William Roberts Road (excluding reserve to southeast of Reeves Road), and both sides Cortina Pl
Open Space - Informal Recreation	1R Ti Rakau Drive (Ti Rakau Corner Reserve) and 6R Paul Place (Paul Place Reserve)
Open Space - Conservation	96R Pakuranga Road (Bus Stop Reserve)
Open Space - Community	13R Reeves Road (Pakuranga Leisure Centre)
Open Space - Sport and Active Recreation	27R Reeves Road (Ti Rakau Park)
Residential - Terrace Housing and Apartment Building	183, 187, and 187A Pakuranga Road
Residential - Mixed Housing Urban	Sections along Seven Oaks Drive and Dale Crescent, including 1R Dale Crescent
Coastal Transition Zone	Southern coastal edge of SEART
General Coastal Marine Zone	CMA

A plan change to the AUP(OP) addressing the intensification planning instrument is expected in August 2020²¹. This plan change is required under the Resource Management (Enabling Housing Supply and Other Matters) Amendment Act 2021 and will introduce new residential development standards across the region. While the contents of the plan change are not yet public, they will have affect from the date of public notification and will be subject to further consideration by AC as part of the processing of both the resource consents and the NoR.

²¹ This future plan change is discussed in AC's "Government's new housing rules: What it means for Auckland" consultation document.

6.4 AUP(OP) Annotations

Table 6-3 sets out the relevant AUP(OP) overlays, controls, and designations for EB2. These apply within both the road and zones. Further detail regarding these annotations is addressed in the relevant sub-sections of this AEE.

Table 6-3 AUP(OP) Annotations Relevant to EB2

AUP(OP) Annotations	
Overlays	<ul style="list-style-type: none"> National Grid Corridor Overlay – National Grid Yard Uncompromised National Grid Corridor Overlay – National Grid Subdivision Corridor Notable Trees Overlay – 1495, 2x Weeping Willow Notable Trees Overlay – 1493, 1x Phoenix Palm
Controls	<ul style="list-style-type: none"> Arterial Road (Ti Rakau Drive, Pakuranga Road) Height Variation Control – Pakuranga, 48.5m Building Frontage Control – General Commercial Frontage Coastal Inundation 1 per cent AEP Plus 1m Control – 1m sea level rise
Designations	<ul style="list-style-type: none"> Designation – 8507, Electricity transmission – the construction, operation and maintenance of underground transmission lines comprising of a 220kV cable circuit to convey electricity between Pakuranga and Penrose substations, Designations, Transpower New Zealand Limited

6.5 Network Utilities

Table 6-4 sets out the network utility infrastructure present in the EB2 area.

Table 6-4 EB2 Network Utilities

Network Utilities	
Transpower – Overhead Lines	<p>There are three existing Transpower overhead transmission lines that currently cross the EB2 alignment in various locations. The cable names, voltages and crossing points are outlined below:</p> <ul style="list-style-type: none"> OTA-PEN-A 110kV – Crosses the Pakuranga Highway alignment near the intersection of Pakuranga Highway and Ti Rakau Drive OTA-PEN-A 110kV – Crosses the Ti Rakau Drive alignment between the intersection of Mattson Road and the intersection of Tiraumea Drive OTA-PEN-B 220kV – Crosses the Pakuranga Highway alignment near the Western extent and is unlikely to be affected by the design OTA-PEN-C 220kV – Crosses the Pakuranga Highway alignment at the Western extent and is unlikely to be affected by the design.
Transpower - Underground	<p>There is an existing Transpower underground cable (Designation 8507), the PAK-PEN-B 220kV within the EB2 site. This currently lies under the west bound shoulder on Pakuranga Highway (SEART) before bearing right and running under the east bound slow lane of Ti Rakau Drive.</p> <p>There are two joint bays, one located in the Pakuranga Highway shoulder and one located in the eastbound slow lane of Ti Rakau Drive.</p>
Watercare	<p>Watercare has the following services within the EB2 alignment:</p> <ul style="list-style-type: none"> Hunua 2 – 1070 mm Concrete Lined Steel Pipe Transmission Watermain Howick Loop – 470 mm Concrete Lined Steel Pipe Transmission Watermain Small Diameter (<300 mm Diameter) Distribution/Connection and Local Supply.
Vector	<p>Vector has several electrical services located within EB2 alignment. These are located underneath or above ground along the existing footpath/berm on both sides of the roads with a number of significant road crossings.</p>

Network Utilities	
	Vector also has both high pressure IP10 and medium pressure MP4 gas mains located underground within the extent of the alignment.
Vodafone	Vodafone has a number of existing copper and fibre cables within the extent of the alignment.
Chorus	Chorus has a number of existing copper and fibre-based network assets. The majority of these are located underneath the existing footpath/berms.
Waka Kotahi	CCTV at the SEART on/off ramps. These cameras enable real time monitoring of road traffic.

6.6 Transport

6.6.1 General Traffic

The EB2 area is based on a historic car-centric transport typology, with large multi-lane road corridors and large areas of the commercial sites dedicated to car parking. The following are identified as regional arterial roads under the NZTA road classification system:

- Ti Rakau Drive
- Pakuranga Road
- SEART.

Reeves Road is classified as an arterial road under the same system, while the other roads located within the immediate area are a mix of collector and access roads. Intersections between the regional arterial roads are signalized, while intersections between regional arterials and lower order roads are typically controlled by stop signs.

Given their regional arterial status, their higher speed limit and their daily traffic volumes, Ti Rakau Drive, Pakuranga Road and SEART all feature measures to separate opposing traffic. On Ti Rakau Drive and Pakuranga Road this is largely achieved using a flush median, whereas on SEART a solid concrete median barrier has been employed. These road corridors feature large information signs, multi-lane intersections and other street infrastructure associated with high vehicle volume environments. The speed limit on Ti Rakau and Pakuranga Road have 60 km/h speed limits, whereas the speed limit for SEART is 80 km/h. Lastly, both Ti Rakau Drive and SEART are over-dimension routes.

The lower order roads feature less road safety and information infrastructure. This includes Reeves Road, which has unsignalized intersections with both William Roberts Road and Cortina Place. Where these roads intersect with regional arterials, access is generally restricted by the presence of raised medians and/or high traffic volumes. These roads have a speed limit of 50 km/h.

Aylesbury Street bisects Pakuranga Plaza, with left in-left out (unsignalised) access to Ti Rakau Drive. The road provides access into Pakuranga Plaza with both on-street parking and access points to the Plaza's various parking areas.

6.6.2 Public Transport

Pakuranga Town Centre acts as a hub for bus services to southeast Tāmaki Makaurau Auckland. This includes bus services to and from Bucklands Beach/Eastern Beach (Routes 712, 714, 733), Howick/Cockle Bay (Routes 72C, 72M, 72X, 711), Manukau Shopping Centre/Highbrook (Route 352) and Botany Town Centre (Route 70). These bus routes are served by bus stops on Pakuranga Road, Ti Rakau Drive and at Pakuranga Plaza.

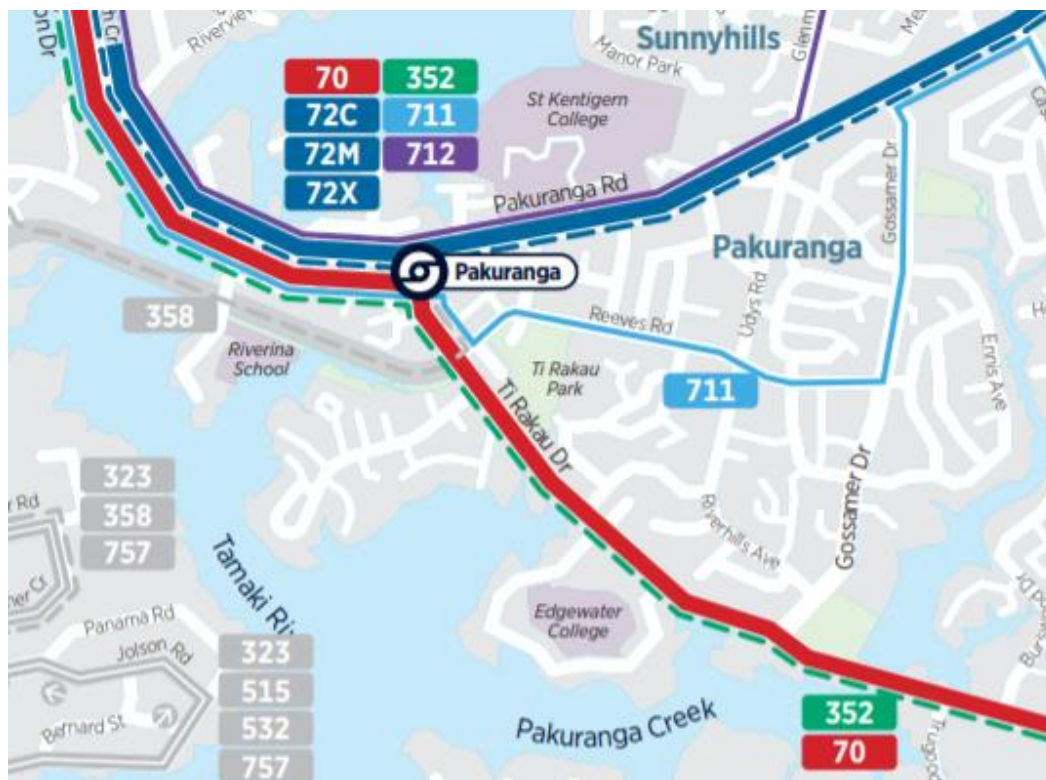


Figure 6-7 EB2 Local Bus Routes

In addition to public bus services, several school bus services run through the EB2 area. These include bus services to Sacred Heart College, Sancta Maria College and Edgewater College.

6.6.3 Pedestrian and Cyclist Network

Active transport infrastructure includes footpaths (present on all roads), signalized crossings at all regional arterial intersections and a non-signalised crossing on Reeves Road. There are currently no cycleways present within the EB2 area.

6.7 Landscape, Visual and Urban Design

As noted in the Natural Character, Landscape and Visual Effects Assessment (Appendix 21: Natural Character, Landscape and Visual Effects Assessment), EB2 will be constructed in a highly urbanised environment where there are few remaining natural landscape features. The area largely covers a series of low hills, which gently descend from 15 m above mean high water springs (MHWS) westwards to the shores of the Tāmaki River. These hills have been extensively modified during the area’s urbanisation, as highlighted by the retaining undertaken for the construction of Pakuranga Plaza. This urban environment contains a

variety of built forms and land uses, with Pakuranga Plaza, the Plaza’s large tower, and roading infrastructure acting to define the local area.

As highlighted above, there are few natural elements contributing to the area’s landscape or visual appearance. These elements are largely limited to deliberately planted trees, both within the road corridor and at Ti Rakau Park. Any streams in the area have been previously culverted, leaving the area free of any identifiable watercourses. The only exception to this man-made environment is along the SEART, where some fleeting views to the Tāmaki River are possible from passing vehicles and two small wetlands are present. However, these sea views are to a degraded section of the Tāmaki River, with a backdrop of industrial development along its opposite shoreline.

There is little, if no, clear urban design characteristics to this area. With the limited natural elements present and its historic urbanisation, development has occurred on an ad-hoc basis. This has resulted in a mixed urban form of building typologies and land uses. This is particularly true when viewing from the SEART off-ramps, where Pakuranga Plaza, the commercial activities around Cortina Place and residential developments can all be seen in a single vista.

6.8 Contaminated Land

An assessment of the potential for contaminated material to exist in-situ within the site has been undertaken, a copy of which is attached as Appendix 14: Contaminated Land Effects Assessment to this AEE. This assessment has identified two closed landfills in EB2, these being at Ti Rakau Park and Dale Crescent. However, both landfills were used for cleanfill disposal, rather than general or hazardous waste. Further to these two landfills, the following additional HAIL sites have been identified within the EB2 area (Table 6-5).

Table 6-5 HAIL sites within EB2 Footprint

Site Name	Land Use Activity	HAIL Category
3 Kentigern Close / 102 Pakuranga Road	Former service station, now a commercial complex	F7 – Service stations including retail or commercial refuelling activities
141 Pakuranga Road	Service station	F7 – Service stations including retail or commercial refuelling activities
11 Cortina Place / 64B Ti Rakau Drive	Former service station, now a medical centre	F7 – Service stations including retail or commercial refuelling activities
Pakuranga Plaza, Aylesbury Street, Pakuranga Town Centre	New Zealand Dry Cleaners store	A5 – Dry-cleaning plants including dry-cleaning premises or the bulk storage of dry-cleaning solvents
12 Cortina Place	Pakuranga Panel Beaters	F4 – Motor vehicle workshops
16 Cortina Place	Pakuranga Automotive	F4 – Motor vehicle workshops

Site Name	Land Use Activity	HAIL Category
16D Cortina Place	Pakuranga Auto Transport	F4 – Motor vehicle workshops
3 Reeves Road	Service station	F7 – Service stations including retail or commercial refuelling activities

In addition to the above-mentioned HAIL sites, there is the potential to uncover asbestos contamination. The source of such contamination will likely be older buildings and infrastructure (e.g. asbestos cement pipes) which may be uncovered during demolition works. Similarly, there is potential to disturb lead contaminated soil, with such contamination arising from earlier use of lead-based paints.

6.9 Air Quality

The existing air quality environment is described in the Air Quality Effects Assessment provided as Appendix 25: Air Quality Effects Assessment. To summarise, EB2 is located within the Auckland Urban Airshed as shown in Figure 6-8, which runs from Orewa in the North to Papakura and Pukekohe in the South. While previously categorised as a polluted airshed, the Auckland Urban Airshed has not held that categorisation since 2018²², with AC records showing that the last excludable breach of the NES-AQ for PM10 occurring in 2013.

At a more local scale, there are limited sources of air pollution within the Pakuranga Town Centre given the lack of heavy industry. Primary sources of air pollution are motor vehicles and emissions from building heat systems (e.g. home fires).

²² Regulation 17(4) of the NES-AQ.

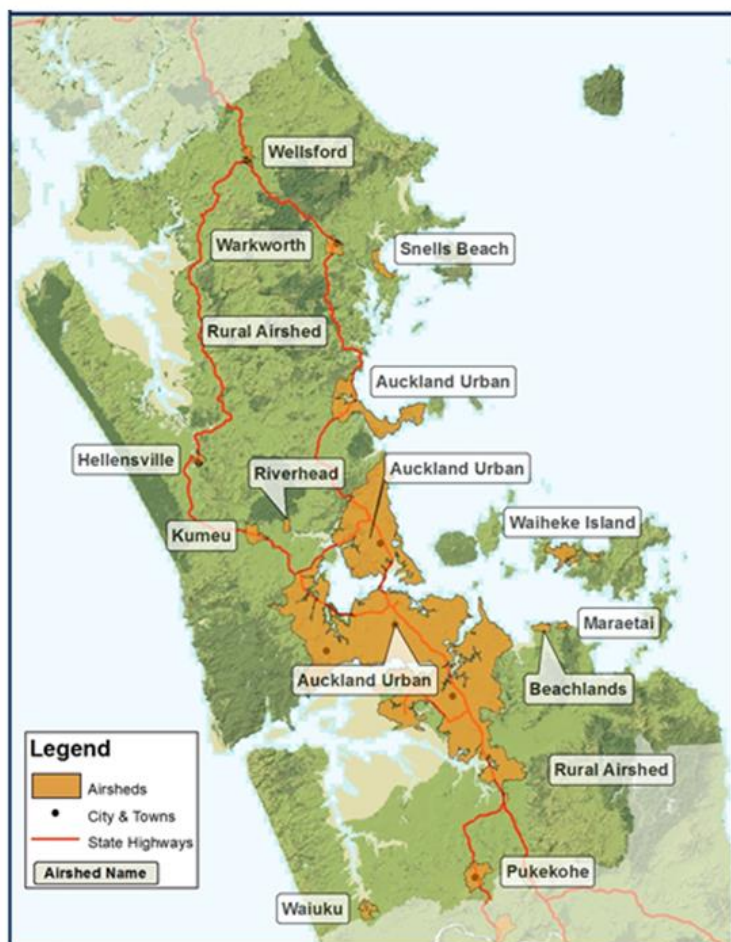


Figure 6-8 The Airsheds of Tāmaki Makaurau Auckland

6.10 Noise

A detailed description of the existing noise environment is provided in the acoustic assessments (Appendix 7: Operational Noise and Vibration Effects Assessment and Appendix 26: Construction Noise and Vibration Effects Assessment) and was based on field data collected in 2018. Further data has not been collected since this time given the impacts of COVID-19 on traffic volumes and other ambient noise sources (e.g. commercial activities). The 2018 data is considered to give an appropriate baseline for noise assessment given those traffic volume match better those modelled for EB2, while other ambient noise generators are more likely to have occurred in 2018 than during the reduced economic activity associated with the COVID-19 lockdowns. This is a similar approach to other infrastructure projects' noise assessments across the Auckland Region.

This field data was collected in accordance with New Zealand Standards 6801, 6802 and 6806, with the noise levels found to be typical of an urban environment with arterial roads as shown in

Table 6-6.

Table 6-6 Existing Environment Noise Levels

Location	Address	Observations	Noise level, dB L _{Aeq} (24h)
ML1	80 Pakuranga Road	Faint noise present from Pakuranga Road	52
ML2	179 Pakuranga Road	Faint noise present from Pakuranga Road	54
ML3	12 Bolina Crescent	Road traffic noise dominant from SEART	69
ML9	13 Reeves Road	Road traffic noise dominant from Reeves Road	60
ML10	Park off Pakuranga Highway	Road traffic noise dominant from Pakuranga Highway	65
ML11	7 Ti Rakau Drive	Traffic noise dominant from Pakuranga/ Ti Rakau intersection	63
ML13	17 Reeves Road	Road traffic noise dominant from Reeves Road	60

6.11 Geotechnical Conditions

As part of the EB2 works, a Groundwater Permitted Activity Assessment has been prepared (Appendix 19). The memorandum details the underlying geological model for the EB2 area and states that the site is underlain by Puketoka Tauranga Group (alluvium) over Waitemata Group East Coast Bays Formation (ECBF). The ground conditions are well understood and comprise a mixture of fine-grained soils, mainly clays, silts and sands, with a less than 0.5 m thick peat layer at about 16 m depth (RL -5 m), over rock.

The superficial deposits (ground level to 20 m below ground level), indicate a sequence of alluvium overlying weathered ECBF bedrock. Nearer the surface, soils become increasingly stiff, with a shallow layer of saturated dense pumiceous silty fine and medium sands. Also present at these shallow depths are lower strength silts and clays, with sand lenses. At more than 20 m below ground level (bgl) are alternating layers of mudstones, siltstones and fine sandstones. These are common ground conditions within Tāmaki Makaurau Auckland.

EBA installed six piezometers to measure groundwater levels as part of project fieldwork in 2021, with a further two historical piezometers data also collected. The result of this fieldwork is shown in Table 6-7 and indicates that a static unconstrained aquifer is present within the EB2 area. This fieldwork indicates that groundwater flow rates through the EB2 works are low, with seasonal depth variations of between 0.9m in the winter and -0.7m in the summer months (from the median).

Table 6-7 Groundwater Fieldwork Results

Drillhole ID	Collar Elevation [m RL]	Top of Slotted Screen (m RL)	Base of Slotted Screen (m RL)	Piezometer Base (manual dip) (m RL)	Response Zone (m RL)	Screened Geology
DH18_103	11.66	8.16	3.66	3.58	3.0-8.5	Completely to Slightly Weathered Sandstone and Siltstone [ECBF]
DH18_104	4.85	3.35	1.35	1.53	1.0-4.0	Clayey SILT, Silty CLAY [Fill]
DH204_P	8.14	1.14	-1.86	-2.20	6.2-10.5	Silty Clay [Alluvium]
DH205_P	7.68	3.68	1.68	1.58	3.5-6.5	Sandy CLAY [Alluvium]
DH210_P	11.82	9.82	6.82	6.77	1.5-5.3	Silty CLAY, Silty SAND, Organic CLAY [Alluvium]
DH212_P	15.87	11.37	8.37	8.12	3.8-8.2	SAND, Organic CLAY [Alluvium]
WB203_P	6.56	0.56	-2.44	-2.62	5.5-9.5	CLAY [Alluvium]
WB213_P	17.12	11.12	9.12	8.98	5.5-8.5	SAND [Alluvium]
WB213_P	17.12	11.12	9.12	8.98	5.5-8.5	SAND [Alluvium]

6.12 Heritage Features

An Archaeological Effects Assessment has been prepared for EB2 (Archaeological Effects Assessment). The assessment states that given the historic urbanisation of the EB2 area, there is not any archaeological materials in-situ. In addition, there are no recorded archaeological sites present or CHI site's in AC's own records.

The only exception to the above is around the area's coastal margins, where undisturbed archaeological materials may be uncovered during land disturbance activities.

6.13 Cultural Values

Prior to the colonial period, the Tāmaki River and Pakuranga Creek formed part of the Ōtāhuhu (also known as Te Toangakiōtāhuhu and Te Tapotū o Tainui) Portage. This portage was an important transport route for Māori, connecting the Waitemata and Manukau Harbours thereby negating the need to travel around Cape Reinga. Also located in the wider area is Mokoia Pa, which was one of the largest Māori populations pre-contact with Pakeha. Other period reporting details large numbers of villages and gardens present along the banks of the Tāmaki River.

One treaty settlement is present within the EB2 area, being a settlement between Ngai Tai ki Tāmaki and the Crown in 2018²³. This settlement includes the provision of a Statutory

²³ Ngāi Tai ki Tāmaki Claims Settlement Act 2018

Acknowledgement Area covering much of the Waitematā Harbour, Hauraki Gulf and Tāmaki River.

There are several claims made under the Marine and Coastal Area (Takutai Moana) Act 2011 (MACAA) for customary marine title. The following iwi and/or hapū have made claims for customary marine title within the Project area (in no particular order):

Figure 6-9 MACAA Claims

Applicant	Court Reference
Ngaati Tamaoho	MAC-01-03-010
Ngāi Tai ki Tāmaki	MAC-01-02-003
Ngāpuhi-nui-tonu Te Kotahitanga Marae)	MAC-01-01-056
Ngāti Kawau and Te Waiariki Korora	MAC-01-01-073
Ngāti Te Ata	MAC-01-02-005
Ngāti Whātua Orakei	MAC-01-02-006
Ihaia Paora, Weka Tuwhera, Gavala Murray, Mahinepua Reserve Trust, Ngāti Ruaiti, Ngati Muri Nagatiruamahue, Ngāti Kawau, Ngāti Haiti, Ngaitupango, Nga Puhi, Ngāti Kahu, Te Auopouri	MAC-01-01-023
Ngāti Maru	AC-01-03-006
Ngāti Taimanawaiti	MAC-01-02-004
Ngāti Tamatera	MAC-01-03-011
Ngāpuhi-nui-tonu (Awataha Marae)	MAC-01-01-050
Ngāpuhi-nui-tonu (Maungarei Marae)	MAC-01-01-053
Ngāti Taimanawaiti	CIV-2017-404-000518
Ngāti Whātua Ōrākei Trust	CIV-2017-404-000520
Mahurangi, Ngāti Awa and Ngapuhi	CIV-2017-404-000524
Ngāpuhi-nui-tonu, Ngāti Rahiri, Ngāti Awa, Nga Tahuu and Ngai Tawake	CIV-2017-404-000537
Ngai Tawake	CIV-2017-404-000558
Te Runanga o Ngāti Whātua	CIV-2017-404-000563
Ngāi Tai ki Tāmaki	CIV-2017-404-000564
Ngāti Te Ata	CIV-2017-404-000569
Te Hikutu Hapū	CIV-2017-404-000570
Ngāti Kawau & Te Waiariki Korora	CIV-2017-485-000398

6.14 Trees

As detailed in the Arboricultural Effects Assessment (Appendix 16: Arboricultural Effects Assessment), the EB2 area features a range of native and exotic trees spread across public

reserves, privately held sites and within road corridors. The assessment has identified the following trees/vegetation.

6.14.1 North and South of SEART

The first area of trees is located north of the SEART corridor, as shown in Figure 6-10 and Figure 6-11. This vegetation includes a number of Pōhutukawa (*Metrosideros excelsa*), as well as maturing/mature Pin oaks (*Quercus palustris*). Similar vegetation is present to the south of SEART. There are extensive grassed areas along the corridor's edges, although there are also areas of contiguous and regenerative vegetation present.

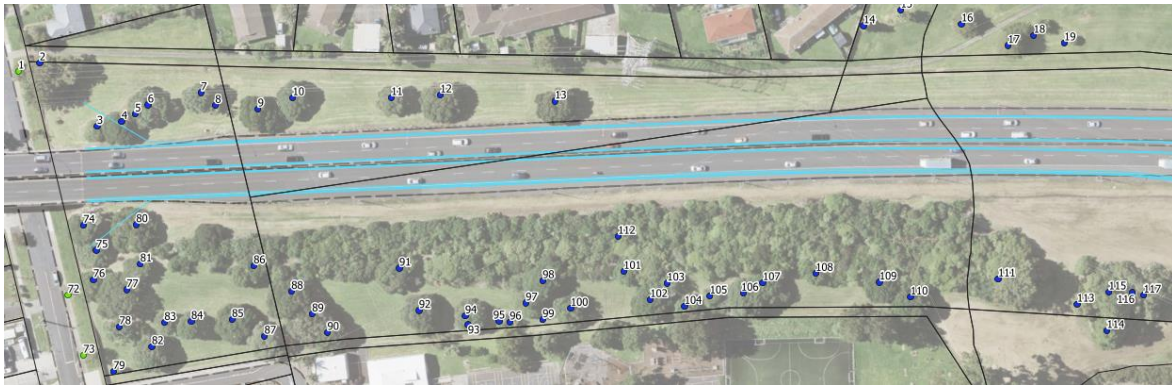


Figure 6-10 Vegetation North and South of SEART

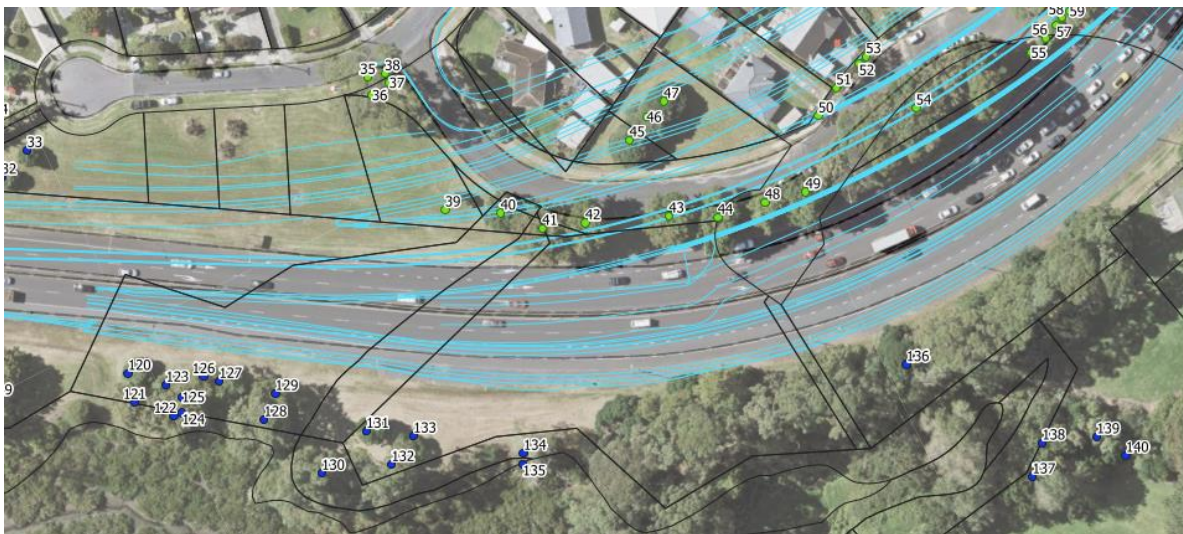


Figure 6-11 Vegetation North and South of SEART

6.14.2 Council Reserves

The Arboricultural Effects Assessment also details the trees present in local reserves. This includes a number of weeping willows (*Salix babylonica*) at Ti Rakau Corner Reserve (Figure 6-12 and Figure 6-13 Figure 6-14), two of which are listed as notable trees under the AUP(OP). No works are proposed to these willows.



Figure 6-12 Trees at Ti Rakau Corner Reserve



Figure 6-13 Three willow trees located within Ti Rakau Corner Reserve

6.14.3 Street Trees

The existing road corridors within the EB2 footprint contain a mix of native and exotic species, with these trees of differing maturity and health. The species present include:

- Pōhutukawa (*Metrosideros excelsa*)
- Bangalay (*Eucalyptus botryoides*)
- *Prunus* sp.
- Karo (*Pittosporum crassifolium*)
- Pin oak (*Quercus palustris*)
- Washington palm (*Washingtonia robusta*)
- Willow myrtle (*Agonis flexuosa*).

6.14.4 Pakuranga Plaza and Associated Land

Pakuranga Plaza and the associated carparks also feature a mix of exotic and native vegetation. This includes the landscaped car park boundaries (which form road reserve), which has Pōhutukawa, Pin Oak, She Oak (*Casuarina glauca*), Norfolk Island Pine (*Araucaria heterophylla*) and a Cooks Pine (*Araucaria columnaris*). These trees are of varying health, with the Norfolk Island Pine exhibiting apical die back²⁴.

6.14.5 Private Sites

Given the intensity of historic development and the limited open space on private sites, there are few trees of note within private properties. The exception to this is St Kentigern College on Pakuranga Road, which has a large range of mature exotic and native trees²⁵.

6.15 Ecology

6.15.1 Terrestrial Ecology

As with other disciplines, a Terrestrial and Freshwater Ecological Effects Assessment has been undertaken and is provided as Appendix 22: Terrestrial and Freshwater Ecological Effects Assessment.

The existing environment is highly urbanised. Regardless, the assessment has identified some patches of mature vegetation that could provide habitat for native fauna. This includes planted areas beside the SEART and along the coastal edge of the Tāmaki River, which have low to high ecological value.

With regard to native fauna, the assessment has noted that while a range of native birds may be present in the project area and the vicinity like the New Zealand dotterel (*Charadrius obscurus*), viable avifauna habitat is fragmented and sparse. Further discussion of avifauna values is provided in Section 6.16.2.

Night-time surveys were undertaken in April 2022 for the long-tailed bat (*Chalinolobus tuberculatus*). These surveys did not find any evidence of bat occupation or movement within the Project area.

The greatest potential for native fauna is native reptiles, like the Ornate skink (*Oligosoma ornatum*), to be present in areas of scrub and landscaping. However, it should be noted that no reptiles were observed or captured during fieldwork for EB2. Regardless, a precautionary approach to lizard protection is recommended, which is detailed further in Section 9 of this AEE.

6.15.2 Freshwater Ecology

There are no watercourses within EB2. Two wetlands have been identified within 100m of the EB2 footprint (Figure 6-14).

²⁴ Die back at the top of the tree.

²⁵ No works are proposed to the trees at Saint Kentigern College.

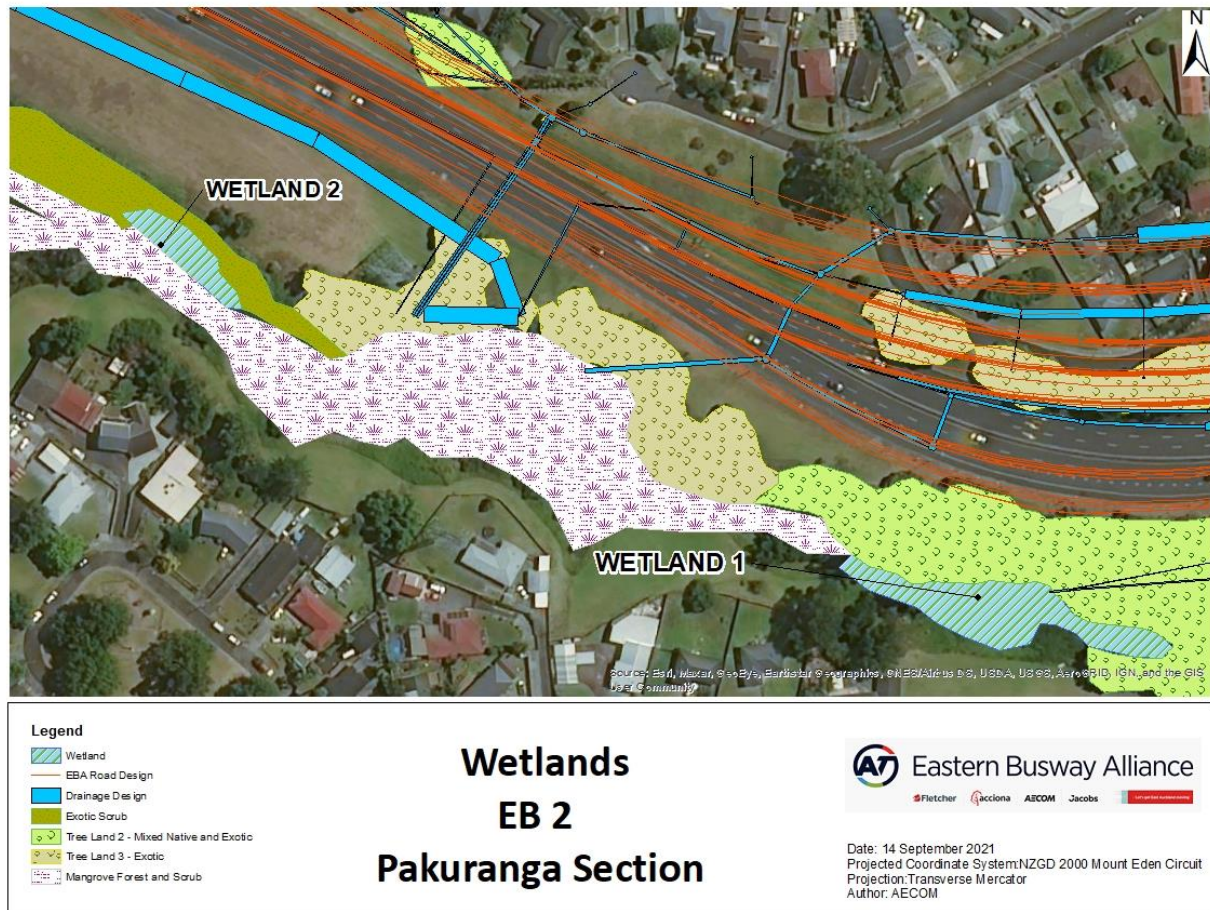


Figure 6-14 Identified Wetlands

Wetland 1 is located within the riparian margins of the Tāmaki River tributary and covers an area of approximately 0.16 ha (Figure 6-15). This wetland receives surface runoff from the Pandora Place Esplanade Reserve, as well as from stormwater outfalls. The wetland features a mixture of mostly exotic species, such as mercer grass (*Paspalum distichum*) and dollar weed (*Hydrocotyle umbellata*).



Figure 6-15 Wetland 1 Exotic wetland located adjacent to SEART.

Wetland 2 is located to the west of Wetland 1 and features restiad rushland/reedland characteristics, while its downstream margins is occupied by mangroves (Figure 6-16). This 0.04 ha wetland has been extensively modified and receives both surface runoff and stormwater discharges from the wider EB2 area.



Figure 6-16 Wetland 2 located adjacent to Pakuranga Highway (EB2).

6.16 Coastal Environment

6.16.1 Coastal Processes

The Tāmaki River is the immediate coastal environment to the EB2 footprint. The Tāmaki River includes a number of small tidal creeks along its length, two of which come within proximity to the EB2 footprint (Figure 6-17). Given their sheltered location and low energy environment, these tidal creeks are not subject to any coastal processes of note.



Figure 6-17 Aerial View of Pakuranga Town Centre showing relative position of the Tāmaki River boundaries

6.16.2 Coastal Ecology

As noted in the Marine Ecology and Coastal Avifauna Effects Assessment (Appendix 28: Marine Ecology and Coastal Avifauna Effects Assessment), the EB2 area contains several branches of the Tāmaki River. Consequently, a series of field investigations have been undertaken, starting in 2018 and finishing in February 2022. These investigations were performed to ascertain the coastal ecological values present, including those associated with water quality, avifauna, flora and benthic invertebrates.

The coastal margins of the EB2 area have experienced degradation from urban development and land uses. These margins and in particular those associated with stormwater outfalls, have a mix of native and exotic vegetation. Common flora found included:

- Mangroves (*Juncus kraussii* var. *australiensis*)
- Karamu (*Coprosma robusta*)
- Pohutukawa (*Metrosideros* spp.)
- Wild ginger (*Hedychium gardnerianum*)
- Pampas (*C. selloana*)
- Woolly nightshade (*Solanum mauritianum*)
- Gorse (*Ulex europaeus*)
- Cabbage tree (*C. australis*).

Figure 6-18 provides two representative photographs of the coastal margin's vegetation.



Figure 6-18 Representative Photographs of Outfall Location Vegetation Types

With regard to benthic invertebrates, the ecological field investigation found that these communities were largely dominated by oligochaete worms, estuarine gastropods (*Potamopyrgus estuarinus* and *Amphibola crenata*) and amphipods. Such species and population characteristics are common within mangrove estuarine environments. Larger

marine fauna, such as tuna hinahina (shortfin eels - *Anguilla australis*) and banded kokopu (*Galaxias fasciatus*) were also observed immediately downstream of manhole MCC_108633.

The marine sediments in these field investigation locations were also collected for contaminant testing. Several locations were found to have higher than guideline values for zinc and copper. None of the samples had above-guideline values for lead. This contamination of marine sediments has likely been caused by urban runoff, including from public roads.

It is noted that the Tāmaki River is utilised by a range of New Zealand resident and migratory shore birds, with the mid-to-lower reaches being particularly important due to the availability of roosting and feeding areas. This includes Significant Ecological Areas (SEAs), which have been identified for their wading bird value. SEA-M1 45a (Pakuranga Creek roost) is a roosting site used by hundreds of wading birds that feed within the Tāmaki River, while SEA-M2 45 w1 provides extensive areas of feeding habitat for wading birds along this coastline. However, no EB2 related works are proposed within either of these SEAs.

However, despite the ecological values of the wider area, the fieldwork undertaken for EB2 only observed one wading bird species, the kotuku (white-faced heron - *Egretta novaehollandiae*) within the areas immediate to and within EB2's footprint. This bird species has a non-threatened status. No evidence of moho pererū (banded rail - *Gallirallus philippensis*) was found, while more common avian species like kōtare (kingfisher - *Todiramphus sanctus*) and pukeko (*Porphyrio melanotus*) were observed.

Overall, the marine environment present with the Project area were found to have only low to low-moderate ecological values, albeit that avifauna values range from low to high given the potential for banded rail to inhabit the EB2 area.

6.17 Water Quality and Hydrology

As noted in the Stormwater Effects Assessment (Appendix 6: Stormwater Effects Assessment), the EB2 area features a number of overland flow paths (OLFPs) and 1 in 100 ARI flood plains (flood plains).

There are two significant OLFPs crossing the proposed works area (Figure 6-19). The first of these flows from SEART into the CMA and is formed from three branches. The first branch originates at Pakuranga Plaza's northern boundary and runs parallel to Ti Rakau Drive, finally joining the main branch at the SEART/Reeves Road intersection. The second branch commences within residential sites on Cardiff Road, before proceeding downhill via the Howick School of Music and Ti Rakau Park. It then meets the main branch following its course through Ti Rakau Drive, Tiraumea Drive and Bolina Crescent. The last branch begins in Grassways Avenue, crossing properties before entering Reeves Road. It is also noted that this last branch is fed from sub-branches from the north and south.

The other OLFP of note commences in Carole Crescent and Cardiff Road, before traveling through Cindy Place and then onto Ti Rakau Drive. This OLFP then crosses Ti Rakau Drive and discharges across an esplanade reserve into the CMA.



Figure 6-19 Overland Flow Paths

Given the abundant OLFPs, historic stormwater management practices and the lower catchment location of EB2, there are also a number of flood plains present (Figure 6-20). These include large flood plains across Ti Rakau Park, Pakuranga Plaza and Ti Rakau Drive. Flood depths range up to 600 mm, causing service disruptions and safety issues within the area's road corridors.

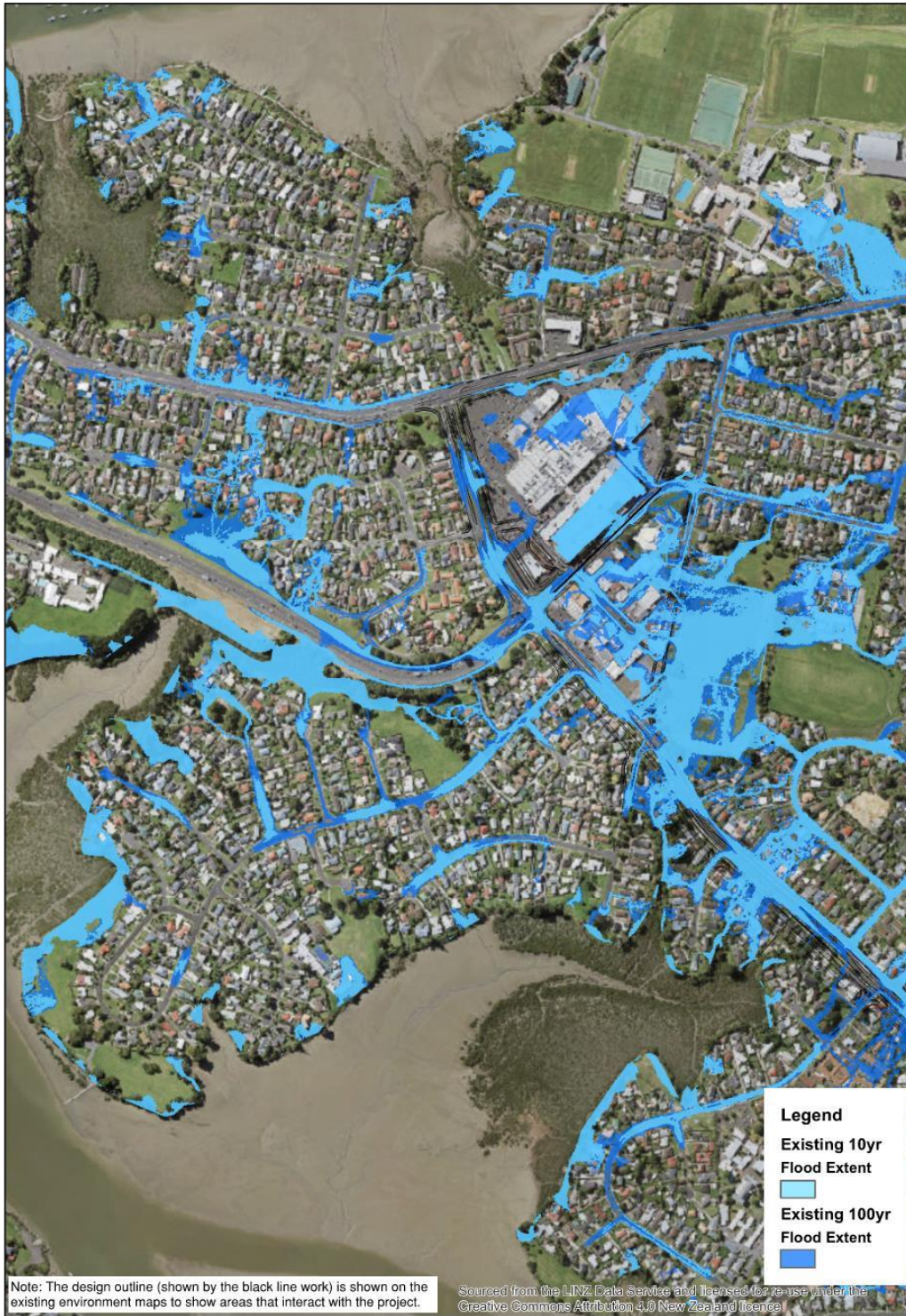


Figure 6-20 Flood Plains within the EB2 Area

7 Reasons for Application

The construction, operation and maintenance of EB2 has been assessed against the AUP(OP) and National Environmental Standards. It should be noted that district land use activities (i.e. those under section 9(3) of the RMA) have not been sought given that those activities will be authorised by way of the NoR.

Resource consent is required for the following activities:

- *Earthworks*
- *Disturbance and discharge of contaminated soil*
- *Vegetation Clearance*
- *Works in the CMA*
- *Occupation of a wetland*
- *Works within a wetland.*

These consents are triggered by both national environmental standards and the AUP(OP).

The proposal also consists of a number of permitted activities, which have been identified.

Overall, the activity status of the resource consent application is for a discretionary activity.

7.1 Introduction

The proposed works have been assessed against rules contained within the following documents:

- AUP(OP)
- Resource Management (National Environmental Standard for Air Quality) Regulations 2004 (NES-AQ)
- Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES-CS)
- Resource Management (National Environmental Standard for Electricity Transmission Activities) Regulations 2009 (NES-ETA)
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020 (NES-FW).

An analysis of the relevant rules from the AUP(OP) and the National Environmental Standards is provided in the sections below.

7.2 Auckland Unitary Plan – Operative in Part

The AUP(OP) contains both district and regional planning rules, noting that only resource consents associated with regional rules are required given the NoR.

The road environment within the AUP(OP) is very enabling for roading activities. A road is defined by the AUP(OP) as the same by the Local Government Act 1974. This definition includes ‘every square or place intended for use of the public generally, and every bridge, culvert, drain, ford, gate, building, or other thing belonging thereto or lying upon the line or within the limits thereof’.

7.2.1 Road Network Activities

Road network activities are relevant to EB2 given their permitted activity status under Rule E26.2.3.2 (A67) under the AUP(OP). This particular land use activity is important to EB2 given EB2's primary role as a transport project and the range of works proposed as part of the NoR that qualify as road network activities.

This includes, but is not limited to the following transport related activities:

- Footpaths, footways and footbridges, bridges for roads, tunnels, retaining walls for roads both above and below the road
- Road verges and berms
- Site access including vehicle crossings
- Road carriageways
- Road pavements
- Cycle facilities
- Road lighting and support structures
- Traffic operation and safety signs, direction signs, road name signs
- Road safety devices including interactive warning signs, road markings, rumble strips, barriers, fences, speed tables and speed cushions, traffic separators, bus friendly vertical deflection devices
- Ancillary equipment and structures associated with public transport systems including seats, shelters, real time information systems and ticketing facilities, bicycle storage and cabinets
- Traffic control devices including traffic islands, pedestrian crossings and roundabouts and intersection controls, traffic and cycle monitoring devices, traffic signals and support structures, cabinets and ancillary equipment associated with traffic signals
- Devices and structures to implement regulatory controls (no-stopping, no-overtaking parking control, bus lane controls, vehicle restrictions) including speed limit and parking restriction signs, parking meters and pay and display kiosks, speed cameras and red light/traffic cameras and on street parking areas
- Road drainage devices including culverts, sub-soils, catch pits, water tables, manholes, inlets, outlets, flumes
- Scour and erosion control devices
- Stormwater management devices including rain gardens, wetlands, stormwater treatment areas and ponds; and noise attenuation walls or fences
- Devices associated with intelligent transport systems including vehicle detection systems (electronic vehicle identification, and infra-red vehicle occupancy counters), lane control signals, ramp signals, variable messaging signs, CCTV cameras, incident detection, emergency telephones, cables and ducting.

7.2.2 Resource Consents Required

Resource consent is required pursuant to section 9(2) and 12(1), (2) and (3) and 15(2A) of the RMA for the reasons (but not limited to) outlined in Table 7-1 below. The activity tables in the overlay, Auckland-wide, zone and precincts specify the activity status for land use and development activities. Any consent triggers associated with section 9(3) of the RMA are addressed by the Notice of Requirement.

Table 7-1 AUP(OP) consents required

AUP(OP) Rule	Description	Activity Status
Land-Use Consent (Section 9(2))		
Chapter E26 - Infrastructure		
E26.3.3.1 (A77)	Vegetation alteration or removal that does not comply with Standards E26.3.5.1 to E26.3.5.4 <i>Comment: Approximately 1120m² of vegetation clearance is proposed around the riparian margins of two terrestrial wetlands (i.e. within 20 m) and the coastal areas of the Tamaki River (i.e. within 25 m of MHWS).</i>	Restricted Discretionary
E26.5.3.2 (A102)	Greater than 10,000m ² up to 50,000m ² where land has a slope less than 10 degrees outside the Sediment Control Protection Area ²⁶ other than for maintenance, repair, renewal, minor infrastructure upgrading. <i>Comment: The construction of EB2 will require 35,000m² across Pakuranga Town Centre.</i>	Controlled
Coastal Permit – Section 12(1) (2) and/or (3)		
F2.19.4 (A50)	Mangrove removal, not otherwise provided for <i>Comment: The proposed works involve approximately 4262m² of mangrove clearance within the CMA. This clearance is required for the construction of two new stormwater outfalls and their associated permanent footprint.</i>	Discretionary
F2.19.10 (A133)	Infrastructure coastal marine area structures not otherwise provided for <i>Comment: The proposed works include two new stormwater outfalls within the General Coastal Zone requiring a permanent occupation of the CMA of 1,375m².</i>	Discretionary
Discharge Permit - Section 15(2A)		
E30.4.1 (A6)	Discharges of contaminants into air, or into water, or onto or into land not meeting permitted activity Standards E30.6.1.1; E30.6.1.2; E30.6.1.3; E30.6.1.4; or E30.6.1.5. <i>Comment: Land disturbance will occur adjacent to contaminated sites (3 Reeves Road and 141 Pakuranga Road) and a detailed site investigation has not been undertaken. As such, a precautionary approach has been applied and resource consent is sought under this rule.</i>	Restricted Discretionary

²⁶ The AUP(OP) defines the Sediment Control Protection Area as:

- (a) 100m either side of a foredune or 100m landward of the coastal marine area (whichever is the more landward of mean high-water springs); or
- (b) 50m landward of the edge of a lake, river or stream, or the edge of a wetland of 1,000m² or greater.

7.2.3 Permitted Activities

Schedule 4 of the RMA requires that where an application is relying on a permitted activity as part of the proposal, a description of the permitted activity that demonstrates that it complies with the requirements, conditions and permissions for the permitted activity must be provided.

The identification of permitted activities is important given the role they provide in defining the “permitted baseline” when considering the effects of a resource consent application or NoR. The role of the permitted baseline is further detailed in Section 9.2.

The following permitted activities set out in Table 7-2 are to be relied upon to support the construction and operation of EB2.

Table 7-2 Permitted Activities

Permitted Activities	
Activity	Rule
Chapter E26 - Infrastructure	
Construction, operation, use, maintenance and repair of road networks activities <i>Comment: All road network activities that form part of the proposal are permitted.</i>	E26.2.3.2 (A67)
Transportation of people, goods and services <i>Comment: All road network activities which enable transportation of people, goods and services on existing and unformed roads are permitted.</i>	E26.2.3.2 (A68)
Public Amenities <i>Comment: All road network activities which establish public amenities for the convenience and amenity of the public such as landscaping, planting, directional signage, shelters are permitted.</i>	E26.2.3.2 (A70)
Pest Plant Removal <i>Comment: As detailed in the Arboricultural Effects Assessment removal of pest plant trees less than 4m in height and less than 400mm in girth are permitted.</i>	E26.4.3. (A82)
Tree trimming or alteration <i>Comment: As detailed in the Arboricultural Effects Assessment, trimming and alteration of protected trees that comply with standard E26.4.5.1 are permitted.</i>	E26.4.3 (A83)
Works within the protected root zone that comply with Standard E26.4.5.2 <i>Comment: As detailed in the Arboricultural Effects Assessment, works within the protected root zone that comply with Standard E26.4.5.2 are permitted.</i>	E26.4.3.1 (A87)
Tree alteration or removal of any tree less than 4m in height and/or less than 400mm in girth <i>Comment: As detailed in the Arboricultural Effects Assessment, tree alteration or removal of any trees less than 4 in height and or less than 400mm in girth are permitted.</i>	E26.4.3.1 (A91)
Earthworks for maintenance, repair, renewal, minor infrastructure upgrading and service connections <i>Comment: The earthwork trenching for underground utility service connections along EB2 are considered to be permitted in all zones the works sits within.</i>	E26.5.3.1 (A94) and E26.5.3.2 (A100)
Earthworks up to 2500m ² other than for maintenance, repair, renewal, minor infrastructure upgrading <i>Comment: The earthwork for trenching for minor infrastructure upgrading will be less than 2,500m² (1,200m²) and are considered to be permitted.</i>	E26.5.3.1 (A95)
Earthworks up to 2500m ³ other than for maintenance, repair, renewal, minor infrastructure upgrading	E26.5.3.1 (A96)

<p><i>Comment: The earthwork for trenching for minor infrastructure upgrading will be less than 2,500m³ (5,87m³ cut and 800m³ fill) and are considered to be permitted.</i></p>	
<p>Chapter E36 – Natural Hazards</p>	
<p>Construction, operation, maintenance, renewal and repair of road network activities within the legal road or road formation width in the coastal erosion hazard area; coastal storm inundation 1 per cent annual exceedance probability (AEP) area; coastal storm inundation 1 per cent AEP plus 1m sea level rise area; overland flow paths; land which may be subject to land instability.</p> <p><i>Comment: Construction and operation of road network activities within legal road within overland flow paths and on land which may be subject to land instability are considered permitted.</i></p>	<p>E36.4.1 (A53)</p>
<p>Chapter E7 – Taking, using, damming and diversion of water and drilling</p>	
<p>Dewatering or groundwater level control associated with a stormwater diversion and diversion of groundwater caused by excavation.</p> <p><i>Comment: the stormwater excavations are a road network linear trenching activity, where no one part of the trench will be open for more than 10 days, this is considered permitted activity. The piling works will involve piles with an external diameter of greater than 1.5m, which will be drilled into rock head. However, these do not exceed 1 hectare in total area and do not impede the flow of groundwater over a length of more than 20 m. Therefore, these are also considered a permitted activity.</i></p>	<p>E7.6.1.6 and E7.6.1.10</p>
<p>Chapter E8 – Stormwater – Discharge and diversion</p>	
<p>Diversion of stormwater runoff from lawfully established impervious areas directed into an authorised stormwater network or a combined sewer network that complies with Standard E8.6.2.1</p> <p><i>Comment: Diversion of stormwater runoff from established impervious road areas will be directed into the authorised stormwater network within the Pakuranga catchment as a permitted activity.</i></p>	<p>E8.4.1 (A1)</p>
<p>Chapter E25 – Noise and Vibration</p>	
<p>Activities that comply with all the relevant permitted activity standards</p> <p><i>Comment: A noise and vibration assessment has been prepared which shows that the operational noise and vibration of the busway can be undertaken in accordance with the relevant standards and is considered to be permitted. Additionally, the proposed bentonite plant will be supported by the Project's CNVMP to meet compliance with the relevant noise standards and is authorised by the NoR therefore considered a permitted activity.</i></p>	<p>E25.4.1 (A1)</p>
<p>Chapter E24 - Lighting</p>	
<p>Activities that comply with all the relevant permitted activity standards</p> <p><i>Comment: The lighting associated with the busway will be in accordance with the permitted standards.</i></p>	<p>E24.4.4 (A1)</p>
<p>Chapter E14 – Air Quality</p>	
<p>Activities meeting the permitted activity standards and not provided for by any other rule</p> <p><i>Comment: The proposed bentonite plant will have covered containers, and the mixing, pumping, receipt, storage and handling of bentonite or polymer is contained and does not lead to any air discharge. Therefore, the establishment and use of the plant is considered a permitted activity.</i></p>	<p>E14.4.1 (A1)</p>
<p>Chapter E33 – Industrial Trade Activity</p>	
<p>Discharge of contaminants from an existing or new industry or trade activity area listed as moderate risk in Table E33.4.3</p> <p><i>Comment: The proposed bentonite plant and petrol storage covers an area of less than 5,000m² and will be in use less than 12 months, supported by subsequent construction</i></p>	<p>E33.4.3.2 (A17)</p>

<i>management plans and procedures over the duration of its use. The activity is therefore considered a permitted activity.</i>	
Chapter E40 – Temporary Activities	
Temporary activities associated with building or construction, (including structures and buildings that are accessory activities), for the duration of the project, or up to 24 months, whichever is the lesser <i>Comment: The proposed bentonite plant is associated with construction and will be in use for a 9-month period. The Site Office at 5 Reeves Road will be in place for the duration of the project and is provided for by the NoR. Therefore, the temporary activity is considered a permitted activity.</i>	E40.4.1 (A20)
Chapter H10 – Business Town Centre Zone	
Activities not provided for <i>Comment: Establishing the proposed bentonite plant during construction is not provided for, however will be supported by subsequent construction management plans and is authorised by the NoR, therefore considered a permitted activity.</i>	H10.4.1 (A1)
Chapter D26 – National Grid Overlay	
Within the National Grid Yard (Compromised and Uncompromised) - Network Utilities (excluding buildings and structures for irrigation) and electricity generation that connect to the national grid <i>Comment: The network utilities and electricity generation which connects to the national grid is considered to be permitted.</i>	D26.4.1 (A3)
Within the National Grid Yard (Uncompromised) any structures that do not meet the definition of Building in Chapter J <i>Comment: The RRF (as a bridge) is specifically excluded from the definition of “building”</i>	D26.4.1 (A13A)
Land disturbance that complies with Standards D26.6.1.1(1)(a), D26.6.1.1(1)(b), D26.6.1.1(1)(c) and D26.6.1.1(1)(d) <i>Comment: Land disturbance undertaken as part of sealing or resealing of a road, footpath or driveway does not require to apply Standards D26.6.1.1(1)(a) – (d) and therefore is considered permitted.</i>	D26.4.1 (A19)
Within the National Grid Substation Corridor – Network Utilities and Electricity Generation that connects to the National Grid <i>Comment: The network utilities and electricity generation which connects to the national grid is considered to be permitted.</i>	D26.4.2 (A27)
Roading activities, and network utilities or electricity generation that connects to the National Grid that are above ground or comply with Standard D26.6.1.2(1), and electricity transmission infrastructure in a road carriageway <i>Comment: All network utilities can comply with Standard D26.4.2 and are considered to be permitted.</i>	D26.4.2 (A28)

7.3 National Environmental Standards

7.3.1 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011

The NES-CS applies to land identified as having had an activity or industry described in the HAIL undertaken in it. As detailed in Section 6.8 and Appendix 14: Contaminated Land Effects Assessment, works are occurring in proximity to the existing service station at 3 Reeves Road, Pakuranga. This section of the EB2 works have been identified as occurring on

a HAIL site without the prior preparation of a detailed site investigation. A discretionary land use consent is required under Regulation 11 of the NES-CS²⁷.

7.3.2 Resource Management (National Environmental Standard for Electricity Transmission Activities) Regulations 2009

The NES-ET sets out a national framework of permissions and consent requirements for activities on existing electricity transmission lines.

No works are proposed as part of this application to existing Transpower assets. All works to Transpower assets are being addressed by a resource consent application by Transpower themselves. This includes the relocation of a transmission tower and associated high voltage cables.

7.3.3 Resource Management (National Environmental Standards for Freshwater) Regulations 2020

The NES-FW sets requirements and standards for activities that pose risks to freshwater and freshwater ecosystems.

As infrastructure works that delivers a service operated by a life utility (i.e. AT) and as a project listed in the Regional Land Transport Plan, EB2 (as part of the overall Project) qualifies as “specified infrastructure in the NES-F²⁸.”

The following resource²⁹ consents are required for works associated with specified infrastructure:

NES-FW Regulation	Description	Activity Status
Regulation 45(1)	Vegetation clearance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure. <i>Comment: The construction of two new stormwater outfalls will require the removal of approximately 4262m² of a mangrove dominated coastal wetland within the Tāmaki River.</i>	Discretionary
Regulation 45(2)	Earthworks or land disturbance within, or within a 10 m setback from, a natural wetland is a discretionary activity if it is for the purpose of constructing specified infrastructure. <i>Comment: The construction of two new stormwater outfalls will require the disturbance of approximately 4262m² of a mangrove dominated coastal wetland within the Tāmaki River.</i>	Discretionary

²⁷ This land use consent is sought under section 9(3) of the RMA.

²⁸ Specified infrastructure is defined by the NPS-FW as:

“(a) infrastructure that delivers a service operated by a lifeline utility (as defined in the Civil Defence Emergency Management Act 2002)

(b) regionally significant infrastructure identified as such in a regional policy statement or regional plan...”

NES-FW Regulation	Description	Activity Status
Regulation 47(3)	<p>The taking, use, damming, diversion, or discharge of water within, or within a 100 m setback from, a natural wetland is a restricted discretionary activity if it—</p> <p>(a) is for the purpose of maintaining or operating specified infrastructure or other infrastructure; and</p> <p>(b) does not comply with any of the conditions in regulation 46(4), but does comply with the conditions in subclause (5) of this regulation.</p> <p><i>Comment: Stormwater discharges are proposed from two new outfalls into a mangrove dominated coastal wetland beside SEART.</i></p>	Restricted discretionary

7.4 Summary

In addition to the Notice of Requirement to designate EB2 for busway purposes, all necessary resource consents from Auckland Council and to authorise the construction, operation and maintenance of EB2 are sought. Overall, it is considered that the following resource consents are required:

- Land use consents for a **discretionary activity**
- A coastal permit for a **discretionary activity**
- A discharge permit for a **restricted discretionary activity**.

The overall activity status of EB2 is **discretionary**.

8 Consultation

Chapter Summary – This chapter details the consultation undertaken by AT and the EBA during development of the EB2 design and application material. This has included engagement with mana whenua, elected members, various Auckland Council departments, local community groups, regional advocacy and interest groups, landowners, tenants, and the local residential and business community

8.1 Introduction

AT and EBA have undertaken extensive community engagement and consultation with partners, various stakeholders, community groups and businesses regarding the proposed EB2 works. There were three objectives of this consultation, which was aligned with the International Association of Public Participation (IAP2) engagement framework:

1. Engage directly impacted property owners on the proposed alignment and for them to meet privately with alliance representatives
2. Inform stakeholders and the community of the proposed alignment, station locations and staging. The Project team highlighted benefits and trade-offs, differences from earlier schemes, options considered, indicative construction phasing, further design and next steps
3. Consult with stakeholders and the community to identify opportunities to maximise access to the busway including walking, cycling and local bus catchments, connections to the stations, crossing points and station functionality.

The Project team worked closely with mana whenua, elected representatives, AC, Howick Local Board, AT's Capital Projects' Accessibility Group (CPAG), diverse cultural and interest groups, business and residents' associations, places of worship, schools and media to promote the consultation programme through their networks. For example, the Korean Positive Ageing Charitable Trust shared Project information in Korean on a popular community website nzkoreapost.com and the Pakuranga Chinese Association distributed information to their membership in Chinese.

8.2 Auckland Council

Regular meetings have been held between EBA and a range of AC officers, including members of Community Facilities, Healthy Waters, Regulatory Services, and Local Board advisors. AC staff were given detailed briefings on the proposed busway and its potential effects and impacts on the AC's assets, facilities, and community disruptions. A collaborative relationship has been established through working through the design challenges and constraints to reach and develop appropriate mitigation strategies and outcomes.

8.2.1 Community Facilities

Regular monthly meetings have been held between EBA and the AC Community Facilities team, which include Parks Planning, Sports and Recreation, Asset Maintenance and Closed Landfill officers to discuss the works occurring within AC reserves (including management and mitigation measures).

8.2.2 Healthy Waters

Regular weekly meetings have been held between the Alliance and Healthy Waters' catchment engineers. Contact with Healthy Waters has primarily focused on EB2's stormwater design, how it will integrate into existing public infrastructure and compliance requirements associated with the NDC.

8.2.3 Regulatory Services/Plans and Places

Regular meetings have been held between EBA and AC's Resource Consent Department, via an AC Premium Project Manager. These meetings have also been attended by planners from AC's Plans and Places Department. These meetings have included introducing the EB2 RMA documentation to AC's planners and specialists, which have enabled potential matters to be addressed prior to formal lodgement. These pre-lodgement meetings have included the sharing of draft documents, discussion of stakeholder engagement results and information requirements for lodgement of the application package.

8.3 Mana whenua

EBA is partnering with mana whenua, regularly meeting with representatives from Ngāti Whanaunga, Ngāi Tai ki Tāmaki, Te Akitai Waiohua, Ngāti Maru, Ngāti Tamaoho, Te Patukikkiri, Ngāti Paoa, Ngāti Paoa Trust, Ngāti Te Ata Waiohua, Te Ahiwaru, and Ngāti Tamaterā through the AT and Mana Whenua Southern Forum.

Engagement with mana whenua has taken place on a minimum of a monthly basis through hui and workshops, both online and in person since EBA was formed in October 2020. Hui have involved presentations from consistent alliance representatives and guest specialists to provide updates and seek input into a broad range of subject matters.

Mana whenua have played a key and valued role in the development of the overall design of the busway and stormwater management approach, along with site investigations, utilities, construction methodologies and the initial development of sustainability and procurement strategies and policies.

Mana whenua expressed support for the provision of high quality and sustainable transport options and investment in a currently underserved area of Tāmaki Makaurau Auckland. Key discussion themes have focussed on opportunities for restoration and education, broader social outcomes, high quality material choices, and opportunities to enhance the environment through stormwater and water quality improvements, substantial planting and canopy cover and enhancement of existing natural features and wildlife habitats. The Cultural Values Assessment for the Project is attached as Appendix 34: Cultural Values Assessment.

8.4 Elected Representatives

The elected representatives of the Howick Ward were updated regularly on the Project and advised of the planned consultation activities.

Simeon Brown (MP for Pakuranga) and Christopher Luxon (MP for Botany) were updated each month through their attendance at the Elected Representatives' meetings. They were

aware of the planned consultation activities and were equipped to respond to any constituent questions they may have received. Adele White, Howick Local Board Chair and Councillors Sharon Stewart and Paul Young were regularly updated through their attendance at the elected representatives' meetings and at the monthly Howick Local Board meetings.

The Howick Local Board was provided with a presentation each month in confidence by several senior members of EBA, outlining the proposal as it developed during the year, design rationale, and engagement process. The chair and local board members were aware of the planned consultation activities and were equipped to respond to any community questions. Board members offered to share information with their constituents and facilitate engagement.

AC's Planning Committee was provided with a presentation on the Project in confidence, and EBA representatives met with Councillor Chris Darby (Chair of the Planning Committee) at key stages.

Project information was also shared with the following elected representatives:

- Naisi Chen MP
- Priyanca Radhakrishnan MP
- Jenny Salesa MP
- Mayor of Auckland, Phil Goff
- Councillor Chris Darby
- Councillor Richard Hills
- Councillor Josephine Bartley
- Councillor Desley Simpson
- Maungakiekie Tāmaki Local Board members
- Ōrākei Local Board members

Elected members have expressed their overall support for the Project, and its intended outcomes and benefits. There is consistent support for the RRF as part of the Project and discussion of how to balance the needs of cyclists and better vehicle access on Pakuranga Road and Ti Rakau Drive. They have expressed empathy for the wellbeing of residents receiving property news at a time of social stress caused by COVID-19.

Most of the Howick Local Board Board's feedback has focused on the Project as a whole, rather than EB2 in isolation. Board members have also raised questions about cycling connections, the Project's cost, time frames for delivery, construction impacts and environmental effects. EBA team members will continue to meet regularly with the Howick Local Board to further discuss these matters.

8.5 Government Ministries

Project information and an outline of the consultation methodology and timings was sent to relevant ministry contacts for their dissemination. In addition, Project briefings and workshops were held with staff from Waka Kotahi NZ Transport Agency, Ministry of Education Te Tāhuhu o te Mātauranga, Kāinga Ora – Homes and Communities, and Department of Conservation Te Papa Atawhai to discuss the proposed scheme in detail.

8.6 Stakeholder Groups

EBA has engaged with regional advocacy groups and stakeholders to provide a Project briefing ahead of public consultation. Virtual meetings were held with GenZero, Greater Auckland, Bike Auckland, Auckland Business Forum and Automobile Association. These meetings raised stakeholder awareness of the Project and provided the opportunity for a two-way conversation about the proposed scheme. The alliance answered various community-related queries during the virtual meetings, preparing advocacy and stakeholder groups with information to share with their networks.

In addition, Project information and an invitation to provide feedback was provided to a wider list of stakeholders including:

- Forest and Bird
- CCS Disability Action
- Royal New Zealand Foundation for the Blind
- National Foundation for the Deaf
- Road Transport Forum
- Road Transport Association
- New Zealand Heavy Haulage Association
- National Road Carriers
- Bus and Coach Association.

8.7 Local Stakeholder Groups

EBA has met with the following local stakeholders to share Project updates and detailed information on the proposed scheme and consultation process:

- Greater East Tāmaki Business Association
- Howick Youth Council
- Pakuranga and Botany Libraries
- Pakuranga and Botany Citizen’s Advice Bureau
- Pakuranga And Howick Budgeting Service
- Pakuranga Counselling Centre
- Pakuranga Rugby League Club
- Fencibles United Football Club
- Te Tuhi Contemporary Art Trust
- Pakuranga Medical Centre
- Howick Residents and Ratepayers Association
- Dementia Auckland.

EBA has also engaged with a number of community leaders in East Auckland’s ethnic communities, including Pakuranga Chinese Association, Asian Safety Education and Promotion Charitable Trust, Korean Positive Ageing Charitable Trust, Chinese Women Association of New Zealand and the Chinese New Settlers Services Trust.

Project information and an invitation to provide feedback was also provided to an extensive stakeholder database including nearby businesses, places of worship, schools and early childhood centres, resident associations, AT’s Capital Projects’ Accessibility Group, sport and leisure groups, aged care providers and other community organisations.

8.8 Education Providers

EBA has briefed Ministry of Education Te Tāhuhu o te Mātauranga, Howick and Pakuranga Principals Association, Kindergarten Association, local schools and kindergartens. School principals from Riverhills, Pakuranga Heights, Anchorage Park Primaries, and Pakuranga Intermediate, and associated school-based kindergarten representatives attended the meetings. Two-way conversations provided an opportunity for the education community to learn about the Project alignment and ask questions, which were predominantly about accessibility once complete.

8.9 Affected Landowners

Providing certainty to property owners and progressing conversations with them as soon as possible has been a priority for AT and EBA. The Project team is sensitive to the impact that the news of proposed property acquisition would have on those affected. Ordinarily the team would consult with property owners in person with face-to-face meetings. As that was not an option within the Auckland COVID-19 restrictions in place between August 2021 and March 2022, consultation primarily took place online.

EBA identified properties that would be impacted by the proposed alignment. A process was developed to identify:

- Properties impacted that had previously been engaged with in 2018
- Properties that were newly impacted
- Properties that were partially impacted
- Properties that were no longer impacted (under the current alignment).

Based on this, four types of letters were produced indicating the different levels of impact, property owners were invited to book a meeting through an online booking system, by calling 0800 BUSWAY or emailing info@easternbusway.nz to discuss the impact on their property.

Letters to property owners were couriered to them on 27 October. The Project team's intent was to talk with each one by phone, on Teams or Zoom with an additional offer to meet face to face in early 2022. The first online meeting was held on Friday October 29, 2021. A subject matter expert in property, design, planning and if appropriate, construction, attended each meeting.

A presentation was produced and minutes taken for each property meeting. A follow up email was sent with a landowner's guide for people affected by land purchase, an outline of compensation, and the contact details of a member of the property team assigned to help them with any specific questions. The Pakuranga Counselling Centre was engaged to offer support to property owners as required.

Following the COVID-19 level 3 restrictions being lifted, follow up emails were sent to 50 property owners who had previously met online. They were offered face-to-face meetings to further discuss property impacts and any other questions they had in the relation to the proposed alignment. Meeting rooms were booked at Te Tuhi Contemporary Art Trust centre in Pakuranga and Botany Library between 8-10 December and 13-15 December. A total of twenty eight 45-minute meeting time options were offered for face-to-face meetings.

8.10 Community

In order to engage with the Project's community and to give them opportunity to provide feedback, the Project team:

- Created and publicised the 'Your Guide to the Eastern Busway' brochure and feedback form online, through social media and in printed copy for community members, property owners and tenants in the Howick Ward. Translated versions were available online and could be accessed through a QR code
- Established a 'virtual consultation room' hosted on the Project's webpage for people to interact with the information, including an interactive online map and digital feedback form
- Emailed the 'Your Guide to the Eastern Busway', posters in English and Chinese (Simplified) a feedback form and link to the short Project video to key stakeholders, interest groups and individuals on our customer database
- Generated media releases, proactive local news stories and Our Auckland content about key features of the Project and consultation timeframe
- Created social media posts advertising opportunities for people to provide feedback
- Provided flyers, brochure, feedback forms and prepaid envelopes to four libraries in the Project area from mid-November when they re-opened following an extended lockdown
- Worked with business and residents' associations, places of worship, elected representatives and Howick Local Board to promote the consultation through their networks
- Emailed the 'Your Guide to the Eastern Busway' to previous submitters who provided feedback on the 2018 proposal
- Provided the 'Your Guide to the Eastern Busway' to AT and EBA staff as informal advocates for the Project
- Provided a short video of the proposed alignment on YouTube, the Project website and on social media.

Feedback was able to be provided by:

- Completing an online feedback form, posting on the Social Pinpoint map or comment wall, or by completing a printed form included with the 'Your Guide to the Eastern Busway'
- Visiting a community library and completing a feedback form there, or mailing it back
- Calling the 0800 number and talking directly with one of the team who would assist with completing a feedback form.

8.11 Summary of Consultation

While most feedback was focused on the EB3 Commercial section of the Project, there was broad support for the design of the EB2 section, particularly the RRF.

Given that plans for the RRF have existed for many years, stakeholders were aware of the proposal, and expressed overall support, albeit with the following concerns and suggestions:

- Concerns about the impact of construction – including the closure of Reeves Road during construction, the potential dust, noise, and vibration caused, wayfinding and the combined impact of these factors on stakeholders’ operations
- The need for additional parking in the area.

Some active mode advocacy groups questioned whether the Reeves Road flyover was needed, and whether it would encourage or perpetuate private vehicle usage.

8.12 Ongoing Engagement

Further community engagement and consultation is being planned for July 2022 to inform the development of the detailed design for EB2 and to inform the community of upcoming construction and enabling works. This consultation will comprise:

- A series of in-person community information pop-in sessions hosted in local community venues, as well as online information using the Project website
- The use of 3D digital models of the design, and virtual flythroughs
- Detailed design imagery with an opportunity to provide feedback on aspects of the design such as station facilities
- Plain language information about construction and enabling works including tree and building removal, site establishment, traffic management, dust and noise – and how to contact the alliance to raise issues and complaints.

Ongoing engagement with partners, stakeholders, elected representatives, property owners, tenants and the wider community will continue throughout the Project as set out in the CCP (Appendix 11: Communication and Consultation Plan).

9 Assessment of Effects

Chapter Summary – This chapter provides a comprehensive assessment of the EB2’s actual and potential environmental effects. This includes separate consideration of effects during its construction and operational phases. This assessment is supported by a number of technical assessments that have been attached to this AEE.

Overall, EB2 is considered to have acceptable adverse effects. This is due to its design, consideration of the permitted baseline and the mitigation/management practices proposed.

It is also noted that EB2 will generate significant benefits given its role in improving the function of Tāmaki Makaurau Auckland’s transport network.

9.1 Introduction

This section of the AEE addresses the actual and potential effects associated with the construction, operation and maintenance of EB2, and is informed by the assessment matters and policy context provided in the relevant sections of the AUP(OP) where appropriate.

The relevant actual and potential environmental effects of EB2 are considered to be:

- Positive effects
- General construction effects
- Transport
- Landscape and visual
- Stormwater and flood management
- Ecological values
- Arboricultural matters
- Groundwater matters
- Effects on groundwater and water availability
- Mana whenua values
- Operational noise
- Air quality.

When considering the effects of EB2, the receiving environment consists of:

- The existing environment (as described in Section 5) and the associated effects from lawfully established activities, these being the existing road network including SEART
- The existing environment as modified by any resource consents granted and likely to be implemented
- The environment as likely to be modified by activities permitted by the AUP(OP).

9.2 Permitted Baseline

Sections 95D(b) and 95E(2)(a) state that for the purposes of an effects assessment, the planning authority may disregard an adverse effect if a rule or national environmental standard permits an activity with that effect. This “permitted baseline” test is commonly

employed on applications under the RMA, with non-use typically occurring in unusual or special circumstances.

It is considered appropriate that the permitted baseline is applied to the current application, given the busway will be constructed largely within existing road reserve or immediately adjacent to the road reserve. Furthermore, the busway will be declared road in due course, which is particularly relevant to operational matters. Lastly, the RRF itself is largely a permitted activity as it pertains to its structural components within existing road corridors (i.e. SEART, Ti Rakau Drive and Reeves Road).

The breakdown of relevant permitted activities, including road network activities, is provided in Section 7.

9.3 Positive Effects

The Project, including EB2, will deliver significant benefits to the communities of southeast Tāmaki Makaurau Auckland and the wider region. As detailed in Sections 2 and 3, the Project has been developed in response to transport issues within southeast Tāmaki Makaurau Auckland, to meet projected population growth, reduce regional greenhouse gas emissions and to achieve modal shift goals.

Numerous studies have identified that the Howick Local Board area experiences heavy congestion, with 90,000 vehicles per day (vpd) using the Panmure and Waipuna Bridges. Recent rapid population growth and a heavy dependence on private motor vehicles has put significant strain on the existing road network. EB2, as part of the Project, will help alleviate some of this congestion. This will principally be achieved through the diversion of traffic from the Ti Rakau Drive/Pakuranga Road intersection and onto the RRF. This diversion will reduce the volumes of through-traffic within Pakuranga Town Centre and local roads. As such, EB2's contribution to congestion reductions will improve travel times, supporting the more rapid movement of freight and people.

In addition, the development of the Project has been driven by both previous and projected population growth within southeast Tāmaki Makaurau Auckland. Pakuranga Town Centre is a major transport hub for southeast Auckland, with traffic flows coming from both established and new suburbs. Ti Rakau Drive and SEART are important for the efficient movement of freight and heavy goods vehicles, connecting the commercial areas of East Tāmaki, Highbrook, Botany, Pakuranga and Highland Park to the wider region.

The established suburbs, such as Howick and Highland Park are experiencing high levels of redevelopment, through both infill housing and wholesale redevelopment of sites. This redevelopment will only grow in intensity through the new medium density residential standards introduced in late 2021 by the New Zealand Government, which will be incorporated into the AUP(OP) by a plan change anticipated to be notified by AC in August 2022. Approximately 24,000 people are expected to be within a 1km walking catchment from the Project's bus stations upon completion.

Traffic flows from the isthmus are also expected to increase given population growth from brownfield developments like the Tāmaki regeneration programme and the movement of these residents to recreation, education and employment opportunities within southeast

Tāmaki Makaurau Auckland³⁰. Botany Town Centre is also expected to grow significantly through greater residential intensification and redevelopment, with these residents and businesses reliant on Ti Rakau Drive as a transport connection to the wider region. Growth is also being generated by greenfield developments like Flat Bush, where 1700 ha of land is being urbanised for a population of approximately 40,000 people. Lastly, congestion due to the growth in commercial activity is also anticipated, noting the role that Ti Rakau Drive has in connecting the commercial areas of East Tāmaki and Highbrook to the wider region.

Without the construction of the Project (including EB2) and the provision of improved transport choices (i.e. public and active transport modes), southeast Tāmaki Makaurau Auckland's road network would experience significantly increased congestion. This congestion would in-turn impact both the quality of life for residents and the economic wellbeing of Tāmaki Makaurau Auckland's businesses. The Project will alleviate, in part, projected increases in road congestion.

As mentioned above, the Project also provides increased transport choices for residents and visitors. The dedicated bus lanes and stations will improve the public transport experience for passengers, through reliable travel times and high quality/frequent services and make it more attractive to current private vehicle users. Increased uptake of public transport will also ease congestion and reduce regional greenhouse gas emissions. Similarly, the Project's walking and cycling investments make those transport modes safer and more attractive to users. This will also assist in reducing congestion and greenhouse emissions. In addition, these investments will make walking and cycling routes safer for their users. This is a significant benefit, given the number of schools, childcare centres and similar land uses present within the Project area.

Lastly, the overall positive effect associated with EB2 and the wider Project is improved accessibility. Reduced congestion, better public transport, safer walking and new cycling infrastructure will improve the ability for both local residents and visitors to access jobs, education, recreation, housing and healthcare.

Given the above, EB2 will have significant positive effects for Tāmaki Makaurau Auckland.

9.4 Construction Phase Effects

The construction period for EB2 will be around 48 months, commencing in late 2022. Given the scale of the works proposed and the existing urban environment, a range of construction effects have been considered and assessed. The following sub-section of the AEE will address the following construction related effects:

- Construction transport effects
- Noise and vibration effects
- Erosion and sediment control
- Effects on terrestrial ecological values
- Effects on coastal ecological values
- Social effects
- Management of contaminated soils

³⁰ Tāmaki regeneration programme will deliver 10,500 new homes over the next 20 years.

- Effects from tree works
- Cultural effects
- Historic heritage effects
- Visual and landscape effects.

Where relevant, cross-referencing will be provided to the discussion of operation phase effects.

9.4.1 Construction Transport Effects

The ITA (Appendix 12: Integrated Transport Assessment) provides significant detail regarding the anticipated transport effects of EB2 during its construction, as well as how works will be phased within the existing active road corridor³¹. The key construction traffic considerations given by the ITA include:

- Generation, timing and routing of heavy vehicles
- Intersection performance
- Parking requirements
- Effects on pedestrians and cyclists
- Effects on bus services
- General safety performance.

It is proposed to operate any heavy vehicles along designated routes to minimise any congestion or safety issues associated with their movement. Heavy vehicles will be largely limited to arterial roads, as shown in Figure 9-1 and summarised in Table 9-1. These roads are better able to handle heavy vehicles given their design and geometry. Key routes will include Pakuranga Road, Ti Rakau Drive, Reeves Road and Gossamer Drive. In addition, the majority of heavy vehicle movements will be outside of peak periods, limiting potential congestion issues along the Pakuranga Road, Ti Rakau Drive and SEART corridors. Furthermore, approximately 50% of all heavy vehicle movements will be associated with the operation of the primary construction yard and construction support sites, which will be focus points for most construction traffic. The use of these routes and minimising peak hour movements form part of EB2's CTMP (Appendix 10: Construction Traffic Management Plan).

In addition, special consideration has been given in regard to construction traffic effects on the social infrastructure hub at Reeves Road (i.e. the Pakuranga Leisure Centre, Te Tuhi, Barnardo's Early Learning Centre, Ti Rakau Park, and Dementia Auckland). While the local roads at this location will form part of a low-speed environment following the completion of the William Roberts Road extension, construction team members will be regularly briefed on the importance of minimising vehicle speeds. Conversely, the use of the CCP (Appendix 11: Communication and Consultation Plan) will ensure that AT will work with these facility operators to ensure their patrons are aware of construction related traffic movement. Similar measures will be employed in relation to construction traffic travelling past Pakuranga Intermediate School and the KIDSpace Early Learning Centre on Reeves Road. These measures also form part of the CTMP.

³¹ Section 4.2 of the ITA.

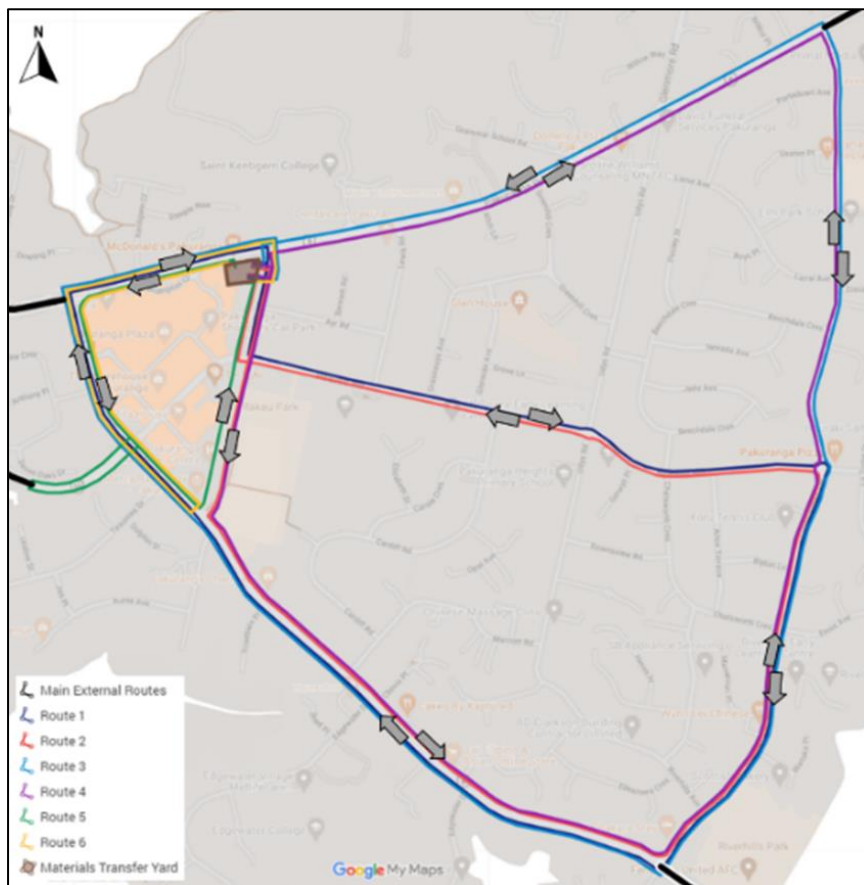


Figure 9-1 Construction Vehicle Routes

Table 9-1 Construction Route Summary

Construction Activity	Description	Vehicle Movements [veh/h]
EB2 SEART	Egress from construction yard onto Pakuranga Rd westbound, then Ti Rakau Dr eastbound, SEART southbound, U-turn within work zone, SEART northbound, Ti Rakau Dr eastbound, William Roberts Rd northbound, return to construction yard.	10
EB2 Ti Rakau Dr	Egress from construction yard onto Pakuranga Rd westbound, then Ti Rakau Dr eastbound, U-turn within work zone, Ti Rakau Drive westbound, Pakuranga Road eastbound, William Roberts Rd southbound, return to construction yard.	8

The construction traffic generated by EB2 is not considered to have any significant effects on traffic flows or road congestion. As detailed in the ITA, anticipated construction vehicle volumes on Reeves Road, Pakuranga Road, William Roberts Road, SEART and Ti Rakau Drive can be accommodated within existing road capacity. These roads have adequate lane widths to allow the smooth movement of both construction vehicles and other road users.

The construction of EB2 will involve a series of temporary road closures. This is particularly true for works within Pakuranga Road, Ti Rakau Drive, Reeves Road and William Roberts

Road. This includes full and partial closures depending on the scale and risk associated with individual construction activities. The ITA details the potential lane and road closures, as well as the sequencing of these closures. Overall, it finds that while congestion and subsequent travel time increases will occur, the area's road network is able to cope with these temporary effects. As with other construction traffic aspects, the temporary closure of roads/lanes and associated detours will be subject to the draft CTMP. The related changes to individual sites' access points will be addressed in Section 9.4.1.5.

9.4.1.1 Effects on Intersection Performance

Construction traffic is not anticipated to significantly affect intersection functioning within the EB2 area. SIDRA modelling has been undertaken which demonstrates that the temporary effects on intersection performance during all construction stages across the network are considered to be negligible or very low. This is achieved in part through the construction staging of EB2, with RRF constructed first to enable the diversion of east-west traffic flows while other parts of the network (i.e. EB3R) are being built.

Particular consideration has also been given to potential effects on the Ti Rakau Drive/Reeves Road/SEART intersection during the upgrading of this major intersection. These effects include increased waiting times and congestion while partial closures of the intersection occur. These closures are required for the safety of construction workers, as well as providing access for utility works, new road surfaces, the tie in of the EB2 and EB3R bus lanes, lane marking and traffic safety infrastructure.

Practically speaking, this will be two separate sub-phases, where Ti Rakau Drive will be reduced to one lane traffic in both directions for up to one month. Given that the RRF will have been constructed at this point, it will be used as a detour route, with Ti Rakau Drive bound traffic on SEART detoured to Pakuranga Road (after which they can travel back to Pakuranga Town Centre). SEART bound traffic will be limited to those travelling in the westbound lane on Ti Rakau Drive. These lane arrangements are shown in Figure 9-2, with the works area highlighted in green.

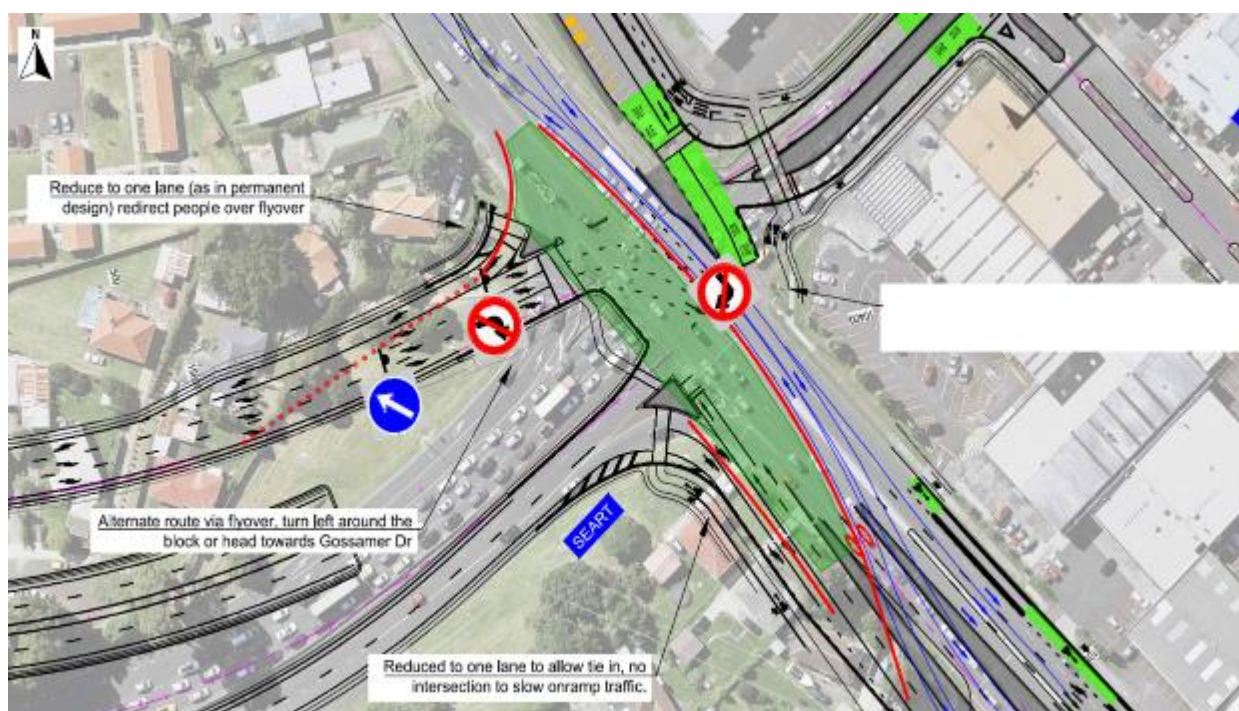


Figure 9-2 Temporary Intersection Arrangement at SEART/Reeves Road/Ti Rakau Drive Intersection

Although the temporary effects to intersection performance during construction are predicted to be negligible or very low, some adverse effects to general traffic travel times are expected at intersections across the wider road network. These effects are again principally associated with longer waiting times and reductions in levels of service, with cumulative effects generated by concurrent construction activities for both EB2 and EB3R. The ITA details the modelled delays and levels of service across the EB2 area, with Table 9-2 and Table 9-3 highlighting the levels of service and delays expected during EB2’s first stage of construction (i.e. construction of the RRF).

Table 9-2 Intersection Performance During Construction Stage 1 (AM Peak)

Intersection	Do-Minimum			Construction Stage 1		
	LOS	DOS (v/c)	Delay [s]	LOS	DOS (v/c)	Delay [s]
Pakuranga Road / Ti Rakau Drive	C	0.85	33	C	0.90	33
Pakuranga Road / Brampton Court	N/A	0.42	1	N/A	0.39	1
Reeves Road / Aylesbury Street	N/A	0.27	1	N/A	0.03	3
William Roberts Road / Reeves Road	N/A	0.68	7	N/A	0.18	4
William Roberts Road / Cortina Place	Built during WRRE			N/A	0.26	1
Ti Rakau Drive / Aylesbury Street north	N/A	1.49	6	N/A	1.67	5
Ti Rakau Drive / Aylesbury Street south	N/A	0.26	1	N/A	0.29	1
Ti Rakau Drive / Reeves Road / SEART	F	0.90	178	D	1.00	49

Intersection	Do-Minimum			Construction Stage 1		
	LOS	DOS (v/c)	Delay [s]	LOS	DOS (v/c)	Delay [s]
Ti Rakau Drive / William Roberts Road	Built during WRRE			C	0.88	26

Table 9-3 Intersection Performance During Construction Stage 1 (PM Peak)

Intersection	Do-Minimum			Construction Stage 1		
	LOS	DOS (v/c)	Delay [s]	LOS	DOS (v/c)	Delay [s]
Pakuranga Road / Ti Rakau Drive	D	0.91	47	C	0.88	32
Pakuranga Road / Brampton Court	N/A	0.53	1	N/A	0.42	1
Reeves Road / Aylesbury Street	N/A	0.38	1	N/A	0.04	2
William Roberts Road / Reeves Road	N/A	0.87	11	N/A	0.22	4
William Roberts Road / Cortina Place	Built during WRRE			N/A	0.21	1
Ti Rakau Drive / Aylesbury Street north	N/A	4.67	36	N/A	2.91	18
Ti Rakau Drive / Aylesbury Street south	N/A	0.38	1	N/A	0.29	1
Ti Rakau Drive / Reeves Road / SEART	F	1.13	83	B	0.81	19
Ti Rakau Drive / William Roberts Road	Built during WRRE			B	0.88	20

However, the ITA identifies that these effects on intersection performance are not unexpected due to the scale of the EB2's construction. It should be noted that these effects are temporary, and once constructed, the RRF and EB2 as a whole, will alleviate congestion around Pakuranga Town Centre.

Nevertheless, to mitigate these effects, the ITA recommends that appropriate public communication and advance warning of the planned works will be undertaken prior to the works being initiated. Public communication and signage will also be provided during construction informing motorists of the works and potential delays, which would lead to changes in travel behaviour such as travelling outside peak periods. Other measures employed, via the CTMP, will include the timing of lane/road closures.

9.4.1.2 Construction Parking for Support Sites

It is proposed that construction staff will be able to utilise parking spaces at:

- 169 – 171 Pakuranga Road (the primary construction yard)
- 5 Reeves Road (a site office)
- 9 Reeves Road (a secondary site office)
- 14 Seven Oaks Drive (a secondary site office)

- Demolished/Deconstructed sites prior to their occupation by EB2 infrastructure (e.g. 26 Ti Rakau Drive).

It is envisaged that, at least for the initial year of construction, the majority of site office staff will use public transport for commuter trips (wherever possible) and will access the site offices on foot. It is proposed to utilise Workforce Travel Management Plans to achieve this. The aim of the Workforce Travel Management Plans will be to reduce the number of private vehicles travelling to the worksites and to increase the accessibility of the worksites through alternative travel options (e.g. public transport or ride share). Following the initial year and as construction activities ramp up, a staff carpark will be provided at 26 Ti Rakau Drive until that site is redeveloped into Pakuranga Bus Station. It is anticipated that up to 150 parking spaces will be provided, although the Workforce Travel Management Plans will reinforce the primary staff transport mode to be public and active transport. These measures will also be enforced as part of EB2's CTMP.

9.4.1.3 Effects on Pedestrians and Cyclists

Consideration of the work's effects on pedestrians and cyclists have also been considered by the ITA. As noted in Section 6.6.3 of this AEE, the EB2 area does not currently feature any walking and cycling infrastructure, other than footpaths and a paved connection to the Pakuranga Rotary Walkway (accessed via Bus Stop Reserve). The management of pedestrian and cyclist movements through the EB2 area is detailed below in Table 9-4.

Table 9-4 Construction Mitigation for Pedestrians and Cyclists

Location	Discussion
Reeves Road	The footpaths along both sides of Reeves Road, as well as the midblock pedestrian crossing, will be maintained during construction. When beam-landing activities are required for construction of the RRF, pedestrians may need to be diverted around these areas for safety purposes.
William Roberts Road North	Although construction is required to form the cul-de-sacs at each end, the existing footpaths along both sides of William Roberts Road North will be maintained. Once the RRF northern abutment is under construction, it is anticipated that the pedestrian footpath on the western side of William Roberts Road North will be closed.
Pakuranga Road Tie-In	The footpath along the northern side of the Pakuranga Road / RRF intersection will be maintained at all times. While the Pakuranga Road tie-in is under construction, pedestrians will be unable to utilise the existing refuge island on the southern side of the intersection. A temporary pedestrian crossing will be provided in a similar location to limit the effects to pedestrian walking time and distance.
SEART	There are no footpaths along SEART provided at present. Once the new SEART off-ramp has been completed and Seven Oaks Drive has been reinstated further north, it is anticipated that the footpath along the northern side of the Seven Oaks Drive will also be reinstated, similar to that currently present.
Ti Rakau Drive from Pakuranga Road to Reeves Road	The footpaths along both sides of the carriageway will be maintained. During the construction of the bus lanes on this section of Ti Rakau Drive, as well as the new Ti Rakau Drive/Aylesbury Street/Palm Avenue crossroads

Location	Discussion
	<p>intersection, pedestrians may need to be diverted around these areas for safety purposes.</p> <p>During construction of the Ti Rakau Drive/Reeves Road intersection, pedestrian crossings will be maintained. Temporary crossings will be provided as necessary to avoid the construction areas.</p> <p>In addition, a temporary footbridge will be installed to provide pedestrian access over work areas within Ti Rakau Drive.</p>
Pakuranga Road	<p>The existing footpaths along both sides of Pakuranga Road will be maintained during construction. The existing signalised midblock pedestrian crossing on Pakuranga Road, constructed as part of EB1, will be maintained for the vast majority of the construction programme. It will be disabled temporarily during the crossing drainage works.</p>
Side Roads	<p>The existing footpaths along both sides of Palm Avenue, Aylesbury Street North, Cortina Place and William Roberts Road will be maintained. In the case of Aylesbury Street, the footpaths will be maintained until the completion of the new Ti Rakau Drive/Aylesbury Street/Palm Avenue crossroads intersection. Following which the existing footpaths will be removed.</p>

Based on the above measures, pedestrian and cyclists through and within the EB2 area will be maintained for the duration of construction with minimum disruptions and delays. These measures are also captured within EB2's CTMP and any future site-specific traffic plans. As such, the construction effects on pedestrians and cyclists will be insignificant.

9.4.1.4 *Effects on Bus Services*

Local bus services will be intermittently affected by the construction works given the need to both reroute buses and relocate bus stops. There will be a change in route and bus stops for the inbound (i.e. westbound) 711 service from Howick to Panmure. At present, this service runs along Reeves Road, before turning onto William Roberts Road North and then onto Pakuranga Road.

The construction of the RRF and closure of the Pakuranga Road/William Roberts Road intersection requires both a change to this bus service route and the bus stop for Pakuranga Town Centre. As shown in Figure 9-3, this bus service will be redirected down William Roberts Road South to Ti Rakau Drive once the William Roberts Extension works are completed. This will also involve the closure of Bus Stop 6060, with Bus Stop 6127 providing a drop off/pick up location for Pakuranga Town Centre.

These changes to the 711 bus service are considered to have negligible effects on the bus service and its passengers. The additional travel time has been assessed to be only a further 21 seconds, while less than 500 m separates the current and proposed bus stops.



Figure 9-3 Changes to the 711 Inbound Bus Service

Changes are proposed to other stops across Pakuranga Town Centre during EB2's construction (Figure 9-4). This principally involves bus stop 6132, located on Ti Rakau Drive. This bus stop will be used until the new bus lanes on Ti Rakau Drive are completed. After the completion of those works, the bus stop will be closed permanently, and the related bus services redirected to the Pakuranga Bus Station.

Following the completion of the RRF and changes to Reeves Road itself, bus stops 6062, 6060 and 6127 will also be closed. The bus services that currently used these bus stops (70, 72C, 72M, 72X, 352, 711 and 712) will all be redirected to the new bus station on Ti Rakau Drive.

Subject to clear communication to bus users regarding the timing of these closures, the effects of bus stop and bus route changes are considered to be negligible given the overall improvements generated by EB2 on bus service reliability and timeliness.



Figure 9-4 Existing Bus Stops within Pakuranga Town Centre

As noted in Section 6.6.2, school bus services also run through and from Pakuranga Town Centre, including buses to Sacred Heart College in Glen Innes. During construction, the S415 school bus service between Pakuranga and Sacred Heart College will continue to depart from the bus stop (ID 6060) outside Farmers in the AM peak and terminate at another bus stop (ID 6062) in the afternoon. Similarly, it will continue to use the general traffic lanes along Pakuranga Road until EB1’s existing bus lanes. However, once the RRF and Reeves Road works are completed, this service will start and terminate at the bus station. It is noted that the S416 school bus service between Botany and Sacred Heart College will follow a similar arrangement, albeit using existing bus infrastructure along Ti Rakau Drive.

The S416 school bus service between Botany and Sacred Heart College will continue to use the general traffic lanes along Ti Rakau Drive as well as the existing bus stops in the EB2 area during construction. It is anticipated that the bus stop (ID 6127) in the Pakuranga Town Centre will only be removed after the RRF and Reeves Road have been completed. Also, it is anticipated that bus stops (ID 6134, 6129, 6131, 6136, 6138 and 6133) along Ti Rakau Drive will only be removed following Phase 2 of EB3R and bus stops (ID 6140 and 6135) following Phase 3 of EB3R.

Lastly, these school bus services are expected to experience similar effects to their travel times as general bus services, as the school buses travel in the same lanes through the network.

9.4.1.5 Site Access

The ITA (Appendix 12: Integrated Transport Assessment) also details the temporary construction access arrangements proposed within the EB2 works area. These temporary access arrangements are required given the planned road closures and demolition/deconstruction activities. Sites affected include the following (Table 9-5):

Table 9-5 Construction Access Arrangements

Site Address	Description
3 Reeves Road (Gull Service Station)	Access to this site will be closed during construction, with permanent access also severed given planned dedicated bus lanes on Reeves Road. AT is in discussions with the site owner regarding the site's future access and use.
11 Reeves Road (Eastside Pups Dog Grooming and day care/Bread of Life Church)	Works on Reeves Road require the closure of vehicle crossings. Alternative access will be provided via 2 Cortina Place once demolition/deconstruction at 2 Cortina Place is completed.
7 Aylesbury Street and 2R Ti Rakau Drive (The Warehouse and Pakuranga Library)	<p>Access maintained to underground car park and loading area.</p> <p>During construction, trucks will access the site from the north on Reeves Road, execute a U-turn and return northbound on Reeves Road towards William Roberts Road. Removeable barriers will be installed in the median and the existing masonry wall on the property boundary will be removed, if required, to accommodate this manoeuvre. The wall would then be reinstated after construction on Reeves Road. The number of delivery vehicles will be limited to one semi-trailer per day and background traffic volumes on Reeves Road will be significantly reduced.</p> <p>Access to the undercover carpark will also be from the north on Reeves Road, turning right into the carpark. Left-out only movements will be provided at this access for vehicles exiting from the carpark.</p> <p>Access to the rear access of the Pakuranga Library will be from the north on Reeves Road, executing a U-turn manoeuvre at the undercover carpark access. During construction, this access will provide for left-in left-out movements only.</p>

Site Address	Description
	<p>Upon completion of the William Roberts Road extension a new link with Cortina Place will be formed. Once the Reeves Road works are completed, access to the undercover carpark will be provided via Cortina Place to the south and Reeves Road to the north.</p> <p>Upon completion of Reeves Road, access to The Warehouse's goods entrance at 7 Aylesbury Street will be reinstated as per the existing environment (left-in left-out) with delivery vehicles approaching from the south via Cortina Place and exiting to the north on Reeves Road. A similar arrangement will be provided for the library.</p>
13R Reeves Road (Te Tuhi)	<p>The main access to the property off Reeves Road will not be maintained during the Reeves Road closure. A temporary indented drop-off area will be provided on the western side of William Roberts Road, with a temporary walkway leading around the property to the main entrance.</p> <p>The drop-off will result in the temporary loss of approximately two off-street parking spaces to the rear of the property and three on-street parking spaces on William Roberts Road. It is expected that the remaining 11 off-street parking spaces on the property would be sufficient during construction.</p>

These access arrangements are indicative only and will be confirmed following further direct engagement with landowners. The process of developing and confirming these access arrangements is also captured by the draft CTMP and related proposed conditions.

9.4.1.6 *Summary of Construction Transport Effects*

In summary, the safety of all road users, pedestrians and cyclists has been a key consideration of all construction activities. In response to this issue, road safety will be at the forefront of the CTMP's development and implementation. This requirement is explicitly stated in the CTMP's stated objective and related proposed conditions. The ITA has highlighted that construction effects cannot be avoided, but can be managed and mitigated by standard practices. This will include clear and timely communication to the community regarding temporary road closures, diversions and potential delays.

Based on these measures and the other controls required by the CTMP, the construction transport effects of EB2 will be acceptable.

9.4.2 Noise

A Construction Noise and Vibration Effects Assessment has been undertaken for EB2 (Appendix 26: Construction Noise and Vibration Effects Assessment). The assessment has included fieldwork, modelling and consideration of the proposed construction methodology (Appendix 8: Construction Methodology).

The technical assessment has followed direction from the AUP(OP), specifically Rule E25.6.1(3)³². The AUP(OP) also contains noise limits for construction noise, when considering effects on sensitive receivers³³. These limits are provided below in Table 9-6 and Table 9-7.

Table 9-6 AUP(OP) Noise Limits for Sensitive Receivers

Time of week	Time Period	Maximum noise level (dBA) > 20 weeks	
		L _{eq}	L _{max}
Weekdays	6:30am – 7:30am	55	70
	7:30am – 6:00pm	70	85
	6:00pm – 8:00pm	65	80
	8:00pm – 6:30pm	45	75
Saturdays	6:30am – 7:30am	45	75
	7:30am – 6:00pm	70	85
	6:00pm – 8:00pm	45	75
	8:00pm – 6:30am	45	75
Sundays and public holidays	6:30am – 7:30am	45	75
	7:30 am – 6:00pm	55	85
	6:00pm – 8:00pm	45	75
	8:00pm – 6:30am	45	75

Table 9-7 Noise Limits for Non-Sensitive Receivers

Time period	Maximum noise level L _{Aeq} dB > 20
07:30 – 18:00	70
18:00 – 07:30	75

These noise limits have been compared to the potential noise sources during construction, as well as the undertaking of weekend and night-time works. Based on the construction methodology, the likely noise sources that will be present during construction are shown in Table 9-8.

Table 9-8 Construction Noise Sources and Levels

Site Activity	Equipment	Sound power level (dBA SWL)	Noise level dB L _{Aeq}			
			5m	10m	20m	50m
	6-Wheeler trucks	107	85	79	73	65

³² This rule states that “The noise from any construction activity must be measured and assessed in accordance with the requirements of New Zealand Standard NZS6803:1999 Acoustics – Construction noise”.

³³ Sensitive receivers include dwellings, medical facilities and schools.

Site Activity	Equipment	Sound power level (dBA SWL)	Noise level dB LAeq			
			5m	10m	20m	50m
Site establishment (including utility works, demolition and clearing)	10Tn Excavator with rock breaker attachment	116	94	88	82	74
	Handheld concrete saw / chainsaw	115	93	87	81	73
	10Tn Excavator	107	85	79	73	65
	20Tn Excavator	107	85	79	73	65
	500kg Plate compactor	110	88	82	76	68
Earthworks and civil works	12Tn Steel compactor roller	107	85	79	73	65
	6-Wheeler trucks	107	85	79	73	65
	20T Excavator	107	85	79	73	65
	Mobile crane	106	84	78	72	64
Pavement Construction (including surfacing)	6-Wheeler trucks	107	85	79	73	65
	Plate compactor, 500 kg	110	88	82	76	68
	Roller compactor, 12T	107	85	79	73	65
	Handheld concrete saw / chainsaw	115	93	87	81	73
	Bitumen sprayer	101	79	73	67	59
	Grader	99	77	71	65	57
	12Tn Double drum steel roller	107	85	79	73	65
	Concrete mixer truck	107	85	79	73	65
Bridge Construction (Reeves Road Flyover)	Gantry crane	95	73	67	61	53
	Large crawler crane	103	81	75	69	61
	Bored piling rig	111	89	83	77	69
	20T Excavator	107	85	79	73	65
	Concrete pump	103	81	75	69	61
	Concrete mixer truck	107	85	79	73	65
	6-Wheeler trucks	107	85	79	73	65

Using the above-mentioned construction equipment data, modelling was undertaken of EB2's potential effects. The modelling indicates that, in the event of high noise generating activities occurring at the works' area boundaries, there are 18 commercial and 43 residential receivers who could potentially experience noise above 70 dB LAeq. It should be noted that these effects represent the noisiest possible scenario and are based on no mitigation being undertaken.

However, the assessment considers that a more realistic scenario, with noise barriers employed, would reduce affected receivers to 15 commercial and 34 residential sites. In addition, these levels are predicted while works take place at the closest possible location at each receiver, when in practice noise levels will quickly reduce as the works progress and high noise generating activities are completed. The technical assessment also notes that

noise at this level can generally be tolerated provided that prior notification is given before high noise generating activities take place.

Commercial receivers, such as Countdown and The Warehouse, have solid façades which could provide a reduction in noise levels up to 50 dB. Noise may be audible inside during high noise generating activities, but due to the nature of these businesses (busy retail with background music playing), construction noise levels are not expected to adversely affect business operations. Regardless, prior communication regarding high noise generating activities will be undertaken with these receivers too.

Other commercial receivers adjacent to the works, such as the Howick Local Board office and Caci Pakuranga, have glazed facades that are expected to reduce noise levels by 20 to 30 dB. Noise effects from worst-case construction activities adjacent to these receivers can include loss of concentration, annoyance, and reduction in speech intelligibility. However, similar noise effects to those affecting the residential sites described above are anticipated and can be addressed, in part, through prior notification of high noise generating activities.

The assessment has also specifically addressed the noise that will be generated by the construction of the RRF. Table 9-9 shows the commercial sites that would be affected during the RRF's piling.

Table 9-9 Noise Affected Sites from Flyover Construction

Address	Name	Use	Noise Level, dB L _{Aeq}
2R Ti Rakau Drive	The Warehouse	Commercial	86
11 Reeves Road	Bread of Life Christian Church	Commercial	80
13R Reeves Road	Te Tuhi	Commercial	78
3 Reeves Road	Gull	Commercial	74

Consultation undertaken by EBA has identified that Te Tuhi's façade will provide limited noise attenuation (approximately 15 dB) and that Te Tuhi carries out noise sensitive activities (e.g. community group meetings and exhibitions). Given this, further consultation with Te Tuhi will be undertaken to confirm appropriate site-specific noise mitigation. A requirement for such consultation forms part of the CNVMP (Appendix 29) and the site-specific schedule to be prepared for this property. Similar measures will be employed to address potential noise effects on 11 Reeves Road (The Bread of Life Christian Church), noting that Sunday works will be the exception, rather than standard for EB2's construction.

In general, the assessment concludes that with the use of effective mitigation, noise levels are predicted to comply with the 70 dB L_{Aeq} noise criterion at surrounding receivers for the majority of the construction works. With regard to mitigation, the assessment has identified a number of measures that should be employed during EB2's construction, including:

- Managing times of activities to avoid night works and other sensitive times
- Liaising with neighbours so they can work around specific activities
- Selecting equipment and methodologies to restrict noise
- Using screening/enclosures/barriers
- Temporary noise barriers
- Employing additional measures and consultation for any night works.

The noise mitigation measures proposed for EB2 have been incorporated into the proposed conditions set and draft CNVMP.

Given the above assessment, the proposed mitigation and further engagement planned, the temporary construction noise effects of EB2 will not be substantial.

9.4.3 Construction Vibration

The Construction Noise and Vibration Effects Assessment (Appendix 26: Construction Noise and Vibration Effects Assessment) details the relevant AUP(OP) vibration standards as they apply to both amenity and building damage³⁴, with these standards shown in Table 9-10.

Table 9-10 AUP(OP) Vibration limits in Buildings

Receiver	Period	Peak Particle Velocity (PPV) mm/s
Occupied activity sensitive to noise or vibration	Night-time 10pm to 7am	0.3
	Daytime 7am to 10pm	2.0
Other occupied buildings	At all times	2.0

The AUP(OP) allows for any works generating vibration for three days or less between the hours of 7am to 6pm to exceed the limits in Table 9-10, as long as a limit of 5 mm/s peak particle velocity in any axis when measured in the corner of the floor of the storey of interest for multi-storey buildings, or within 500mm of ground floor level at the foundation of a single storey building, is not exceeded. In such circumstances, EBA is required to advise all occupied buildings within 50m of the extent of the works generating vibration in writing no less than three days prior to the vibration-generating works commencing.

Further to the AUP(OP) vibration limits and standards, the noise and vibration assessment has also considered German Standard "DIN 4150-3:1999 – Structural Vibrations: Effects of Vibrations on Structures", British Standard "(BS) 5228-2: 2009 "Code of practice for noise and vibration control on construction and open sites" and AT's "Construction Vibration Criteria". The assessment has applied them to the proposed construction methodology (including the equipment detailed in Table 9-11.

³⁴ Rule E25.6.30 details these vibration standards.

Table 9-11 Vibration sources and Indicative Emission Radii

Equipment	DIN 4150 short-term emission radii			Daytime amenity criterion (2 mm/s)
	Commercial (20 mm/s)	Residential (5 mm/s)	Historic/Vibration sensitive (3 mm/s)	
Roller Compactor	2m	8m	14m	21m
20T Excavator	1m	5m	8m	12m
Tipper truck	1m	1m	2m	2m
Vibratory plate compactor	1m	1m	2m	3m

In general, the worse-case source of vibration will be the roller compactor, which could generate vibration of up 2mm/s within 21 m (i.e. within property boundaries). While this is highly unlikely to cause building damage, it would be perceivable to building occupiers. It is also noted that 0.3 mm/s vibration limits could be felt up 140 m from construction areas. Such vibration could be perceivable to occupiers, especially during night-time when other vibration sources (i.e. traffic) is not present.

Modelling undertaken for the Project and based on the methodology/effects above, indicates 38 residential dwellings may experience vibration levels 2 mm/s if a roller compactor is used on the construction boundary in the closest position. Once the compactor is 8m away from the dwellings, then less than 2 mm/s would be experienced. The noise and vibration assessment also found that 12 commercial buildings may experience vibration levels above 10 mm/s PPV, exceeding the DIN 4150 commercial building criterion, if a roller compactor is used within 2m of the building.

To address these construction vibration effects, AT propose the following measures:

- Managing times of activities to avoid night works and other sensitive times
- Liaising with neighbours so they can work around specific activities
- Operating vibration generating equipment as far from sensitive sites as possible
- Selecting equipment and methodologies to minimise vibration
- Undertaking pre and post works building inspections at properties where the 2 mm/s limit will be exceeded.

Given the above assessment, the proposed mitigation and further engagement planned, the construction vibration effects of EB2 will not be significant.

9.4.4 Erosion and Sediment Management

Land disturbance will occur during the following construction activities:

- Site clearance
- Reworking of existing road and hard stand areas
- Construction of new embankments, road corridors and the RRF

- Installation of utilities via trenching
- Stormwater outfall construction.

The Erosion and Sediment Control Effects Assessment (Appendix 30) has identified that there is limited environmental risks associated with the planned land disturbance. This is primarily due to the existing flat gradient within the majority of the works area, the significant amount of works that involve only road surface replacement, as well as the staged construction approach that will be employed.

All land disturbance will be undertaken in accordance with GD05. This includes the preparation of an ESCP detailing the specific erosion and sediment control works for each relevant stage (location, dimensions, capacity) in accordance with industry best practice, as well as GD05:

- Supporting calculations and design drawings
- Details of construction methods
- Monitoring and maintenance requirements
- Catchment boundaries and contour information
- Details relating to the management of exposed areas (e.g. grassing, mulch).

Chemical treatment will be employed, where appropriate. This is also addressed by the proposed conditions, which require the preparation of a chemical treatment management plan. This management plan will be required to detail the chemical treatment set up, as well as include all relevant batch dosing information as part of dewatering operations. Similarly, any related decanting earth bunds (DEB)s will be required to be chemically treated in accordance with that management plan.

In addition, site-specific ESCPs (ssESCPs) will also be prepared, where required. Site specific plans may be required where works are occurring in close proximity to sensitive receiving environments, for example the stormwater outfall works. The ssESCPs will be required to include the following details:

- Contour information
- ESC measures for the works being undertaken within a particular construction area
- Chemical treatment design and details
- Catchment boundaries of works and devices installed
- Location of the work
- Details of construction methods
- Design criteria, typical and site-specific details of erosion and sediment control
- Design details for managing the treatment, disposal and/or discharge of contaminants (e.g. concrete wash water).

This hierarchy of erosion and sediment control measures is shown in Figure 9-5.

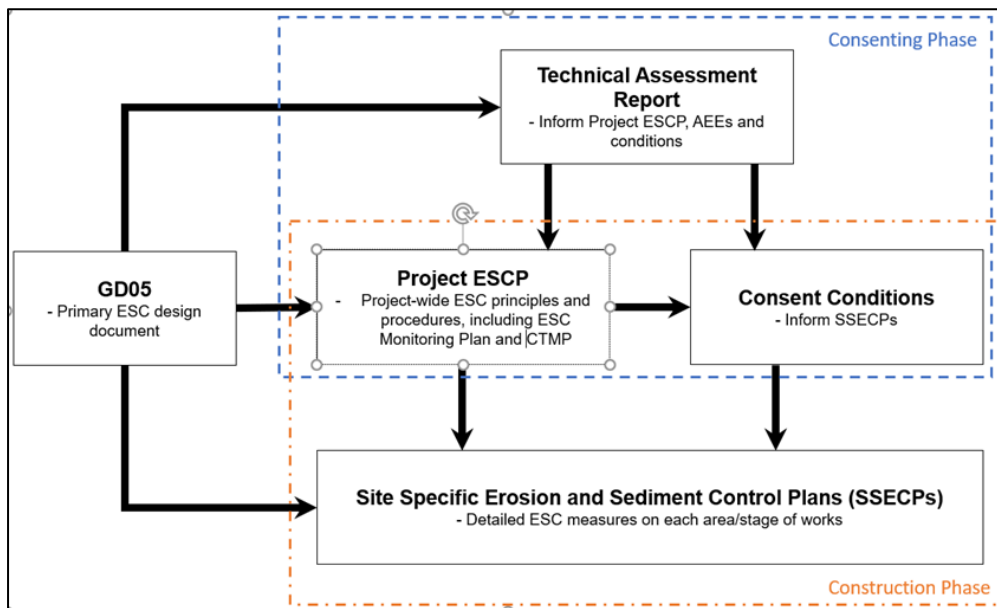


Figure 9-5 Erosion and Sediment Control Management Plan Hierarchy.

Further measures include undertaking progressive staged earthworks and regular inspections of controls. The ESCP will be required to be certified prior to works commencing, as well as on-site certification by a SQEP once installed. In addition, AT have offered a review condition in the conditions set to enable additional erosion and sediment controls to be imposed (if needed).

In addition to the ESCP, other earthworks related measures will be employed. This includes the use of a CLMP to address potential soil contamination (see Section 9.4.8) and an accidental discovery protocol in relation to cultural/historic heritage (see Section 9.4.11).

Based on the above measures and AT’s proposed conditions, the effects of land disturbance associated with EB2 will be insignificant.

9.4.5 Effects on Terrestrial Ecological Values

Infrastructure projects may affect ecological values both within the construction footprint and further afield. Given this, a Terrestrial and Freshwater Ecological Effects Assessment has been undertaken (Appendix 22: Terrestrial and Freshwater Ecological Effects Assessment).

The assessment notes the limited terrestrial ecological values within the EB2 area. As an existing urbanised area, there is little natural habitat present for native fauna. What habitat that exists is fragmented and subject to competition and predation by introduced species, such as domestic cats. While the EB2 area itself does not have any native bats as confirmed by a bat survey, nor significant numbers of at-risk native birds within a 5km radius, the ecological assessment has identified the high likelihood that native lizards will be present. They are most likely to be found within landscaped areas, such as beside SEART and within sites identified for stormwater outfall works.

In order to address the potential effects on native lizards, a draft Lizard Management Plan has been prepared and will be implemented during construction (Appendix 18: Lizard Management Plan). This management plan addresses:

- Details of search methods to be implemented for capturing arboreal and ground-dwelling native lizards prior to any construction activities in any of the above areas within the EB2 works area;
- Mechanisms for re-establishing affected lizard habitat
- Locations for the potential release of lizards, including whether a pest control programme for before and after the release of lizards is necessary and, if so, the details of such a control programme
- The methodology for any post-capture release of lizards
- The methodology for captive management of lizards if they are required to be held in captivity.

Further to the LMP, the terrestrial ecology assessment has recommended that vegetation removal is not undertaken during bird nesting season (September to February). Where these months cannot be avoided, the assessment recommends pre-construction nesting bird surveys should occur. This approach will protect any native birds

The management plan also requires the re-establishment of lizard habitat, which will involve new plantings under a HRP and will be linked to the development of the UDLP. The final location and quantum of new plantings will be determined following further engagement with AC Community Facilities, given that some these plantings are likely to be undertaken within public reserves. The HRP will also entail further engagement with mana whenua to ensure cultural values are incorporated.

The ecological assessments have identified the planned land disturbance as having the greatest potential to affect freshwater and coastal ecology values. As previously detailed, Project construction will employ a ESCP and ssESCPs during construction to limit any sediment discharges into the local environment, including the two freshwater wetlands identified beside SEART. In addition, the ecological assessments identify that any effects associated with sediment discharges will be temporary, given the limited duration of exposed earthworks within the EB2 works area.

The ecological assessments state that there are potential indirect effects associated with EB2 construction activities, including:

- Dispersal of invasive plant species
- Potential changes to the physiochemical characteristics of local soil conditions
- Increased pesticide use
- Generation of dust.

While the assessment determined that the scale of these indirect effects would be negligible, it is noted that dust management will form part of the ESCP, while any pest management will be incorporated into the overarching HRP.

Based on the above measures and the proposed construction methodology, the construction effects on terrestrial ecology will be minimal.

9.4.6 Effects on Coastal Ecological Values

As noted in the Marine Ecology and Coastal Avifauna Assessment (Appendix 28: Marine Ecology and Coastal Avifauna Effects Assessment⁸), both temporary and permanent

activities are proposed within the coastal environment. This includes work below MHWS (i.e. the CMA), as well as the foreshore and landward of the coastal environment. These activities are associated with the upgrading and construction of new stormwater outfalls around SEART as detailed in 4.3.10.

These activities will require vegetation clearance and the disturbance of soil/sediment. With regard to the vegetation clearance, approximately 5,382 m² of vegetation (both in and outside of the CMA) will be removed for works on outfalls P98086C (existing), MCC_108680 (existing), 06-05 (new) and 89-18 (new) as detailed in Table 4-9. This vegetation affected is primarily mangroves and exotic species, as commonly found throughout the Tāmaki River. This vegetation does not have any notable biodiversity values, in part to the common nature of the vegetation affected and the remaining foraging habitat available for native bird species in the wider area. As such, the removal of this vegetation is anticipated to have low to very low overall effect on coastal ecological values.

Construction of these stormwater assets will also require the disturbance of sediment and soil both landward and seaward of MHWS. This disturbance has the potential to affect water quality, both from increasing the level of suspended solids in the water column and from remobilising trapped contaminants. As detailed in Section 9.4.4, land-based earthworks will be controlled through the Project-wide ESCP and associated ssESCPs. For works below MHWS (i.e. within the CMA), additional measures will be employed to control effects from sediment disturbance, such as coffer dams or bunds. These temporary structures will isolate the work areas from the surrounding coastal environment. Furthermore, the works will be undertaken during appropriate times during the tidal cycle and weather windows. Again, these measures will limit the opportunity for any disturbed sediments to travel into the wider environment. Again, the effects of these coastal earthworks on ecological values will be low to very low.

Based on the above, the construction related effects on coastal ecology will be minimal.

9.4.7 Social Effects

A Social Impact Assessment (SIA) has been undertaken for EB2 (Appendix 31). The SIA has identified a range of potential social effects during construction, including:

- Loss of housing
- Severance from social infrastructure (e.g. medical facilities, open space, schools)
- Business disruption
- Reductions in amenity.

The SIA focuses, in part, on the acquisition of private properties and dislocation of current property owners and occupiers, with Table 9-12 and Table 9-13 highlighting the number of properties affected. It is noted from the SIA that the Project area has a lower median rent than surrounding suburbs and consequently has a very low vacancy rate. This due, at least in part, to AC's ownership (purchased for the Project) of many affected sites and the associated short-term rental agreements for them. This means that for the residential occupants of these properties³⁵, it will be challenging to find affordable accommodation (either for rental or purchase). This will disproportionately affect the elderly and families

³⁵ The SIA estimates that 183 people will be displaced from the clearance of rental properties.

given severance from established relationships within the area and social infrastructure (e.g. schools).

AT is aware of these issues and proposes to address them through a “no surprises” approach with site owners and occupants. This will include clear communication relating to property acquisitions and clearance, with additional warning time given to tenants prior to their required departure (i.e. longer than 90 days).

Table 9-12 Planned EB2 Property Acquisitions

Type of property	Full	Partial	Subtotal
Commercial	1	1	2
Residential	0	1	1
Total	1	2	3

Table 9-13 Rental Properties to be Cleared

Type of property	Full	Partial	Subtotal
Commercial	7	0	7
Residential	59	19	78
Total	66	19	85

As detailed above, the SIA also identifies that potential severance from social infrastructure during construction can cause adverse social effects. Social infrastructure in the EB2 works area includes Te Tuhi, Ti Rakau Park, Pakuranga Library, Pakuranga Mosque and the Citizens Advice Bureau. Section Site Access 9.4.1.5 has detailed how temporary access will be arranged for sites whose direct road access will be affected by construction activities. Furthermore, the draft CTMP includes measures to allow continued access to all other sites in the work areas, including any temporary traffic diversions or pedestrian links. The draft CCP requires AT and EBA to consult directly with affected parties, as well as undertake clear communication with the wider community regarding access to social infrastructure during EB2’s construction.

The SIA also identifies business disruption as a potential adverse effect. This disruption could arise from the acquisition of land from which businesses operate, road disruptions, changes to access and general disruption from offensive construction activities. As with residential properties, AT proposes to employ a “no surprises” approach with business owners/tenants to reduce stress associated with businesses finding new premises. Similarly, the CCP requires AT to undertake timely and clear communication with affected business, while the CTMP requires the development of appropriate construction access arrangements.

The SIA addresses the potential reduction of amenity values from EB2’s construction activities (e.g. piling, dust generation). These matters will be addressed through the various proposed management plans. These management plans will be developed in recognition of local conditions, with the opportunity to work with directly affected parties, where appropriate.

Given the above, the social effects arising from construction are acceptable.

9.4.8 Management of Contaminated Soils

The locations and types of potential contaminants has been previously described in Section 6.8 and the Contaminated Land Effects Assessment (Appendix 14: Contaminated Land Effects Assessment). Land disturbance will be undertaken in proximity of HAIL sites. This includes utility trenching in Pakuranga Road beside the GAS service station and the works in Reeves Road beside the Gull service station. Other potential sources of contamination include asbestos and lead from building demolition/deconstruction.

Dust generation has also been highlighted by the erosion and sediment control assessment, the SIA and air quality assessment. Given the potential for dust effects, the proposed condition set includes requirements to manage dust generation via the ESCP. This will include minimising the opened area of earthworks (at any one time) and wetting earthworks/demolition/deconstruction as needed.

The CLMP will be implemented during the land disturbance activities for EB2, as required as part of the proposed condition set. CLMPs are a commonly accepted approach to the management of contaminated site works across the region and the contaminated land assessment has not found any types or concentrations of contaminants which would generate a different management approach.

In addition to the CLMP and ESCP, the following contamination specific controls are proposed within the proposed condition set (Appendix 3: Proposed Conditions Set):

- Controls regarding the dewatering and disposal of any disturbed contaminated groundwater
- Record keeping of the disposal location of any excess spoil
- Requiring any imported fill to meet Ministry for the Environment guidelines on “cleanfill”.

Finally, the proposed conditions require submission of a Site Completion report (SCR) within three months of the completion of earthworks. The SCR is required to detail:

- A summary of the works undertaken, including a statement confirming whether excavations on the route has been completed in accordance with the application reports listed in this consent
- The location and dimensions of the excavations carried out, including a relevant site plan
- A summary of any testing undertaken, including tabulated analytical results, and interpretation of the results in the context of the contaminated land rules in the AUP(OP)
- Copies of the disposal dockets for the material removed from the route
- Evidence that all imported fill material complies with the definition of 'cleanfill', in accordance with the 'Guide to the Management of Cleanfills', Ministry for the Environment (2002)
- Records of any unexpected contamination encountered during the works, if applicable
- Details regarding any complaints and/or breaches of the procedures set out in the CLMP and/or the conditions of this consent.

Given the various measures proposed by conditions of consent, as well as the likely contaminant types and concentrations present, the effects of contaminated land disturbance will be minimal.

9.4.9 Tree Works

As detailed in the Arboricultural Effects Assessment (Appendix 16: Arboricultural Effects Assessment) and Section 4.3.10, the construction of EB2 will require the removal of a number of trees located within road corridors and AC reserves. These works are required given the need to provide for the construction and safe operation of EB2. Other tree works, including the removal of trees on residential sites and within business zoned sites (e.g. Pakuranga Plaza), are permitted activities and can be undertaken without resource consent or mitigation.

Given the brownfield location of works and age of urban development, there are a number of mature trees of varying native and exotic species. As such, while existing vegetation contributes to the overall amenity and biodiversity values of Pakuranga, contributions of individual trees vary depending on their wellbeing, location and maturity. Where practical, the Project has sought to retain vegetation but given the scale of works proposed some removal is unavoidable.

The Arboricultural Effects Assessment has reviewed the construction methodology and proposed plans, utilising those documents to detail the potential adverse effects on trees during EB2's construction.

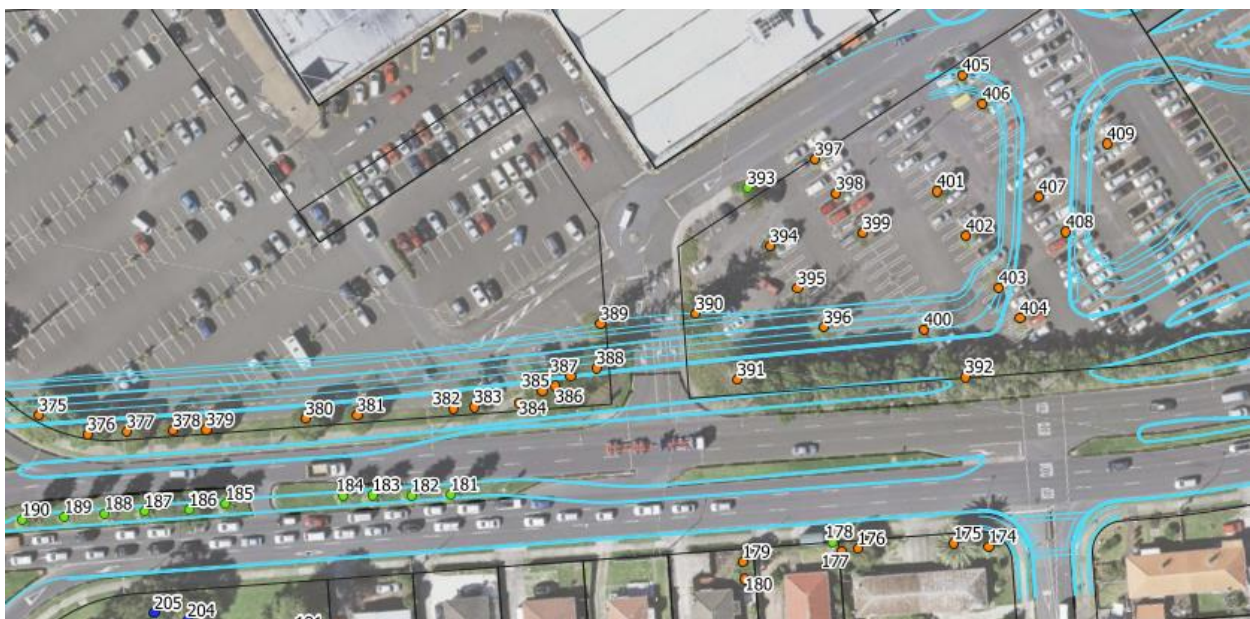


Figure 9-6 Location of Trees at Pakuranga Plaza

Other tree clearance includes the removal of trees along the northern edge of SEART. This clearance is needed to construct the new off-ramp onto Ti Rakau Drive and will affect Pōhutukawa, eucalyptus, pittosporums and other exotic species within road corridors (shown in Figure 9-7 and Figure 9-8).



Figure 9-7 Tree Locations at SEART Works



Figure 9-8 Further Tree Locations at SEART Works

In addition to the SEART works, there will be branch trimming and root zone excavations to trees located within the front yard of Te Tuhi, shown in Figure 9-9 as trees 527 and 529. It is noted that Te Tuhi is located within the Open Space - Community Zone and these trees works are subject the AUP(OP)'s tree rules.



Figure 9-9 Trees Affected by Reeves Road works

The Arboricultural Effects Assessment has identified that only a limited number of protected trees will be affected by EB2's construction in William Roberts Road. These trees are mostly willow myrtle street trees (Trees 559, 567-569 and 582-584) as shown in Figure 9-10 and Figure 9-11.

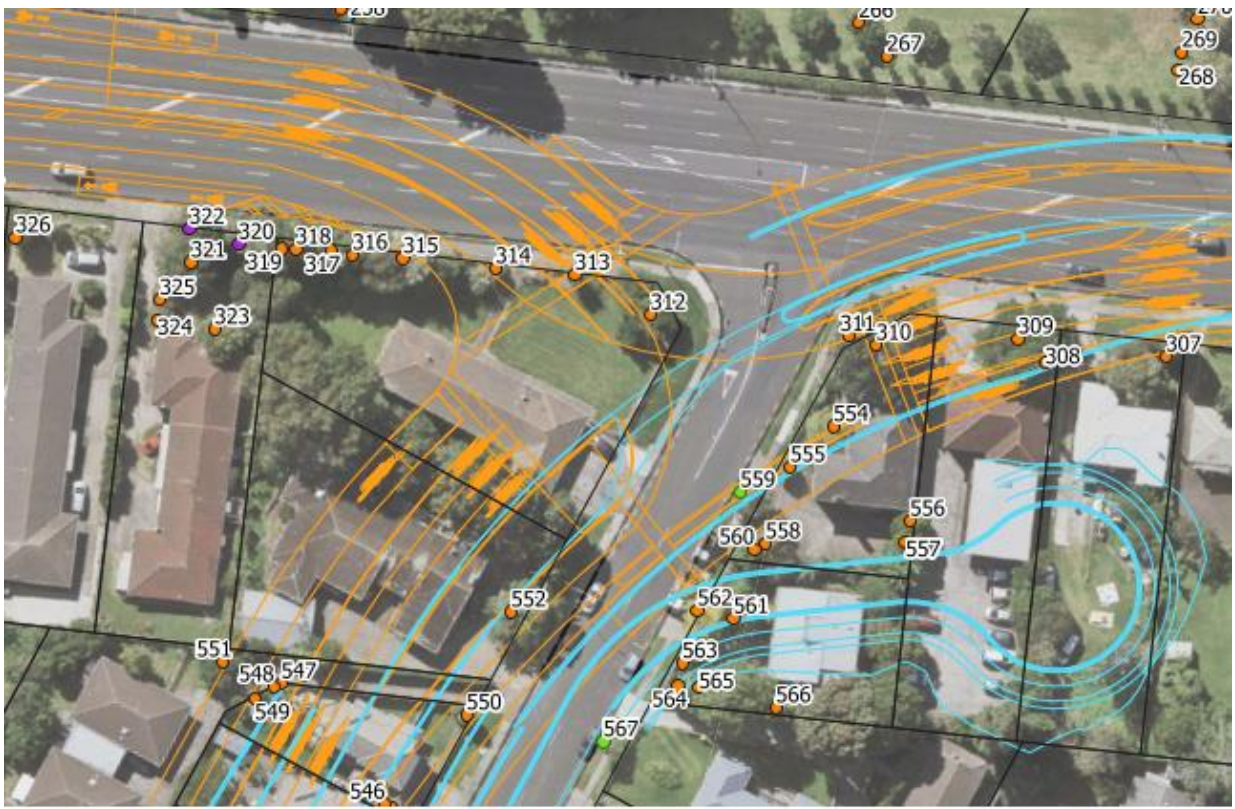


Figure 9-10 Trees within William Roberts Road



Figure 9-11 Trees within William Roberts Road

Lastly, some tree removals are proposed within the road reserve of Pakuranga Road between William Roberts Road and Ti Rakau Drive. This includes the removal of a pin oak and three other exotic trees (Trees 371-374 in Figure 9-12), which is required to enable the construction of the new road kerb line and cycle lane.



Figure 9-12 Tree Locations within Pakuranga Road

AT proposes to undertake mitigation plantings to address these tree removals. This mitigation will be based on the draft landscaping drawings provided (Appendix 5: Landscape Drawings) and the UDLP as detailed in the proposed conditions (Appendix 3: Proposed Conditions Set). As detailed in Section 4.3.10, mitigation planting will include a mix of trees (45L to 160L), shrubs and groundcover. This landscaping will also provide for a more comprehensive and cohesive approach to street tree and open space landscaping within Pakuranga Town Centre.

An arboricultural methodology has also been developed for works to and around any trees which are to remain. This methodology has been incorporated into the proposed conditions

as a draft TPMP (Appendix 17: Tree Protection Management Plan). The TPMP includes the following:

- Tree protection measures for trees to be retained
- Tree pruning measures
- How the demarcation of temporary construction access and storage areas outside the permeable dripline and / or rootzone areas of retained trees will be undertaken
- Where and what type of protective barrier fencing will be employed
- The procedures for working within the dripline/rootzone of any retained tree, including appointment of a qualified Council approved arborist (“appointed arborist”) to oversee directly all works within the dripline and rootzone of the trees located in the designated areas of work for the duration of the site works
- Specific bio-security removal restrictions that will apply to all elms (*Ulmus* sp.) and kauri (*Agathis australis*), to avoid the risk of spread of Dutch Elm Disease or kauri dieback
- The measures used to clearly mark all tree removals prior to implementation of each stage of the works.

These measures are consistent to those employed during the construction of EB1.

Based on the scale of works, mitigation planting and the use of the TPMP, the tree works will have minimal effects.

9.4.10 Cultural Values

AT has been working with mana whenua during the development of the Project’s design and construction of EB1 (i.e. Panmure to Pakuranga). Through this engagement, AT has developed a deeper understanding of the EB2 area’s cultural values and the measures which should be employed to address potential cultural effects.

It is considered that site clearance, earthworks, works in the CMA and vegetation clearance all have the potential to generate adverse cultural effects. These effects would arise through:

- The discharge of sediment into watercourses and the CMA
- Loss of habitat due to vegetation loss, with resulting biodiversity reduction
- Disturbance of archaeological material
- Changes to landform
- Discharge of contaminants in the air, land and water.

These effects of construction activities have been minimised wherever possible and will be governed by a number of management plans including the ESCP, CEMP and CLMP. One purpose of those plans is to minimise construction effects on cultural values and this purpose is detailed within the proposed conditions (Appendix 3: Proposed Conditions Set). In addition, AT have proposed ecological related conditions to address both habitat loss and direct effects on native fauna. This will help address the Project area’s already compromised biodiversity values.

Furthermore, AT have undertaken an Archaeological Effects Assessment (Archaeological Effects Assessment) of the project area to determine what, if any, known archaeological

sites may be affected. The assessment notes that while there are no recorded sites present within EB2's footprint, it is possible that sites with Māori archaeological material may be uncovered during works. As such, AT will employ an accidental discovery protocol during all land disturbance. This protocol will include the steps to be employed when material is uncovered and the appropriate mana whenua representatives to contact.

9.4.11 Historic Heritage

As detailed in Sections 6.12 and 9.4.11, there are no historic heritage or known archaeological sites present within the EB2 footprint. As a brownfield location, previous development is likely to have destroyed or damaged any in-situ materials, such as pre-contact middens or colonial period fencing. Regardless, an accidental discovery protocol will be employed when undertaking land disturbance activities. Lastly, AT will be seeking an authority to modify as a precaution from Heritage New Zealand Pouhere Taonga.

Based on the above, the historic heritage effects of EB2's construction will be negligible.

9.4.12 Air Quality

An Air Quality Effects Assessment has been undertaken for EB2 (Appendix 25). The assessment considered potential air contaminant sources, local weather conditions and the sensitivity of existing land uses.

The assessment has identified that construction generated dust is the principal air quality issue. In order to prevent and/or minimise dust related effects on the locations detailed above, dust management measures will be an integral part of the ESCP, ssESCPs and the CLMP as required by the proposed conditions (Appendix 3: Proposed Conditions Set). These measures that are likely to be employed during construction include:

- Minimising extent of exposed dry dusty surfaces
- Hardstand surfacing for frequently travelled access routes
- Availability of water carts for dry periods
- Construction vehicle speed restrictions
- Semi-porous or solid boundary fencing to provide shelter
- Minimisation of double-handling of spoil or fill materials
- Minimisation of drop heights when transferring spoil or fill to stockpiles or trucks
- Avoiding frequently-used stockpiles close to sensitive receivers.

Based on the above measures, EB2's effects on air quality will be minimal.

9.4.13 Land Stability and Groundwater

A Groundwater Permitted Activity Assessment has been undertaken for EB2 (Appendix 19: Groundwater Permitted Activity Assessment). The assessment has not identified any groundwater risks associated with EB2, in part due to the limited cuts required for construction, as well as the underlying geological conditions. EB2 is located within a relatively level area, without any slopes with steep gradients. This minimises the need for any large retaining structures or deep trenches.

The deepest works are largely restricted to the RRF piles. These piles will be constructed under hydrostatic pressure, with the use of proprietary gels to minimise the inflow of any

groundwater into the pile excavations. This approach avoids the need to divert or undertake significant dewatering of the piles, thereby reducing the possibility of ground settlement.

Given these factors, no land stability or groundwater related effects are anticipated by EB2's construction.

9.4.14 Visual and Landscape Effects

The temporary visual and landscape effects associated with EB2's construction are detailed in the Natural Character, Landscape and Visual Effects Assessment (Appendix 21: **Natural Character, Landscape and Visual Effects Assessment**). It is noted that the construction of EB2 will be visible from numerous public spaces, reserves and private sites, including:

- Paul Place Reserve
- Bus Stop Reserve
- The Pakuranga Leisure Centre
- Pakuranga Plaza.

These effects include the disruption of users/occupiers appreciation of existing visual amenity values, shadowing and dominance impacts and a general decrease in local visual amenity values, although as noted in 6.7 these values are limited to a small number of natural features. This is most pronounced for those sites closest to the RRF, the associated works and which are used for recreation or community activities.

The effects on Paul Place Reserve and Bus Stop Reserve will be minimal. Both these reserves have limited existing visual amenity values, with Paul Place Reserve featuring a backdrop of Transpower infrastructure and SEART. Neither reserve features significant natural landscape values nor is as heavily used as other reserves in Pakuranga (e.g. Ti Rakau Park).

Greater effects have been identified at Pakuranga Leisure Centre. These arise due to the proximity of the site to the RRF and its high level of community use. The site's outdoor areas are used by the general public and construction equipment/materials (such as cranes) will overshadow and visually dominate these spaces during construction of the RRF. However, these effects will be temporary, the RRF structure is largely a permitted activity within the Reeves Road corridor and there are no AUP(OP) protected viewshafts or character overlays at this location.

Fewer visual and landscape effects are anticipated for Pakuranga Plaza or the commercial sites on Cortina Place. As noted previously, the tenancies at Pakuranga Plaza are largely facing inwards towards the centre of the site. Their views to the various construction activities will be limited by both this inwards orientation and distance from the activities. The commercial activities on Cortina Place are similarly inwards facing, with their street frontages largely dedicated to vehicle parking and access. The scale of effects on these sites will be minimal.

Another viewing audience will be persons travelling to, from and through Pakuranga Town Centre. The construction of EB2 will be visible from public roads in several directions, most notably for persons travelling along Ti Rakau Drive. However, such views will be transient given that any viewers will be moving through the construction area. As such, the effects on the travelling audience will be minimal.

Lastly, EB2's construction will be viewable from private dwellings, notably those dwellings on William Roberts Road, Ayr Road, Dale Crescent, Tiraumea Drive and Bolina Crescent. Construction activities at these locations may be highly visible, in part due to the removal of

intervening structures and vegetation that would otherwise obscure construction. These views of construction activities would also have long durations, given the scale of works proposed and time needed to construct the larger elements of EB2 (e.g. the RRF).

However, it is noted that infrastructure construction is not an uncommon activity in an urban environment and there is the potential to provide ground level screening to minimise views into active construction areas. In addition, there are no AUP(OP) landscape or character overlays present within these residential areas. Given the temporary nature of the construction activities, the potential for screening and the lack of any character/landscape AUP(OP) overlays, the effects on these residential sites are considered to be acceptable.

9.4.15 Effects on Open Space

As detailed in the Open Space Effects Assessment (Appendix 32), the construction of EB2 requires both permanent and temporary occupation in the following reserves:

Table 9-14 Project Footprint with Open Space Sites

Reserve Name	Address	Area Occupied (approx. m ²) – Temporary	Area Occupied (approx. m ²) – Permanent ³⁶
Paul Place Reserve	6R Paul Place, Pakuranga	1229	312
Bus Stop Reserve	96R Pakuranga Road	1135	N/a
Pandora Place Esplanade Reserve	35R Pandora Place, Pakuranga	268	N/a
Tiraumea Reserve	25 Tiraumea Drive Pakuranga	87	N/a

The temporary occupation areas are required to enable the construction of stormwater infrastructure and the new SEART offramp.

Paul Place Reserve, Pandora Place Esplanade Reserve and Tiraumea Reserve have been observed as being poorly used recreation spaces and do not feature any significant community infrastructure (e.g. sports fields). These reserves are located in close proximity to SEART, with Pandora Place Esplanade Reserve having limited access given its position between SEART and a tidal arm of the Tāmaki River. Given this, the temporary occupation within these reserves will not significantly affect the local community’s access to open space and recreational opportunities, particularly given the unaffected parts of these reserves will still be available for public use.

Bus Stop Reserve differs from the other three reserves, given its location on Pakuranga Road and its role in connecting the Rotary Millennium shared path to Pakuranga Town Centre. However, no works are proposed to the shared path, while AT will provide continued community access to and from the shared path.

³⁶ The permanent occupation within Paul Place Reserve is discussed in Section 9.5.5.

Following construction, AT will remove all construction equipment and materials, as well as replant any affected grassed or vegetated areas. This will ensure that longer term amenity values associated with these open spaces are maintained.

Given the above, the construction of EB2 will have minimal effects on open space values.

9.4.16 Summary of Construction Effects

AT and EBA have worked to develop a construction methodology, design and conditions set which address all actual and potential environment effects arising from construction. This includes a broad suite of management plans which give both stakeholders and AC confidence that the EB2's effects are appropriately addressed and EB2 will be undertaken in a way that minimises disruption to the local community. The proposed conditions also require clear and timely consultation with the community and key stakeholders, while the continuation of the kaitiaki forum maintains the involvement of mana whenua through the Project's delivery. As such, the construction effects of EB2 can be mitigated and the effects are not considered significant.

9.5 Operational Effects

Consideration has been given to the operational effects of EB2 once construction is complete. Given the scale of EB2 and its potential to reshape the surrounding urban form, the following operational effects are detailed in the following sub-sections:

- Transport effects
- Visual and landscape effects
- Open space effects
- Cultural effects
- Noise effects
- Stormwater effects.

9.5.1 Transport Effects

9.5.1.1 General Transport Benefits

The primary driver for EB2 is to improve the overall functioning of southeast Tāmaki Makaurau Auckland's transport network. While the positive effects of the wider Project and EB2 are detailed in Section 9.3, the ITA has undertaken a detailed analysis of how local transport networks will operate once construction is complete. Key transport benefits identified by the ITA include:

- Better connections and sustainable travel options for pedestrians, cyclists, motorists, bus and train customers
- A reliable 40-minute bus and train trip between Botany Town Centre and Britomart (saving 20-minutes)
- Increase in public transport trips from 3,700 to 18,000 per day by 2028
- Increase in public transport mode share from 7% to 25% by 2028
- 24,000 more people with access to a rapid transit bus station within 1 km from home
- 5 km of busway between Pakuranga and Botany fully separated from other traffic

- 5 new bus stations with quality facilities
- 12 km of safe and separated walking and cycling infrastructure
- Reductions in vehicle congestion around Pakuranga Town Centre
- Accommodates electric buses, a key part of AT’s low-emission vehicle fleet by 2040.

9.5.1.2 General Transport Effects

The ITA has undertaken modelling to ascertain how EB2 will affect Tāmaki Makaurau Auckland’s road network, as shown in Table 9-15.

Table 9-15 Do-Minimum and Post-Construction Traffic Volumes (2028)

Location	Direction	AM Peak		PM Peak	
		Do-Minimum [veh/h]	EB2/EB3R [veh/h]	Do-Minimum [veh/h]	EB2/EB3R [veh/h]
Pakuranga Road (West of the RRF) ³⁷	Westbound	2,552	964	1,429	960
	Eastbound	1,100	848	2,702	977
Pakuranga Road (East of the RRF) ³⁸	Westbound	2,687	3,041	1,427	1,992
	Eastbound	1,102	1,448	2,767	2,461
William Roberts Road (Ti Rakau Drive – Reeves Road) ³⁹	Northbound	39	445	46	567
	Southbound	31	332	70	372
Reeves Rd (West of William Roberts Road)	Westbound	519	133	396	49
	Eastbound	231	107	762	283
Reeves Rd (East of William Roberts Road)	Westbound	478	411	193	149
	Eastbound	241	393	550	633
RRF	Northbound	-	931	-	1,638
	Southbound	-	2,445	-	1,141
SEART (West of ramps)	Westbound	3,387	3,352	1,740	2,072
	Eastbound	1,133	1,830	3,054	2,915
Ti Rakau Drive (Pakuranga Road – Reeves Road)	Westbound	1,097	1,200	2,129	584
	Eastbound	1,387	754	1,003	848

The above table highlights that with the construction of RRF, less traffic is expected to travel on Pakuranga Road west (between Ti Rakau Drive and the RRF). Instead, this traffic will travel on RRF to directly access SEART during both AM and PM peaks periods. The RRF will also assist in reducing traffic volumes on Ti Rakau Drive itself, between Pakuranga Road and Reeves Road. However, increased traffic flows are anticipated on Pakuranga Road east of the RRF, given Pakuranga Road’s role as an arterial road to the south-eastern suburbs.

It is noted that with the completion of the William Roberts Road extension, more traffic is predicted to travel along William Roberts Road between Ti Rakau Drive and Reeves Road in both directions during the AM and PM peaks. However, this fits with its role of providing road

³⁷ Relates to the section of Pakuranga Road west of William Roberts Road in the Do-Minimum scenario.

³⁸ The section of Pakuranga Road east of William Roberts Road in the Do-Minimum scenario.

³⁹ The section of William Roberts Road south of Reeves Road, prior to the completion of the extension, in the Do-Minimum scenario.

access to and from Reeves Road and Cortina Place. Since general traffic will not be able to access Reeves Road from Ti Rakau Drive in the future and with the William Roberts Road link completed, traffic volumes are expected to be lower on Reeves Road West between William Roberts Road and Cortina Place. This section of Reeves Road will provide access to the Pakuranga Plaza. Reeves Road East, from William Roberts Road towards Pakuranga Heights, is expected to carry roughly the same traffic volumes westbound and higher traffic volumes eastbound in the future.

9.5.1.3 Intersection Performance

In addition to traffic volumes, the ITA has modelled post-construction intersection performance, as shown in Table 9-16 and Table 9-17.

Table 9-16 Intersection performance – Do-Minimum vs Post-Construction (AM peak)

Intersection	Do-Minimum ⁴⁰			EB2/EB3R Final		
	LOS	DOS (v/c)	Delay [s]	LOS	DOS (v/c)	Delay [s]
Pakuranga Road / Ti Rakau Drive	C	0.85	33	D	0.81	41
Pakuranga Road / Brampton Court	N/A	0.42	1	N/A	0.53	1
Pakuranga Road / RRF	Built during EB2			F	1.14	87
Reeves Road / Aylesbury Street	N/A	0.27	1	C	0.60	34
William Roberts Road / Reeves Road	N/A	0.68	7	E	0.95	68
William Roberts Road / Cortina Place	Built during WRRE			N/A	0.27	2
Ti Rakau Drive / Aylesbury Street / Palm Avenue	Built during EB2			E	0.92	60
Ti Rakau Drive/ Reeves Road / SEART	F	0.90	178	E	1.02	66

The ITA notes that in the AM peak the EB2/EB3R Final scenario is expected to result in minimal adverse effects on intersection performance along the network. In particular, it is noted that minor delay increases are expected at the Pakuranga Road / Ti Rakau Drive intersection, although the level of service remains the same (i.e. LOS D).

In addition, it is recognised that the new Pakuranga Road/RRF intersection will operate with a LOS F during the AM peak. The reason for this is the right-turn movement from Pakuranga Road eastern approach to the intersection, which is treated as a minor movement at the intersection. However, the overall travel time towards Howick is predicted to only increase by 1 minute.

Furthermore, bus services at this intersection will enjoy a LOS C, given the priority given to public transport at this intersection. As a consequence, this will help improve public transport travel times towards Howick, Highland Park, Cockle Bay and Bucklands Beach. This intersection's performance highlights the balance that has been planned between competing priorities of bus, general traffic and freight, and pedestrians within a very congested network and constrained corridor. The only practicable method to increase the

⁴⁰ The do-minimum scenario involves a future transport network without the Project.

LOS for private vehicles would be to add further general traffic lanes, which would require the permanent occupation of additional privately held lane and increased construction costs. Such an approach would not be consistent with the Project objectives.

With regard to the signalisation of the Reeves Road/Aylesbury Street and William Roberts Road/Reeves Road intersections, it is expected that acceptable levels of service will occur and that midblock queues blocking the bus lanes are predicted to be unlikely.

The ITA has also considered PM peak intersection performance, as detailed in Table 9-17.

Table 9-17 Intersection performance – Do-Minimum vs Post-Construction (PM peak)

Intersection	Do-Minimum			EB2/EB3R Final		
	LOS	DOS (v/c)	Delay [s]	LOS	DOS (v/c)	Delay [s]
Pakuranga Road / Ti Rakau Drive	D	0.91	47	D	0.82	41
Pakuranga Road / Brampton Court	N/A	0.53	1	N/A	0.33	1
Pakuranga Road / RRF	Built during EB2			E	1.08	75
Reeves Road / Aylesbury Street	N/A	0.38	1	D	0.75	45
William Roberts Road / Reeves Road	N/A	0.87	11	D	0.81	43
William Roberts Road / Cortina Place	Built during WRRE			N/A	0.31	2
Ti Rakau Drive / Aylesbury Street / Palm Avenue	Built during EB2			E	0.88	63
Ti Rakau Drive/ Reeves Road / SEART	F	1.13	83	D	0.92	45

In general, the SIDRA analysis indicates that in the PM peak the EB2/ Final scenario is expected to result in minimal adverse effects on intersection performance at the majority of intersections along the network. This includes minor improvements at Pakuranga Road / Ti Rakau Drive, which can be expected given the diversion of through traffic onto RRF. Similarly, acceptable levels of service are anticipated at the following intersections:

- Pakuranga Road / RRF
- William Roberts Road / Cortina Place
- Ti Rakau Drive / Aylesbury Street / Palm Avenue

As with the AM Peak, the signalisation of the Reeves Road/Aylesbury Street and William Roberts Road/Reeves Road intersections, it is expected to provide acceptable levels of service. In addition, midblock queues blocking the bus lanes at the intersection are predicted to be unlikely.

To summarise, the proposed design of EB2 is expected to lead to overall improved operations for general traffic across the network, and importantly, bus movements are predicted to operate at LOS C and with spare capacity. Furthermore, despite the poor performance at some of the intersections, significant improvements in travel time are expected overall as a result of EB2 and will further improve once the full Project has been implemented.

9.5.1.4 Effects on Bus Services

The most significant effect on bus services within EB2 is the provision of the new Pakuranga Bus Station on Ti Rakau Drive and the provision of bus lanes along that road corridor. The bus station represents a step-change in public transport services for Pakuranga, with improved passenger amenities and connectivity to the land uses within the town centre.

The provision of the new bus station is expected to generate significant increases in bus patronage as shown in

Table 9-18, with a 32 fold increase in AM peak patronage and a 77 fold increase in PM peak patronage. This increased bus service patronage will have the cross-benefits of helping reduce road congestion and transport related greenhouse gas emissions.

Table 9-18 Project Bus Service Patronage at Pakuranga Bus Station

Station	2018 Base Model			2028 EB2/EB3R Model		
	Boarding	Alighting	Total	Boarding	Alighting	Total
Pakuranga Town Centre (AM Peak)	37	8	45	708	760	1,468
Pakuranga Town Centre (PM Peak)	13	4	17	725	589	1,314

Furthermore, the bus station provides for both current and future planned bus routes, as shown in Figure 9-13. Existing bus services (72X, 711 and 712) will all stop at the bus station, with westbound services from Howick/Cockle Bay/Bucklands Beach diverting to the bus station via Reeves Road (rather than their current routes directly down Pakuranga Road). The benefit of this minor route change is that it enables for smoother transfers with Botany and East Tamaki services (70, 352), with current transferring passengers needing to cross Pakuranga Road to access bus stops on Ti Rakau Drive. With regard to future bus services, two new routes from Howick (705) and Ormiston (706) will also stop at Pakuranga Town Centre.



Figure 9-13 Current and Future Bus Services for Pakuranga Bus Station

The frequency of bus services will also improve with the completion of EB2 (and EB3R). As shown in Table 9-19, both the 70 and 72⁴¹ services will experience reduced headways⁴², improving public transport reliability and accessibility. It is noted service headways for the 72X service will remain the same upon completion of EB2 and EB3R. However, the ITA expects these frequencies to be sufficient to service the route's predicted 2028 patronage.

In addition, the service headways of the 352 service will improve significantly, when compared to the existing service delivery. The ITA also expects that 12 min headways will be provided for this service across all periods.

Furthermore, it is recognised that the 711 service headways will improve to 15 min in the peak directions, while service headways will be halved during the inter-peak period and the off-peak periods. Similarly, the 712 service headways will be halved for the peak directions, to 10 minutes, while the inter-peak period and off-peak service headways will be improved to 20 minutes. Lastly, the new 705 and 706 services are expected to run at 15 min headways in the peak directions only (AM being inbound, PM being outbound), with the capacity to expand the timetable if required in the future.

⁴¹ The 72 service will replace the 72C and 72M services.

⁴² I.e. times between bus services

Table 9-19 Service headways – Existing Environment vs EB2/EB3R (2028)

Service Description	Direction	Existing Environment			EB2/EB3R 2028		
		AM Headway [min]	IP Headway [min]	PM Headway [min]	AM Headway [min]	IP Headway [min]	PM Headway [min]
70 – Botany to Auckland CBD	Inbound	8	10	10	5	7	7
	Outbound	10	7	7	7	7	5
72C – Botany and Howick to Panmure	Inbound	20	30	30	-	-	-
	Outbound	30	30	20	-	-	-
72M – Botany and Howick to Panmure	Inbound	-	30	30	-	-	-
	Outbound	30	30	-	-	-	-
72 – Botany and Howick to Panmure (replacement for 72C and 72M)	Inbound	-	-	-	5	12	15
	Outbound	-	-	-	15	12	5
72X – Botany and Howick to Auckland CBD	Inbound	10	-	-	10	-	-
	Outbound	-	-	10	-	-	10
352 – Manukau to Panmure	Inbound	20	20	20	12	12	12
	Outbound	20	20	20	12	12	12
705 – Meadowlands to Panmure (new route)	Inbound	-	-	-	15	-	-
	Outbound	-	-	-	-	-	15
706 – Flatbush to Panmure (new route)	Inbound	-	-	-	15	-	-
	Outbound	-	-	-	-	-	15
711 – Howick to Panmure	Inbound	20	60	60	15	30	30
	Outbound	60	60	20	30	30	15
712 – Bucklands Beach to Panmure	Inbound	23	30	30	10	20	20
	Outbound	30	30	20	20	20	10

The ITA has also considered EB2’s effects on bus travel times, which are summarised in Table 9-20. In general, bus travel times will improve with the completion of EB2, given the road changes and bus lanes proposed. This is most apparent with the westbound 70 and 352 services, which will travel along the Ti Rakau Drive bus lanes noting that the eastbound 70 service will experience a negligible increase in travel times.

It is also noted that the new consolidated 72 service (AM Peak) will have longer travel times, although this will be offset by the increased frequency in services as detailed in Table 9-19. The 72X, 711 and

712 routes are also predicted to experience negligible increases or in some cases small improvements, in both directions during the AM peak.

Again, while service headways for the 72X service are expected to remain the same, headways for the 711 and 712 service will be significantly improved in the future. This is likely due to the route changes of these services and in particular the additional number of intersections these services have to pass through. Again, while service frequencies for the 72X are expected to remain the same, service headways for the 711 and 712 services will be significantly improved. Furthermore, the integration off all services at the bus station will provide for an improved transfer experience between these services. Passengers will not be required to walk across the town centre to transfer between services on Pakuranga Road and Ti Rakau Drive.

Table 9-20 Bus travel times – Do-Minimum vs EB2/EB3R Final (2028)

AM Peak						
Route Description	Westbound			Eastbound		
	Do Minimum [min]	EB2/EB3R Final [min]	Difference [min]	Do Minimum [min]	EB2/EB3R Final [min]	Difference [min]
70 – Botany to Auckland CBD	42.3	29.3	-13.0	26.9	30.3	3.4
72C – Botany and Howick to Panmure	20.6	-	-	16.0	-	-
72M – Botany and Howick to Panmure	-	-	-	15.8	-	-
72 – Botany and Howick to Panmure	-	21.0	-	-	20.1	-
72X – Botany and Howick to Auckland CBD	24.6	25.6	1.0	-	-	-
352 – Manukau to Panmure	36.8	25.1	-11.7	29.1	28.2	-0.9
705 – Meadowlands to Panmure	-	29.7	-	-	-	-
706 – Flatbush to Panmure	-	25.9	-	-	-	-
711 – Howick to Panmure	29.1	27.8	-1.3	22.7	25.5	2.8
712 – Bucklands Beach to Panmure	22.6	24.1	1.5	16.6	17.9	1.3
PM Peak						
Route Description	Westbound			Eastbound		
	Do Minimum [min]	EB2/EB3R Final [min]	Difference [min]	Do Minimum [min]	EB2/EB3R Final [min]	Difference [min]
70 – Botany to Auckland CBD	35.7	29.9	-5.8	38.1	31.1	-7.0
72C – Botany and Howick to Panmure	14.6	-	-	14.8	-	-
72M – Botany and Howick to Panmure	15.0	-	-	-	-	-
72 – Botany and Howick to Panmure	-	16.9	-	-	20.0	-
72X – Botany and Howick to Auckland CBD	-	-	-	16.8	24.7	7.9
352 – Manukau to Panmure	33.4	32.3	-1.1	27.9	32.4	5.5
705 – Meadowlands to Panmure	-	-	-	-	-	-
706 – Flatbush to Panmure	-	-	-	-	-	-

711 – Howick to Panmure	23.8	24.6	0.8	24.5	32.2	7.7
712 – Bucklands Beach to Panmure	19.7	22.0	2.3	18.1	25.9	7.8

Lastly, the bus station will also accommodate school bus services, including those for Sacred Heart College and Sancta Maria College. Similar benefits to those for public bus services are anticipated, including improved transfers between school and public services, as well as improved student safety given the open location of the bus station (as opposed to the current Brampton Court bus stops).

9.5.1.5 *Effects on Pedestrians and Cyclists*

EB2 will provide dedicated footpaths and cycleways to improve pedestrian and cyclist amenity and safety to, from and across Pakuranga Town Centre. These connections will also improve accessibility to bus services, which will be concentrated at Pakuranga Bus Station.

EB2 will provide dedicated cycle lanes, which will connect to EB1’s own cycle lanes. These separated cycle lanes will provide for a safer journey for cyclists, reducing the need for cyclists to travel on open road lanes. In addition, cycle storage will be provided at Pakuranga Bus Station, enabling for multi modal journeys without the use of private motor vehicles.

Improved footpaths and pedestrian crossings will be provided through EB2. This includes footpaths along Aylesbury Street, which currently has no such facilities. These pedestrian connections will also be provided for movements across the wider town centre, including crossings over Reeves Road. Furthermore, raised tables at selected intersections will help reduce vehicle speeds and improve pedestrian safety.

9.5.1.6 *Summary of Transport Effects*

Overall, the ITA demonstrates the significant benefits that EB2 and the wider Project will deliver with regard to the operation of the Tāmaki Makaurau Auckland’s transport network. In particular, the functioning of the region’s bus services will experience a transformation, with the ability to provide increased services, reduced journey times and improvements in the ability to transfer between services. The passenger experience will also benefit from the provision of new bus shelters, real time information and general safety. EB2 also delivers improvements to walking and cycling transport modes, with dedicated and improved infrastructure. This will allow for safer journeys and better connectivity to local activities.

These benefits are delivered in a manner which also avoids significant disruptions to general traffic. While some intersections will experience minor delays, these are offset by the improved performance by other components of the transport network. In addition, these delays are further offset by the modal shift towards public and active transport modes.

Given the above, EB2 will deliver significant transport benefits.

9.5.2 **Visual and Landscape Effects**

As detailed in the Natural Character, Landscape and Visual Effects Assessment (Appendix 21); the operative effects of EB2 can be broken into respective landscape elements.

The assessment considers that landscape effects can be further categorised as:

- Landform
- Vegetation

- Open space
- Key landscape features
- Landscape character.

EB2 will require little change to the underlying landform, which is relatively flat and has a gentle gradient moving east to west. This existing topography is conducive to construction and does not require significant cuts or fill to provide a stable road corridor and structures. It is noted that there are no AUP(OP) protected viewshafts or landscape features within the EB2 works.

As noted in Sections 9.4.9 and 9.4.5, vegetation clearance is required across a mix of reserves, privately owned sites and road corridors. While this vegetation clearance will be immediately apparent during the construction phase, it will be mitigated through the UDLP and demonstrated by the proposed landscape drawings (Appendix 5: Landscape Drawings). The UDLP, as shown by the proposed landscape drawings, will provide for a consistent planting scheme across EB2, with a focus on species which would have been present prior to the human occupation (i.e. natives). This new vegetation will contribute to a sense of place for Pakuranga Town Centre, while acting to soften the harder elements of the Project. It will also have broader ecological functions, including mitigation for the removal of potential lizard habitat.

It is noted that some minimal effects are anticipated on public reserves. This is principally at the fringes of these reserves, where there will be vegetation clearance at their boundaries within SEART and Pakuranga Road. EB2's proposed stormwater infrastructure will also have permanent footprints in the coastal fringes of the area's reserves. However, the majority of this infrastructure will be underground and out of public view. The only evidence of their presence will be the outfalls themselves and manholes. Such structures are common sights in Tāmaki Makaurau Auckland's reserves and have a minimal footprint in comparison to the overall size of the reserves. Lastly, no works are proposed within any natural character or landscape overlays.

The assessment notes that EB2 will have limited effects on the area's principal landscape features, these being views towards Maungarei/Mount Wellington and open spaces. As detailed above, minimal change is planned to local reserves, while views will still be provided towards Maungarei.

Consideration has been given by the assessment to the effects on the area's natural character. Such effects are limited given the area's existing urbanised environment, combined with the limited works in public reserves. The key exception to this is the viewing audiences for the RRF. The assessment identifies this as the critical aspect of EB2 which will generate a greater scale of effects than other planned transport infrastructure. Key viewpoints affected by the RRF includes the Pakuranga Community Centre, business sites along Reeves Road, some residences⁴³ and persons travelling along Ti Rakau Drive. From these sites, the RRF will be a significant change to their outlook given both its height and bulk. The visual effect of the RRF decreases over distance but will still remain a visually dominant structure within the local environment. However, it is noted that much of the RRF is a permitted activity given that it is a road network activity and the most visually prominent RRF structural elements will be located within existing road corridors. Furthermore, the RRF is not located within any AUP(OP) character, heritage or landscape overlays.

To summarise, the mitigation to address EB2's operational visual landscape effects will be via the use of the ULDP. The ULDP will include the following:

- Urban design details for works (e.g. station layouts)
- Landscape design details for works in public reserves and road corridors
- Type, number and location of replacement tree planting
- Lighting, signage and street furniture details
- The location of property accessways required to service affected properties and where those properties are located in the Project footprint

⁴³ These residences are 17 -23 Ti Rakau Drive, 9 Bolina Crescent and 3 – 13 Tiraumea Drive.

- The measures to achieve a safe level of transition for cycling and walking modes, including providing advanced warning and signage to cyclists and pedestrians, and safe and convenient cycling transitions at the ends of the Project
- The design features and methods for cultural expression and in order to reflect outcomes agreed through mana whenua engagement
- Design features associated with the management of stormwater, including both hard and soft landscaping;
- A maintenance plan and establishment requirements over a three-year period for landscaping and five years for specimen trees following planting and reinstatement/construction of road verges, and including:
 - Vegetation maintenance policies for the proposed planting, in particular details of maintenance methodology and dates / frequencies
 - Details of watering, weeding, trimming, cultivation, pest and disease control, checking stakes and ties, pruning and other accepted horticultural operations to ensure normal and healthy plant establishment and growth
 - Details of a maintenance programme for any other green asset and/ or parks infrastructure including vandalism eradication policies
 - An agreed reporting mechanism for annual inspections of all new plantings to ensure the plants are healthy and are being maintained to the Monitoring officer's(s) standards.
- Measures to minimise clearing work to preserve soil and any indigenous vegetation
- Measures to ensure the appropriate disposal of any clearance of invasive/noxious weeds
- Local sourcing of 'new' tree stock (within the Auckland Region)

In a practical sense, the mitigation detailed in the UDLP will include both hard and soft landscape elements, with design details focusing on the following key areas:

- Bus station design and location
- Ti Rakau Drive
- Pakuranga Road
- Reeves Road
- William Roberts Road.

Each of these areas will have their own individual design responses, which relate to both the existing environment and the aspirations set by the Pakuranga Town Centre Masterplan. Significant landscaping across the EB2 is planned, while walking, cycling and public transport infrastructure has been designed at a human scale. These various design elements will help improve local amenity values across much of Pakuranga Town Centre.

As mentioned previously, the UDLP will be developed with input from EB2's ecologist, arborist, open space specialist and mana whenua. This is due to the importance of incorporating cultural values into the final design, as well as the cross-over of the UDLP with mitigation for EB2's other environmental effects.

Given the above assessments and mitigation, the visual and landscape effects of EB2 will be acceptable.

9.5.3 Cultural Effects

As previously discussed in Section 9.4.10, AT has been working with mana whenua throughout the development of the Project. While the temporary effects of EB2 can be addressed through the proposed management plans, AT is cognisant of the importance in incorporating cultural values into

EB2’s long-term elements. As such, opportunities will be provided for mana whenua to contribute to the UDLP and EB2’s stormwater design.

9.5.4 Noise Effects

A technical assessment to address the adverse operational noise effects of EB2 is contained in Appendix 7: Operational Noise and Vibration Effects Assessment. The assessment details the relevant noise standards, the existing noise environment, an assessment methodology and the recommended best practicable option available to address the Project’s noise effects.

The assessment identifies that Rule E25.6.33 of the AUP(OP) requires new or altered roads that are within scope of NZS 6806:2010 to comply with the requirements of that standard⁴⁴. NZS 6806 provides specific criteria and the assessment method that should be employed when analysing road traffic noise. It is used on roading projects to identify the scale of noise effects and the mitigation measures that should be employed. Noise effects can impact the wellbeing of both individuals and communities, given the restrictions it can impose on quality of life. As such, the standard applies to “protected premises and facilities” (PPFs) like housing, healthcare and community facilities, all of which are present within the EB2 area.

When considered effects on PPFs, the standard applies three levels of noise criteria, with a priority given to achieving the lower noise level. Noise levels may increase where it is not practicable to apply controls, with these noise levels detailed in Table 9-21.

Table 9-21 NZS 6806 Noise Criteria

Category	Criterion	Altered Road
A	Primary	64 dB LAeq (24 hr)
B	Secondary	67 dB LAeq (24 hr)
C	Internal	40 dB LAeq (24 hr)

Based on the above criteria, the existing noise environment and EB2’s design, modelling was undertaken to ascertain both the number of/effects on PPFs and then the types of mitigation needed. The modelling to identify the number of PPFs was based on the following scenarios:

- Existing scenario – Noise environment as it currently exists
- Do Nothing scenario – Noise environment in the design year, assuming that the Project was not built
- Do Minimum scenario – Noise environment in the design year, assuming that the Project was built, but without implementing any noise mitigation measures as recommended by the acoustic assessment.

The results of this modelling are presented in

Table 9-22. These results were then incorporated into a further modelling exercise to determine the appropriate mitigation for EB2. This further modelling was based on four mitigation options based on a range of mitigation measures shown Table 9-23.

⁴⁴ NZS 6806 only applies to roads that carry more than an average daily traffic of 2000 of more vehicles or where threshold standards are triggered (e.g. change of at least 3 dB for at least one protected premise or facility).

Table 9-22 Summary of PPF Categories for EB2

Category	Criteria	EB2, Number of PPFs		
		Existing	Do-Nothing	Do Minimum
A	64 dB L _{Aeq} (24h)	254	250	256
B	67 dB L _{Aeq} (24h)	18	15	20
C	40 dB Internal L _{Aeq} (24h)	8	15	4
Total		280	280	280

Table 9-23 Summary of Mitigation Options

Mitigation Option	Description
Mitigation Option 1 (Mit1)	Modelling of OGPA PA-10 for all altered roads.
Mitigation Option 2 (Mit2)	Implementation of noise barriers at all PPFs in Categories B and C.
Mitigation Option 3 (Mit3)	Implementation of noise barriers at all PPFs in Category C.
Mitigation Option 4 (Mit4)	Implementation of 1.8m noise barriers at as many single-storey PPFs in Categories B and C as is practicable.

Mitigation Option 4 performed the best of the four options modelled, with an increase in category A PPFs and reductions in both category B and C PPFs (Table 9-24). As such, noise walls have been proposed at 23B Dale Crescent (along its western and southern boundaries) and 2 Dale Crescent (between the current dwelling and SEART). No other noise walls have been identified.

Table 9-24 Mitigation Option 4 Results

Category	Criteria	Number of PPFs		
		Do Min	Mitigation 4	Change
A	64 dB L _{Aeq} (24h)	474	477	+3
B	67 dB L _{Aeq} (24h)	72	70	-2
C	40 dB Internal L _{Aeq} (24h)	5	4	-1
Total		551	551	0

Based on the above modelling and proposed mitigation, the operational noise effects of EB2 will be acceptable.

9.5.5 Open Space Effects

As noted in Section 9.4.15, 312m² of Paul Place Reserve will be permanently occupied for the new SEART offramp. Both the Open Space Effects Assessment (Appendix 32: Open Space Effects Assessment and the Natural Character, Landscape and Visual Effects Assessment (Appendix 21: Natural Character, Landscape and Visual Effects Assessment) have noted the poor amenity values associated with the reserve. In particular, the reserve does not feature any community facilities or amenities, such as a playground or public toilets. Rather, the reserve is a largely featureless lawned expanse, which runs between Pauls Place itself and SEART. As a result of these features, limited public use has been observed at the reserve.

In addition, the limited public use of the reserve has been confirmed by AC, during consultation with the AC Parks team. AC has also confirmed that there are no future plans to invest in the reserve,

which will remain as a passive open space. Given these factors, no mitigation is proposed at this reserve and the related open space effects are considered negligible.

9.5.6 Air Quality Effects

The Air Quality Effects Assessment (Appendix 25: Air Quality Effects Assessment) has considered the operational air quality effects of EB2, noting that discharges from motor vehicles are a permitted activity under the AUP(OP)⁴⁵. Regardless, a full modelling exercise was undertaken to ascertain what, if any, effects would be generated from the completed Project.

This modelling included consideration of road alignment, air contaminant types, particulate matter sizes, rate of electric vehicle uptake and general traffic data. Based on Ministry for the Environment's guidance, the modelling found that there would be negligible impacts on air quality.

As such, the operational air quality effects of EB2 will be minimal.

9.5.7 Stormwater Effects

As detailed in both the Stormwater Effects Assessment (Appendix 6: Stormwater Effects Assessment) and Section 4.2.6, EB2 will involve the upgrading of existing and construction of new stormwater infrastructure. This design philosophy has been developed to also incorporate the aspirations of mana whenua and Healthy Waters. With this philosophy in mind, AT have developed a stormwater design to address the attenuation and water quality issues associated with EB2 and the existing environment. Also underpinning the stormwater design is a "maintenance-led" approach, which seeks to protect worker safety and reduce the maintenance and operational expenditure to AT and Aucklanders.

Section 6.17 details the types and locations of OLFPs and flood plains present within Pakuranga Town Centre. Many of these OLFPs originate in the upper catchment around Reeves Road, Cardiff Road and William Roberts Road. They then flow downhill via Ti Rakau Park, Pakuranga Plaza and Reeves Road towards Ti Rakau Drive. From Ti Rakau Drive, the OLFPs proceed to discharge into the CMA after crossing further private properties. Nuisance flooding can also result, with flood waters collecting in Ti Rakau Park, under The Warehouse and within Ti Rakau Drive. These flood waters are due in part to the previous urbanisation of Pakuranga, the loss of natural streams/wetlands and current stormwater infrastructure capacity.

In accordance with the design philosophy and in recognition of the existing flooding issues, the longitudinal drainage for EB2 will provide new stormwater networks. The new networks, where feasible, will themselves connect to existing networks close to their outfalls with the existing pipe between the connection point and the outfall, including the outfall and upstream network being upgraded where necessary.

These attenuation works have been modelled to ascertain any changes in flood levels across EB2 (Figure 9-14 and Figure 9-15). The modelling shows that while some flooding will still occur during 1 in 10 and 1 in 100 ARI events, flood levels are generally decreased across all of Pakuranga Town Centre. This includes flood levels with Pakuranga Plaza, sites within Cortina Place and along Ti Rakau Drive. This demonstrates that the planned stormwater attenuation works are a benefit to the local

⁴⁵ See Rule E14.4.1(A114).

area, reducing the risks to safety and property. Furthermore, the functioning of the road network is improved, given that there is a reduced need to close road lanes during heavy rain.

Given the above, the residual adverse operational stormwater effects of EB2 are positive overall.



Figure 9-14 EB2 Design Case 10-Year Flood Depth Difference



Figure 9-15 EB2 Design Case 100-Year Flood Depth Difference

9.5.8 Coastal Ecology Effects

As stated in Section 4.2.6 and Table 4-9, the two new outfalls for EB2 will permanently occupy 1375m² of the CMA. These outfalls are located immediately to the south of the existing SEART corridor, within a shallow tidal branch of the Tāmaki River. The Marine Ecology and Coastal Avifauna Effects Assessment (Appendix 28: Marine Ecology and Coastal Avifauna Effects Assessment⁸) has reviewed the effects of this occupation, as well as the effects of the stormwater discharges themselves.

The assessment has confirmed that the effects of occupation will be minimal. It notes that the coastal environment at the outfalls' location does not have any significant ecology values and is typical of other coastal areas within the Tāmaki River catchment. Furthermore, fieldwork undertaken has not identified any threatened or at-risk species within the proposed occupation. The proposed occupation does not result in a significant loss of habitat for native fauna or native flora biodiversity.

EB2’s stormwater design philosophy is detailed in Section 4.2.6, including the types and locations of treatment devices. Mana whenua and broader community aspirations for improvements to stormwater quality have informed the stormwater design process. This is particularly relevant for EB2 given its proximity to the coastal environment and the degraded water quality of the Tāmaki River. EB2’s stormwater flows will be treated by a mix of swales, raingardens and storm filters. Raingardens will be employed in road medians and beneath the RRF, providing treatment and contributing to the visual amenity values of Pakuranga Town Centre. Swales will be used beside SEART given the space available for them, while a storm filter will be installed for flows discharging from the outfall in Bus Stop Reserve.

The stormwater treatment for EB2 has also been modelled to ascertain contaminant load reduction (Table 9-25). In general, the overall stormwater quality from the EB2 area will be improved, most significantly with total suspended solids (a 39% reduction) and then total petroleum hydrocarbons (23%).

Table 9-25 EB2 Stormwater Treatment Performance

Outfall	TSS	Zinc	Copper	TPH
Outfall P98086C	0%	0%	0%	0%
Outfalls MCC_108673, 05,06, & 89-18	-41%	-5.3%	-14%	-23%
Outfalls MCC_108680	-73%	-81%	-81%	-81%
Outfall MCC_108699	-54%	-43%	-46%	-50%
Outfall MCC_108633	-17%	0.4%	0.4%	0.4%
Total EB2 change	-39%	-14%	-18%	-23%

It is recognised that minor increases are predicted at Outfall MCC_108633. These contaminant levels will have a minimal effect on ecological values. This is due to the overall reduction in contaminant loads, combined with the low ecological values present at discharge locations. In addition, the cumulative effects of both EB2 and EB3R’s discharges will have minimal effects. This is due to both the overall improvement in treatment performance, as well as the existing environment’s ecological values. Given the positive effect from improved water treatment, the Marine Ecology and Coastal Avifauna Effects Assessment confirmed that no specific mitigation beyond those proposed for stormwater treatment would be required.

Given the above, the operational effects of EB2 on coastal ecological values will be minimal.

9.6 Conclusion

EB2 will generate a range of effects during its construction and its operation. Given its urbanised location, some adverse effects are unavoidable, but AT has provided a range of mitigation and management measures to address the Project’s effects. This includes a suite of management plans, which build upon practices previously employed during EB1, providing a no surprises approach to the community, mana whenua and AC. The adverse effects of EB2, as mitigated, will be acceptable.

EB2 will also deliver significant benefits to both Pakuranga Town Centre and the wider region. EB2 provides a number of improvements to the transport network, not least in providing more efficient, safer and comfortable public transport connections. EB2, via the RRF, will take traffic away from Pakuranga Town Centre, aiding traffic flows and improving amenity values. These

improvements will also provide safer and more legible movements for active transport modes. Overall, these changes will increase modal shift, assist in addressing congestion, support urban intensification and help reduce transport related greenhouse gas emissions.

AT has prepared a design which contributes, rather than detracts, from Pakuranga Town Centre. This approach includes the UDLP, which includes landscaping, open space improvements and linkages across Pakuranga Town Centre. The works will also help address legacy stormwater issues within the local catchment, while ecological mitigation will help provide quality habitat for native fauna.

10 Notification

AT request that this application package of EB2's resource consents and NoR undergoes public notification pursuant to section 95B(3)(a) of the RMA.

As such, no related notification assessment is required.

11 Statutory Assessment

Chapter summary – This chapter addresses the matters for statutory assessment under sections 104 and 171 of the RMA. This includes assessments against sections 104B, 105, 107, 123, 125 and 171 of the RMA.

As part of these assessments, the following statutory and non-statutory documents were considered:

- *The Hauraki Gulf Islands Marine Park Act (HGIMA)*
- *Marine and Coastal Area (Takutai Moana) Act 2011*
- *National Policy Statements for Freshwater Management and Urban Development*
- *National Environment Standard for Freshwater*
- *National Environment Standard Assessing and Managing Contaminants in Soil to Protect Human Health*
- *AUP(OP) – RPS, Regional and District Objectives/Policies*
- *The Pakuranga Town Centre Master Plan*
- *The Auckland Plan 2050*
- *The Regional Land Transport Plan*
- *Auckland Transport’s Statement of Intent 2021/22 – 2023/24*

AT’s Statement of Intent (SOI) 2021/22 – 2023/24 sets out AT’s strategic priorities over the next three years. These strategic priorities align with the priorities and expectations set out in a number of existing strategic documents, and include the following objectives:

- Providing and accelerating better travel choices for Aucklanders
- Better connecting people, places, goods and services
- Enabling and supporting Auckland’s growth, particularly in brownfield areas
- Improving the resilience and sustainability of the transport system and significantly reducing the greenhouse gas emissions it generates

The SOI identifies the Project, including EB2, as a key project/initiative in the 2021/22 0 2023/24 work programme.

- *Integrated Transport Programme 2012-2041*
- *Auckland Transport Alignment Project 2021-2031*
- *Regional Public Transport Plan 2018 - 2028*
- *Howick Walking and Cycling Network Adopted Report November 2018*
- *Howick Local Board Plan 2020.*

Lastly, a full assessment under Part 2 of the RMA has also been undertaken.

Overall, the assessment determines that EB2 is consistent with all the relevant statutory tests and documents.

11.1 Introduction

The RMA is the principal statutory document governing the use of land, air and water. The purpose of the RMA, as set out in section 5, is to ‘promote the sustainable management of natural and physical resources’. The RMA sets out a statutory framework, within which resources are managed. The framework sets out a hierarchy of tests that must be employed to

confirm the appropriateness of a NoR and/or a resource consent application. This section of the AEE sets out the framework under the RMA that applies to both the NoR and resource consents for EB2.

As noted in Section 7 of this AEE, the overall activity status of the resource consent applications required for EB2 is discretionary. As such, it is necessary to consider the resource consent applications under the decision-making framework of section 104(1) and 104B of the RMA and to assess the NoR in accordance with section 171 of the RMA.

11.2 Actual and Potential Effects

With respect to section 104(1)(a) of the RMA, the actual and potential effects on the environment of EB2 are summarised in section 9 of this AEE (with further detail provided in the technical assessments appended to this AEE). As set out below, this assessment of the actual and potential effects is also relevant to the statutory assessment required for the Notice of Requirement under section 171 of the RMA. Overall, it is concluded that the adverse effects of EB2 will be acceptable. This is based on a range of technical assessments, EB2’s design, the use of numerous management plans and the proposed conditions. While some adverse effects are anticipated, they are predominantly related to construction effects and offset by the significant positive effects generated by the EB2, not least the improvements made to the functioning of the transport network.

11.3 Relevant Statutory Planning Instruments

With regards to section 104(1)(b) and 171(1)(a) of the RMA, an assessment of the relevant statutory documents was undertaken by reviewing the documents specified in Figure 11-1 below and identifying the key objectives and policies within these documents that are relevant to EB2. Where similar themes were identified across the documents, the provisions were grouped and assessed collectively. Table 11-1 provides this assessment.

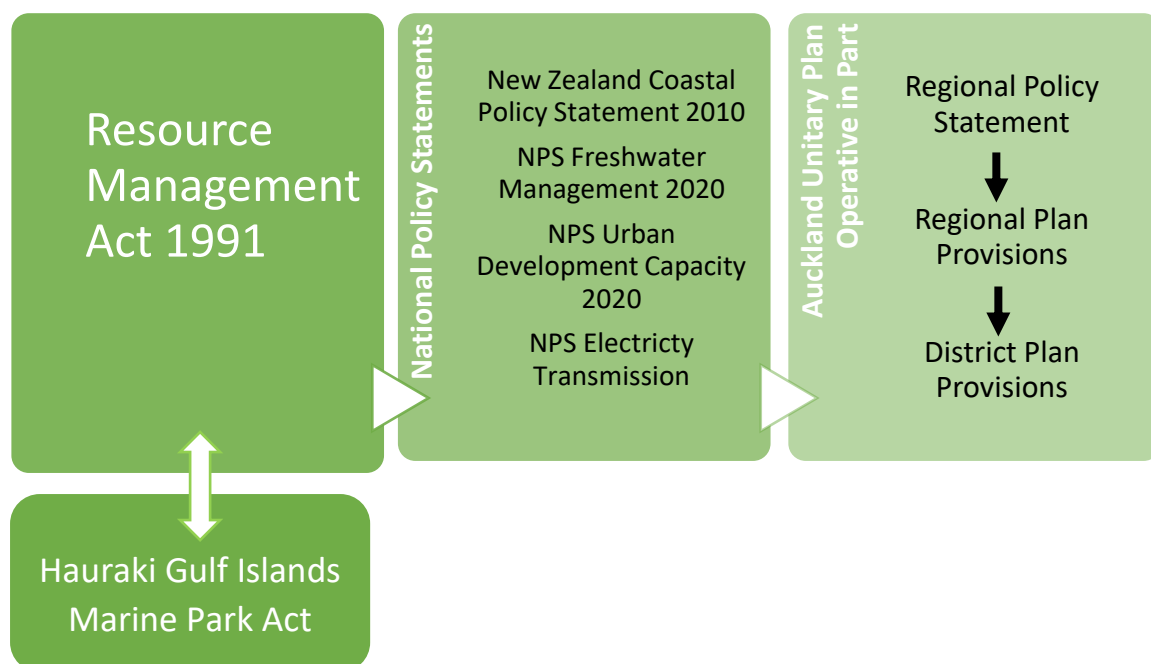


Figure 11-1 Relevant Statutory Planning Instruments

Table 11-1 Assessment Against AUP(OP) Objectives and Policies

Key Objectives and Policies	Analysis
Urban growth and intensification	
<p>NPS – UD</p> <p>Objectives 1, 4, 6 and 8. Policies 1, 6</p> <p>RPS</p> <p>B2.2.1 (1), (2), (3), (4), (5); B2.2.2 (4), (5), (6), (7); B2.2.3 (1), (2), (3); B2.3.2 (1), (2), (3), (4); B2.4.1 (1), (2), (3); B2.4.2 (2), (3), (6), (9); B2.5.1 (2), (3); B2.5.2 (1), (2), (3); B2.7.1 (1), (2); B2.7.2 (1), (2), (3), (7), (10).</p>	<p>Summary of Objectives and Policies</p> <p>The objectives and policies promote a quality compact urban form that enables the efficient provision of new infrastructure and improved and more effective public transport. Urbanisation is primarily accommodated within the existing urban area with high residential intensification enabled in and around centres, along identified corridors and close to public transport.</p> <p>A quality-built environment is promoted which responds and adapts to the effects of climate change, promotes the health and safety of people and communities and maximises resource and infrastructure efficiency. This includes contributing to the safety of the street, developing street networks that provide good access and a range of travel options and meeting the functional and operational needs of activities. Walking, cycling and public transport is enabled, and vehicle movements are minimised. The main functions of streets will be balanced as places for people and as routes for the movements of vehicles.</p> <p>Land in close proximity to public transport is a primary focus for residential intensification and non-residential activities are provided in residential areas to support the needs of people and communities. Adequate infrastructure should be provided prior to or at the same time as intensification. Commercial growth and activities are focussed within a hierarchy of centres to support a compact urban form.</p> <p>Recreational needs of people and communities are met, the physical connection of open spaces is promoted and public access to the CMA is maintained and enhanced. Significant adverse effects of development on open spaces and recreation facilities will be avoided, remedied and mitigated.</p> <p>Assessment</p> <p>EB2, as part of the wider Project, is critical to delivering the quality compact urban form sought by the AUP(OP) and the urban development capacity sought by the NPS-UD. This urban form relies heavily on the redevelopment and intensification of existing urban areas, focused in areas with infrastructure capacity to absorb this growth. EB2 delivers additional capacity and overall transport network improvements to Pakuranga Town Centre and wider southeast Tāmaki Makaurau Auckland.</p> <p>The justification and background to EB2 has been detailed in Sections 2 and 3 of this AEE. To summarise, the Howick Local Board area is projected to experience significant population growth over the coming decades, with existing transport infrastructure unable to adequately meet the demand of current users. The planned urban intensification, combined with increases in freight movements, is projected to place further stress on roading and other transport connections. As such, the Project will deliver additional roading capacity, improved public</p>

Key Objectives and Policies	Analysis
	<p>transport reliability and capacity, rationalise traffic movements, improved active transport infrastructure, provide greater transport choice and safer travel for all users.</p> <p>The RFF’s design also supports the above objectives. It will help divert through traffic away from Pakuranga Town Centre’s ground level streets, helping make these more pedestrian focused and safer for all users. While it is a substantial structure, it has been designed to be accommodated within the existing road corridor, while the planned interventions associated with the UDLP will assist in lessening its effects on visual amenity and character.</p> <p>It is also noted that EB2 assists in Tāmaki Makaurau Auckland’s efforts to reduce transport related emissions. This is principally through improving public and active transport infrastructure, helping support a shift towards these transport modes. Furthermore, better management of congestion will reduce vehicle wait times with more efficient use of fossil fuels.</p> <p>Lastly, the effects of EB2 on open space has been considered. This includes mitigation required for vegetation loss, minimising operational occupation of stormwater infrastructure (e.g. outfalls) and improving pedestrian linkages between the Town Centre core and the surrounding reserves. The proposed stormwater outfalls are minimal in footprint and will not obstruct public access or enjoyment of the CMA.</p>
Enabling Infrastructure	
<p>RPS</p> <p>B3.2.1 (1), (2), (3), (4), (5), (6), (7), (8); B3.2.2 (1), (2), (3), (6), (7), (8), (9); B3.3.1 (1); B3.3.2 (1), (2), (3), (4), (5), (7).</p> <p>AUP</p> <p>E26.2.1; E26.2.2; E27.2; E27.3</p>	<p>Summary of Objectives and Policies</p> <p>The objectives and policies recognise the benefits of infrastructure and promote and enable the development, operation, maintenance, and upgrading of infrastructure while managing adverse effects. The functional and operational needs of infrastructure are recognised and provided for. In particular, it is recognised that there can be a need to be located in areas with natural and physical resources that have been scheduled in the AUP(OP).</p> <p>With specific regard to transport infrastructure, the objectives and policies promote effective, efficient transport that enables the movement of people, goods and services. Existing and future areas and routes for developing transport infrastructure should be identified and protected. Land use and transport should be integrated and provide effective pedestrian and cyclist connections.</p> <p>The adverse effects from the construction and operation of transport infrastructure should be avoided, remedied or mitigated.</p>

Key Objectives and Policies	Analysis
	<p>Assessment</p> <p>EB2 represents a significant transport infrastructure project for Tāmaki Makaurau Auckland, which will deliver significant benefits to both the local community and the wider region. The location and scale of the Project have been dictated in part by the existing urban form in Pakuranga, with major east-west connections present on Pakuranga’s western fringe and two arterial roads acting to pass road traffic through Pakuranga Town Centre.</p> <p>Given the current transport network limitations and the projected population growth of southeast Tāmaki Makaurau Auckland, AT has developed the EB2’s design in sympathy to the existing environment.</p> <p>The brownfield location of EB2 does mean that some adverse effects will be experienced during both construction and operation, but efforts have been made to limit these effects. This includes the extensive use of management plans during construction, such as the CEMP, CTMP and CNVMP. Operational effects will also be addressed through EB2’s design, the implementation of the UDLP and noise mitigation. This will ensure that EB2 is integrated with both the existing and planned urban form of Pakuranga Town Centre. Furthermore, EB2 avoids any works in locations with AUP(OP) scheduled natural and physical resources.</p> <p>Lastly, the proposed works will include improved connectivity and efficient movement by both pedestrians and cyclists. This will be achieved through reducing through traffic (at ground level), cycle lanes, improved footpaths and new connections between the town centre and surrounding reserves.</p>
National Grid	
<p>RPS B3.2.1 (7); B3.2.2; B3.4.1; B3.4.2</p> <p>NPS-ET Objective 1; Policies 1, 10.</p> <p>AUP D26.2; D26.3; E26.2.1 (7); E26.2.2 (13)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the NPS-ET, AUP and RPS recognise and promote the national significance of the National Grid, through enabling and providing for its development, operation, maintenance, repairs, upgrade and removal. The National Grid Corridor Overlay in the AUP (D26) adds that this efficient functioning is not to be compromised by subdivision, use and development. Specific NPS-ET objectives seek to meet the transmission needs while managing adverse environmental effects from the network and from other activities on the network.</p> <p>The policies of the AUP and RPS recognise the social, economic, cultural and environmental benefits derived from infrastructure provision. Furthermore, the AUP and RPS aim to provide for infrastructure in a way which recognises its operational needs and the locational constraints, while managing any adverse effects on areas scheduled in the Unitary Plan through overlays, controls or otherwise. Specific National Grid Corridor Overlay (D26) policies require that structure plans take it into account to ensure the National Grid is not compromised</p>

Key Objectives and Policies	Analysis
	<p>by reverse sensitivity and other effects. Specific NPS-ET policies include that decision-makers must, to the extent reasonably possible, manage activities from third parties (parties excluding Transpower NZ Limited) to avoid reverse sensitivity effects on the electricity transmission network.</p> <p>Assessment</p> <p>As noted in Section 8, AT has meet with Transpower New Zealand (Transpower) to discuss the EB2 works and Transpower’s requirements for working around its infrastructure.</p> <p>Through this consultation and internal design processes, AT has avoided wherever possible works in proximity to Transpower’s assets. However, the RRF works will require removal of one tower and its replacement with two new towers due to potential clashes. The relocation of this pylon will be addressed by a separate resource consent application by Transpower.</p>
Indigenous Biodiversity and Ecological Values	
<p>RPS B7.2.1 (1), (2); B7.2.2 (5)</p> <p>AUP E15.2 (1), (2); E15.3 (1), (2), (4), (7)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the AUP and RPS seek to protect areas of significant indigenous biodiversity value from adverse effects arising from subdivision, use and development. These sensitive areas include terrestrial, freshwater and coastal marine areas, with the objectives seeking to maintain biodiversity values, or restore and enhance values in areas that have been degraded.</p> <p>The policies of the AUP and RPS seek to avoid - as far as practicable - significant adverse effects on biodiversity values, and avoid, remedy, or mitigate other adverse effects. The AUP and RPS deliver this through the identification of Significant Ecological Areas (SEAs). The AUP (E15.3(7)) recognises that, in managing adverse effects, it is not always practicable to locate or design infrastructure to avoid areas with indigenous biodiversity values.</p> <p>Assessment</p> <p>No works are proposed within any AUP(OP) SEAs. EB2 will protect and enhance the limited ecological values that are present within the area. As highlighted previously, the area is highly urbanised with few natural features present. The historic urbanisation of Pakuranga has resulted in the loss of most natural freshwater values and native vegetation. The few fragments that are present are degraded through surface runoff and the lack of contiguous vegetation cover.</p>

Key Objectives and Policies	Analysis
	<p>However, given the likely presence of native fauna (principally native lizards), a LMP has been prepared to address lizard protection during vegetation clearance. Captured lizards will be relocated to new landscaped areas within the EB2 area, with this new landscaping and the management of these areas subject to the HRP.</p> <p>The proposed stormwater design will largely improve the quality of stormwater discharges into the CMA. This includes reductions in TSS and TPHs, which will aid in the restoration of the Tāmaki River’s ecological values. While the stormwater design will require works and permanent occupation in the CMA, they have been designed to minimise the related areas of CMA disturbance and occupation.</p> <p>A UDLP will be employed to provide for new landscaping across EB2, with the UDLP focusing on the use of native species which would have been present prior to land clearance. Planting undertaken within reserves will also focus on the use of native species and will provide an opportunity to improve linkages with Pakuranga’s coastal edge.</p>
Freshwater	
<p>NPS-FM Objective 2.1 (1); Policy 1, Policy 2, Policy 3, Policy 6, Policy 7, Policy 9, Policy 15</p> <p>RPS Objectives B7.3.1 (1), (2), (3); Policies B7.3.2 (1), (3), (4), (5); Policies B7.4.2 (8)</p> <p>AUP(OP) E1.2 (1), (2); E12.2 (1)</p>	<p>Summary of Objectives and Policies</p> <p>The objective of the National Policy Statement for Freshwater Management 2020 (NPS-FM) is to ensure that the natural and physical resources are managed in a way that prioritises first, the health and well-being of water bodies and freshwater ecosystems, then, the health needs of people (such as drinking water), then, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. The objectives of the RPS and AUP seek the enhancement of degraded freshwater systems, the minimisation of freshwater system loss, and the avoidance, remedy, or mitigation of adverse effects on freshwater from changes in land use. Specific AUP objectives in water quality and integrated management (E1.2) seek to maintain or progressively improve the mauri of freshwater over time to enable traditional and cultural use of this resource by mana whenua.</p> <p>The policies of the NPS-FM include the management of freshwater in a way that gives effect to Te Mana o te Wai, a concept that refers to the fundamental importance of water and recognises that protecting the health of freshwater protects the health and well-being of the wider environment and protects the mauri of the wai. Also, the NPS-FM sets out a policy on the management of freshwater in a whole-of-catchment basis that considers the effects on the receiving environment. The NPS-FM also sets clear direction that there is to be no further loss of natural inland wetlands, that wetland values are protected and their restoration is promoted.</p> <p>The policies of the RPS and AUP seek to avoid the permanent loss and significant modification of freshwater systems, unless a series of conditions apply, which include not having any practicable alternative. In managing the adverse effects on freshwater arising from temporary activities such as construction, the RPS seeks to</p>

Key Objectives and Policies	Analysis
	<p>minimise sediment runoff through promoting measures that retain soil on-land and requiring land disturbing activities to use industry best practice commensurate to its nature and scale and the sensitivity of the receiving environment.</p> <p>The RPS and AUP also seek the integrated management of freshwater systems, and the identification of freshwater systems to determine whether their enhancement or reduction in adverse effects is promoted. Specific AUP policies in land disturbance (E12.3) seek to manage land disturbance in a way which maintains the cultural and spiritual values of Mana Whenua, including in terms of water quality.</p> <p>Assessment</p> <p>EB2 will primarily address its freshwater effects in two ways. The first of these is through the management of earthworks and related discharges during construction. As previously detailed, AT will employ an ESCP and a CLMP during all EB2 earthworks as required by the proposed conditions. Both of these plans will require the involvement of SQEPs in both their preparation and implementation. In addition, both plans will be prepared in accordance with Council and MfE guidance, such as GD05.</p> <p>Freshwater values have been addressed for the operation of EB2 through the proposed stormwater design. This includes improved attenuation of stormwater flows and better treatment of the stormwater discharge. Both these elements of the stormwater design will require new infrastructure including outfalls, pipes and raingardens. The stormwater design has also incorporated projected climate change conditions to ensure that the works are future-proofed and can accommodate projected flows.</p> <p>Furthermore, EB2 will not require the reclamation of any natural inland wetlands. While works will occur around the riparian margins of two identified wetlands, these works will be managed through ESC measures and EB2's other management plans. In addition, stormwater flows will continue to be discharged at existing wetland locations.</p> <p>AT is worked with mana whenua throughout the development of EB2 to ensure that cultural values are incorporate in all aspects of its design. AT will continue to work with mana whenua to develop the Project's stormwater responses and the UDLP.</p>
Ngā Manawhenua	
<p>NPS-FM Objective 2.1 (1); Policy 1, Policy 2</p> <p>NPS-UD</p>	<p><u>Kaitiakitanga</u></p> <p>Summary of Objectives and Policies</p> <p>The NPS-FM seeks the active involvement of tangata whenua in freshwater management, including in decision-making processes. The NPS-UD and RPS requires the recognition of and provision for the principles of Te Tiriti o</p>

Key Objectives and Policies	Analysis
<p>Objective 5; Policy 9</p> <p>RPS</p> <p>B6.2.1; B6.2.2; B7.4.1 (6)</p>	<p>Waitangi, including through the participation of mana whenua in resource management processes. Additionally, the RPS seeks to provide participation opportunities that includes recognising the role of mana whenua as kaitiaki, providing for the practical expression of kaitiakitanga, and recognising mana whenua as specialists in the tikanga of their hapū or iwi and as being best placed to convey their relationship with their ancestral lands, water, sites, wāhi tapu and other taonga.</p> <p><u>Māori values</u></p> <p>Summary of Objectives and Policies</p> <p>The RPS requires the recognition of and provision for the principles of Te Tiriti o Waitangi in the sustainable management of natural and physical resources including ancestral lands, water, air, coastal sites, wāhi tapu and other taonga. The RPS requires that mana whenua values, mātauranga and tikanga are properly reflected and accorded sufficient weight in resource management decision-making, and that any assessment of environmental effects for an activity that may affect mana whenua values includes an appropriate assessment of adverse effects on those values.</p> <p>Assessment</p> <p>As noted previously, AT have been working with mana whenua throughout the development of EB2’s design, including the elements associated with stormwater, landscaping and place making. The relationship of mana whenua with the environment is further enshrined in the proposed conditions, which require continued engagement with mana whenua.</p>
Natural hazards, including climate change	
<p>NPS-UD</p> <p>Objective 1; Objective 8; Policy 1; Policy 6</p> <p>RPS</p> <p>B10.2.1; B10.2.2</p> <p>AUP</p> <p>E36.2; E36.3</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the NPS-UD seek to have urban environments that are resilient to the current and future effects of climate change, and also support reductions in greenhouse gas emissions. Specific objectives of the RPS (B10.2.1) seek to ensure communities are more resilient to natural hazards and the effects of climate change, that the conveyance function of overland flow paths is maintained, and that the risks to people, property, infrastructure and the environment from natural hazards are not increased in existing developed areas. Specific objectives of the AUP include avoiding or, if avoidance cannot be totally achieved, mitigating the risk of adverse effects when infrastructure has a functional or operational need to locate in a natural hazard area (E36.2(4)), and using natural features, where appropriate, to manage natural hazards.</p> <p>The policies of the NPS-UD require decision-makers to have particular regard to the likely current and future effects of climate change. Specific policies of the RPS (B10.2.2) include managing the subdivision, use and</p>

Key Objectives and Policies	Analysis
	<p>development of land subject to natural hazards with respect to the type and severity of events, the vulnerability of the activity to adverse events, and the cumulative effects arising from the activity's location. Specific AUP policies include controlling subdivision, use and development of land that is subject to natural hazards so that the proposed activity does not increase, and where practicable reduces, risk (E36.3(4)). This risk consideration includes any exacerbation of an existing natural hazard risk or the emergence of natural hazard risks that previously were not present at the location in the risk assessment (E36.3(2)).</p> <p>Assessment</p> <p>Natural hazards have been considered as part of the design process for EB2. These hazards principally relate to surface flooding given the presence of both flood plains and OLFPs within Pakuranga Town Centre. Currently, these hydrological features have the ability to endanger private property, public spaces and the road network. These hazards are expected to gain further significance based on climate change modelling for the Tāmaki Makaurau Auckland Region, with increased risks of significant storms and rainfall.</p> <p>As such, a range of stormwater improvements are proposed as part of EB2, including new pipework and outfalls. These stormwater improvements have been developed to address the flows projected under relevant climate change conditions, while the stormwater outfalls have been designed specifically to avoid erosion issues. Furthermore, the stormwater works being undertaken for EB2 will assist in addressing existing flooding areas within Pakuranga Town Centre, reducing long-term risks to the local community and road users during storm events.</p> <p>It should also be noted that no land stability hazards have been identified in Pakuranga Town Centre. This is due to the underlying landform, as well as the limited cuts and filling required for EB2.</p>
Built Environment	
<p>AUP</p> <p>E24.2(1); E24.3(1), (2); E25.2(2), (4); E25.3(2), (10)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the AUP include the enablement of outdoor activities and the security and safety of people and property through the use of artificial lighting (E24.2(1)), and that amenity values of residential zones are protected from unreasonable noise and vibration, particularly at night (E25.2(2)). Additionally, the AUP includes objectives that enable construction activities that cannot meet noise and vibration standards while controlling duration, frequency and timing to manage adverse effects (E25.2(4)).</p> <p>The policies of the AUP include providing for appropriate levels of artificial lighting to enable the safe and efficient undertaking of outdoor activities (E24.3(1)) and controlling artificial lighting to avoid significant glare and light spill (E24.3(2)). Additionally, the AUP includes policies on minimising, where practicable, noise and vibration at its source or on the site from which it is generated (E25.3(2)), and avoiding, remedying or mitigating</p>

Key Objectives and Policies	Analysis
	<p>the adverse effects of noise and vibration from construction, maintenance and demolition activities while having regard to the sensitivity of the receiving environment, the proposed duration and hours of operation of the activity, and the practicability of complying with permitted noise and vibration standards (E25.3(10)).</p> <p>Assessment</p> <p>AT has sought to ensure that the environmental disturbance generated by EB2’s construction and operation is minimised as far as practicable. Construction effects will be managed through implementation of both the proposed CEMP and CNVMP. These two management plans will address the lighting, noise and vibration effects during construction through a series of controls, stakeholder engagement (including the CCP) and plan certification. The requirements of both plans are detailed in the proposed conditions and are commonly used tools for major infrastructure projects in Tāmaki Makaurau Auckland. Both management plans will also be able to be updated and recertified should any further environmental effects arise.</p> <p>Operational lighting and noise effects have also been considered. The lighting for EB2 will be developed through the ULDP, which will recognise the importance of avoiding light spill and glare from artificial lighting. This approach will protect the amenity of neighbouring sensitive land uses, such as the remaining residential properties on William Roberts Road. Operational noise will be largely governed through the use of speed restrictions and noise walls where necessary. These noise mitigation measures will ensure compliance with NZS 6806 and protect the amenity of sensitive land uses adjoining the completed EB2 works.</p>
Historic Heritage	
<p>RPS B3.2.1(3); B3.2.2 (3), (6); B5.2.1(2); B5.2.2(6), (7), (8)</p> <p>AUP E26.2.1; E26.2.2</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the RPS recognise historic heritage and special character when developing, operating, maintaining and upgrading infrastructure, with the AUP outlining that the adverse effects from infrastructure are to be avoided, remedied or mitigated. Scheduled heritage includes those listed in the AUP Schedule of Historic Heritage, New Zealand Heritage List/Rārangi Kōrero, the Cultural Heritage Inventory (CHI), amongst others. Specific objectives in Chapter B5 of the RPS include the identification and protection of significant historic heritage places from inappropriate subdivision, use and development, with their protection, management and conservation being encouraged.</p> <p>The policies of the RPS enable infrastructure in areas with scheduled historic heritage whilst ensuring that adverse effects on these historic values are avoided or otherwise remedied or mitigated. Specific objectives in Chapter B5 of the RPS include the avoidance, where practicable, of significant adverse effects on significant historic heritage. Additionally, Chapter B5 includes the provision of significant historic heritage places, where</p>

Key Objectives and Policies	Analysis
	<p>this will support the retention of, and will not detract from, the historic heritage values of the place. Specific policies of the AUP include the consideration of whether the infrastructure has a functional or operational need to be located in areas where historic heritage may be present or has been identified.</p> <p>Assessment</p> <p>As detailed in Section 9.4.11, no historic heritage is expected to be uncovered during EB2’s construction nor are works proposed within any identified heritage sites. However, in accordance with the Archaeological Effects Assessment (Archaeological Effects Assessment7), an accidental discovery protocol will be employed during construction. Furthermore, an authority to modify will be sought from Heritage New Zealand Pouhere Taonga on a precautionary basis.</p>
Land Disturbance	
<p>AUP</p> <p>E11.2(1), (2), (3); E11.3(1), (3); E12.2(1); E30.2(1); E30.3(2)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the AUP seek to ensure that land disturbance is undertaken in a manner which protects the safety of people and avoids, remedies or mitigates adverse effects arising from land disturbance (E11.2(1)), and that contaminant discharge from the land is managed to protect the environment and human health and to enable land to be used for suitable activities now and in the future (E20.2(1)).</p> <p>The policies of the AUP include avoiding, where practicable, adverse effects on areas where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, mana whenua, natural resources, coastal environment, historic heritage and special character (E11.3(1)). Additionally, the AUP includes policies on managing the impact on mana whenua cultural heritage that is discovered while undertaking land disturbance (E11.3(3)) and requiring any use or development of land containing elevated levels of contaminants resulting in discharges to air, land or water to manage or remediate the contamination to a certain level (E30.3(2)).</p> <p>Assessment</p> <p>While no significant cut or fill is need for EB2, the overall quantum of earthworks proposed warrants the need for an ESCP. The ESCP, as detailed in the proposed conditions, will require all works to be undertaken in accordance with GD05, with on-site certification of controls by a SQEP prior to the commencement of earthworks. Other proposed measures include regular inspection of these controls, with inspection also required after wet weather. Provision has also been made for site-specific ESCPs, where required (e.g. stormwater outfall construction).</p>

Key Objectives and Policies	Analysis
	<p>It is noted that the use of ESCPs is a common approach for infrastructure projects in Tāmaki Makaurau Auckland, with both AT and the appointed contractors familiar with their contents and implementation.</p> <p>It is noted that the CLMP will also address potential effects arising from earthworks, specifically in relation to contaminated soils. The CLMP has been proposed given the presence of both current and historic HAIL activities in proximity to the road corridor. While no significant soil contamination is anticipated, AT have proposed a precautionary approach via the CLMP. In addition, certification of incoming fill and disposal sites is required, as will be a Site Completion Report.</p> <p>Lastly, the use of an ADP for historic heritage will ensure the appropriate steps are employed in the event that unrecorded material is uncovered.</p>
Coastal	
<p>NZCPS Objectives 1-6</p> <p>HGMPA Sections 7 and 8</p> <p>NPS-FM Objective 2.1 (1); Policy 1, Policy 2, Policy 3, Policy 4, Policy 6, Policy 9, Policy 15</p> <p>RPS B7.4.1 (2), (4), (5), (6); B7.4.2 (1), (3); B8; B6.2.2</p> <p>AUP E1.2 (3); E1.3 (9), (11), (12), (26); E12.3 (1); F2.2.2; F2.2.3; F8; E21.2; E21.3</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the NZCPS seek to safeguard and preserve the coastal environment, ecosystems, natural features, and landscape values, while the NPS-FM seeks to ensure that resources are managed to prioritise first, the health and well-being of water bodies and freshwater ecosystems, then, the health needs of people, then, the ability of people and communities to provide for their social, economic, and cultural well-being, now and in the future. Additionally, the NZCPS seeks to take account of the principles of Te Tiriti o Waitangi/ Treaty of Waitangi, recognise the role of tangata whenua as kaitiaki and provide for tangata whenua involvement in management of the coastal environment. The objectives of the RPS include preserving and protecting coastal areas from inappropriate subdivision, use and development, and, where practicable, restoring or rehabilitating areas with degraded natural character. Specific objectives from the AUP include the maintenance of the natural character of the coastal environment whilst providing for subdivision, use and development (E18.2), and that reclamation, drainage or declamation does not adversely affect public access, amenity and mana whenua values (F2.2.2(3)).</p> <p>The policies of the NZCPS include the recognition of different types and characters of coastal environments, taking into account the principles of Te Tiriti o Waitangi/ Treaty of Waitangi and kaitiakitanga in relation to the coastal environment, and adopting a precautionary approach towards proposed activities whose effects on the coastal environment are uncertain, unknown, or little understood, but potentially significantly adverse. The NZCPS also seeks for reclamation or effects on indigenous biodiversity to be avoided</p> <p>The policies of the RPS seek to avoid, remedy or mitigate adverse effects on the coastal environment when subdividing, using, or developing. Specific policies of the AUP include the promotion of land use practices that restore natural character values, and the prevention or minimisation of adverse effects from activities on the</p>

Key Objectives and Policies	Analysis
	<p>quality of coastal water (E1.3 (26)). Also, Policy F2.2.3(1) of the AUP includes the avoidance of reclamation and drainage in the coastal marine area except where it would provide significant benefit, there are no practicable alternatives of accommodating the activity, and that the coastal marine area is used efficiently by minimising the required area.</p> <p>The Coastal Marine Area is a Coastal Statutory Acknowledgement Area of Ngai Tai ki Tāmaki. The objectives of the AUP include that the occupation, development and use of Treaty settlement land is not adversely affected by the location of new infrastructure (E21.2(5)). The policies of the RPS include recognising and providing for, where a proposal affects land or resources subject to Treaty settlement legislation, matters that include the historical association of the claimant group with the area, and any historical, cultural or spiritual values associated with the site or area, and any relevant memorandum of understanding between the Council and the claimant group (B6.2.2(2)). Specific AUP policies include, under consideration of several matters, enabling the occupation, use and development of Treaty settlement land where there are natural and physical resources that have been scheduled in the Plan in relation to natural heritage, Mana Whenua, natural resources, coastal environment, historic heritage and special character (E21.3(8)).</p> <p>Assessment</p> <p>EB2’s construction will require limited works within the CMA associated with the EB2’s stormwater infrastructure. No reclamation is proposed. These works are necessary to both address the stormwater effects of EB2, as well as the limited other locations in Pakuranga Town Centre where stormwater discharges could occur. These works in the CMA will involve both vegetation clearance and sediment disturbance. A construction methodology has been proposed that will actively limit the potential for sediment discharge, while also minimising the Project’s footprint. This methodology will also be captured by the EB2’s ESCP and ssESCPs.</p> <p>In addition, EB2’s stormwater design will improve the overall quality of stormwater discharges into the CMA. This will be achieved through a variety of measures, including rain gardens and swales. These treatment processes will help reduce the overall volumes of suspended sediment, hydrocarbons and heavy metals entering the Tāmaki River. This improvement in water quality will assist in longer term efforts to restore the local CMA’s ecological values.</p> <p>AT also recognises the importance of the CMA to mana whenua, given both spiritual values, its historical uses and as a source of kaimoana. AT will continue to work with mana whenua through the detailed design and construction of EB2.</p> <p>Lastly, it is noted that the proposed coastal works will not obstruct the public’s enjoyment and access to the coastal environment. The outfall locations are generally in poorly accessed locations, such as beside SEART.</p>

Key Objectives and Policies	Analysis
	While these areas will be inaccessible during construction, what public access exists will be restored once works are completed.
Discharges	
<p>RPS B7.5.1 (1); B7.5.2(2)</p> <p>AUP E14.2 (2); E14.3 (1), (2); E30.2 (1); E30.34 (2),</p>	<p>Summary of Objectives and Policies</p> <p>In terms of air quality, the objectives in the RPS seek to manage the discharge of airborne contaminants to improve region-wide air quality and enhance amenity values in the urban area (B7.5.1(1)), with RPS policies seeking to manage contaminant discharge into the air through the implementation of regulatory and non-regulatory methods (B7.5.2(2)).</p> <p>Assessment</p> <p>The construction phase of EB2 will involve the potential discharge of soil contaminants, as well as dust. Both discharge types will be managed and controlled through the Project’s various management plans, including those of the ESCP and CLMP. In addition, works in close proximity to sensitive receivers will be subject to site specific plans/schedules.</p> <p>With the use of the above-mentioned management plans, any nuisances or risks associated with discharges from EB2 construction activities will be avoided.</p>
Open Space Zones	
<p>AUP H7.2 (1)(2); H7.3(1)(4), H7.4.2 (1)(2); H7.4.3(1)(2)(3); H7.5.2(2); H7.5.3(2)(9)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives promote the provision of quality open space that provides for both active and passive recreational activity, with adverse effects arising from the use or development of this zone being avoided, remedied or mitigated.</p> <p>The policies promote open spaces that provide for the needs of the local and wider community, are safe and attractive to users, and, where appropriate for the zone, reflect the natural, heritage and landscape values of the area. Open spaces should reflect mana whenua values, where appropriate, including through the restoration and enhancement of ecosystems and biodiversity. In addition, policies seek to enable infrastructure that is necessary to service open spaces and recreation facilities, and enable the construction operation, maintenance, repair and minor upgrading of infrastructure located on open spaces.</p> <p>Assessment</p>

Key Objectives and Policies	Analysis
	<p>EB2 will involve temporary construction activities and permanent works within public reserves. This is principally driven by the proposed stormwater works, including the pipes and outfalls. These works have to occur in the reserves given the need to discharge stormwater to the nearest waterbody, which is the Tāmaki River. There are no watercourses, wetlands or coastal margins in Pakuranga Town Centre which can be used as stormwater discharge locations. However, any disturbance to these reserves’ recreational and amenity values from the stormwater works will largely be temporary, with the finished infrastructure located mostly underground.</p> <p>A small area of Paul Place Reserve will also be permanently occupied as part of the new SEART offramp. This land take is unavoidable given the existing layout of SEART and the need to provide a safe highway corridor. However, this reserve currently has limited facilities and amenity, which results in it being used for limited passive recreation activities. Given its low amenity values and community use, mitigation is not required at the reserve.</p>
Residential Zones	
<p>NPS-UD</p> <p>Objectives 1, 4 and 6. Policy 1</p> <p>AUP</p> <p>H4.2 (1)(4); H4.3(9)(10); H5.2(1)(4); H5.3(8); H6.2(1)(4); H6.3(9)(10)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives of the AUP residential zones promote housing capacity, increase, and choice. Specific AUP objectives for the Residential – Terrace Housing and Apartment Buildings Zone include promoting high-density urban living near centres and public transport, with development being of predominantly 5-7 storeys in identified areas. Specific AUP objectives for the Residential – Mixed Housing Urban Zone include promoting higher-density residential living close to Metropolitan Centres and Town Centres, with non-residential activities being compatible with the scale and intensity of the anticipated development within the zone. Specific AUP objectives for the Residential – Mixed Housing Suburban Zone include promoting the increase of housing capacity, intensity, and choice, while being in character with the planned suburban character and with non-residential activities being compatible with the scale and intensity of the anticipated development within the zone.</p> <p>The policies of the AUP residential zones include enabling a variety of housing types that encourage the achievement of attractive and safe public surrounds.</p> <p>Assessment</p> <p>EB2 has been designed to support the long-term development and general urban intensification expected within Pakuranga Town Centre. While EB2 will involve the loss of some housing to enable SEART upgrades and minor changes to side streets, the other core components of EB2 do not require any residentially zoned land. AT has sought to minimise the quantum of residentially zoned land that will be permanently occupied by EB2.</p>

Key Objectives and Policies	Analysis
	<p>The proposed conditions will also ensure that amenity values are protected and maintained for residential sites beyond EB2’s permanent footprint. This will be principally undertaken through the UDLP. EB2’s proposed landscaping and placemaking elements (e.g. improved pedestrian linkages) will support the existing residential amenity values.</p> <p>It should also be acknowledged that EB2 supports the longer-term redevelopment of southeast Tāmaki Makaurau Auckland’s residential areas through improving the functioning and capacity of the region’s transport network. The provision of better transport links across all modes supports the levels of residential intensification sought by the AUP(OP)’s zone-based objectives and policies. As such, EB2 is an enabler of residential development and the AUP(OP)’s planned outcomes.</p>
Business Zones	
<p>NPS-UD</p> <p>Objectives 1, 4 and 6. Policy 1</p> <p>AUP</p> <p>H10.2(1),(2),(3),(5), (6), (7), (8); H10.3(2), (3), (4), (5), (7), (11), (12), (15), (16), (17), (21); H13.2(1), (2), (3), (5); H13.3(1), (3), (5), (7), (11), (12), (20), (21)</p>	<p>Summary of Objectives and Policies</p> <p>The objectives promote aesthetically and commercially attractive centres that provide for a variety of activities at a variety of scales. Visually, they reinforce themselves as the community focal point, creating a sense of place. A network of centres is developed which gives context to the urban area, provides a clear framework for public and private investment, and serves as the basis for regeneration and intensification.</p> <p>The policies reinforce the hierarchy of centres and require development to positively contribute to the outcomes of the Plan, including aesthetic, amenity, and safety values. Universal access for all development is encouraged, while at-grade parking is designed to avoid or mitigate adverse effects to the streetscape. Development adjacent to residential zones and the Special Purpose – School Zone and Special Purpose – Māori Purpose Zone are required to maintain the amenity values of those areas, and the functional and operational requirements of activities and development is recognised.</p> <p>Assessment</p> <p>EB2 has been designed and developed to contribute to the current and planned urban environment within Pakuranga Town Centre. It is recognised that the area is going through significant change, both due to EB2 and planned redevelopment projects by private interests. As a town centre, there are a range of land uses present, including open space, business and residential activities. These activities are expected to intensify as the Town Centre is redeveloped and acts as an urban focal point for the surrounding residential neighbourhoods.</p> <p>EB2’s design provides for strong pedestrian linkages across the town centre and a bus station that is located close to the town centre’s core. The RFF is designed to minimise its visual and character effects, and ample</p>

Key Objectives and Policies	Analysis
	<p>landscaping will be undertaken to replace lost vegetation and enhance existing amenity values. This approach will ensure EB2 contributes to Pakuranga Town Centre’s built form and sense of place.</p> <p>However, the construction phase of EB2 will generate some adverse effects on the form, function and amenity of Pakuranga Town Centre. While these effects are temporary in nature, a suite of management plans and mitigation measures will be employed to maintain public access and enjoyment of the town centre. This includes the overarching CEMP, CNVMP and CTMP. By using these practices, construction disruption will be minimised, as well as any related economic or social dislocation.</p>

11.4 National Environment Standards

Section 104(1)(b)(i) requires consideration of the relevant national environment standards, as detailed below.

11.4.1 The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health

The NES-CS applies to activities that disturb the soil if the relevant piece of land is, or has previously been, a HAIL site (recorded on the Hazardous Activities and Industries List – Ministry for the Environment).

Comment

The contaminated land assessment has identified the presence of several HAIL sites within the EB2 area. This included a currently active service station at 3 Reeves Road (Gull branded) and the proposed works adjacent to this site are considered to trigger consent under the NES-CS given the likely presence of soil contaminants. The contaminated land assessment details that the potential risks associated with human health from soil disturbance at this location are limited and can be managed through the proposed CLMP.

11.4.2 The National Environment Standard for Freshwater

The NES-F applies to activities within and adjacent to freshwater lakes, rivers, streams and wetlands.

Comment

Resource consent has been sought for vegetation clearance and earthworks within, or within 10 m of, natural wetlands under the specified infrastructure provisions of the NES-F. As detailed in Section 6.15, works are proposed within vegetated areas of the CMA beside SEART that qualify as wetlands under the NES-F.

In general, the ecological values of the EB2 area have been compromised by historic urbanisation, including the severance of natural habitats, habitat loss and pollution. Regardless of the compromised nature of the EB2 area's wetlands, land disturbance and vegetation clearance around and within them has been minimised to only the works required for the construction and operation of stormwater infrastructure. The effects generated by these outfall structures and associated pipework will be addressed through EB2's ESCP, mitigation planting and a construction methodology which will limit the volumes of sediment which will be disturbed during CMA works.

11.5 Other Matters

11.5.1 Marine and Coastal Area (Takutai Moana) Act 2011

The purpose of the MACAA is to establish a durable scheme to ensure the protection of the legitimate interests of all New Zealanders in the marine and coastal area of New Zealand. It recognises mana tuku iho exercised in the marine and coastal area by iwi, hapū, and whānau as tangata whenua and provides for the exercise of customary interests in the common marine and coastal area.

Section 62(3) of the MACAA requires that any person making an application under the RMA for a proposal within the marine and coastal area must notify and seek the views of any applicant for customary marine title prior to lodging the application.

EBA notified the applicants' for customary marine title and protected customary rights applicable to the Tāmaki River and Pakuranga Creek on 11 July 2022 seeking views on EB2. The letters notifying those applicants are contained in Appendix 33.

11.5.2 Auckland Plan 2050

The Auckland Plan is required by the Local Government (Auckland Council) Amendment Act 2010, to contribute to Auckland's social, economic, environmental and cultural wellbeing. It sets out the 30-year spatial framework for the growth and development of Tāmaki Makaurau. The Auckland Plan contains six outcomes, a Development Strategy detailing how the region will grow and changes over the next 30 years, 20 Directions to achieve the Outcomes and 37 Focus Areas.

The outcome of particular relevance to EB2 is the Transport and Access Outcome that states 'Aucklanders will be able to get to where they want to go more easily, safely and sustainably'.

The direction and focus areas of the transport and access outcome are:

Directions	Focus Areas
Direction 1: Better connect people, places, goods, and services	Focus Area 1: Make better use of existing transport networks
Direction 2: Increase genuine travel choices for a healthy vibrant and equitable Auckland	Focus Area 2: Target new transport investments to the most significant challenges
Direction 3: Maximise safety and environmental protection	Focus Area 3: Maximise the benefits from transport technology
	Focus Area 4: Make walking cycling and public transport preferred choices for many more Aucklanders
	Focus Area 5: Better integrate land-use and transport
	Focus Area 6: Move to a safe transport network, free from death and serious injury
	Focus Area 7: Develop a sustainable and resilient transport system

The Auckland Plan also includes a Development Strategy that is based on the desired outcomes, takes into consideration population growth projections, and the provisions of the AUP(OP). The Development Plan identifies where development is most likely to occur and provides a framework for prioritisation and coordination of the infrastructure required to support growth.

The Project, including EB2, is identified in the Auckland Plan as a Decade 1 improvement. It is also identified as a Decade 1 (2018 - 2028) strategic public transport network project. The Auckland Plan acknowledges that improving transport and access in Tāmaki Makaurau Auckland requires an integrated approach and is a partnership between Auckland Council and central Government.

The Development Strategy identifies Development Areas in specific locations that are expected to undergo a significant amount of housing and business growth in the next 30 years. Panmure and Pakuranga are identified as a Development Area in an existing urban area, Pakuranga and Botany are identified as a Town Centre and a Metropolitan Centre respectively.

The Auckland Plan identifies the following anticipated timeframe of development:

- Panmure as Decade 1, Short term 2018 – 2021, with an expected dwelling growth between 2018 - 2048 of 1,780
- Pakuranga as Decade 1 Medium Term 2021 – 2028, with an expected dwelling growth between 2018 – 2048 of 1,700
- Pakuranga Corridor as Decade 2 / Decade 3 Long Term 2028 -2048, with an expected dwelling growth between 2018 – 2048 of 1,040
- Highland Park Development Area is identified as Decade 2 / Decade 3 Long Term 2028 -2048, with an expected dwelling growth between 2018 – 2048 of 1,380.

The Project is specifically referenced in both the Pakuranga, Pakuranga Corridor and Highland Park Development Areas and the Glen Innes, Tāmaki and Panmure Development Area.

The Auckland Plan estimates that the Glen Innes, Tāmaki and Panmure Development Area together have a feasible capacity of approximately 5,730 dwellings. With regard to the Project the Auckland Plan states:

‘The new Panmure public transport interchange, opened in 2014, has resulted in improved accessibility for the area. There is also potential for accessibility to increase further once linkages to the station are improved and AMETI is complete.’

The Auckland Plan identifies Pakuranga, Pakuranga Corridor and Highland Park Development Areas, as having a feasible capacity of approximately 9,420 dwellings. In regard to the Project the Auckland Plan states:

‘Pakuranga will be well connected to Panmure, Botany and the city centre, via the bus/rail interchange at Panmure, when AMETI is complete.’

‘It is likely that Highland Park and the corridor between Pakuranga and Highland Park will see some redevelopment as improved accessibility from the completion of AMETI is realised.’

Based on the above, EB2 is consistent with the outcomes sought by the Auckland Plan. In particular, EB2 will support the Auckland Plan’s development strategy, both with regard to urban intensification and greenfield development planned within the Howick Local Board area. It also supports growth in other parts of Tāmaki Makaurau Auckland, such as Tāmaki and Panmure, by providing for an improved multi-modal regional transport network.

Furthermore, EB2 will improve local transport safety, with the provision of separated walking and cycling infrastructure, modified road network layouts and the diversion of through-traffic away from ground level within the Town Centre.

11.5.3 Auckland Transport's Statement of Intent 2021/22 – 2023/24

AT's Statement of Intent (SOI) 2021/22 – 2023/24 sets out AT's strategic priorities over the next three years. These strategic priorities align with the priorities and expectations set out in a number of existing strategic documents, and include the following objectives:

- Providing and accelerating better travel choices for Aucklanders
- Better connecting people, places, goods and services
- Enabling and supporting Auckland's growth, particularly in brownfield areas
- Improving the resilience and sustainability of the transport system and significantly reducing the greenhouse gas emissions it generates

The SOI identifies the Project, including EB2, as a key project/initiative in the 2021/22 0 2023/24 work programme.

11.5.4 Integrated Transport Programme 2012-2041

Developed by AT and Waka Kotahi in collaboration with Auckland Council, the Integrated Transport Programme (ITP) provides a consolidated transport investment programme for Auckland's transport system over a 30-year period.

The ITP identifies the key transport challenges facing the region and proposes two major strategies to meet the priorities in the Auckland Plan. These are:

- Management of transport as one system
- Development of a transport programme to 2041.

The programme covers state highways and local roads, railways, buses, ferries, footpaths, cycleways, intermodal transport facilities and supporting facilities such as parking and park-and-ride.

The ITP seeks to ensure that Auckland's transport system better connects communities and supports a high-quality urban form.

The overarching outcome identified in the ITP is *"Auckland's transport system is effective, efficient and provides for the region's social, economic, environmental and cultural wellbeing"*.

To deliver such a transport system, the following impacts are identified that are sought to be achieved over the 30-year period:

- Better use of transport resources to maximise return on existing assets
- Auckland's transport network moves people and goods efficiently
- Increased access to a wider range of transport choices
- Improved safety of Auckland's transport system
- Reduced adverse environmental effects from Auckland's Transport system
- Auckland's transport system effectively connects communities and provides for Auckland's compact urban form.

Of particular relevance to the Project, including EB2, are the objectives in relation to the implementation and management of the 'one system' approach. This includes the integration of transport planning and investment with land use development, to prioritise and optimise investment across transport modes and manage demand efficiently and safely.

11.5.5 Auckland Regional Land Transport Plan 2021-2031

The Regional Land Transport Plan 2021-2031 (RLTP) sets out Auckland land transport objectives, priorities and measures for the next least 10 years. It is prepared in accordance with the Land Transport Management Act 2003 (LTMA) and includes a 10-year programme of activities to support the achievement of these objectives. It includes the land transport activities of AT, NZTA, KiwiRail and other agencies.

The RLTP provides for significant improvements to be made in public transport, including rapid transit, walking and cycling, network initiatives to help to address congestion, and support for greenfield and urban redevelopment. It also provides for a major focus on improving safety on Tāmaki Makaurau Auckland's road network.

The Project, including EB2, will enable the delivery of a safe, reliable and accessible transport system that supports and shapes the region's development. It will encourage a move away from single-occupant vehicles as the dominant mode of travel, enabling public transport, walking and cycling to play a significant role in the transport system.

It will help lead Auckland towards being a city where there is growth without increased congestion, where it is easy to access employment and services, where it is safe to drive, walk and cycle, where there are genuine travel choices, and where the negative impacts of the transport system on people and the environment are minimised.

11.5.6 Auckland Transport Alignment Project 2021-2031

The Auckland Transport Alignment Project (ATAP) brings together the Government and AC to strategically align transport objectives and investment priorities for Tāmaki Makaurau Auckland. The ATAP includes an indicative investment package which guides statutory funding plans, including the RLTP. The ATAP 2021-2031 programme invests around \$31.4 billion into critical transport infrastructure and services across Auckland.

Rapid transit is seen as forming the backbone of Tāmaki Makaurau Auckland's public transport network. The ATAP places a major focus on developing the RTN to improve the attractiveness of public transport and encourage mode shift away from the private car. The indicative investment package and the investment programme includes a significant investment in Tāmaki Makaurau Auckland's RTN and specifically identifies the Project as a key project planned for delivery over the next decade.

Rapid transit formed the largest part of the ATAP 2018 package and investment of around \$7.6 billion is indicated for new rapid transit in the current ATAP Investment Programme, with around \$800 million of this allocated to the Eastern Busway. The ATAP states that the provision of an urban busway that allows buses to avoid congestion will improve travel times, reliability and corridor throughput along Ti Rakau Drive. The Project is seen as providing an excellent opportunity to unlock significant growth potential in the area.

11.5.7 Regional Public Transport Plan 2018 - 2028

The Regional Public Transport Plan (RPTP) is a statutory document that AT formally adopted on 12 February 2019. The RTP describes the public transport network that AT proposes for the region, identifies the services that are integral to that network over a 10-year period, and sets out the policies and procedures that apply to those services.

The RPTP has four key focus areas:

- Expanding and enhancing the rapid and frequent network
- Improving the way customers access public transport
- Increasing Māori responsiveness
- Seizing the opportunity of emerging technologies.

The RPTP identifies the Project, including EB2, as a key project that will extend Tāmaki Makaurau Auckland’s RTN out into the east and southeast part of the city.

11.5.8 Howick Local Board Plan 2020

The Howick Local Board Plan (HLBP) is a strategic three-year plan that has been developed in consultation with the local community. The HLBP identifies effective and accessible transport choices as a key outcome. The HLBP recognises that the Project will begin construction and will significantly improve transport choices to other parts of the region. It states that the Local Board will work with AT to ensure the transport network meets the needs of East Auckland, particularly by providing connectivity to the busway and continuing to represent community interests in the delivery of the Project.

11.5.9 Howick Walking and Cycling Network Adopted Report November 2018

This report defines the long-term walking and cycling network plan for the Howick Local Board area. The report shows a number of proposed walking and cycling routes within the EB2 area, including along Ti Rakau Drive and Pakuranga Road. EB2 will contribute to the network plan through the provision of cycleways and improved pedestrian linkages across, to and from Pakuranga Town Centre.

11.5.10 Pakuranga Town Centre Masterplan July 2015

The Pakuranga Town Centre Masterplan (the Masterplan) sets a clear direction for making Pakuranga a vibrant town centre. The Masterplan recognises that Pakuranga is on the verge of change and that its urban form will fundamentally change over the coming 30 years. The Masterplan vision is:

“Pakuranga is a vibrant town centre destination, well-connected to its coastal walkway and local communities, enhanced by the creation of new civic spaces, green links, live/ work opportunities and by its celebration of cultural diversity.”

The Masterplan also incorporates the Project (referred to as AMETI in the document). This includes the provision of a new bus station, grade separation of Reeves Road and wider busway improvements. The Masterplan also acknowledges that the Project will result in significant changes to traffic flows, pedestrian connectivity and the town centre’s built form. The core elements of the Masterplan including its desired urban design outcomes have been

incorporated into EB2, principally in the requirement for the UDLP. Lastly, it should be recognised that the Project represents a key infrastructure investment to deliver on the Masterplan’s vision, not least through improving connectivity to the surrounding communities.

11.6 Section 171 Assessment

The following statutory assessment is provided in accordance with those sections of the RMA applicable specifically to the NoR. Section 171 of the RMA lists the various matters which a territorial authority must have particular regard to when considering a NoR, with these matters addressed by Table 11-2.

Table 11-2 Consideration of Section 171 Matters

Relevant Section Reference	Matter	Discussion
171(1A)	When considering a requirement and any submissions received, a territorial authority must not have regard to trade competition or the effects of trade competition.	AT is not aware of any trade competition regarding the EB2 NoR.
171(1)(a)	When considering a requirement and any submissions received, a territorial authority must, subject to Part 2, consider the effects on the environment of allowing the requirement, having particular regard to— (a) any relevant provisions of— (i) a national policy statement: (ii) a New Zealand coastal policy statement: (iii) a regional policy statement or proposed regional policy statement: (iv) a plan or proposed plan; and	These matters have been assessed in Section 11.3 of this AEE. This has included assessment of the NoR against the NPS-UD, NPS-FM, HGMPA and the AUP(OP). Assessments against these statutory documents broad suite of objectives and policies have been provided. This AEE has determined that the NoR is consistent with and will give effect to all these documents and their relevant contents. In addition, this AEE has considered all related matters for resource consent (Section 7), as well as the range of permitted activities which enable much of EB2’s planned works and operation (Section 7.2.3).
171(1)(b)	whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if— (i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or	AT have considered a broad range of alternatives to addressing the strategic problem detailed in Section 3 given that it does not hold an interest in all the land covered by the NoR. Section 2 of this AEE provides significant detail of the Project’s long history and development, commencing in the 1950s and continuing to the current day. This is discussed further in Section 5, with a thorough assessment of alternatives. This has included looking

	<p>(ii) it is likely that the work will have a significant adverse effect on the environment; and</p>	<p>at how to address the various transport modes, achieving modal shift, improving transport choices and helping improve the urban form of Pakuranga Town Centre.</p> <p>AT has considered a variety of design responses and methods for undertaking the work, including trenching under Reeves Road, as well as the location and layout of Pakuranga Bus Station.</p> <p>These assessments have occurred over many years, through a number of iterations and via MCA processes.</p> <p>Ultimately, AT have demonstrated that adequate consideration has been given to alternatives to the Project's location, design and construction methodology</p>
171(1)(c)	<p>whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought; and</p>	<p>Section 3 detailed the strategic problems which AT has sought to address by this NoR, as well as the Project's objectives.</p> <p>The Project's history, as detailed in Section 2, has highlighted that the issues of addressing transport network congestion, population growth and climate change mitigation have underpinned Project across its development.</p> <p>The construction of EB2 is necessary to alleviate the congestion present through Pakuranga Town Centre, help support urban intensification through the south-eastern suburbs and address the region's greenhouse gas emissions. EB2 has also been designed to be sympathetic to enhancement of Pakuranga Town Centre, through the diversion of heavy traffic flows onto the RRF, improved public transport and public realm improvements.</p>
171(1)(d)	<p>any other matter the territorial authority considers reasonably necessary in order to make a recommendation on the requirement.</p>	<p>The other matters associated with the NoR have been addressed in Section 11.4 of this AEE. This includes how the Project supports the outcomes of the Auckland Plan, the Masterplan and the various regional transport strategies.</p>
171(1B)	<p>The effects to be considered under subsection (1) may include any positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from the activity enabled by the designation, as long as those effects result from measures proposed or agreed to by the requiring authority.</p>	<p>The positive effects of the NoR have been detailed in Section 9 of this AEE.</p> <p>These include supporting the follow Project outcomes:</p> <ul style="list-style-type: none"> • Better connections and sustainable travel options for pedestrians, cyclists, motorists, bus and train customers • A reliable 40-minute bus and train trip between Botany Town Centre and Britomart (saving 20-minutes)

		<ul style="list-style-type: none"> • Increasing public transport trips from 3,700 to 18,000 per day by 2028 • Increasing in public transport mode share from 7% to 25% by 2028 • 24,000 more people with access to a rapid transit bus station within 1 km from home • 5 km of busway between Pakuranga and Botany fully separated from other traffic • 5 new bus stations with quality facilities • 12 km of safe and separated walking and cycling infrastructure • Reducing vehicle congestion around Pakuranga Town Centre • Accommodating electric buses, a key part of AT's low-emission vehicle fleet by 2040.
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11.7 Part 2 Assessment

Part 2 provides a common set of principles to be applied to the management of all resources.

In relation to EB2's NoR, section 171(1) provides that when considering the requirement and any submissions received, the Council must consider the effects on the environment of allowing the requirement, having "particular regard" to the various matters in section 171(1)(a) to (d), which have been addressed above. However, s171(1) makes it clear that these considerations are all "subject to Part 2". An assessment of the Project against Part 2 is therefore set out below.

11.7.1 Section 5 Assessment

The RMA has a single overarching purpose: to promote the sustainable management of natural and physical resources. Sustainable management is defined in Section 5 of the RMA as:

...managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –

- (a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
- (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Comment

The proposed works support the purpose of the RMA as defined by section 5. In particular, EB2 will provide for an improved transport network for Pakuranga Town Centre and

surrounding communities. The works will provide increased modal choice, assist in reducing congestion, provide for safe active transport modes and reduce street-level traffic around the town centre. These benefits will be long lasting and will provide for the planned urban intensification of Pakuranga and wider southeast Tāmaki Makaurau Auckland.

Furthermore, AT has provided a range of mitigation and management measures which have been developed to address EB2's adverse effects. This includes the use of a CEMP, CNVMP and CTMP during construction, while the UDLP will provide longer term amenity and landscape mitigation. AT has also worked with a range of key stakeholders to develop EB2's design and the previously mentioned measures and will continue to do so throughout the development and construction of the Project. This commitment to consultation, mitigation and management of effects is also enshrined in AT's proposed set of proposed conditions.

11.7.2 Section 6 Assessment

Section 6 of the RMA requires that in achieving the purpose of the Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for matters of national importance. The specified matters of importance of relevance to this Project are:

- (a) *the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (c) *the relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga:*
- (d) *the maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- (h) *the management of significant risks from natural hazards.*

Comment

The proposed works are consistent with section 6 of the RMA. AT has sought to minimise EB2's footprint within the coastal environment, with permanent occupation limited to stormwater outfalls and scour protection. EB2's stormwater discharges will also involve appropriate treatment prior to discharge into the Tāmaki River. While the planned treatment will deliver overall improvements to discharge quality, AT will continue to work with mana whenua and Healthy Waters towards further improvements, where practicable. Furthermore, the permanent stormwater assets proposed will not restrict public access to the CMA within the EB2 area.

AT has acknowledged mana whenua's relationship with the Pakuranga area, the Tāmaki River and their position within wider Tāmaki Makaurau. This relationship and historical connection to the area is enshrined in the Project's objectives, its design and mitigation/management practices proposed. AT will continue to work with mana whenua, through the kaitiaki forum, to refine and include cultural values and knowledge into the Project. In addition, mana whenua will be provided with the opportunity to culturally monitor construction works and brief construction crews on cultural values.

Lastly, the EB2 design has considered the natural hazards in the EB2 area, principally associated with flooding and climate change. This approach is reflected in the stormwater design, with adequate capacity provided for projected storm conditions and improvements to currently constrained stormwater infrastructure.

11.7.3 Section 7 Assessment

Under Section 7 of the RMA (Other Matters) all persons exercising functions and powers under the RMA, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to:

- (a) *kaitiakitanga:*
 - (aa) *the ethic of stewardship;*
 - (b) *the efficient use and development of natural and physical resources;*
 - (c) *the maintenance and enhancement of amenity values;*
 - (f) *maintenance and enhancement of the quality of the environment.*
 - (i) *the effects of climate change:*

Comment

Kaitiakitanga is a core principle of EB2 and the wider Project. This Project is region shaping, in that it will form core transport infrastructure for urban intensification and redevelopment across southeast Tāmaki Makaurau Auckland. This urban form, which is provided for by the AUP(OP) and other planning documents, is reliant on the transport network improvements delivered by EB2. Underpinning this approach is a recognition of kaitiakitanga and the need to perform stewardship of the local environment for future generations of Aucklanders.

By providing for greater urban intensification, EB2 also supports the efficient use of resources. The development capacity of urban land can only be met where reliable and adequate infrastructure capacity is provided. EB2 delivers such capacity, both through public transport links, but also through improving active transport networks and reducing road congestion. These Project benefits help unlock the redevelopment potential of Pakuranga Town Centre and surrounding environs.

Given its brownfield location, consideration has been given to how EB2 can help maintain and enhance the amenity values of the town centre. EB2 has been acknowledged as a key component of the Town Centre by the Masterplan, with the UDLF and subsequent UDLP directing the Project's design to assist in the improvement of the town centre. This includes the provision of significant quantities of new landscaping and improved pedestrian connectivity.

Lastly, the effects of climate change have been considered and addressed through EB2's design. This is principally through the stormwater design, which includes infrastructure capacity for the projected increases in rainfall and storm events.

As such, EB2 is consistent with section 7 of the RMA.

11.7.4 Section 8 Assessment

Section 8 of the RMA requires that in achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi.

Comment

As previously discussed, AT have worked with mana whenua through the development of EB2. This relationship will continue via the ongoing development of the UDLP and EB2's stormwater design.

Given these factors, EB2 is consistent with section 8 of the RMA.

11.8 Sections 105 and 107

It is also noted that s105 and s107 of the RMA address discharge applications. In particular, s105 states that a discharge permit under s15 of the RMA must have regard to:

- (a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
- (b) the applicant's reasons for the proposed choice; and*
- any possible alternative methods of discharge, including discharge into any other receiving environment.*

As previously addressed by this AEE and relevant technical assessments (Appendix 14: Contaminated Land Effects Assessment and Appendix 30), the construction related discharge of potential soil contaminants will have minimal effects and can be addressed by way of the proposed ESCP and CLMP. It is also noted that it is not possible to avoid these discharges given their association with land disturbance within and beside established transport corridors. Regardless, the proposed construction method has also been chosen on the basis that few deep excavations within proximity to 3 Reeves Road or 141 Pakuranga Road will be required, other than for piles (in the case of 3 Reeves Road) and utility trenches. No other forms of discharge are considered appropriate given the nature of the contamination (soil based) and the inability to discharge it into an authorised stormwater network.

Section 107 states that a discharge shall not generate the following effects:

- "a) the production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials;*
- b) any conspicuous change in the colour or visual clarity;*
- c) any emission of objectionable odour;*
- d) the rendering of fresh water unsuitable for consumption by farm animals; and*
- e) any significant adverse effects on aquatic life."*

EB2 will not generate any of these types of effects on the receiving environment given the measures contained in the ESCP and CLMP. These management plans are a standard method for addressing potential discharges during infrastructure construction and are appropriate for EB2.

12 NoR Lapse and Consent Duration Dates

12.1 Lapse Date - NoR

While it is proposed to complete all works within a 4-year period following confirmation of the NoR, it is considered prudent that a 10-year lapse date is applied given the uncertain impacts of COVID-19. A 10-year lapse date will ensure that adequate time is given for the commencement of construction and matches the standard timeframe for an AC Council-led review of the AUP(OP).

It is also noted that AT will uplift the designation of those areas required only for construction upon the completion of works. This will avoid blighting these sites for future development and a mechanism for achieving this has been included within the proposed conditions (Appendix 3: Proposed Conditions Set).

12.2 Duration – Resource Consents

Pursuant to section 123 of the RMA, the following durations are sought for EB2’s resource consents:

Consent Type	Duration	Discussion
Land Use Consent (section 9(2))	5 Years	Given consent has been sought for land disturbance and vegetation clearance associated with construction, a five-year duration has been sought.
Coastal Permit (Occupation)	35 Years	Given consent has been sought for permanent stormwater infrastructure (i.e. outfalls), the maximum duration has been sought.
Coastal Permit (Disturbance)	5 Years	Given consent has been sought for disturbance associated with construction, a five-year duration has been sought.
Discharge (Earthworks/Contaminants)	5 Years	Given consent has been sought for construction related discharges, a five-year duration has been sought.
Discharge (NES-F)	35 Years	Given consent has been sought for the operational discharge of stormwater from the two new outfalls, a thirty five-year duration has been sought.

13 Conclusion

As detailed throughout this AEE, EB2 represents a significant change to southeast Tāmaki Makaurau Auckland’s transport network. The Project will deliver significant benefits for the community via reduced congestion, improved linkages for all transport modes, the removal of traffic from Pakuranga Town Centre and improved stormwater management.

The proposed consents have been considered against the relevant statutory tests under the RMA, including sections 104, 105, 107 and 171. In particular, adequate consideration has been given to alternative sites, routes and methods to address the problem description and Project objectives detailed in Section 3. EB2 is also consistent with the objectives and policies of a suite of RMA documents, including the NPS-UD, NPS-F, HGMPA and the AUP(OP).

With regard to its environmental effects, while EB2 will generate some adverse effects will be generated, these effects can be mitigated and managed through the proposed conditions, draft management plans and other proposed related documents.

Lastly, EB2 is consistent with a number of non-statutory documents. This includes, at a local level, the Pakuranga Town Centre Masterplan and at a regional level, the Auckland Plan.