WAKA KOTAHI
NZ TRANSPORT AGENCY

PAPAKURA TO BOMBAY STAGE 2

LANDSCAPE, NATURAL CHARACTER, AND VISUAL ASSESSMENT

Reference: 506207-0590-REP-NN-0192

Revision: A

16/02/2024

New Zealand Government

Copyright information

Copyright ©. This copyright work is licensed under the Creative Commons Attribution 4.0 International licence. In essence, you are free to copy, distribute and adapt the work, as long as you attribute the work to the NZ Transport Agency and abide by the other licence terms. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

Disclaimer

The NZ Transport Agency Waka Kotahi has endeavoured to ensure the material in this document is technically accurate and reflects legal requirements. However, the document does not override governing legislation. The NZ Transport Agency does not accept liability for any consequences arising from the use of this document. If the user of this document is unsure whether the material is correct, they should refer directly to the relevant legislation and contact the NZ Transport Agency.

More information

NZ Transport Agency
xxx 2022

If you have further queries, call our contact centre on 0800 699 000 or write to us:

NZ Transport Agency
Private Bag 6995
Wellington 6141

This document is available on the NZ Transport Agency's website at http://www.nzta.govt.nz

Aurecon New Zealand Limited

Level 3, Te Tihi
110 Carlton Gore Road,
Newmarket, Auckland 1023

PO Box 9762, Newmarket, Auckland 1149, New Zealand
New Zealand

T +64 9 520 6019
E auckland@aurecongroup.com
W aurecongroup.com

Document Control

Rev No	Date	Description	Author	Reviewer	Verifier	Approver
A	17/02/24	NoR	N.Lamb	R.Saward	S.Lange	

This document remains the property of NZTA, Papakura to Bombay (P2B) Project. Its contents are confidential and shall not be reproduced, destroyed, or given away without the express, written permission of NZTA, Papakura to Bombay (P2B) Project. The electronic version of this document in Geodocs on the designated server(s) is the Master Copy and is a controlled document. Unless specifically noted thereon, other copies of this document are uncontrolled.

Contents

1 Introduction 14

1.1 Purpose and scope of this Report 14
1.2 Report Structure 14

2 Project Description 15

2.1 Papakura to Bombay Project 15
2.2 Stage 2 15
2.2.1 Construction 15

3 Assessment methodology 19

3.1 Preparation of this Report 19
3.2 Methodology 19
3.2.1 Assumptions and Limitations 20
3.2.2 Identifying the Study area 20
3.2.3 Assessment of effects 20

4 Existing and Future Receiving Environment 24

4.1 Landscape context 24
4.1.1 Statutory Context 24
4.1.2 Land Use 24
4.1.3 Topography and Hydrology 27
4.1.4 Ecology 28
4.1.5 Heritage Values 29
4.1.6 Pre-European Māori settlement 29
4.2 Landscape and Natural Character Types 31
4.2.1 *LCT 1:* Rāngai tuarua – Cultivate & harvest 33
4.2.2 *LCT 2:* Rāngi tuatoru – Observe & defend 34

5 Assessment of overall Landscape, Natural Character and Visual Effects 36

5.1 Landscape and Natural Character Effects 36
5.2 Visual Effects 37
5.2.1 Detailed assessment of representative viewpoints 37
5.2.2 Summary of viewpoint assessment 58

6 Assessment of Positive Effects 60

6.1 Positive landscape and visual effects 60
6.1.1 Assessment of construction effects 60

6.1.2 Assessment of operational effects 60
6.2 Summary of beneficial effects 61

7 Stage 2 NoR 1-3 (Alteration to SH1 Designations) 62

7.1 Overview and description of works 62
7.2 Existing & receiving environment 67
7.3 Assessment of construction effects 67
7.4 Assessment of operational effects 68
7.5 Summary of effects 69
7.6 Recommendations 70

8 Stage 2 NoR 4 (Shared User Path) 71

8.1 Overview and description of works 71
8.2 Existing & receiving environment 72
8.3 Assessment of construction effects 72
8.4 Assessment of operational effects 74
8.5 Summary of effects 75
8.6 Recommendations 76

9 Stage 2 NoR 5 (Drury South Link Road) 76

9.1 Overview and description of works 76
9.2 Existing & receiving environment 78
9.3 Assessment of construction effects 79
9.4 Assessment of operational effects 80
9.5 Summary of effects 83
9.6 Recommendations 83

10 Recommendations 84

10.1 Construction phase recommendations 84
10.2 Operational phase recommendations 86

11 Conclusions 89
12 References 91

Appendix

Appendix A

Concept Plan

Appendix B

Visual Prominence Rationale

Appendix C

Landscape Character Types

Appendix D

Land Zone mapping

Appendix E

Overlay mapping

Appendix F

Topography and hydrology mapping

Figures

Figure 2-1: Indicative location plan showing Stage 2 of NZTA's P2B Project
Figure 4-1: Residential lifestyle block set in rolling hills (image: Aurecon, Oct. 2023)
Figure 4-2: Planted crops in field (image: Aurecon, Oct. 2023)
Figure 4-3: New housing development – Maketū Drive, Ramarama (image: Aurecon, Oct. 2023)
Figure 4-4: Earthworks in greenfield development – Drury South Crossing, Quarry Road (image: Aurecon, Oct. 2023)
Figure 4-5: Hingaia Stream at Ballards Bridge, Drury South Crossing (image: Aurecon, Oct. 2023)
Figure 4-6: Maketū Stream at Stone Road (image: Aurecon, Oct. 2023)
Figure 4-7: Rolling hills to the west of SH1 (image: Aurecon, Oct. 2023)
Figure 4-8: Looking east towards the Drury Hills in the background of crops (image: Aurecon, Oct. 2023)
Figure 4-9: St Stephen's College buildings seen from east of SH1 (image: Aurecon, Oct. 2023)
Figure 4-10: Bishop Selwyn Memorial Cairn (image: Aurecon, Oct. 2023)
Figure 4-11: St Stephen's school driveway – London Plane trees (image: Aurecon, Nov. 2023)
Figure 4-12: Landscape Character Areas and key features
Figure 4-13: Middleground between sea and Drury Hills in the background, Hingaia Stream in the foreground (image: Aurecon, Oct. 2023)
Figure 4-14: Crops on fertile land (image: Aurecon, Oct. 2023)
Figure 4-15: Pukekura/Bombay Hills (image: Aurecon, Oct. 2023)
Figure 4-16: Views north from Bombay Hill (image: Aurecon, Oct. 2023)
Figure 5-1: Viewpoint locations (1 of 5)
Figure 5-2: Viewpoint locations (2 of 5)
Figure 5-3: Viewpoint locations (3 of 5)
Figure 5-4: Viewpoint locations (4 of 5)
Figure 5-5: Viewpoint locations (5 of 5)
Figure 5-6: Viewpoint 1 existing setting, looking south along GSR (image: Aurecon, October 2023)
Figure 5-7: Viewpoint 2 existing setting, looking east at GSR/Quarry Road intersection (image: Aurecon, October 2023)
Figure 5-8: Viewpoint 3 existing setting, looking southeast from GSR (image: Aurecon, October 2023)
Figure 5-9: Viewpoint 4 existing setting, looking southeast from Loop Road parallel to GSR (image: Aurecon, October 2023)
Figure 5-10: Viewpoint 5 existing setting, looking east from Ararimu Road (image: Aurecon, October 2023)
Figure 5-11: Viewpoint 6 existing setting, looking east from Flay Road (image: Aurecon, October 2023
Figure 5-12: Viewpoint 7 existing setting, looking east from Flay Road (image: Aurecon, November 2023)
Figure 5-13: Viewpoint 8 existing setting, looking towards the school driveway (image: Aurecon, November 2023)
Figure 5-14: Viewpoint 9 existing setting, looking southwest from GSR near underpass with SH1 (image: Aurecon, October 2023

Figure 5-15: Viewpoint 10 existing setting, looking north from GSR parallel to SH1 (image: Aurecon, October 2023
Figure 5-16: Viewpoint 11 existing setting, looking north from Mill Road overbridge (image: Aurecon, October 2023
Figure 5-17: Viewpoint 12 existing setting, looking south from Hillside Road parallel with SH1 (image: Aurecon, October 2023
Figure 5-18: Viewpoint 13 existing setting, looking west from Ararimu Road outside of Ramarama School (image: Aurecon, October 2023
Figure 5-19: Viewpoint 14 existing setting, looking west from John Main Drive, Ramarama (image: Aurecon, October 2023
Figure 5-20: Viewpoint 15 existing setting, looking west from John Main Drive, Ramarama (image: Aurecon, October 2023
Figure 12-1: Papakura ki Pukekura Urban Design Landscape Framework – Corridor Character Areas

Tables

Table 1-1 Summary landscape character effects
Table 1-2 Summary visual amenity effects
Table 1-1 Report structure
Table 2-1: Stage 2 P2B Notice Package Summary
Table 3-1 Magnitude of effects 7-point scale
Table 3-2 Level of effect
Table 3-3 Criteria for determining the level of modification to landscape character
Table 3-4 Criteria for determining the level of modification to visual amenity
Table 4-1 Future and existing zoning
Table 5-1: Assessment of LCT effects
Table 5-2: Summary of visual effects
Table 6-1: Project beneficial effects
Table 7-1: Overview of alteration to SH1 Designation 6706
Table 7-2: Overview of alteration to SH1 Designation 6700
Table 7-3: Overview of alteration to SH1 Designation 6701
Table 7-4: Stage 2 NoR 1-3 construction effects
Table 7-5: Stage 2 NoR 1-3 operational effects
Table 8-1: Stage 2 NoR 4 Proposed works
Table 8-2: Stage 2 NoR 4 construction effects
Table 8-3: Stage 2 NoR 4 operational effects
Table 9-1: Overview of the Drury South Interchange Connections
Table 9-2: Stage 2 NoR 5 construction effects
Table 9-3: Stage 2 NoR 5 operational effects
Table 10-1: Construction recommendations to avoid, remedy or mitigate effects
Table 10-2: NoR specific construction recommendations to avoid, remedy or mitigate effects
Table 10-3: Operational recommendations to avoid, remedy or mitigate effects
Table 10-4: Summary of NoR specific operational recommendations to avoid, remedy or mitigate effects
Table 11-1: Summary of Landscape Character Effects
Table 11-2: Summary of Visual Effects

Abbreviations

Abbreviation	Term
AEE	Assessment of Environmental Effects
AUP:OP	Auckland Unitary Plan (Operative in Part 2016)
BPO	Best Practicable Option
GSR	Great South Road
km	Kilometres
LCT	Landscape Character Type
LVA	Landscape and Visual Assessment
m	Metres
NoR	Notice of Requirement
NoR 1	Alteration to the SH1 Designation 6706
NoR 2	Alteration to the SH1 Designation 6700
NoR 3	Alteration to the SH1 Designation 6701
NoR 4	Shared User Path between Quarry Road and Bombay Interchange
NoR 5	Drury South Interchange Connections
P2B Project	Papakura to Bombay Project
(the) Project	Stage 2 of the P2B
RMA	Resource Management Act 1991
SEA-T	Significant Ecological Area – Terrestrial
SGA	Supporting Growth Alliance
SH1	State Highway 1 Motorway, the Southern Motorway
Southern IIG	Southern Iwi Integration Group
SUP	Shared Use Path

Glossary of Acronyms/Terms

Acronym/Term	Description
Auckland Council	Means the unitary authority that replaced eight councils in the Auckland Region as of 1 November 2010.
the Project	Stage 2 of the P2B Project between Papakura to Bombay (Pukekura)
P2B Project	Papakura to Bombay Project
Project Area	Area of land that is within the proposed designation boundary.
NZTA	NZ Transport Agency Waka Kotahi
the ULDF	Papakura ki Pukekura Urban and Landscape Design Framework (Rev G 2024) which outlines the Projects design strategies

Executive Summary

This report comprises a Landscape, Natural Character and Visual Assessment (LVA) to support the Proposed SH1 Papakura to Bombay Stage 2 upgrade (the Project).

This assessment of effects on the Project has been undertaken in accordance with Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines. The visual effects are a result of the degree of visual modification as understood in a future developed context of 10-15years, comprising Future Urban Zone (FUZ) and a higher degree of urbanisation in accordance with the Auckland Unitary Plan (AUP).

It has been considered that the effects of the Project include:

- Earthworks, removal of existing vegetation, construction and installation works;
- New interchange constructed at Drury South including connections to Maketū Road and Great South Road (GSR);
- Upgrades to existing Bombay Interchange ;
- Upgrades to Ramarama Interchange;
- Continuation of a Shared User Path (SUP) from Quarry Road to Bombay Interchange;
- Stormwater management devices; and
- Landscape planting as per Papakura ki Pukekura Urban and Landscape Design Framework.

Landscape Visual Baseline

This assessment examines the existing landscape and visual conditions of the Study Area (both physical and statutory) to establish a baseline against which potential effects of the Project can be assessed.

The Study Area has been defined within a radius of 1,000 metres from the location of the proposed site. This area captures where the Project is potentially observable and is more at risk of adverse effects.

Relevant planning policies and legislation have been reviewed to understand any specific landscape or visual conditions relating to the Study Area, as well as a desktop study to understand the various physical elements that combine to create landscape and visual character. Landscape features within the Study Area include the Ingram Road tuff ring, classified as an Outstanding Natural feature (ONF), and a Terrestrial Significant Ecological Area (SEA-T) comprising a small area of dense native vegetation. The design has avoided physical effects of these features.

The majority of the Project site is zoned as a Strategic Transport Corridor, comprising an existing four-laned motorway with central barrier splitting the north and southbound traffic. NoR-5 Drury South Interchange Connections (Drury South Link Road) is in land zoned light industrial, mixed housing suburban zone and open space - informal recreation to the Hingaia Stream floodplain. The existing and receiving environment adjoining the Project alignment comprises Future Urban Zone (FUZ) at Drury South, mixed-rural, rural production, mixed-suburban and light industrial zones. Public open space is also proposed along the Hingaia Stream corridor.

The Landscape Character Types (LCTs) are in accordance with those identified in the *Papakura ki Pukekura - Urban & Landscape Design Framework*, (refer to Section 5 and Appendix C) including:

- LCT 1: Rāngai tuarua – Cultivate & harvest; and
- LCT 2: Rāngi tuatoru – Observe & defend.

15 representative viewpoints within the Study Area were assessed (refer to Section 6), to determine the visual effects of the Project, from sensitive receptors. Visual receptors within the Study Area are predominantly users of the transport corridor, with adjacent residential receptors expected to have views of the Project.

Summary of landscape and natural character effects

- LCT 1: Rāngai tuarua – the Project overall has **Less than Minor** effects to the character; and
- LCT 2: Rāngi tuatoru – the Project overall has **Less than Minor** effects to the character.

The Project specific elements have localised effects on the landscape character as described in Table 0-1 below:

Table 0-1 Summary landscape character effects

NoR	Construction Landscape effects	Operational Landscape Effects	Residual Landscape Effects
NoR 1	**No effect -** area dominated by transport infrastructure	**No effects –** baseline character dominated by transport infrastructure	LCT 1: Localised positive effects
NoR 2	**Less than minor -** construction will present a temporary change to the baseline condition that is a very low contrast	**No effects –** baseline character dominated by transport infrastructure	LCT 1: Localised positive effects
NoR 3	**Less than minor -** construction will present a temporary change to the baseline condition that is a very low contrast	**No effects –** baseline character dominated by transport infrastructure	LCT 1: Localised positive effects
NoR 4	**Less than minor** - removal of some roadside vegetation and earthworks	**Less than minor –** introduction of active transport users, however infrastructure is low change to setting which influenced by SH1	LCT 1 & 2: Localised positive effects
NoR 5	**More than Minor** - construction of Drury South Link Road in environmentally sensitive area	**Minor** - prominence of Drury South Link Road and localised prominence to small area of LCT including recreational open space	LCT 2: Localised positive effects

There are limited effects to the natural character of waterways within the Project designation, with potential low modification localised where the Drury Link Road crosses the floodplain and the Hingaia Stream within NoR 5. The bridge design proposes to avoid direct interference with waterways, and a narrow section of the floodplain at Drury South, within the future environment comprising a restored open space and wetlands, will temporarily be affected during construction.

Summary of visual amenity effects

The Project has the following effects on visual amenity including localised effects of specific elements as assessed from sensitive viewpoints, see Table 0-2 below:

Table 0-2 Summary visual amenity effects

NoR	Construction Visual Effects	Operational Visual Effects	Residual Visual Effects
NoR 1	**Less than minor adverse** - works are considered commensurate with regular road maintenance	**Less than minor adverse -** road widening and addition or upgrade of overbridges commensurate with existing setting.	Localised positive effects

NoR 2	**Minor adverse** – installation of Drury South Interchange noticeable to motorists on SH1. **More than minor adverse** at VP5, representative of residents adjacent Ramarama Interchange. **Less than minor adverse -** works temporarily visible but a low contrast to the existing setting for VP2, 11-13	**Less than minor adverse -** road widening and addition or upgrade of overbridges. **Less than Minor adverse** at VP5, representative of residents adjacent Ramarama Interchange	Localised positive effects **VP5: Less than minor** as planting along SUP matures to screen interchange and add landscape amenity
NoR 3	**Less than minor** **-** removal of vegetation and earthworks	**Less than minor -** road widening and addition or upgrade of overbridges are noticeable but commensurate with existing setting.	Localised positive effects
NoR 4	**Less than minor adverse -** motorists with views of the larger SUP infrastructure ***More than minor* adverse** at GSR private dwelling and St Stephen's School driveway (VP7 & VP8) due to close proximity of dwelling and loss of notable trees with high amenity value. **Minor adverse** at Mill Road overbridge (VP11) - noticeable introduction of SUP bridge to motorists and commercial visitors.	**Less than minor adverse** - the SUP is noticeable to motorists on SH1, presenting little difference to the overall scene. ***More than minor* adverse** at GSR private dwelling (VP7) due to introduction of the elevated SUP at GSR which will be visible and reduced amenity from loss of trees. ***Less than minor* adverse** St Stephen's School driveway (VP8) visual amenity restored with reinstatement of avenue of trees.	Localised positive effects **VP7: Minor effect** achieved through replanting of trees to screen SUP & high-quality screen facade of elevated SUP **VP8: Less than minor** effect achieved through replacement trees to reinstate visual amenity along driveway and to SH1 embankment
NoR 5	**More than Minor adverse** - construction of Drury South Link Road in environmentally sensitive area	**More than minor adverse –** the introduction of the bridge and link road is a noticeable change within the open space and waterway environment. Representative viewpoint: VP15	Localised positive effects **VP15: Minor effect**, reduction achieved through implementation of vegetation screening and visual permeability of bridge design

The visual effects have been converted to RMA effects using the Ministry for the Environment (MfE) continuum, as explained in section **Error! Reference source not found.**. The effects have been assessed as minor and more than minor but are not significant.

The level of adverse environmental effects which are considered in continuum as below (Determining the extent of adverse *effects, Ministry for the Environment, 2017*).

- Less than Minor Adverse Effects - Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons.
- Minor Adverse Effects - Adverse effects that are noticeable but will not cause any significant adverse impacts.
- More than Minor Adverse Effects - Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied.

Summary of positive effects

The landscape character and visual effects proposed by the Project, are assessed as having a **less than minor positive effect.** The positive effects are planting and design strategies outlined in the Papakura ki Pukekura Urban Design and Landscape Framework (*ULDF).*

Landscape character is enhanced through the following:

- Extensive planting to either side of SH1, providing a green corridor;
- Introduction of the SUP to provide active accessibility for the community;
- Opportunity for improved Akaroa Trail route within SUP; and
- Introduction of stormwater basins and wetlands to the west of SH1 restore the character of the area which historically comprised of wetlands.

Visual amenity is enhanced through the following:

- Landscape planting to increase visual amenity around SH1; and
- Improved aesthetics of existing bridges through application of architectural screening/facades.

Recommendations

The recommendations have limited ability to change or reduce the assessed landscape character or visual effects, however, have the potential to provide localised positive landscape character effects. It is noted that whilst the ULDF planting strategy would improve the amenity, the following considerations would provide further positive effects:

- Detailed design should to consider planting heights to enhance and frame key views; and
- Landscape planting between SUP and SH1 would enhance SUP user experience.

The assessed effects can be managed or mitigated by:

- Preparation of an Urban Design and Landscape Master Plan (UDLMP);
- Construction management plan;
- Consideration of bridges aesthetics and their integration with landscape context; and
- Installation and maturation of landscape planting to provide amenity and to soften views towards the built Project infrastructure.

With the adoption of mitigation measures, the effects of *landscape and visual amenity* are managed. There is potential to reduce More than Minor effects of the Project, to Minor effects, in the following areas:

- NoR 4: planting of trees to be reinstated to both sides of the realigned St Stephen's School driveway to restore avenue of trees, and for indigenous/native planting to SUP embankment; and
- Nor 5: design of the bridge structure is to provide a visually permeable structure and planting within the floodplain providing visual screening of the structure, for open space users.

1 Introduction

This Assessment of Landscape, Natural Character, and Visual Effects report (Report) has been prepared to inform the Assessment of Effects on the Environment (AEE) for five Notices of Requirements (NoR) being sought by New Zealand Transport Agency Waka Kotahi (referred herein as 'NZTA) under the Resource Management Act 1991 (RMA), for Stage 2 of the Papakura ki Pukekura – Papakura to Bombay Project (P2B) or 'the Project'.

1.1 Purpose and scope of this Report

Specifically, this Report considers the actual potential effects associated with the construction and operation of the Project on the existing and likely future environment as it relates to the landscape, natural character, and visual effects and recommends measures that may be implemented to avoid remedy, and/or mitigate these effects.

This Report should be read alongside the application AEE, which contains further details on the history and context of the Project. The application AEE also contains a detailed description of works to be authorised within each NoR, and the typical construction methodologies that will be used to implement this work. These have been reviewed by the author of this Report and have been considered as part of this assessment of Landscape, Natural Character and Visual effects. As such, they are not repeated here. Where a description of an activity is necessary to understand the potential effects, it has been included in this Report for clarity.

1.2 Report Structure

To provide a clear assessment of each NoR, this Report follows the structure set out in the application AEE. That is, there is an overall assessment of landscape and visual effects, followed by each notice separated out into its own section, and each section contains an assessment of the actual and potential effects for the specific NoR. Where appropriate, measures to avoid, remedy or mitigate effects are recommended. Table 1-1 below describes the extent of each section, and where the description of effects can be found in this Report.

Table 1-1 Report structure

Sections	Section number
Description of the Project	Section 2
Overview of the methodology used to undertake the assessment and identification of the assessment criteria and any relevant standards or guidelines	Section 3
Identification and description of the existing and likely receiving environment	Section 4
Assessment of overall Landscape & Visual Effects	Section 5
Assessment of positive effects	Section 6
Assessment of specific LVA matters for Stage 2 NoR 1-3: Alteration to SH1 Designations	Section 7
Assessment of specific LVA matters for Stage 2 NoR 4: SUP between Quarry Road and Bombay Interchange	Section 8
Assessment of specific LVA matters for Stage 2 NoR 5: Drury South Link Road	Section 9
Recommendations	Section 10
Overall conclusion of the level of potential adverse landscape and visual effects of the Stage 2 P2B Project.	Section 11

2 Project Description

2.1 Papakura to Bombay Project

Papakura to Bombay, P2B also known as Papakura ki Pukekura is a NZTA led project to improve the transport capacity and functionality of the State Highway network and provide for long term growth in the South of Auckland. An indicative location plan of the P2B area is illustrated in Figure 2-1 (below). For clarity and by way of summary we note that:

- The previous stages of the P2B, were approved under the Covid 19 Recovery (Fast Track Consenting) Act 2020 (FTA), as part of the Papakura to Drury South project (P2DS), this includes: Stage 1B1 and Stage 1B2; and,
- Stage 1B1 of the P2DS, was approved by the Expert Consenting Panel (EPA) in November 2022, Stage 1B2 was approved by the EPA in July 2023, both applications altered the existing SH1 Designation 6706 (Takanini to Drury Interchange), which is the subject of NoR 1.

Further discussion of the different stages of the P2B Project is contained in the, Assessment of Effects on the Environment Design Report - Appendix C, and legal submissions supporting this application.

2.2 Stage 2

NZTA is seeking five NoRs for Stage 2 of the P2B, which are summarised in Table 2-1 (below).

For clarity and by way of summary we note that:

- The Project area, which was formally known as Stages 2 and 3 under the P2B, is now to be referred to as a single stage for route protection only, this is referred herein as ‘Stage 2’ or ‘the Project’;
- Stage 2 incorporates the remaining portion of the P2B Project area south of Quarry Road to approximately 600 meters (m) south of the existing Bombay Interchange; and
- Stage 2 is for route protection of the land required for the future upgrades of the SH1 corridor.
- NZTA is seeking to protect adequate land to accommodate the following planned works:
- New interchange constructed at Drury South (one additional lane in both direction of the proposed interchange) including connections to Maketū Road and Great South Road;
- Upgrades to existing Bombay Interchange (one additional lane in both directions);
- Upgrades to Ramarama Interchange;
- Continuation of a SUP from Quarry Road to Bombay Interchange ; and
- Stormwater management devices.

2.2.1 Construction

This Project is primarily a route protection for future upgrades to the state highway network. There is currently no funding allocated towards the construction of the projects, though it is expected to be constructed within 15-20 years.

Construction will likely include, but is not limited to the following works:

- Earthworks: cutting and filling to achieve the proposed design alignment using earthmoving and grading specific machinery;
- Road widening including using machinery such as milling machines, pavers, compactors and rollers;
- Use of cranes for installation of bridge structures; and

- Set up of Construction Support Areas a short distance from Project works, required for the provision of contractor and welfare facilities, plant/material storage, and earthworks stockpiling as required.

A Design Construction Report has been prepared to support the application (attached at Appendix C of the application AEE). Once the project moves through the detailed design stage, a detailed construction methodology for each NoR will be prepared.

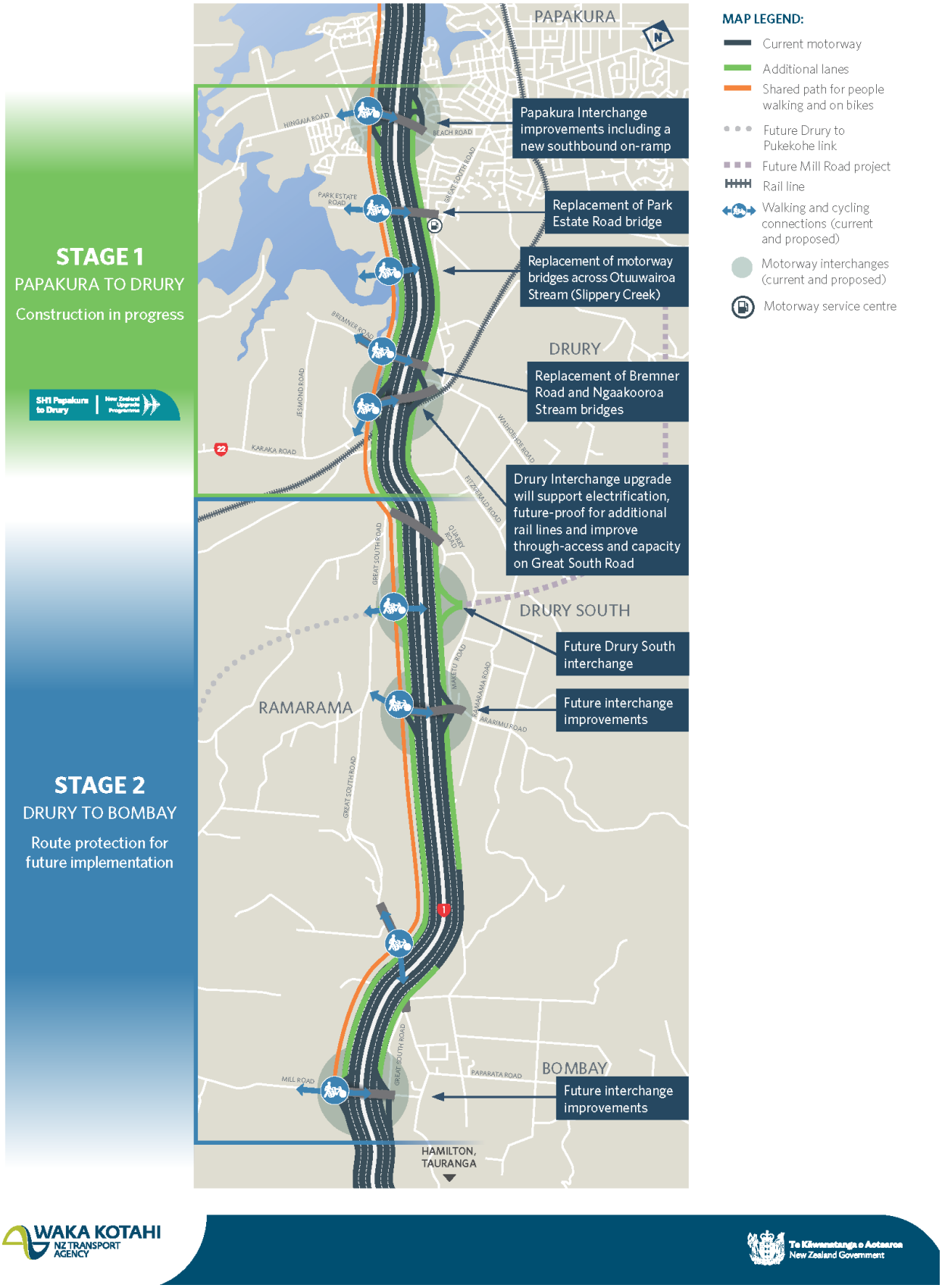


Figure 2-1: Indicative location plan showing Stage 2 of NZTA's P2B Project

Table 2-1: Stage 2 P2B Notice Package Summary

Notice	Requiring Authority	Project	Purpose	Extent	Lapse Period
NoR 1	NZTA	Alteration to SH1 Designation 6706	Motorway between Takanini and Hamilton	SH1 CH 15160 to CH 15500 State Highway 1 from north of Takanini Interchange to south of Quarry Road, Drury	Given effect (i.e. no lapse date)
NoR 2		Alteration to SH1 Designation 6700	Motorway	SH1 CH 15500 to CH 22740 State Highway 1 from south of Quarry Road, Drury to Bombay Road, Bombay	
NoR 3		Alteration to SH1 Designation 6701	Motorway	SH1 CH 22740 to CH 24600 State Highway 1 from Bombay Road to Mill Road, Bombay	
NoR 4		Shared User Path	Designation for the construction, operation and maintenance of a shared path and associated infrastructure.	SH1 CH 15160 to CH 24580 State Highway 1 from Quarry Road, Drury to Bombay Interchange/Mill Road.	20 years
NoR 5		Drury South Interchange Connections	Designation for the construction, operation and maintenance of a new link road and associated infrastructure.	CH 300 to CH 1750 Adjacent State Highway 1 at Drury South Interchange, linking to Quarry Road to the east, and Great South Road to the west.	20 years

3 Assessment methodology

3.1 Preparation of this Report

Aurecon has prepared this report for NZ Transport Agency (NZTA), exclusively for its use. It has been prepared in accordance with our scope of services and the instructions given by or on behalf NZTA. Data or opinions contained within the report may not be used in other contexts or for any other purposes without Aurecon's prior review and agreement.

Aurecon accepts no responsibility or liability to any third party for the use of, or reliance on, the report by any third party and the use of, or reliance on, the report by any third party is at the risk of that party.

3.2 Methodology

The assessment methodology is based on, and consistent with, **the Te Tangi A Te Manu Aotearoa New Zealand Landscape Assessment Guidelines**, Tuia Pito Ora New Zealand Institute of Landscape Architects, July 2022. This assessment has also been prepared with consideration given to the following guidelines and documents:

- NZTA – Bridging the Gap: NZTA Urban Design Guidelines (2013);
- NZTA – Landscape and Visual Assessment Guidelines (2013);
- NZTA – Bridge Manual (2013);
- Auckland Council – Auckland Unitary Plan (AUP:OP);
- Auckland Council – Auckland's Urban Ngahere (Forest) Strategy (2019);
- Auckland Council – Drury-Ōpāheke Structure Plan (2019); and
- Auckland Council – Plan Change 48 (Private): Drury Centre Precinct

Alongside the preparation of this assessment, the author has reviewed the following documents:

- Construction Method Statement;
- Revisions of concept design drawings;
- Other Technical Assessment reports relevant to this LVA are included in the application AEE, including:
    - Appendix F: Ecological Assessment;
    - Appendix G: Arboricultural Assessment; and
    - Appendix H: Archaeology and Historic Heritage Assessment.

The following scope of works was undertaken for the assessment of Landscape and Visual effects:

- Baseline analysis including:
    - Desktop study to examine and review existing available information pertaining to the study area including but not limited to environmental reports, historical information, aerial photographs and property files;
    - Identify relevant statutory and non-statutory provisions;
    - Field survey by lead assessor on 18 October 2023, to ground truth desktop studies and undertake site photography; and
    - Describe the Project including scale, materiality and areas affected.
- Assessment of landscape and visual effects:

- Identify any significant landscapes, views and sensitive receptors;
- Analysis of site photography and design models provided by the design team; and
- Assessment of landscape and visual impacts based on the sensitivity to change and level of modification.

- Production of this LVA report, whereby the desktop review and recommendations are presented.

3.2.1 Assumptions and Limitations

- The assumption is that FUZ will be live-zoned and in development at the time of constructing of Stage 2. Current rural zoning unless stipulated in the structure plan, will be as it exists now;
- For those areas that are already urbanised, or are planned to be (as per precinct plans in the AUP:OP), construction and operation of the transport corridors will be within an urban environment (e.g. part of NoR 1 and NoR 5);
- For those areas that are in the rural zone and are to remain so, construction and operation of the transport corridors will be within the rural zone (e.g. parts of NoR 2, NoR 3 and NoR 4).
- Earthworks will be limited to within the footprint of the designation.
- The assessment does not specifically address cultural landscape and any cultural effects. For matters related to the cultural impact assessment, please refer to the attached at Appendix H of the application AEE;
- This assessment focuses on the landscape character and visual amenity effects of the land use activities that will be authorised by the proposed designations for the Projects. Effects on the natural character of wetlands, lakes, rivers and their margins have also been considered through the options assessment, design and designation footprint for the Project; and
- Site assessment has been undertaken from publicly accessible land and supported through desktop analysis, which included GIS mapping and aerial photography.

3.2.2 Identifying the Study area

The Study Area relevant to the Project, has been determined through the extent of the Site's potentially visible surface area, as identified during a desktop study and ground-truthing in a subsequent field visit (conducted 18th October by the lead assessor). The Study Area for the purposes of this assessment includes the area within the designation boundary (the Site) and a viewshed analysis of 1,000m radius offset from the designation boundary.

As the distance increases from any proposed development, the field of view decreases causing the visibility of components to diminish. At a distances further than 500m from the Project, viewers are unlikely to distinguish the Project from the existing highway infrastructure and surrounding landscape. Therefore, the selection of viewpoints are mostly within 500m of the Project, with the exception of elevated views. **Error! Reference source not found.** defines this diminishing visual prominence rationale.

3.2.3 Assessment of effects

This assessment is prepared recognising the statutory framework of the Resource Management Act in accordance with Schedule 4, clause 7(1)(b) which seeks that, in any assessment of a proposed activity, consideration is given to landscape and visual effects. The assessment considers both positive and adverse effects.

Landscape or visual effects are a consequence of a change to the landscape value to change as a consequence of changes to the landscapes' physical attributes. The magnitude of change is rated through a 7-point scale, along with a description of the nature of the effect as shown in Table 3-1. If the Project is not apparent from a viewpoint, there is 'nil effect'.

Table 3-1 Magnitude of effects 7-point scale

Very Low	Low	Low – Moderate	Moderate	Moderate – High	High	Very High

Effects are identified by establishing and describing the changes resulting from the different components of the proposal on individual landscape or visual receptors.

This assessment is used to guide the significance of landscape and visual effects in accordance with the Resource Management Act (1991) as outlined in Table 3-2.

Table 3-2 Level of effect

					Significant	
Less than Minor		Minor	More than Minor			
Very Low	Low	Low – Moderate	Moderate	Moderate – High	High	Very High

The level of adverse environmental effects which are considered in continuum as below (*Determining the extent of adverse effects, Ministry for the Environment, 2017*).

- Nil Effects – no effects;
- Less than Minor Adverse Effects - Adverse effects that are discernible day-to-day effects, but too small to adversely affect other persons;
- Minor Adverse Effects - Adverse effects that are noticeable but will not cause any significant adverse impacts;
- More than Minor Adverse Effects - Adverse effects that are noticeable that may cause an adverse impact but could be potentially mitigated or remedied; and
- Significant Adverse Effects - An effect that is noticeable and will have a serious adverse impact on the environment but could potentially be mitigated or remedied.

Landscape effects

Landscape character is the distinctive combination of landscape attributes that gives an area its identity, and is derived from a combination of landform, land cover and land use. The effects on landscape character relate to changes in land use, (new or different activities); changes to existing patterns and elements in the landscape such as vegetation, waterbodies, landform, and building patterns; and the introduction of new elements and patterns including structures and paving and the various associated processes such as earthworks.

Landscape Receptors are elements or groups of elements that may be directly or indirectly affected by the proposals. These elements include landform, waterways and vegetation, and those physical landscape elements that influence the quality and significance of landscapes such as landscape features identified with regional or local significance.

Landscape Character Types (LCTs) are defined based on physical characteristics such as:

- Topography;
- Vegetation;
- Drainage patterns;

- Geology; and
- Land use patterns.

The key considerations in determining the level of modification to landscape character as outlined in Table 3-3 include:

- Topographic variation;
- Alteration to presence of and patterning of vegetation and density; and
- Human modification such as presence of built from and/or extensive clearing resulting in a highly altered landscape.

Table 3-3 Criteria for determining the level of modification to landscape character

Effect rating	Definition
Very High	Dominant or major change to baseline character or condition
High	Very noticeable change to baseline character or condition
Moderate-High	The proposal is noticeable in regard to the size, scale and geographical extent and/or a noticeable compositional change to the existing landscape setting.
Moderate	Clearly noticeable change to baseline character or condition
Low-Moderate	The presents a low-moderate contrast to the existing landscape setting
Low	Small change to baseline character or condition
Very Low	Very small change to baseline character or condition

Visual effects

The assessment of visual effects is concerned with the effects of change and development on the views available to people and their visual amenity.

Visual modification is not easily predicted objectively, requiring application of interpretation and professional judgment. A clear picture of the modification is determined from a combination of the degree of change to the view due to the Project including the extent of the area over which changes would be visible, the period of exposure to the view and reversibility.

The key considerations in determining the level of visual modification as outlined in Table 3-4 include:

- Size and scale;

  The scale of the change in the view with respect to the loss or addition of features in the view, and changes to the composition including the proportion of the view occupied by the Project components;

  The degree of contrast or integration of the Project components in the landscape setting with the existing or remaining elements including form, mass, line, height, colour, texture and materiality; and

  The nature of the view towards the Project components in terms of duration of the view.
- Geographical extent;
- The angle of the view in relation to sensitive land use;
- The distance of the viewpoint from the Project component(s); and
- The extent of the area over which the changes would be visible.

Table 3-4 Criteria for determining the level of modification to visual amenity

Effect rating	Definition
Very High	Proposal is prominent and a focus of views for a large viewing audience or within close proximity of sensitive receptors
High	Proposal will be a major element of view for a large number of people and/or be a focus of view from key locations
Moderate-High	The proposal is noticeable in regard to the size, scale and geographical extent and/or a noticeable compositional change to the existing view
Moderate	Proposal will form a visible and recognisable new element within the overall scene
Low-Moderate	The proposal is barely perceptible, however presents some contrast to the existing landscape setting
Low	Proposal will be a limited component of a wider scene and/or make little difference to the overall scene
Very Low	Proposal will form a very limited component of the wider scene and/or be viewed from a considerable distance

The assessment of visual modification is based on the Project description outlined in Section 2.

4 Existing and Future Receiving Environment

4.1 Landscape context

The following section provides a brief description of the existing and future conditions, associated land uses and key landscape features within the overall Stage 2 Study Area at a range of 1,000m from the designation boundary.

4.1.1 Statutory Context

The following section provide a brief overview of the statutory context within the Project area, which will likely influence land use changes in the future receiving environment.

Future Development Strategy

In July 2023 Auckland Council approved[1] the Future Development Strategy (FDS 2023-2053), which replaced the Development Strategy 2018 and the Future Urban Land Supply Strategy 2017 (FULSS). The FDS 2023-2053 anticipates a full build out of FUZ land at Drury, however on a new timeframe, which sequences land development later than originally proposed in the FULSS 2017. Based on FDS 2035-2053 FUZ areas at Drury will be developed from 2035 onwards, which will largely occur around the time that Stage 2 of P2B Project will be constructed.

Drury-Opāheke Structure Plan

The Drury-Opāheke Structure Plan was adopted by Auckland Council in 2019 and sets out the pattern of land uses and the supporting infrastructure network for the future growth areas of Drury-Opāheke area. The structure plan provides a signal to developers and Requiring Authorities for when land use is expected to be progressively live zoned through private plan changes.

Plan Changes

Auckland Council has initiated Plan Change 78 (PC78), which was notified on 18 August 2022. PC78 is the only active plan change within the Project area. The plan change applies to all current residential zones and land adjacent to rapid transit stops, where greater intensification is anticipated in line with recent policy changes including the introduction of the National Policy Statement for Urban Development (NPS-UD) and Medium Density Residential Standards (MDRS).

4.1.2 Land Use

The existing operative AUP zones are mapped in

[1] Request provided to Auckland Council's Planning, Environment and Parks Committee to adopt the final version of the FDS 2023-2053, with a decision expected late 2023.

Appendix D, and outlined in Table 4-1 below, alongside the potential future zoning (mapped in Drury-Opāheke Structure Plan). The changes to land use are described to underpin the baseline conditions against which the Project is assessed.

Table 4-1 Future and existing zoning

NoR	Existing zoning	Future zoning	Relevance to LVA
NoR 1-3	▪ Strategic Transport Corridor (SH1)	No change	Main national motorway comprising transport infrastructure
NoR 1 (east SH1)	▪ Rural - Mixed Rural ▪ Light industrial	▪ Future Urban / Light industrial ▪ Open space – informal recreation	An increase of built form including commercial/light industry. Hingaia Stream corridor restoration of future public open space.
NoR 1 (west SH1)	▪ Future Urban	▪ Future Urban (likely Light industrial)	An increase of built form including commercial/light industry.
NoR 2 (east SH1)	▪ Light industrial ▪ Residential – mixed housing suburban zone (UPBZ)	No change	Increased urbanisation is underway at Drury South Crossing (from previous rural use), comprising large warehousing, depots and light industrial sites; as well as adjacent medium density suburban residential housing in Ramarama.
	▪ Rural Production	No change	Area south of Ararimu Rd comprises horticultural crops, glasshouses, packing sheds and associated residential dwellings
NoR 2, NoR 4 (west SH1)	▪ Future Urban	▪ Future Urban (likely Light industrial)	Area identified for urbanisation as per *Drury – Opāheke Structure Plan, 2019*.
	▪ Rural - Mixed Rural ▪ Rural – Countryside Living (east GSR)	No change	Low density residential on large lots
NoR 3 (east SH1)	▪ Rural Production	No change	Area south of Ararimu Rd comprises horticultural crops, glasshouses, packing sheds and associated residential dwellings
NoR 3, NoR 4 (west SH1)	▪ Rural - Mixed Rural ▪ Special Purpose	No change	NZ Hothouse development. St Stephen's School – historic building of regional significance is characterised by campus-style developments.

NoR 5	■ Light industrial ■ Residential – mixed housing suburban zone (UPBZ)	■ Addition of Open space – informal recreation	Increased urbanisation is underway at Drury South Crossing (from previous rural use), comprising large warehousing, depots and light industrial sites; as well as adjacent medium density suburban residential housing in Ramarama. Hingaia Stream corridor - Future recreational users and place of environmental and cultural value.

The majority of the project area is adjacent rural zone, and the assumption is that this will remain so in the future, with the exception of a few areas to the north of the corridor at Drury South.

The FUZ to the west of Hingaia Stream / east of SH1, has existing consent for the southern portion of the Drury Centre site (228 Flanagan Road, Drury) for large format buildings of 10m in height. This indicates that this zone is transitioning away from rural use to light industry.

Drury Town Centre to the east of SH1 will introduce residential housing and commercial use, a Shared Use Path (SUP) and Hingaia Stream restoration. The town centre is proposed to be accessed by Drury Access Ramp, from Drury Interchange.

The proposed greenfield developments primarily at Drury South to Ramarama, are a contrast to the existing environment which comprise of large residential lifestyle blocks and land subject to rural production (refer images Figure 4-1 - Figure 4-4).

Figure 4-1: Residential lifestyle block set in rolling hills (image: Aurecon, Oct. 2023)

Figure 4-2: Planted crops in field (image: Aurecon, Oct. 2023)

Figure 4-3: New housing development – Maketū Drive, Ramarama (image: Aurecon, Oct. 2023)

Figure 4-4: Earthworks in greenfield development – Drury South Crossing, Quarry Road (image: Aurecon, Oct. 2023)

4.1.3 Topography and Hydrology

The geographical extent of the Study Area comprises an approximate 9.5 km corridor surrounding the existing SH1.

The current motorway extents is framed by embankments, with steeper cuttings at overpasses and at Bombay Hill. At the north end of the Project area (Quarry Road), SH1 is slightly elevated above adjacent areas of Drury South and Drury East which sits at approximately 15 m Above Sea Level (ASL) (refer Appendix F).

The north side of Ararimu Road, SH1 is within a cutting and undulating terrain to either side of the motorway at 30 to 40m ASL. The land continues to rise toward the south on the approach to the Bombay Hills, with 100m ASL at the base of the hill, where it crosses over GSR, to a high point of approximately 170m ASL at the Mill Road – Bombay Interchange .

The route straddles the Ngākōroa and Hingaia Catchments, dominated by waterways of the same names. These waterways originate around Pukekura at the southern extent of the Project area and empty into Ōtuwairoa / Slippery Creek before discharging into Te Mānukanuka / Manukau Harbour.

The flood plain around the Hingaia Stream to the east side of SH1, covers a broader geographical extent within the Study Area from Quarry Road to past Ararimu Road where the terrain is flatter.

Hingaia Stream has low but steep embankments, is a narrow waterway and is of moderate amenity given the level of modification and history of land use surrounding it. There are several other tributaries which flow

from the Drury Hills to the east (see Figure 4-5 - Figure 4-6), and eventually connect with to the Pahurehure Inlet and the wider Manukau Harbour.

The Ecological Assessment discusses the likelihood that the Hingaia Stream floodplains were once a swamp / floodplain Kahikatea, pukatea forest and Taraire, tawa, podocarp forest and the floodplains of the Ngākōroa Stream were covered Pūriri trees. There are numerous wetlands within the existing environment, however these are likely non-native due to the widespread modification and development of land for agricultural purposes (refer to Ecological Effects Report attached at Appendix F of the application AEE).

There are small tributaries within gullies on the west side of SH1. Maketū Stream crosses beneath SH1 at Hillview Road, flowing from the west to east. The terrain to the west comprises rolling hills, however it does not have the taller hill range like the Drury Hill range to the east (see Figure 4-7 to Figure 4-8).

Figure 4-5: Hingaia Stream at Ballards Bridge, Drury South Crossing (image: Aurecon, Oct. 2023)

Figure 4-6: Maketū Stream at Stone Road (image: Aurecon, Oct. 2023)

Figure 4-7: Rolling hills to the west of SH1 (image: Aurecon, Oct. 2023)

Figure 4-8: Looking east towards the Drury Hills in the background of crops (image: Aurecon, Oct. 2023)

4.1.4 Ecology

As observed in the field visit and in the Ecological assessment (attached at Appendix F of the application AEE), the existing environment adjacent SH1 within the Project area is predominantly associated with open pasture or other agricultural land, with scattered areas of weedy scrub, hedgerows and fragments of exotic and native vegetation.

Along the Hingaia Stream riparian corridor, vegetation species comprise pasture grasses and pampas, with patches of exotic weed species, and rarely ponga (*Cyathea dealbata*) on the top of the bank. Stock access to stream banks has had an adverse effect on bank slumping and instability.

The stream environments are proposed to be improved as part of blue-green network restoration works to be undertaken by other development projects. An increase in riparian planting along stream corridors and stabilisation of embankments through planting, will result in a demonstrable improvement in instream habitat.

The Auckland Unitary Plan identifies a number of Significant Ecological Areas (SEAs), both land and marine based (identified in Appendix E Overlay mapping). The terrestrial SEAs tend to contain tracts of dense remnant native vegetation, which was originally forested, with pūriri and taraire forests in upland areas and kahikatea and pukatea forests in lowland areas. Mapped SEAs are outside of the proposed designation boundary and therefore not included in NoR route protection consent application. These SEAs include:

- SEA-T-4580: west of Hingaia Stream, near Drury South Interchange link road;
- SEA-T-4513: adjacent SH1 proposed drainage swale and SUP, northwest of SH1 overpass at Great South Road, Pukekura; and

4.1.5 Heritage Values

There are a few sites of local heritage value within the Study Area as identified in mapping (see Appendix E). A historic heritage place may include; cultural landscapes, buildings, structures, monuments, gardens and plantings, archaeological sites and features, traditional sites, sacred places, townscapes, streetscapes and settlements. Sites identified in the mapping include various archaeological sites, early settlement homestead dwellings, WWII military camps and large heritage trees. These sites contribute to the history and character of the region. Heritage items with the designation boundary of potential relevance to landscape and visual effects include:

- Ramarama Hall: current hall is replacement for original hall (located in centre of SH1) built in the 1880s;
- Bishop Selwyn Memorial Cairn (see Figure 4-10): commemorating George Augustus Selwyn (1809-1878), Bishop who became fluent in Te Reo Māori and defended the Treaty of Waitangi, supporting Māori rights and setting up a Trust for St Stephen's School (below). The cairn was built to mark the spot where Bishop Selwyn used to rest when undertaking his missionary trips into the Waikato:

  Two groupings of Notable trees associated with the cairn include a grove of mature Puriri trees and two Norfolk Island Pines.
- St Stephen's School Tipene (see Figure 4-9): established in 1844 (opening in 1849) as a Māori boys' school and boarding house. The school was temporarily requisitioned during the 1939-45, as a hospital. The school closed in 2000, however is proposed to reopen (National Library of NZ):

  An avenue of London Plane trees frames the driveway to the school from GSR, which are of high landscape and amenity value (see Figure 4-11).

  St Stephen's School is outside of the designation boundary, however the avenue of trees along the driveway is within NoR 3 and 4.

4.1.6 Pre-European Māori settlement

Pre-European Māori settlement in the area can be attributed to a focus around waterways, which acted as transportation routes and access to areas of cultivation, as well as a food source. The fertile soils would have supported large areas of māra kai (gardening for food) of kūmara, taro, uwhi and other root crops.

The area was significant to Māori as a link between the Auckland Isthmus and the Waikato along Te Ararimu Track. The track was guarded particularly by Te Maketū pā, located approximately 1500 m east of Ararimu Road interchange. In addition to Te Ararimu Track, access through this area was provided by the Ngākōroa and Hingaia streams.

Refer to the attached at Appendix H of the application AEE for the Archaeology and Historic Heritage Assessment, for further detail.

Figure 4-9: St Stephen's College buildings seen from east of SH1 (image: Aurecon, Oct. 2023)

Figure 4-10: Bishop Selwyn Memorial Cairn (image: Aurecon, Oct. 2023)

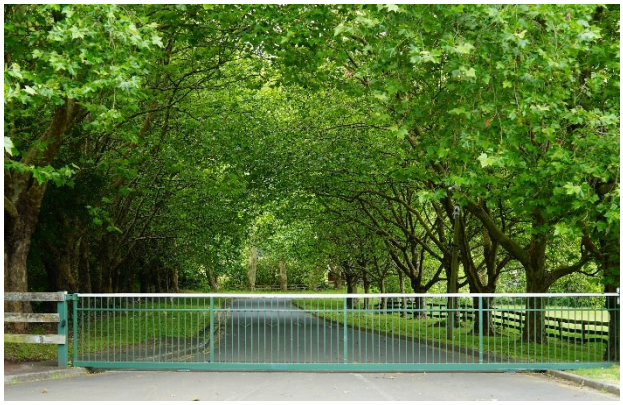


Figure 4-11: St Stephen's school driveway – London Plane trees (image: Aurecon, Nov. 2023)

4.2 Landscape and Natural Character Types

Landscape Character Types (LCT) help to identify unifying aspects of the landscape and distinguish why one landscape is visually distinct from another.

The identification of Landscape Character for the purpose of this assessment, have been taken from '*Stage 1B2 Papakura to Drury South SH1 - Urban and Landscape Design Framework'* (the *ULDF,* see Appendix C) including:

- Rāngai tuatahi: Settle & trade – Coastal/Urban;
- Rāngai tuarua: Cultivate & harvest – reflecting on a rural productive landscape; and
- Rāngi tuatoru: Observe & defend – reflecting on conservation.

The LCTs are based on cultural and physical landscape qualities as well as land use, as mapped in Figure 4-12 and described in sections 4.2.1 and 4.2.2. 'Rāngai tuatahi' is north of the Study Area and thus not included in this assessment.

Much of the Study Area is outside of the Rural Urban Boundary; and comprise large paddocks used for growing crops, although there are many lifestyle blocks spotted within this area and adjacent Rural – Countryside Living Zone. NoRs 2-5 will encroach into land that is indicatively been identified as 'highly productive' in the AUPOP (Land Use Class 1-3). For further assessment of the Project impacts on 'highly productive' land refer to the Appendix A of the application AEE.

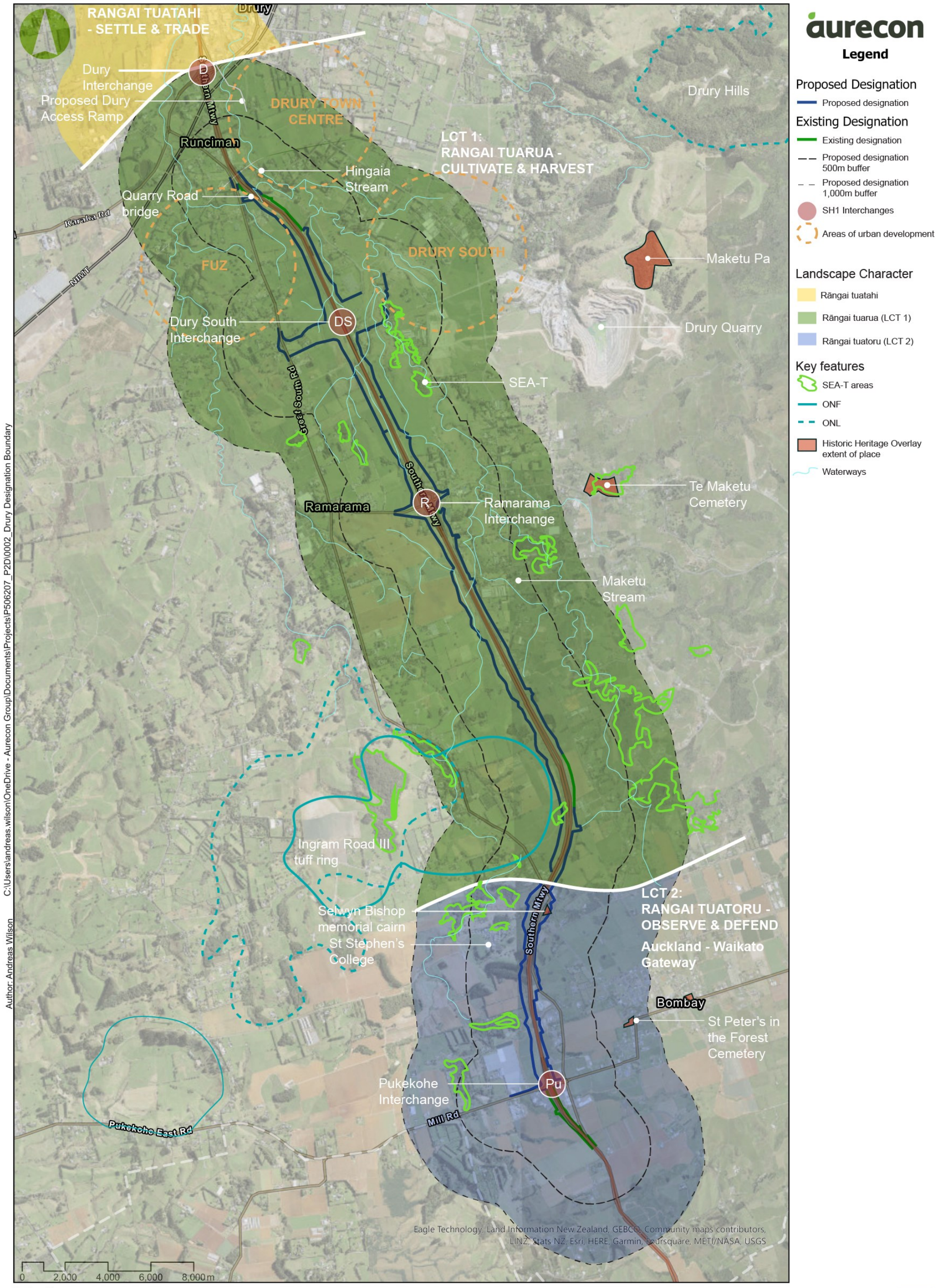


Figure 4-12: Landscape Character Areas and key features

4.2.1 *LCT 1:* Rāngai tuarua – Cultivate & harvest

LCT 1 extends from the Drury Interchange to the bottom of the Bombay Hill (SH1/GSR crossing). Key qualities include:

- Location between Drury Hills and wetlands further to the north (see Figure 4-13);
- Flat plains and gently rolling hills;
- Resource-rich for produce and animal husbandry; and
- ID 59: West Ramarama and Bombay – Hill country cultured nature:

  Attractive sequence of remnant native forest and stream corridors contrasting with surrounding pasture and market gardens, that reinforces the rolling to incised nature of the local rural landscape.

It is expected that areas of the FUZ in Drury will undergo a material change in their character from what is existing. It is likely that the construction of the transport corridor will occur ahead of, or in parallel to, the urbanisation of these areas

Natural features

The hills west of the Pukekura GSR/SH1 crossing, form an area of significance which includes Outstanding Natural Feature (ONF) and Outstanding Natural Landscape (ONL). The landscape significance is described in '*Outstanding Natural Landscapes Overlay and Schedules 7 of the Plan'*, as above. The ONF is *the Ingram Road III tuff ring*, of geological significance.

The area comprises floodplains to the east around Hingaia and Maketū Streams and their tributaries', where land is flatter. The Ngaakaroa Stream flows to the west of SH1. The key waterways within the Study Area of LCT 2 include:

- The **Hingaia Stream** is located outside the NoR 2 and 4 – Section 1 footprint. The stream is separated from the Project area by existing light industrial development. The proposed designation is in very close proximity to this stream, specifically at the corner of Quarry Road (NoR 5) and Great South Road;
- **Ngaakaroa Stream** is situated west, outside the NoR 1-2 footprint. However, it's important to note that the proposed designation comes in very close proximity to this stream, specifically at the corner of Quarry Road and Great South Road. A number of roads intersect this stream through culvert crossings; and
- Maketū Stream is situated outside the NoR 2 footprint, to the east of SH1 and south of Ararimu Road.

Drury Hills and Hunua Ranges (further east) are observed from a wide area, providing a key wayfinding feature, visible from the motorway as well as views towards the east.

There is a high level of modification as a result of agricultural and animal grazing practice, mining resources at the Drury (Stevensons) Quarry and built form from large industrial/commercial buildings to lifestyle blocks with large houses distributed through the zone. There are few areas of unaltered appearance, limited to some patches of trees; including those SEAs and steeper creek valleys that have more abundant vegetation.

Natural character

The Hingaia and Maketu Streams catchment is an important element within the landscape and a noticeable natural attribute for Drury South. It is considered a taonga (treasure) by Mana Whenua. The health of the waterway is directly affected by the health of the tributaries spread from Drury Hills to the east. As such, it is expected that future urban development will be sensitive to the existing hydrological system and follow water sensitive urban design principles.

The existing stream environments are of moderate to low ecological value (refer Ecological Assessment Report – Freshwater ecological value) due to modification by human activity, animal grazing and presence of exotic and pest plant species. There remain some areas of planted native species such as mānuka, kānuka, and cabbage trees. Restoration planting has been undertaken in some waterway sections and continued

restoration is the objective of urban developments within these stream environments. The future environment of the Hingaia Stream floodplain near Quarry Road at Drury South Crossing, is for a public open space which comprises '*riparian enhancement designed to achieve ecological, recreational and cultural benefits, and to reflect traditional pathways through the basin.' (https://www.drurysouthcrossing.co.nz/masterplan-1, November 2023).*

Motorway character

The character of the SH1 motorway corridor takes on that of the adjacent land use, where it is not screened by embankments, being urban-industrial to the north and increasingly urban to the south. Windrows are noticeable both in parallel and perpendicular to the motorway, following the patchwork of agricultural paddocks (Figure 4-14). Transmission towers are also present for much of the corridor running parallel to the motorway, with road lighting and barriers contributing to the road furniture. A narrow grassed median strip runs central to two-lanes in each direction, with a grassed verge on each side of the motorway.

Figure 4-13: Middleground between sea and Drury Hills in the background, Hingaia Stream in the foreground (image: Aurecon, Oct. 2023)

Figure 4-14: Crops on fertile land (image: Aurecon, Oct. 2023)

4.2.2 LCT 2: Rāngi tuatoru – Observe & defend

LCT 2 encompasses the Pukekura/Bombay Hills. Key qualities include:

- Higher ground offering views and views offering a defensive position;
- Inaccessible – steeper hills harder to traverse;
- Resource-rich for tools and inorganic materials; and
- Gateway between Auckland and the Waikato.

Natural character

The area comprises hill country with a patchwork of planted vegetation and remnant native vegetation, contrasting with surrounding pasture and market gardens, that reinforces the rolling to incised nature of the local rural landscape.

Motorway character

Within the SH1 corridor, the gateway character between Auckland and the Waikato, is enhanced through the ascension or descension (depending on direction) of the Pukekura/Bombay Hill. The hill is a landscape marker for being either 'in' or 'out' of the Auckland region, with the colloquial phrase "south of the Bombay Hills" associated with the distinction that New Zealand's largest populated city is to the north and south of the hills where life is more rural.

The adjacent land use is rural with a higher level of vegetation on the hill. A narrow grassed median strip runs central to two-lanes in each direction, with a grassed verge/embankment on each side of the motorway. The road is often within a cutting, with views constrained mostly to within the road corridor. Road lighting to the outside verge and safety barriers to both the central median and outside verge, contribute to the road furniture along the corridor.

Figure 4-15: Pukekura/Bombay Hills (image: Aurecon, Oct. 2023)

Figure 4-16: Views north from Bombay Hill (image: Aurecon, Oct. 2023)

5 Assessment of overall Landscape, Natural Character and Visual Effects

5.1 Landscape and Natural Character Effects

The level of modification to the existing landscape and natural character has been assessed based on the broad effects of the Project as outlined below in Table 5-1 **Error! Reference source not found.**.

Table 5-1: Assessment of LCT effects

Landscape Type	Landscape Character effects	Rationale
LCT 1: Rāngai tuarua – Cultivate & harvest	Low	Proposed change: Widening of SH1, the introduction of the SUP and drainage basins/swales, though of a limited geographical extent across the LCT. The LCT has a moderate ability to absorb the proposed changes due to the extent of modification and natural features comprising modified waterways, a patchwork of SEAs and ONL/ONF: ■ An increase in stormwater treatment and wetlands to the west of SH1 is considered commensurate with the presence of waterways and wetlands to the east, and potential to restore presence of wetlands in a modified landscape. ■ The widening of SH1 and introduction of the SUP is commensurate to the existing conditions, with some beneficial cross corridor connections created at Drury South. ■ There is no modification to the ONL/ONF or disturbance to areas of SEA-T. The Project has a low magnitude of change to Rāngai tuarua.
Natural character – waterways	Low	■ There is a **low** level of modification to a small area of Hingaia Stream and open space area, with an increased amount of infrastructure with the introduction of the Drury South Link Road and bridge. Bridge piers will be located within the floodplain and not within the stream banks. ■ There is limited change to other waterways within the Study Area, with native planting proposed in new wetlands/ stormwater treatment swales, beneficial for the health of waterways. Localised works to existing culverts. The Project has a low magnitude of change to the natural character.
LCT 2: Rāngi tuatoru – Observe & defend	Very Low	Proposed change: Widening of SH1, the introduction of the SUP and drainage basins/swales, though of a limited geographical extent across the LCT. The LCT has a moderate ability to absorb the proposed changes due to the extent of modification and natural features limited to rolling hills, some waterways and historical features. The Project has a **very low** magnitude of change to Rāngai tuarua.

Effects to the landscape character has been assessed for each of the NoR designations, in which particular proposed elements are likely to have temporary or long-term effects. Refer to the following report sections for assessment of:

- Section 7 Stage 2 NoR 1-3 (Alteration to SH1 Designations);
- Section 8 Stage 2 NoR 4 (Shared User Path); and
- Section 9 Stage 2 NoR 5 (Drury South Link Road) assessment of waterway effects (Hingaia Stream).

5.2 Visual Effects

5.2.1 Detailed assessment of representative viewpoints

15 viewpoints were identified for LVA assessment of the Project based on the design, viewing distance, aspect and sensitivity of receptors. The viewpoints are located within a 500m radius of the designation boundary, with the exception of VP4 and VP6 (within 1,000m) due to their elevation. Beyond this area, views of the ramp are unlikely, due to intervening topography, vegetation and built form. Therefore, these viewpoints are considered *worst-case* scenarios for potential visual impacts of the Project. The location of the assessed viewpoints are shown in Figure 5-1- Figure 5-5.

Site photos (18th October and 30th November 2023) of the Project are included from each of the viewpoints. The site photos are of the existing conditions and *do not* demonstrate the baseline conditions which include approved developments (including Drury South). These are used to demonstrate the existing environment and the scale of key elements against those proposed in the Project.

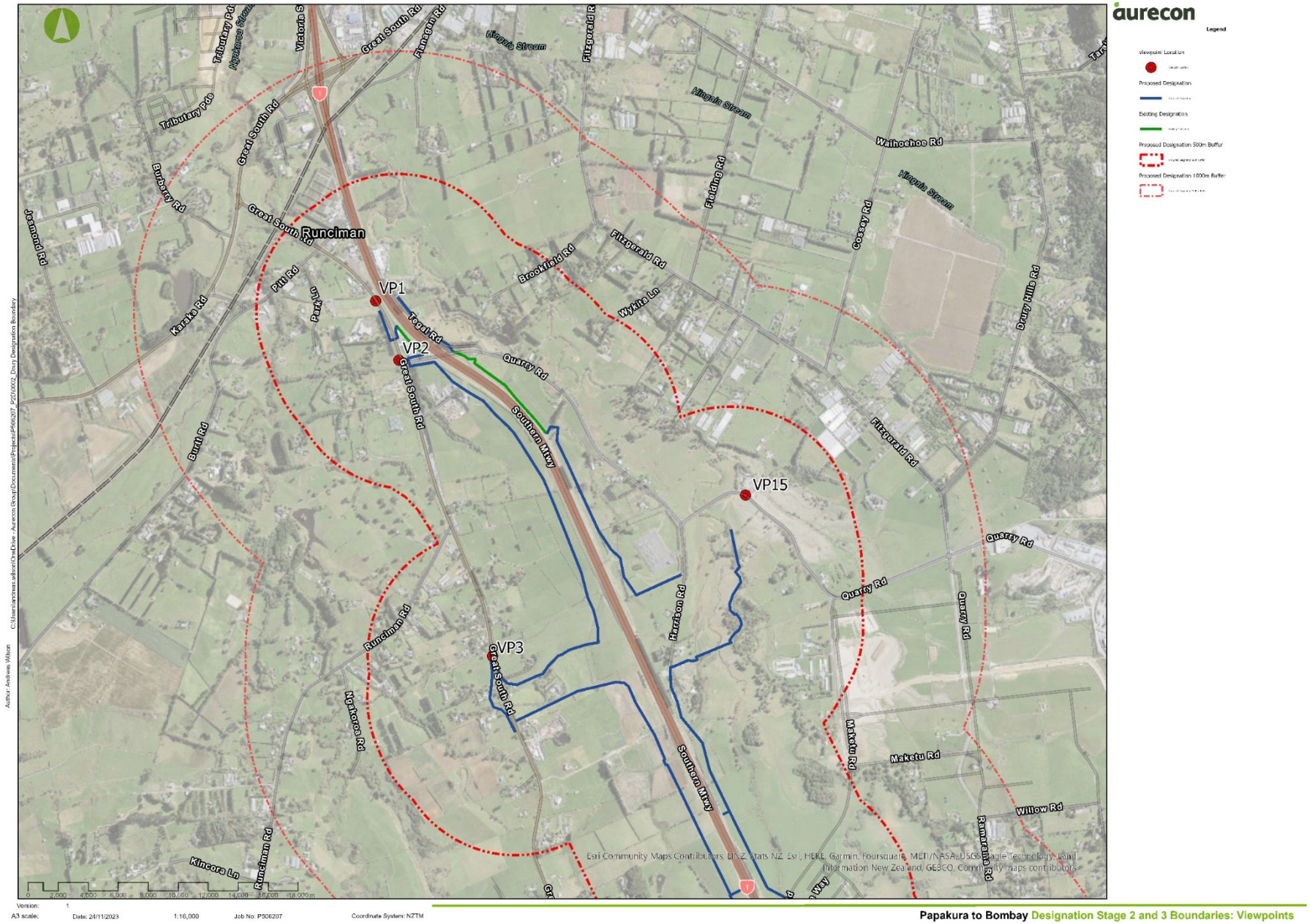


Figure 5-1: Viewpoint locations (1 of 5)

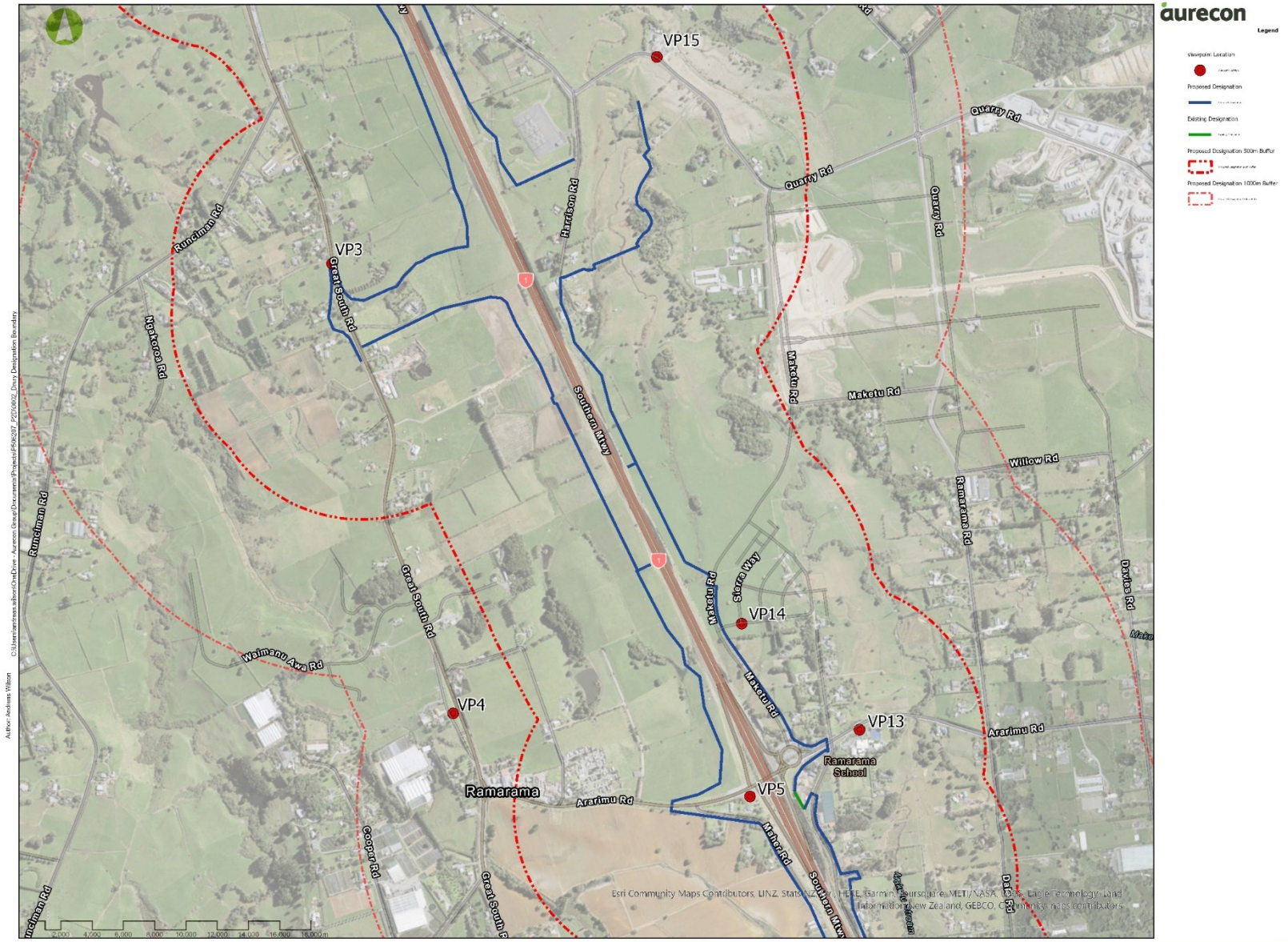


Figure 5-2: Viewpoint locations (2 of 5)

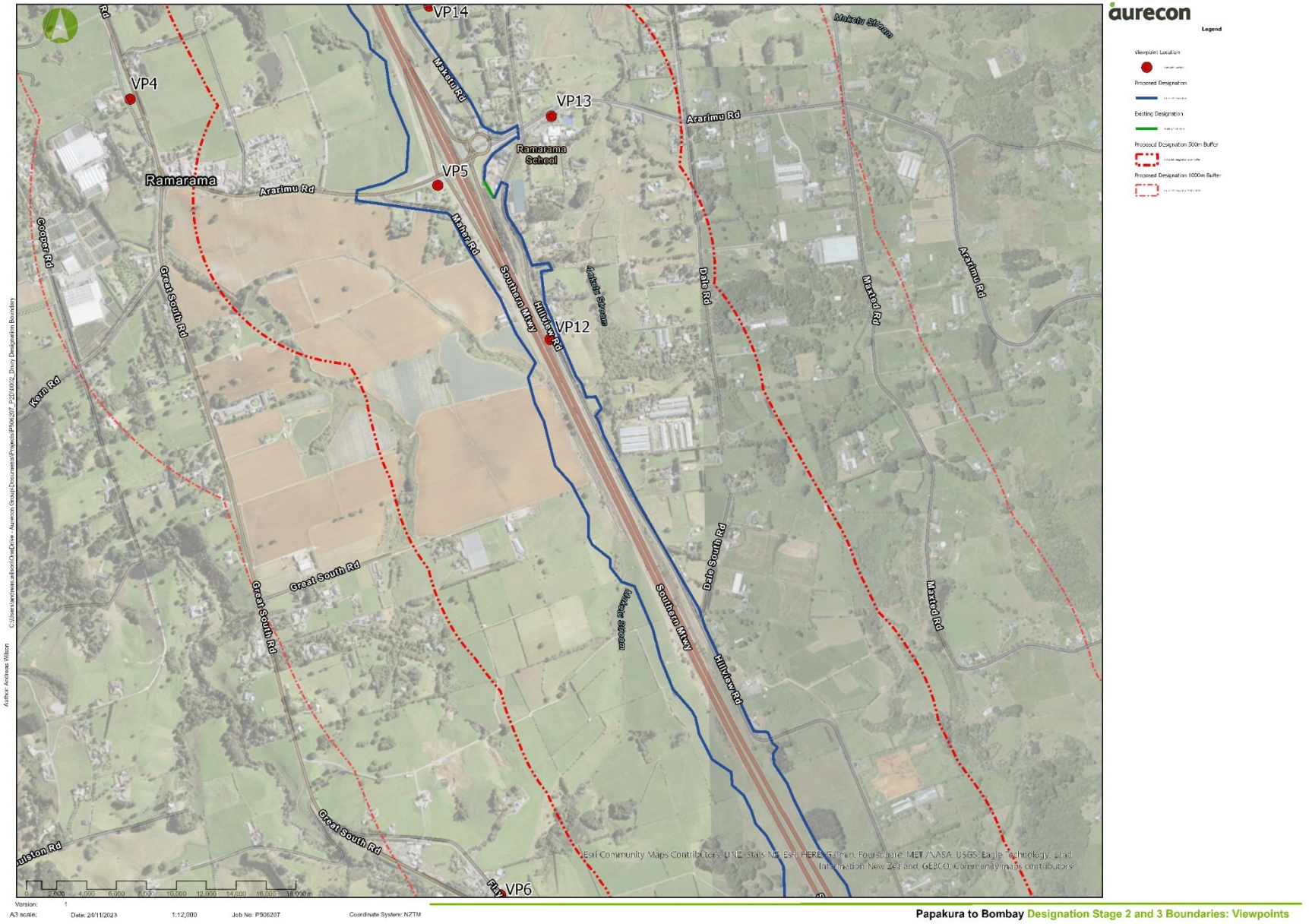


Figure 5-3: Viewpoint locations (3 of 5)

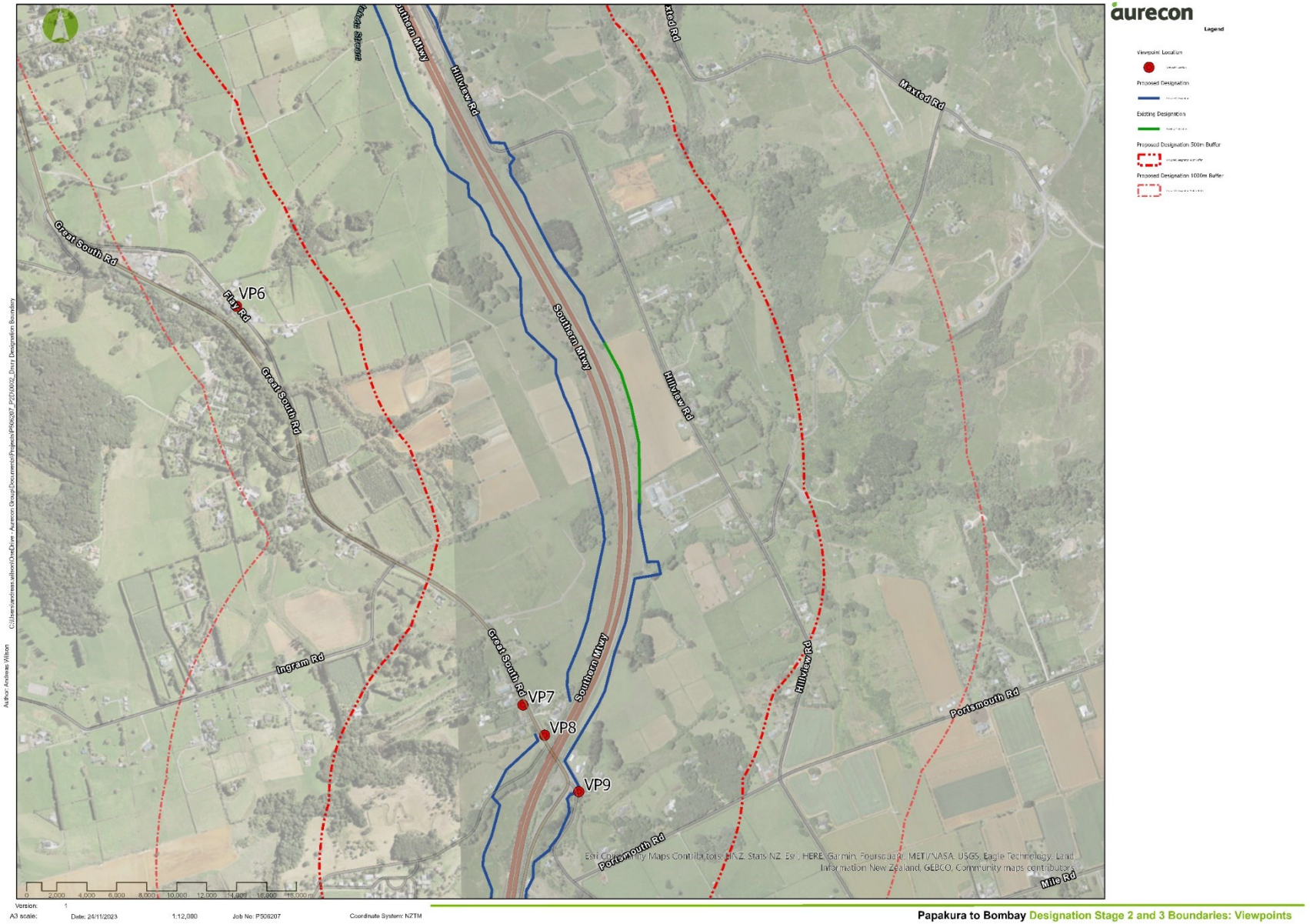


Figure 5-4: Viewpoint locations (4 of 5)

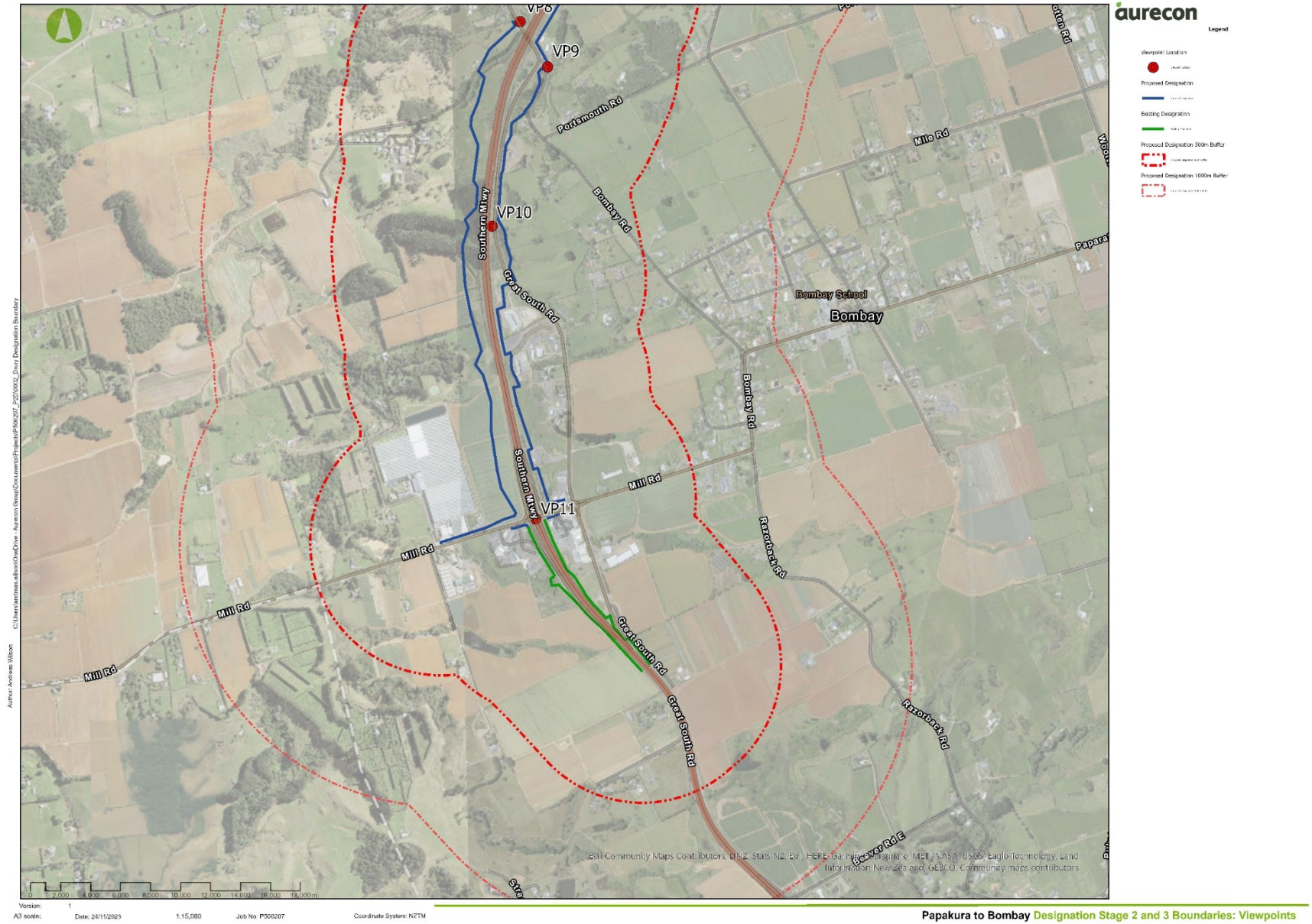


Figure 5-5: Viewpoint locations (5 of 5)

VIEWPOINT 01

600 Great South Road, Runciman

Figure 5-6: Viewpoint 1 existing setting, looking south along GSR (image: Aurecon, October 2023)

Existing setting	The view is representative of residential dwellings and commercial buildings to the west side of Great South Road (GSR). The viewpoint is looking south along GSR and towards SH1 (refer Figure 5-6). GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. At this location, there is a narrow road reserve (43pprox.. 10m) between GSR and SH1 – a four laned motorway. The road reserve is a grassed strip with low bund and comprises farm fencing. North-bound traffic is visible from this location. Views from the adjacent residential large-lots are partially screened towards SH1, with existing perimeter vegetation to the perimeter of private properties located to the west side of GSR.	
Future land use	Future Urban Zone	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (43pprox.. 40m from north-bound lane on SH1)	
Visual Modification Level		
Viewpoint discussion	The Project will comprise a third north-bound lane to this west side of SH1 and an SUP. The SUP will be within the existing grassed road reserve to the viewpoint foreground, reducing the width of the existing road reserve.	
Construction Visual Effects	**LOW** Construction work will be noticeable to local workers and residents, comprising some earthworks and civil works. Due to existing presence of road traffic and infrastructure, this is considered a low level of visual modification from the baseline conditions.	
Operational Visual Effects (at year 1 of operation)	**LOW** The slight widening of the road corridor and introduction of an SUP will be noticeable to travellers and adjacent residents, however, does not contrast greatly to the existing setting where road infrastructure in prominent in the foreground. The level of visual effect is considered Low.	

VIEWPOINT 02

Quarry Road and Great South Road intersection, Runciman

Figure 5-7: Viewpoint 2 existing setting, looking east at GSR/Quarry Road intersection (image: Aurecon, October 2023)

Existing setting	The view is representative of residential dwellings to the west side of GSR and light industry located around the Quarry Road intersection. The viewpoint is looking east along Quarry Road, which rises for a bridge across SH1 (refer Figure 5-7). GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. Quarry Road connects to the east side of SH1 and to Drury South. From the intersection, the wide road surfaces, road barriers and overhead powerlines and poles are within the foreground, with light industry and depots to either side of the intersection. The bridge over SH1 is not apparent, with the road rising gently. Drury Hills are visible in the background of the view.	
Future land use	Future Urban Zone	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (44pprox.. 170m from top of ramp)	
Visual Modification Level		
Viewpoint discussion	The Project will comprise a third north-bound lane to this west side of SH1. The Project does not include works to the existing overbridge. The SUP will be within the existing SH1 road reserve and traversing under Quarry Road, with a SUP connection to the south side of Quarry Road.	
Construction Visual Effects	**LOW** Construction work will be noticeable to local workers and residents, comprising some earthworks and civil works. Due to existing presence of road traffic and infrastructure, this is considered a low level of visual modification from the baseline conditions.	
Operational Visual Effects (at year 1 of operation)	**VERY LOW** There is a slight separation from GSR, with the Project being screened by a light industrial business. The Project will form a limited component of the wider scene. The level of visual effect is considered Very Low.	

VIEWPOINT 03

1220 Great South Road, Runciman

Figure 5-8: Viewpoint 3 existing setting, looking southeast from GSR (image: Aurecon, October 2023)

Existing setting	The view is representative of residential dwellings on large lots to the east and west sides of GSR. There is also some light industry nearby in the presence of a 'Ignition Firewood', as well as some large farming sheds and planted paddocks. The viewpoint is looking southeast along GSR from a slightly elevated position, with SH1 down to the left of the viewpoint (refer Figure 5-8). GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. Overhead powerlines are located to the east side of GSR. In the foreground, shrub hedgerows line the edge of properties parallel to GSR, with tall tress present along private driveways; limiting outward and long-distance views. Private property fences and gates (some visually permeable and some solid), are regularly present 45pprox.. 3-4m back from the side of the road. The dwellings typically have high level of surrounding planted gardens and trees. The land surrounding the houses is used for agricultural crops and some animal grazing, amongst gently rolling hills. Drury Hills are occasionally visible to the east, between planted trees, in the background views.
Future land use	Rural living The viewpoint location is a short distance from the end of the Future Urban Zone
Viewing context	Duration of view: static Viewing angle: perpendicular
Viewing distance (m)	Foreground (45pprox.. 120m north of proposed intersection)
Visual Modification Level	
Viewpoint discussion	The Project will comprise a roundabout connecting GSR to the Drury South Interchange at SH1. The roundabout will be within the foreground view of the viewpoint and required some property acquisition with road widening and SUP. There will be some localised removing of vegetation. As the land falls toward the east and SH1, embankments will mound up to the level of the new interchange road.
Construction Visual Effects	**LOW – MODERATE** Construction work will be noticeable to local residents, comprising localised vegetation removal, earthworks and civil works. The construction works and introduction of new route, is noticeable change to residents in regard to scale and geographical extent. The contrast to the visual amenity near to a future urban zone is considered a low-moderate level of visual modification.
Operational Visual Effects (at year 1 of operation)	**LOW** The introduction of a roundabout and connecting road in this location is a noticeable change to rural residents. However, the level of modification near to a future urban zone with increased housing and activity, is considered low.

VIEWPOINT 04

Loop Road look southeast along GSR

Figure 5-9: Viewpoint 4 existing setting, looking southeast from Loop Road parallel to GSR (image: Aurecon, October 2023)

Existing setting	The view is representative of residential dwellings on large lots along GSR. There is also some light industry (mechanical and plumbing workshops) to the corner of Ararimu Road (c.200m to the south), as well as some large agricultural/horticultural sheds and planted paddocks. The viewpoint is looking southeast along GSR (refer Figure 5-9). GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. Overhead powerlines are located to the east side of GSR. In the foreground, the grassed embankment of Loop Rd is a few meters above GSR. This is an access road to private driveways, with dwellings having established gardens enclosing properties and their views. The land surrounding the houses is used for agricultural crops, horticulture and some animal grazing, amongst gently rolling hills. Pukekura Hills are partially visible to the south, in the background views.	
Future land use	Rural living	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (46pprox.. 900m from Ararimu Road/GSR intersection)	
Visual Modification Level		
Viewpoint discussion	The Ramarama interchange is the closest Project works to VP4, comprising a new roundabout and SUP connections next to SH1 with existing on/off-ramps.	
Construction Visual Effects	**NO EFFECT** There is likely to be a temporary increase in construction traffic along GSR, however this is considered commensurate with local light industry traffic and existing construction traffic already present. Therefore there is no increase to visual effects experienced during construction.	
Operational Visual Effects (at year 1 of operation)	**NO EFFECT** The Ramarama interchange is screened by intervening topography and vegetation, with no views of the Project experienced by residents at this viewpoint.	

VIEWPOINT 05

Ararimu Road, Ramarama

Figure 5-10: Viewpoint 5 existing setting, looking east from Ararimu Road (image: Aurecon, October 2023)

Existing setting	The view is representative of residential dwellings at Ararimu Road and Maher Rd. It is a short distance from SH1 and the Ararimu Rd bridge over to the east. The viewpoint is looking northeast towards the SH1 overbridge and motorway ramps (refer Figure 5-10). In the foreground, SH1 south-bound off-ramp and on-ramp junctions with Ararimu Road. The road and ancillary signage, barriers and light poles are prominent. HV towers are visible to the north middleground, with overhead line in the foreground parallel to SH1. SH1 is in a cutting and is not visible from this viewpoint, with intervening vegetation parallel to the motorway. The dwellings on Maher Rd have established vegetation surrounding the property, with partial views toward the Ararimu Rd and SH1. The surrounding land to the west to north, is used for agricultural crops and gently sloped. Views to the east of SH1 in the middleground, comprise trees, with Drury Hills rising above in the background.	
Future land use	Rural living	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (47pprox.. 60m southwest of Ararimu Road overpass at SH1)	
Visual Modification Level		
Viewpoint discussion	Ramarama interchange will be in the foreground of the viewpoint. A new 2-laned bridge over SH1 will be slightly further north of the existing alignment, with an SUP to the south side. The SH1 on-ramp and Ararimu Road junction is realigned further to the north, to tie in with the new bridge. The SUP will cross over Ararimu Rd from the south, with the SUP alignment continuing south and connecting over the off-ramp to the overbridge. The SUP is positioned lower than the road alignment, and below the position of the viewpoint with landscaped embankments to either side. Retaining wall will be positioned to the west side of the SUP, parallel to the SH1 off-ramp.	
Construction Visual Effects	**MODERATE** Construction works will comprise some vegetation removal parallel to the off-ramp, earthworks, building a retaining wall, civil road and bridge works. This will be experienced in foreground views by one residential dwelling and from the community hall, and will be noticeable to three dwellings on Maher Rd. The scale of works is considered a noticeable change for residents, with a moderate level of adverse visual modification.	
Operational Visual Effects (at year 1 of operation)	**LOW** The Project comprising new roundabout, realigned roads and bridge will be commensurate with the foreground road infrastructure, and further away from the dwelling and community hall. The SUP is a new element within the environment, and although it increases the width of transport infrastructure, it is softened through adjacent planted embankments. This is considered a low level of adverse visual effects.	

VIEWPOINT 06

65 Flay Road, Ramarama

Figure 5-11: Viewpoint 6 existing setting, looking east from Flay Road (image: Aurecon, October 2023

Existing setting	The view is representative of residential dwellings on large lots at Flay Road. The viewpoint is looking east from Flay Road (refer Figure 5-11) and is slightly elevated, looking down in the direction of SH1. In the foreground, surrounding the houses, are rolling hills used for crops and animal grazing. Paddocks have shrub and tree hedgerows. The scene is rural, with some other houses spotted around the environment.	
Future land use	Rural living	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (48pprox.. 850m west of SH1 north-bound lane)	
Visual Modification Level		
Viewpoint discussion	The Project works are surrounding SH1 which are to the east of the viewpoint. Views of SH1 are potentially partially visible from dwellings, between hills, however at approximately 800m, are unlikely to be noticeable.	
Construction Visual Effects	NO EFFECT Construction works are of a distance that will not be noticeable and obscured by intervening topography and vegetation. Construction routes are not within foreground views.	
Operational Visual Effects (at year 1 of operation)	**NO EFFECT** SH1 is not visible from this viewpoint, therefore Project effects will also not be visible. This are no visual effects experienced by residents near to VP6.	

VIEWPOINT 07

1823 Great South Road, Pukekura

Figure 5-12: Viewpoint 7 existing setting, looking east from Flay Road (image: Aurecon, November 2023)

Existing setting	The view is representative of residential dwellings on large lots to the east and west sides of GSR. The SH1 bridge over GSR is visible in the middleground to the right of the image. The viewpoint is looking southeast along GSR (refer Figure 5-12). GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. Overhead powerlines are located to the east side of GSR. In the foreground, shrub hedgerows line the edge of properties parallel to GSR, with tall trees present along private driveways; limiting outward and long-distance views. Private property fences and gates (some visually permeable and some solid), are regularly present 3-4m back from the side of the road. The dwellings typically have high level of surrounding planted gardens and trees limiting outward views. The SH1 bridge spans over GSR in the middleground, largely screened by foreground trees. The land surrounding the houses is used for agricultural crops and some animal grazing, amongst gently rolling hills.	
Future land use	Rural living	
Viewing context	Duration of view: static	Viewing angle: perpendicular
Viewing distance (m)	Foreground (100m west of SH1 overbridge)	
Visual Modification Level		
Viewpoint discussion	The Project will comprise an elevated SUP bridge to the foreground of the existing SH1 bridge over GSR. The SUP will ramp up to bridge level, at the rear of the residential properties (x2) to the north (left of image), sharing a boundary with SH1. There are existing trees within the Project designation boundary, parallel to SH1. At least six (6) of the more significant, Notable, London Plane trees within 1832 Great South Road, require removal to form the batter.	
Construction Visual Effects	**MODERATE** The design will involve the re-alignment of the existing driveway and the removal of approximately 34 of the notable trees. The removal of existing trees parallel to SH1 and to the tree-lined driveway of St Stephen's School, will make the motorway and SUP more noticeable and reduce the visual amenity. The tree removal will expose views of the elevated SH1 road infrastructure, and the temporary construction works including earthworks, bridge works and installation of the SUP Construction works will be a temporary adverse moderate visual effect.	
Operational Visual Effects (at year 1 of operation)	**MODERATE** The introduction of the elevated SUP and visibility of SH1 is a noticeable compositional change to this viewpoint. The resident closest to the works will have motorway vegetation screening removed, with little space to replace like for like. Other residents will have a barely noticeable change in their view due to perimeter vegetation screening views. The elevated SUP forms a visible and recognisable new element within the overall scene, and reduced landscape amenity with the removal of trees. The visual effect is considered moderate adverse.	

VIEWPOINT 08

St Stephen's School driveway, Great South Road

Figure 5-13: Viewpoint 8 existing setting, looking towards the school driveway (image: Aurecon, November 2023)

Existing setting	The view is representative of St Stephens School driveway (private access) located to the right of the viewpoint, framed by large Plane trees. The SH1 bridge over GSR is visible in the foreground to the left of the image. The viewpoint is looking south along GSR (refer Figure 5-13). The school is currently closed (since the year 2000 – see Section 4.1.5), however it is possible for it to be reopened. GSR is a prominent two-laned arterial road connecting Pukekura through to Epson. As such, it is regularly used by local traffic including light industry trucks and commuting cars. Overhead powerlines are located to the east side of GSR. In the foreground, an avenue of London Plane trees (see Ecology report), are located either side of the school driveway, as well as on the batter within the road reserve parallel to SH1. The Plane trees screen views of SH1 bridge, with bridge columns and abutments visible to the side of GSR. There is no pedestrian pathway along GSR or beneath the bridge, and the road verge is narrow. The land surrounding school entry is used for agricultural crops and some animal grazing, with several residential dwellings located along GSR.	
Future land use	SUZ	
Viewing context	Duration of view: dynamic	Viewing angle: parallel
Viewing distance (m)	Foreground (50pprox.. 100m west of SH1 overbridge)	
Visual Modification Level		
Viewpoint discussion	The row of London Plane trees currently growing directly adjacent to the northern side of SH1 within the road reserve will require removal, however trees to the north side of the existing driveway are retained. Furthermore, the re-alignment of the St Stephen's School driveway will likely require further tree removals through the central section for the re-alignment of the driveway, where it ties back in with the existing. Replacement trees will be provided along the realigned driveway to reinstate the avenue of trees to the entrance of St Stephen's School. Native vegetation is to be planted to the embankment between SH1/ SUP and the realigned driveway. The SUP will be visible parallel to SH1 above a steep batter and an access ramp will connect to GSR, providing an active-mode path beneath SH1 bridge and connecting to Bishop Selwyn memorial reserve to the east. A drainage basin is proposed to the southeast side of SH1, that will be visible from the realigned St Stephens School driveway.	
Construction Visual Effects	**MODERATE-HIGH** The removal of London Plane trees in the foreground will be an adverse visual effect to visitors of the school, nearby residents and motorists on GSR. The tree removal will expose views of the elevated SH1 road infrastructure, and the temporary construction works including earthworks, bridge works and installation of the SUP. Trees behind SH1 will become visible. Additionally, the removal and reduction of London Plane trees, of similar age and appearance, along the driveway will reduce the visual amenity through the loss of symmetry. The temporary visual effect is considered moderate-high adverse.	
Operational Visual Effects (at year 1 of operation)	**LOW** The introduction of the elevated SUP , as well as the widened SH1 bridge will be commensurate in scale to the existing road infrastructure, however the views will be partial due to remaining London Plane trees, new replacement trees and juvenile planting on the embankment. The realignment of St Stephen's School driveway and reinstatement of the avenue of trees will restore the formal character and high visual amenity of the entry. However, a reduction of visual amenity is still considered due to loss of symmetry. The visual effect is considered low adverse.	

VIEWPOINT 9

Corner Great South Road and Bombay Road

Figure 5-14: Viewpoint 9 existing setting, looking southwest from GSR near underpass with SH1 (image: Aurecon, October 2023

Existing setting	The view is representative of residential dwellings on large lots, at the intersection of GSR with Bombay Road. The viewpoint is looking west towards SH1, with the Bishop Selwyn memorial reserve to the left of the panorama (refer Figure 5-14). The Bishop Selwyn Memorial Cairn (historic monument) is located in the reserve, between SH1 and GSR (far left of image). The reserve is a historic site with the Bishop Selwyn Cairn, notable trees including a grove of Puriri and two Norfolk Island Pines. However, the reserve is not of high visual or recreation value due to the proximity to the motorway. Dwellings to the right of views (35 Great South Road and 3 Bombay Road) have partial views to the northwest towards SH1, and background views comprising rolling hills and vegetation. The SH1 bridge spans over GSR in the foreground, partially screened by foreground trees.
Future land use	Rural living
Viewing context	Duration of view: static Viewing angle: parallel
Viewing distance (m)	Foreground (51pprox.. 120m east of SH1 overbridge)
Visual Modification Level	
Viewpoint discussion	The Project will comprise widening of the existing SH1 bridge over GSR to the east (closest) side and introduction of an SUP to the west (far) side of the viewpoint. No works are proposed within the Selwyn memorial reserve (heritage extent of place). There are existing trees within the Project designation boundary, to the west (far) side SH1 which are likely to be removed for civil construction and embankment earthworks.
Construction Visual Effects	**LOW** The removal of existing trees to the north side (far side of viewpoint) of SH1 will reduce some visual amenity, with the elevated motorway becoming more apparent. Trees to the foreground of the viewpoint, including those notable trees within Bishop Selwyn memorial reserve, are untouched. Construction works including vegetation removal, earthworks and bridge/road widening will be a noticeable temporary adverse low visual effect.
Operational Visual Effects (at year 1 of operation)	**LOW** The Project is commensurate with the existing motorway; however it is recognised that there will be a temporary reduced landscape amenity with the removal of trees in the middleground. The visual effect is considered low adverse.

VIEWPOINT 10

Top of Pukekura Hill, SH1/Great South Road

Figure 5-15: Viewpoint 10 existing setting, looking north from GSR parallel to SH1 (image: Aurecon, October 2023

Existing setting	The view is representative of motorists on SH1 and GSR. The viewpoint is near to the top of Pukekura/Bombay Hill and has long-range views north and gateway views of Auckland for visitors travelling from the south (refer to Figure 5-15). GSR and SH1 are parallel to each other at this location, separated by a steep landscaped embankment and road barriers. St Stephen's School (historic building) is visible in the middleground (to the west) and Drury Hills starting to the east. The background comprises rolling hills and vegetation and increasing built structures over a wide-spread area.	
Future land use	Strategic transport corridor	
Viewing context	Duration of view: dynamic	Viewing angle: parallel
Viewing distance (m)	Foreground (52pprox.. 10m from existing SH1 south-bound lane)	
Visual Modification Level		
Viewpoint discussion	The Project will comprise widening of the motorway to accommodate threes lanes in each direction, and an SUP on the west (far) side of the viewpoint. Earthworks will be undertaken mainly to the west side, creating embankments and a drainage swale. Landscaping including swale vegetation and tall revegetation will occur, mostly to the west side of SH1. The view is experienced by motorists at speeds up to 100km/hr on SH1 and 80km/hr on GSR, therefore the visual experience captures a broader scene and rhythm of elements.	
Construction Visual Effects	**LOW-MODERATE** The construction works will undertake some vegetation removal and earthworks to shape embankments, supporting a widened road corridor and addition of the SUP. The works will be noticeable to motorists and have a temporary low-moderate adverse visual effect.	
Operational Visual Effects (at year 1 of operation)	**LOW** The introduction of a widened motorway within the hill cutting, does not contrast to the existing scene. The drainage swale and SUP to the west side will be a limited component of a wider scene and make little difference to the overall scene, resulting in a low visual effect.	

VIEWPOINT 11

Mill Road/SH1 overbridge, Pukekura

Figure 5-16: Viewpoint 11 existing setting, looking north from Mill Road overbridge (image: Aurecon, October 2023

Existing setting	Representative of commercial properties (service stations, truck stops and fast-food outlets) and its users at the Pukekura Interchange at Mill Road. The receptors are typically visitors and motorists making use of the retail and convenience facilities close to the motorway. The view looks north above SH1 from the overbridge (refer Figure 5-16). Views of SH1 are not visible from adjacent areas due to the motorway containing within a cutting and surrounding by vegetated embankments. Roads including, motorway ramp connections to the west of SH1 and a roundabout connecting to GSR to the west, are prominent, along with single story commercial buildings.	
Future land use	Rural living	
Viewing context	Duration of view: dynamic	Viewing angle: perpendicular
Viewing distance (m)	Foreground (view to centre of SH1)	
Visual Modification Level		
Viewpoint discussion	The Project comprises a widened/reconfigured overbridge to accommodate an SUP to the north and south sides of the bridge. The SUP will continue west to the GSR roundabout and to the east, connecting to the SUP parallel to SH1. The introduction of the SUP will include crossing points at Mill Road level, at on/off ramp junctions. To the northwest of SH1 there will be a drainage swale located between SH1 and the slightly elevated SUP.	
Construction Visual Effects	**LOW – MODERATE** Temporary construction works including installation of an SUP bridge will be noticeable to motorists and users of commercial outlets, however this is considered commensurate with civil road works often experienced on roads. The construction effects are a temporary low-moderate visual effect for visitors.	
Operational Visual Effects (at year 1 of operation)	**LOW** The introduction of the SUP is an extension of the existing road infrastructure. The SUP parallel to the SH1 will be noticeable to on-ramp motorists, however it is not considered a noticeable contrast set amongst existing paddocks, due to its surface profile. The Project will make little difference to the overall scene, with low adverse visual effect.	

VIEWPOINT 12

55 Hillview Road, Ramarama

Figure 5-17: Viewpoint 12 existing setting, looking south from Hillside Road parallel with SH1 (image: Aurecon, October 2023

Existing setting	The viewpoint is representative of residential dwellings to the east side of Hillview Road, motorists and trail walkers – the road is part of the Te Araroha Trail. The view looks northwest along SH1 (see Figure 5-17). The residential dwellings in the surrounding area are on large lots and have a substantial amount of planted vegetation to the property, limiting outward views. The land surrounding the houses is used for agricultural crops and some animal grazing, amongst gently rolling hills. SH1 is flanked by steep grassed embankments, within a low hillside cutting, with not background views. HV towers and overhead lines run parallel to the motorway to the west side.
Future land use	Rural living
Viewing context	Duration of view: static Viewing angle: parallel
Viewing distance (m)	Foreground (54pprox.. 20m west of existing SH1 south-bound lane)
Visual Modification Level Viewpoint discussion	The Project will comprise widening of the motorway to accommodate three lanes in each direction, and an SUP on the west (far) side of the viewpoint. Earthworks will be undertaken mainly to the west side, creating embankments and a drainage swale. There is potential for a retaining wall to be placed on the east side of the motorway in the foreground of the viewpoint, due to widening on the east side.
Construction Visual Effects	**LOW** The construction works will undertake earthworks to shape embankments, supporting additional width for the road corridor and addition of the SUP. The works will be noticeable to motorists, however their views of works with remain screened by existing vegetation surrounding residents. The temporary visual effects are considered low adverse.
Operational Visual Effects (at year 1 of operation)	**VERY LOW** The introduction of a wider motorway does not contrast to the existing scene. The drainage swale and SUP to the west side, as well as the foreground retaining wall, will be limited components of a wider scene and make little difference, resulting in a very low visual effect.

VIEWPOINT 13

Ramarama School, Ararimu Road – east

Figure 5-18: Viewpoint 13 existing setting, looking west from Ararimu Road outside of Ramarama School (image: Aurecon, October 2023

Existing setting	The view is representative of Ramarama school and nearby residential dwellings. It is a short distance from SH1 and the Ararimu Rd bridge over to the west. The viewpoint is looking west towards the SH1 overbridge and motorway ramps (refer Figure 5-18). In the foreground is school parking and a vegetated embankment to the left (south), to which the school is located at a slightly elevated position. The school has perimeter trees and vegetation, limiting outward views. To the right (north) of Ararimu Road the land falls gently to some private residential properties on large lots. The road and ancillary signage, light poles and overhead powerlines are noticeable in the foreground. In the middleground is the Ramarama/SH1 ramp roundabout. SH1 is in a cutting and is not visible from this viewpoint, with intervening vegetation to the foreground.	
Future land use	Rural living	
Viewing context	Duration of view: dynamic	Viewing angle: perpendicular
Viewing distance (m)	Foreground (55pprox.. 300m east of existing SH1 south-bound lane)	
Visual Modification Level		
Viewpoint discussion	Ramarama interchange is in the middleground of the viewpoint. The Project (to the east side of SH1) comprises widening of the existing SH1 overbridge to accommodate an SUP. The SUP will ramp down and cross under the south-bound off-ramp, Ararimu Rd and the on-ramp, to continue connect in with paths on Ararimu Rd and Maketu Dr.	
Construction Visual Effects	**LOW** Construction work will be noticeable to school attendees and nearby residents, comprising some civil works and some construction traffic. Due to existing presence of road traffic and infrastructure, this is considered a low level of visual modification from the baseline conditions.	
Operational Visual Effects (at year 1 of operation)	**VERY LOW** The Project is of a distance with intervening screening vegetation, with views of the Project forming a limited component of the wider scene, and not contrasting the existing road infrastructure. The level of visual effect is considered Very Low.	

VIEWPOINT 14

John Main Drive/Sierra Way, Ramarama (new sub-division)

Figure 5-19: Viewpoint 14 existing setting, looking west from John Main Drive, Ramarama (image: Aurecon, October 2023

Existing setting	The viewpoint is representative of residential dwellings within a new sub-division off Maketū Drive. The viewpoint is looking west towards SH1, two houses up from Maketū Drive (see Figure 5-19). The foreground setting comprises single-storey dwellings on small lots, with perimeter fencing. There is no intervening vegetation, with low grasses and juvenile street trees. The sub-division was undergoing building works during the field visit (October 2023). The housing is on flat or gently sloping land. Middleground views comprise a low planted embankment alongside SH1. Traffic is noticeable from the viewpoint. Background views are of a planted windrow tot eh west side of SH1.
Future land use	Future Urban Zone
Viewing context	Duration of view: static Viewing angle: perpendicular
Viewing distance (m)	Foreground (56pprox.. 140m from SH1 south-bound lane)
Visual Modification Level Viewpoint discussion	The Project will comprise widening of the motorway to accommodate three lanes in each direction, and an SUP on the west (far) side of the viewpoint. Earthworks will be undertaken, forming a steeper embankment and a drainage swale further to the north (right) of the viewpoint.
Construction Visual Effects	**LOW** The construction works will undertake earthworks to shape embankments, supporting additional width for the road corridor. The construction of the SUP is to the far of the motorway from this viewpoint. The works will be noticeable to residents, more so to those directly facing the motorway and already subject to views of motorway traffic. The temporary visual effects are considered low adverse.
Operational Visual Effects (at year 1 of operation)	**NO EFFECT** The introduction of a wider motorway does not contrast to the existing scene. It is acknowledged that shaping of embankment and replanting will take some time to establish the vegetation, however this is a temporary effect and there are no visual effects as a result of the Project.

VIEWPOINT 15

Quarry Road, Drury

Figure 5-20: Viewpoint 15 existing setting, looking west from John Main Drive, Ramarama (image: Aurecon, October 2023

Existing setting	The viewpoint looks southwest towards SH1, across land which is undergoing 'Drury South Crossing' earthworks (viewpoint is to the front of the construction zone depot). The area is undergoing urbanisation with earthworks in progress as evident in Figure 5-20. Land use will comprise commercial and light industry, with public open space/stormwater management occurring along the Hingaia Stream corridor and flood plain (in accordance with 1410 Drury South Industrial Precinct) The viewpoint is representative of the most sensitive future use receptors, which will be users of the public open space along Hingaia Stream. The open space is proposed to comprise '*a unique wetland environment'* with pedestrian and shared path network through *'an open meadow environment'* and '*restoration and enhancement of the Hingaia and Maketū Streams'* (Drury South Crossing Masterplan). The creek has existing vegetation (mostly exotic) in embankments as visible from the viewpoint in the middleground. Ballards bridge crosses the creek along Quarry Road to the west of the viewpoint (refer Figure 4-5). To the background HV towers connect to a substation which is located approximately 150m east of SH1.
Future land use	Light industrial and Open Space (Hingaia Stream corridor)
Viewing context	Duration of view: dynamic Viewing angle: perpendicular
Viewing distance (m)	Foreground (57pprox.. 180m north of proposed Drury South Interchange/Quarry Road intersection)
Visual Modification Level	
Viewpoint discussion	The viewpoint is near to where the Drury South Interchange will connect with Quarry Road / Maketū Road. An intersection with realigned Maketū Road will be located to the right of the viewpoint, with bridge over Hingaia Stream and floodplain to the west (centre of viewpoint), connecting to Drury South Interchange south of existing substation (middleground). The proposed long-span bridge will have approximately 5m headroom above ground level at its highest point. Either side of the bridge, steep embankments will connect from the ground to road level. The presence and positioning of the road and bridge will be prominent in the future environment, comprising a recreational open space.
Construction Visual Effects	**MODERATE** The construction of the link roads would occur after future development and public open space is completed. The construction would be experienced by recreational users of the open space and local workers using the adjacent roads. The construction is likely to interrupt public open space use, however it is acknowledged that the Link Road sits between a highly modified environments and connects from Drury South Interchange at SH1 and the future Drury South residential and light industry zones. The temporary construction visual effects are considered moderate adverse.
Operational Visual Effects (at year 1 of operation)	**MODERATE** A bridge over Hingaia Stream and surrounding public open space, will be a visible and recognisable element in the scene, however its elevation allows for continuity of the creek, surrounds and public accessibility. As per the construction effects, the completed bridge will be a noticeable new element between highly modified environments, traversing over the Hingaia Stream and low-lying floodplain, used as public open space. The visual effect is considered moderate adverse.

5.2.2 Summary of viewpoint assessment

The following Table 5-2 provides a summary of the visual effects from representative viewpoints during construction and operation, before recommended mitigation measures:

Table 5-2: Summary of visual effects

Viewpoint	Representative user	Location	Construction visual effects	Operational visual effects (at year 1)
VP1	Residential	600 Great South Road, Runciman	Low	Low
VP2	Residential	Quarry Road/Great South Road intersection	Very Low	Very Low
VP3	Residential	1220 Great South Road, Runciman	Low – moderate	Low
VP4	Residential	Loop Road, Runciman	No Effect	No Effect
VP5	Residential	Ararimu Road (west), Ramarama	Moderate	Low
VP6	Residential	65 Flay Road, Ramarama	No effect	No effect
VP7	Residential	1823 Great South Road, Pukekura	Moderate	Moderate
VP8	School	St Stephen's School driveway	Moderate	Low
VP9	Residential	35 Bombay Road, Bombay	Low	Low
VP10	Motorists	Top of Pukekura Hill, Bombay	Low	Low
VP11	Commercial	Bombay Interchange , Mill Road/SH1, Bombay	Low – moderate	Low
VP12	Residential	55 Hillview Road, Ramarama	Very Low	No effect
VP13	Residential/ Community	Ramarama School	Very Low	No effect
VP14	Residential	John Main Drive/Sierra Way, Ramarama	Low	No Effect
VP15	Recreational	Hingaia Stream public open space, Quarry Road, Drury	Moderate	Moderate

The temporary visual effects of Project during construction phase include:

- More than minor visual effects:

  VP5: due to the construction of Ramarama Interchange near to residential properties on Maher Road;

  VP7: due to vegetation removal and construction an elevated SUP adjacent residential property on Great South Road;

  VP8: removal of Notable London Plane trees which are of high landscape and amenity value, associated with St Stephen's School; and

  VP15: extensive construction works of Drury South Link Road, within open space corridor.

- Minor visual effects:

VP3: introduction of Drury Interchange link road; and

VP11: due to removal of vegetation and earthworks.

- Less than minor visual effects:

  VP1-2, VP9-14: Construction is visible however are not intrusive or a high contrast to the existing setting.

The visual effects of Project at year 1 of operation are:

- More than minor visual effects:

  VP5, VP7and VP15: as per the construction effects, the Project introduces new road infrastructure elements that are a moderate-high to moderate adverse change to the existing setting.

- Less than minor visual effects:

  VP1-3, VP9-11: Project elements are visible however are not intrusive or a high contrast to the existing setting which is dominated by transport infrastructure.

  VP8: Reinstatement of trees to St Stephen's School driveway will restore landscape and amenity value.

6 Assessment of Positive Effects

This section assesses common or general landscape and visual matters across the entire Stage 2 corridor (i.e. all five NoRs). This section also recommends measures to avoid, remedy, or mitigate actual or potential adverse effects.

The new and upgraded transport corridor has potential to provide positive effects through the design which can include landscape mitigation planting and safety improvements, as well as the introduction of an active transport node.

6.1 Positive landscape and visual effects

Positive landscape and visual effects within large infrastructure, provide improvements in protecting, restoring, and enhancing certain aspects of the environment. The RMA provides for positive effects and environmental enhancement, including restoration and rehabilitation.

The baseline against which the positive effects are assessed is outlined in Section 4 – Existing and Future Receiving Environment.

6.1.1 Assessment of construction effects

The Projects construction environmental management plan (CEMP) will be undertaken once the project moves through to the detailed design stage. Typically, there are limited beneficial effects during construction due to the disruptive activity and some areas of vegetation removal.

6.1.2 Assessment of operational effects

The Papakura ki Pukekura ULDF vision for the corridor is *"to reflect and celebrate the underlying natural and cultural landscape through which it passes".* It seeks to retain views of natural features, balanced with the nearby urban development where visual and noise mitigation implemented for future neighbours.

THE ULDF design vision include the following landscape and visual enhancements.

- Planting design:

  develop an ecological corridor between the southern hills and Te Mānukanuka.
  This provides biophysical improvements through enhancing biodiversity and habitat creation, and enhancing landscape and visual amenity with an increase in natural or seminatural areas as seen from the motorway.

- Stormwater management:

  Enhancement of stream environments through the application of treatment trains and through riparian planting;

  Naturalisation of the flow of water by contouring to more natural slopes (where space allows);

  Upgrade of wider Papakura wetland filtration systems where possible and proposed planting schemes to integrate them into the broader landscape, slow water flows and enhance the water treatment process; and

  Chamfering and naturalisation of culverts to match the contour of the surrounding landforms.

- Bridge design including proposed new bridges and upgrades to existing bridges at Drury South Interchange and GSR Bombay:

  Use a consistent, logical and well-defined architectural style across all bridges in the project; and

  Utilisation of colour, material and texture to assist with visual amenity.

The following table outlines the Project beneficial effects:

Table 6-1: Project beneficial effects

NOR	Description of modification	Effect
NoR 1	Extensive landscape planting to motorway structure embankments and drainage swales, to enhance landscape amenity.	Low beneficial landscape and visual effect
NoR 2	Extensive landscape planting to motorway structure embankments and planted drainage swales, creating a coherent blue-green infrastructure corridor. The planting provides a buffer between the motorway and adjacent visual receptors.	Low beneficial landscape and visual effect
NoR 3	Extensive landscape planting to motorway structure embankments and drainage swales, creating a coherent blue-green infrastructure corridor in an area with commanding views to the north and apparent natural character of surrounding hills.	Very Low beneficial landscape and visual effect
	Upgraded bridge over GSR provides beneficial landscape and visual effect with opportunity to provide an architectural façade to reflect context and cultural heritage.	Very Low beneficial landscape and visual effect
NoR 4	The introduction of an SUP to the west side of SH1 provides an alternative/safer route for the Akaroa Trail (current route on Hillview Road). The SUP improves community accessibility.	Low-moderate beneficial landscape effect
NoR 5	The link road alignment proposes a bridge over the Hingaia Stream open space which will allow passage beneath for recreational users. ULDF bridge design strategy has the potential to enhance the environmental and cultural heritage context through bridge aesthetics.	Very low beneficial landscape effect

6.2 Summary of beneficial effects

The landscape and natural character and visual effects proposed by the Project, are assessed as having a **less than minor positive effect.** The positive effects are planting and design strategies from the *ULDF.*

Landscape and natural character are enhanced through the following:

- Extensive planting to either side of SH1, providing a green corridor;
- Introduction of the SUP to provide active accessibility for the community;
- Opportunity for improved Akaroa Trail route within SUP; and
- Cross-corridor connection at GSR between St Stephen's School and historical monument.

Visual amenity is enhanced through the following:

- Landscape planting increase visual amenity around SH1; and
- Improved aesthetics of existing bridges.

It is noted that whilst the ULDF planting strategy would improve the amenity, the following would provide further positive effects.

- Detailed design is to consider planting heights to enhance and frame key views; and
- Landscape planting between SUP and SH1 would enhance SUP user experience.

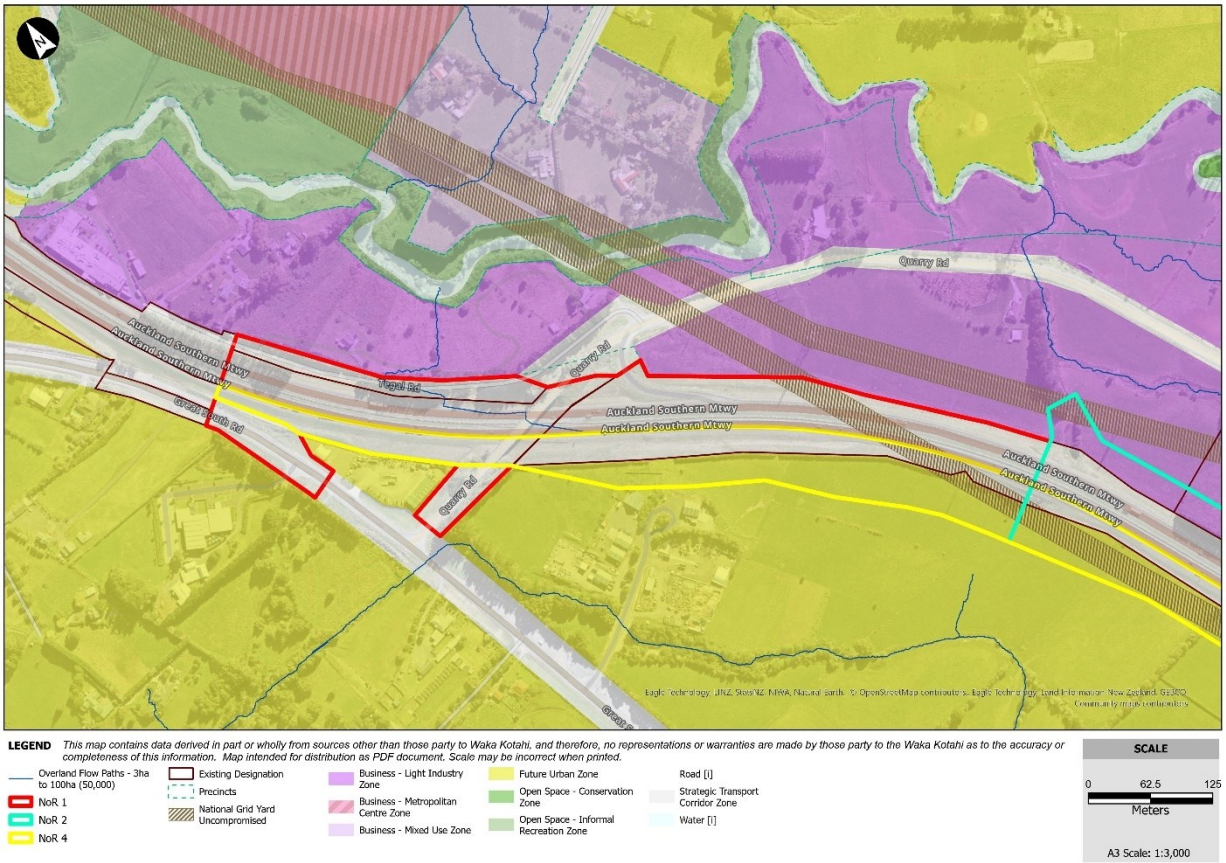
7 Stage 2 NoR 1-3 (Alteration to SH1 Designations)

This section assesses the specific landscape and visual matters relation to NoR 1-3 – Alterations to the existing SH1 Designations 6706, 6700, and 6701.

7.1 Overview and description of works

As set out in **Table 7-1** to **Table 7-3** below, the proposed works in NoR 1-3 to provide widening of the existing SH1 corridor, to accommodate the future upgrades to the SH1 network.

Table 7-1: Overview of alteration to SH1 Designation 6706

NoR 1 – Alteration to SH1 Designation 6706	
	
Key features	
Overview	▪ Six general traffic lanes (4.3m shoulders) on State Highway 1. ▪ Safety improvements include upgrading interchanges, wider shoulders, new barriers, and improved lighting along the full extent of the Project.
Speed Environment	▪ Design to accommodate 110km/h on State Highway 1
Access Lanes	▪ Designed to accommodate special vehicle lane within the 4m shoulder
Intersections	▪ N/A

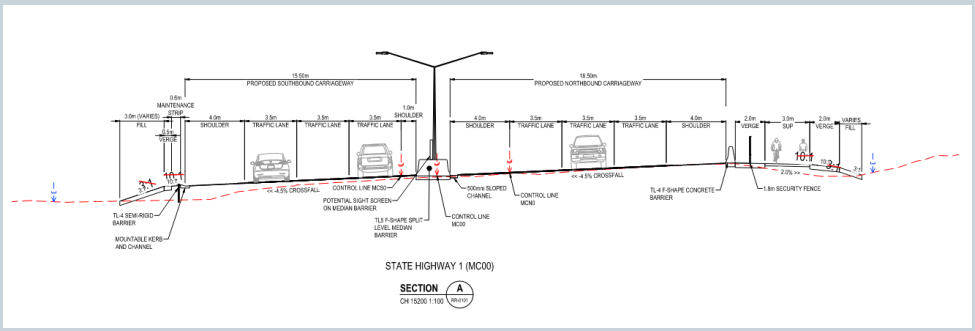
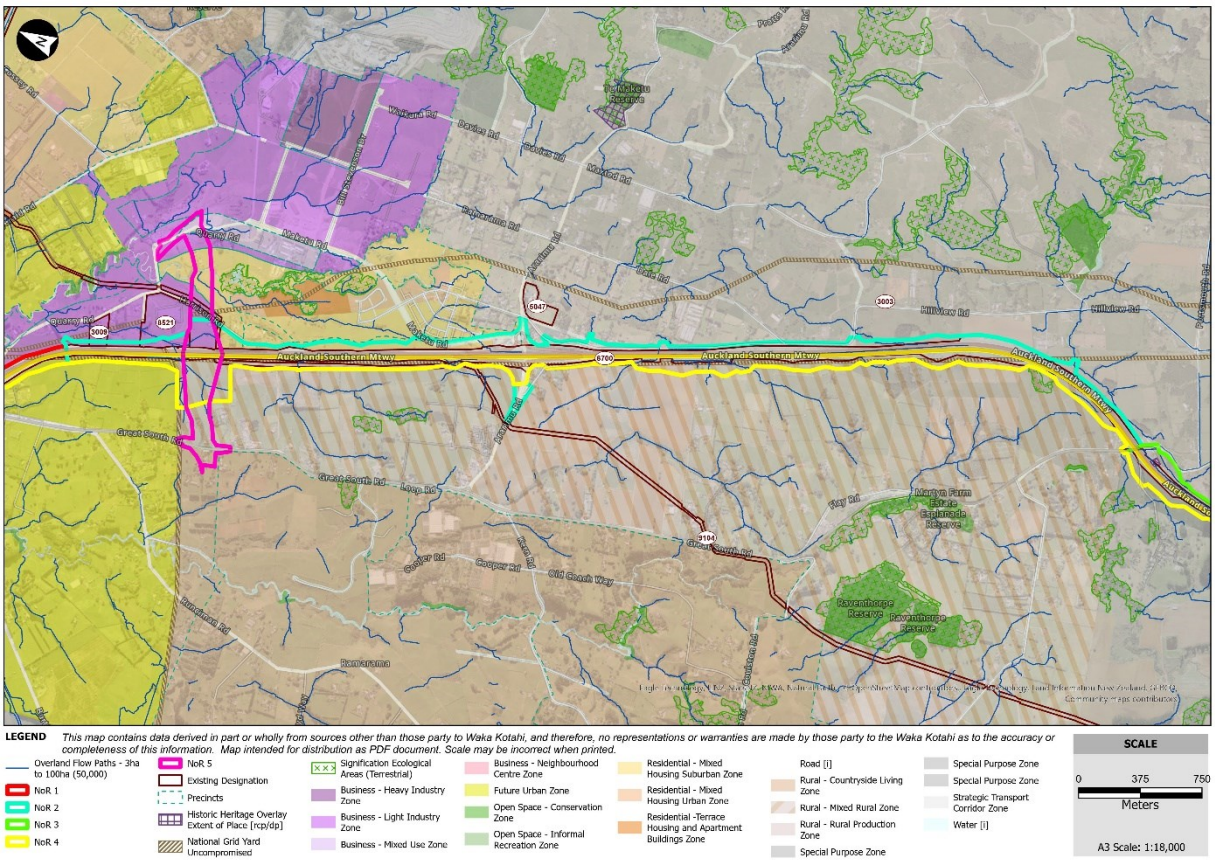
Stormwater Infrastructure	▪ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland)
Typical cross sections	▪ 

Table 7-2: Overview of alteration to SH1 Designation 6700

NoR 2 – Alteration to SH1 Designation 6700



Key features	
Overview	▪ Six general traffic lanes (4.3m shoulders) on State Highway 1. ▪ Safety improvements include upgrading interchanges, wider shoulders, new barriers, and improved lighting along the full extent of the Project.
Structures	▪ Drury South Interchange ▪ Ramarama Interchange
Speed Environment	▪ Design to accommodate 110km/h on State Highway 1
Access Lanes	▪ Designed to accommodate special vehicle lane within the 4m shoulder

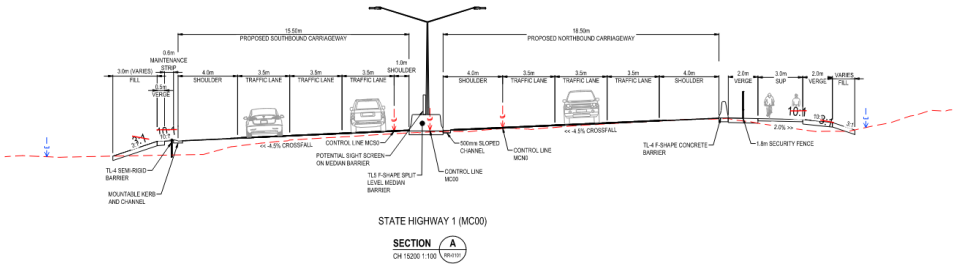
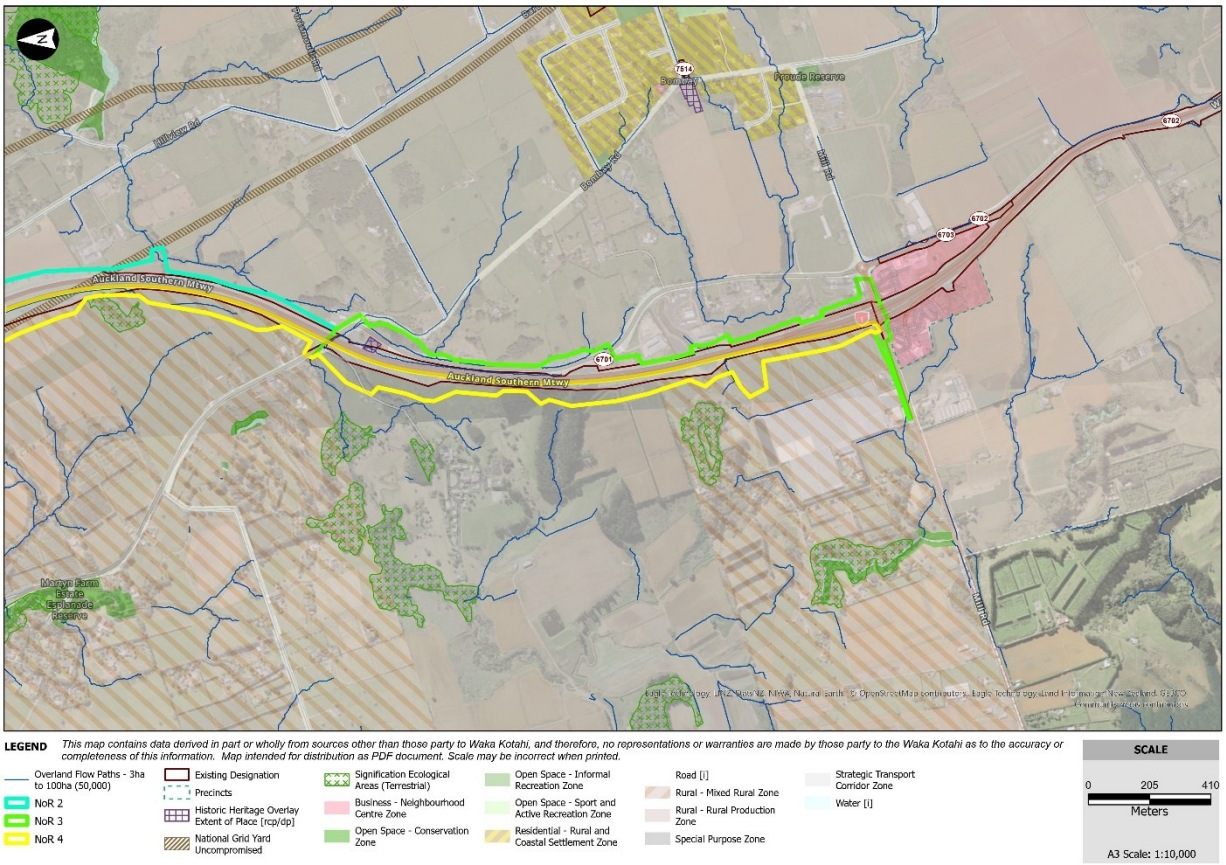
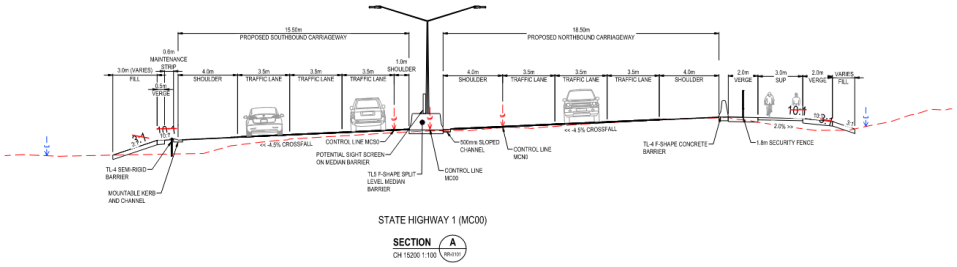
Intersections	▪ Drury South Interchange – new over-pass with roundabouts ▪ Ramarama Interchange – modified Stevensons roundabout with ramp signals and off-line bridge
Stormwater Infrastructure	▪ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland)
Typical cross sections	

Table 7-3: Overview of alteration to SH1 Designation 6701

NoR 3 – Alteration to SH1 Designation 6701	
	
Key features	
Overview	▪ Six general traffic lanes (4.3m shoulders) on State Highway 1. ▪ Safety improvements include upgrading interchanges, wider shoulders, new barriers, and improved lighting along the full extent of the Project.
Structures	▪ Upgrades to the existing Mill Road/Bombay Interchange ▪ Mill Road over-bridge and abutments ▪ SH1 Great South Road Bridge
Speed Environment	▪ Design to accommodate 110km/h on State Highway 1
Access Lanes	▪ Designed to accommodate special vehicle lane within the 4m shoulder
Intersections	▪ Bombay Interchange – northbound signals ▪ Mill Road Bridge – altering both abutments to allow realignment of the road beneath Bombay Interchange
Stormwater Infrastructure	▪ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland)

Typical cross sections	

7.2 Existing & receiving environment

SH1 is a strategic transport corridor. The adjacent environment between Drury Interchange (Stage 1B2) and the Ramarama interchange is set to undergo urbanisation with land zoned Future Urban (FUZ) and Business – Light Industry (refer Section 4 Existing and Future Receiving Environment). The existing four-laned motorway is a dominant feature of the landscape.

The Study Area terrain is undulating with the motorway either cut into the landscape and framed by embankments; or at a slightly higher elevation than adjacent areas with road reserves. The road reserves and embankments are a mix of exotic grass cover or a mix of taller vegetation.

There is a higher presence of built infrastructure at bridge abutments located at Mill Road, Ararimu Road and Quarry Road. There are currently no retaining or noise walls within Stage 2.

Pylons and overhead transmission lines are located parallel to SH1 for the majority of Stage 2, including from Drury Interchange to Drury substation (to the east), crossing west at Drury substation and then back to the east side and away from the motorway at the sweeping curve at the bottom of Pukekura Hill.

Key landscape views experienced from the motorway include:

- Southbound views towards the Pukekura/Bombay Hill;
- Southwest views towards the Ingram Road III tuff ring (ONF – see section 0);
- Northbound views from the top of the Pukekura/Bombay Hill; and
- Eastbound views toward the Drury Hills from overbridges at Quarry Road, Ararimu Road and Mill Road.

Landscape overlays within the designation alignment include a Significant Ecological Area (SEA), associated with denser native vegetation, located to the west of SH1. This area of vegetation is not differentiated from other areas of denser vegetation as viewed from the motorway. There are no effects to the SEA, which is outside of the designation boundary.

7.3 Assessment of construction effects

The construction stages will result in temporary effects on landscape character and visual amenity which are addressed for each NoR.

A detailed construction methodology for the project has not yet been prepared, however, it is anticipated that the majority of works will be undertaken during daylight-hours. Should there be a requirement for any night works, construction lighting may be required. In this event, it is anticipated that any lighting would be highly localised (to the areas being worked on at the time) and temporary in duration.

Effects on landscape character and visual amenity will likely include matters such as:

- Landscape Character:

  Vegetation clearance; and

  Earthworks.

- Visual Amenity:

  Changes to foreground environment by presence of construction works and machinery.

Table 7-4 includes the assessment of construction effects for the alteration of SH1. The recommendations to avoid, remedy or mitigate adverse effects are further discussed in Section 0.

Table 7-4: Stage 2 NoR 1-3 construction effects

NoR	Description of modification	Construction Effects	Recommendations (refer Table)

NoR 1	Landscape & Natural Character: construction effects will be temporary and have limited effect on this highly modified environment.	No effect	
	Visual Amenity: construction works will be in foreground views temporarily visible to motorists at reduced speeds. Works are considered commensurate with regular road maintenance.	Low	C1 Construction worksites – minimising visibility C3 – Light pollution
NoR 2	Landscape & Natural Character: earthworks and some removal of vegetation will have a limited effect on the broader LCT 2, in an area which has undergone transformation and has cultivated land.	Very low	C4 – Vegetation & landscape
	Visual Amenity: construction will have a temporary effect on the visual amenity of motorists in foreground views, comprising installation of Drury South Interchange and GSR overbridge, retaining walls to east at Hillside Road and at Ramarama interchange and earthworks for widening.	Low-moderate	C1 Construction worksites – minimising visibility C5 – Construction footprint
NoR 3	Landscape & Natural Character: construction will present a temporary change to the baseline condition that is a very low contrast.	Very low	C1 Construction worksites
	Visual Amenity: construction earthworks will be noticeable in foreground views, however, will not diminish the commanding views from Pukekura Hills or towards landscape features in the middleground to background views.	Very low	C1 Construction worksites – minimising visibility

7.4 Assessment of operational effects

Project effects for SH1 landscape character and visual amenity will likely include matters such as:

- Landscape Character:

  Road corridor widening;

  Integration of development patterns (e.g. topography, earthworks);

  Stormwater / wetlands; and

  Formation of new infrastructure / structures.

- Visual Amenity:

  Screening of landscape views due to introduction of noise walls; and

  Changes to foreground environment by formation of new infrastructure.

Table 7-5 includes the assessment of operational effects for the alteration of SH1, including recommendations to avoid, remedy or mitigate adverse effects.

Table 7-5: Stage 2 NoR 1-3 operational effects

NoR	Description of modification	Operational Effects	Recommendations (refer Table)
NoR 1	Landscape Character: the road widening is within a highly modified environment with no effect to LCT 1: Rāngai tuarua.	No-effect	

	Natural Character: no effects to waterways or other natural characteristics	No-effect	
	Visual Amenity: the road corridor widening is a very low change experienced by motorists.	Very low	Op1 – Landscape to enhance corridor
NoR 2	Landscape Character: the road widening and additional road infrastructure is commensurate with the existing motorway including overbridges, with no effect to LCT 1: Rāngai tuarua.	No-effect	
	Natural Character: limited works to existing waterways within culverts and an increase in the stormwater/wetlands tot eh west of SH1, with positive long-term effects on the natural character.	Low-positive	
	Visual Amenity: the road corridor widening and introduction of Drury South and Ramarama Interchange overbridges is a very low change experienced momentarily by motorists. The landscape planting is along the corridor is a positive effect for motorists. Overall the visual effect is considered very low.	Very low	Op1 – Landscape to enhance corridor OP2 – Bridge & structures
NoR 3	Landscape Character: the road widening is commensurate with the existing motorway and associated overbridges, with no effect to LCT 2: Rāngai tuatoru.	No-effect	
	Natural Character: limited works to existing waterways within culverts and an increase in the stormwater/wetlands tot eh west of SH1, with positive long-term effects on the natural character.	Low-positive	
	Visual Amenity: the road corridor widening, introduction of SUP bridge at GSR and Mill Road, and upgrade of GSR overbridge is a very low change experienced momentarily by motorists. The landscape planting is along the corridor is a positive effect for motorists. Overall the visual effect is considered very low.	Very low	Op1 – Landscape to enhance corridor OP2 – Bridge & structures

7.5 Summary of effects

Views are experienced by motorists at speeds of up to 100km/hr on SH1, therefore the visual experience of motorists captures a broad scene and rhythm of elements. Motorists are likely to notice a change to the visual rhythm of elements in the foreground or a change to the broad scenic composition and whether or not this is visible i.e. a long-distance scenic view or whether this is screened by vegetation or built elements which enclose the view. The view of landmarks assists motorists to orientate themselves within the broader landscape.

The landscape and natural character and visual effects proposed by the Project within NoR 1-3, are assessed as

- Construction:

  minor visual effects for NoR 2 due to the installation of new interchange structures within the motorway corridor;

  less than minor landscape and visual effects due to removal of vegetation and earthworks; and

  no effect to landscape character in NoR due to this area dominated by transport infrastructure.

- Operational (at year 1):

  less than minor visual effects as a result of road widening ,addition or upgrade of overbridges; and

no landscape character effects for NoR 1-3.

Low positive effects on the natural character with an increase of stormwater treatment ponds.

7.6 Recommendations

The landscape and visual effects for NoR 1-3 are less than minor. The modification includes widening of the motorway corridor, introduction of a new interchange and overbridge at Drury South and upgrade to overbridge at Ramarama contribute to the existing highly modified environment.

There is opportunity to enhance the landscape character and cross-corridor connection at interchanges through the following measures:

- Frame views towards Drury Hills at motorway bridges (Quarry Road, Drury South Interchange and Ramarama Interchange) through architectural design of the structures and use of streetscape approach planting; and
- New bridges at Drury South and Ramarama Interchanges should be designed as features within the landscape, create a threshold experience for users and contribute to local identity by strengthening sense of place.

These measures are not expected to reduce the assessed landscape character or visual effects, however, have the potential to provide localised positive landscape character effects.

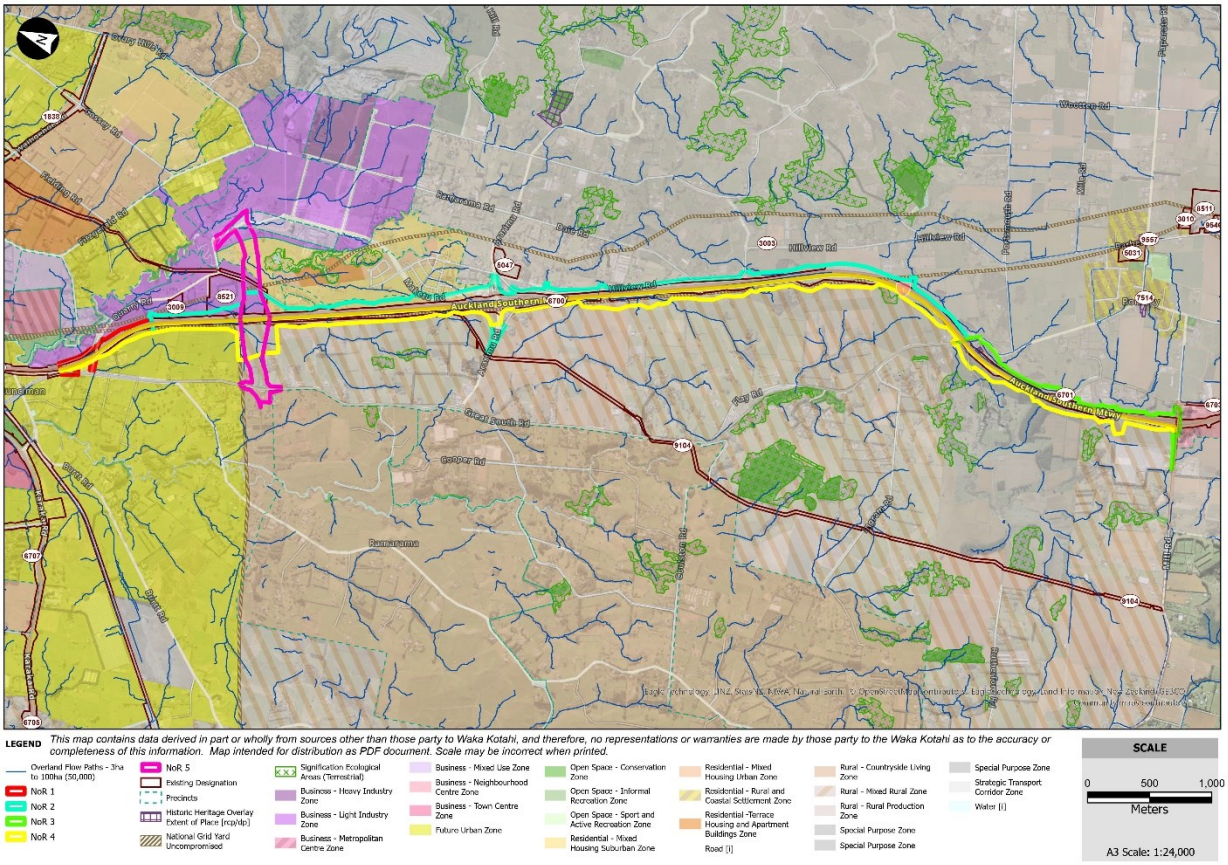
8 Stage 2 NoR 4 (Shared User Path)

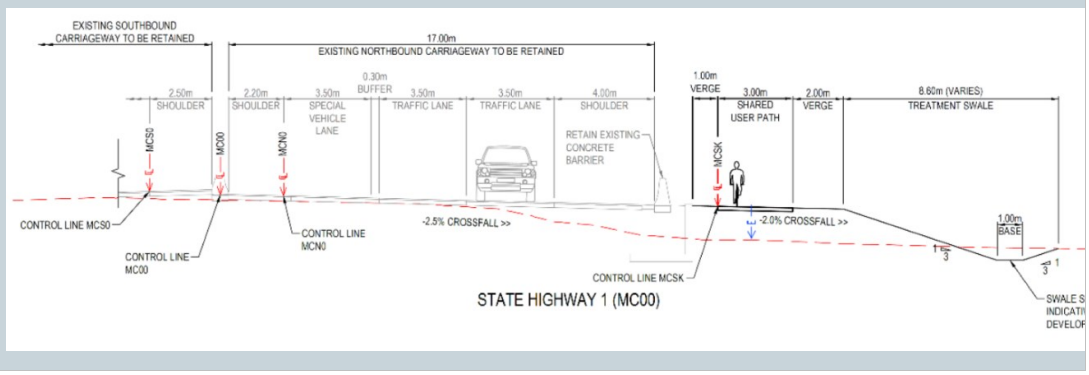
This section assesses the specific landscape and visual matters relation to NoR 4 – Construction of a new Shared User Path (SUP) from Quarry Road to Bombay Interchange .

8.1 Overview and description of works

As set out in Table 8-1 below, the proposed works in NoR 4 include the construction of high-quality walking and cycling facilities along the SH1 corridor.

Table 8-1: Stage 2 NoR 4 Proposed works

NoR 4 – Shared User Path	
	
Key Features	
Overview	▪ Requires a new designation between 200m north of Quarry Road to 600m south of the existing Mill Road/Bombay Interchange s, with some locations overlapping the existing SH1 Designations 6706, 6700 and 6701; ▪ 3.0m wide SUP continuing from 200m north Quarry Road to 600m south of the existing Bombay/Mill Road Interchange; and ▪ Located on the western side of the motorway.
Structures	▪ Tie-ins to all new and upgraded motorway interchange (i.e. Drury South, Ramarama and Bombay); and ▪ New bridge at Great South Road.

Access	▪ Connection from north to the Stage 1B1 SUP at Quarry Road. Access provided at Drury South Interchange, Ramarama Interchange and Bombay Interchange .
Intersections	▪ Grade separated tie-in at all interchanges
Stormwater Infrastructure	▪ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland)
Typical cross section	

8.2 Existing & receiving environment

The SUP is a new element proposed in an environment comprising Future Urban and Mixed Rural zones; and runs parallel to a Strategic Transport Corridor. The alignment is to the west of SH1 with perpendicular connections at Quarry Road (west only), Drury South Interchange, Ararimu Road and Mill Road.

The rural residential properties in which the SUP alignment and construction works are likely to effect is located at 1823 Great South Road, Bombay and includes removal of London Plane Trees at the perimeter of the property.

The alignment avoids SEA-T-4513 (refer Section 4.1.4), a small area of denser native vegetation.

8.3 Assessment of construction effects

A detailed construction methodology for the project has not yet been prepared, however, it is anticipated that the majority of works will be undertaken during daylight-hours. Should there be a requirement for any night works, construction lighting may be required. In this event, it is anticipated that any lighting would be highly localised (to the areas being worked on at the time) and temporary in duration.

The construction of the SUP will result in temporary effects on landscape character and visual amenity, and will likely include matters such as:

- Vegetation clearance:

  Within road reserve; and

  Within/adjacent to 1823 Great South Road.

- Earthworks:

  Changes to foreground environment by presence of construction works and machinery; and

  Grading, mounding and surface finishing.

- Construction:

  SUP bridges at Drury South Interchange, Ararimu Road, GSR and Mill Road;

  Road underpasses at Ararimu Road and Drury South Interchange;

  Civil works including crossing points and safety barriers; and

Paving.

- Landscape planting to adjacent mounds.

The following Table 8-2 includes the assessment of construction effects of a new SUP, including recommendations to avoid, remedy or mitigate adverse effects.

Table 8-2: Stage 2 NoR 4 construction effects

NoR	Description of modification	Construction Effects	Recommendations (refer Table)
NoR 4	**Landscape & Natural Character** Construction of SUP bridge overpasses and road underpasses are noticeable works in the existing transport corridors, providing a barely noticeable change to the landscape character. The SUP alignment follows parallel to SH1, with minor deviations around drainage swales introduce by motorway widening. It is therefore anticipated that the alignment will require limited and localised vegetation removal with a very low contrast to the existing receiving environment.	Very low	C1 – Construction worksites C4 – Vegetation and landscape
NoR 4	**Visual Amenity** The visual receptors of the construction works are limited to those few existing residential properties at SH1/GSR as assessed in VP7 (refer VIEWPOINT 07). SUP works will be noticeable to motorists on SH1 with SUP bridge construction a temporary and limited component of a wider scene, providing a temporary Low level of modification.	Low	C1 – Construction worksites C3 – Light pollution C4 – Vegetation and landscape

8.4 Assessment of operational effects

The introduction of the SUP to the west side of SH1 will result in permanent effects on landscape character and visual amenity, including the following new elements:

- SUP path to the west side of SH1;
- SUP connecting paths at Quarry Road (west only), Drury South Interchange, Ararimu Road and Mill Road;
- SUP bridges to the north side of existing bridges at Drury South Interchange, Ararimu Road and Mill Road and west of GSR;
- SUP road underpasses at Drury South Interchange (east and west), Ararimu Road (east and west);
- SUP crossings including barriers and kerb crossings at Mill Road;
- On road bike path and road markings west of Drury South Interchange;
- Safety barriers and fencing; and
- Landscape planting to mounds adjacent SUP.

The following Table 8-3 includes the assessment of operational effects of a new SUP, including recommendations to avoid, remedy or mitigate adverse effects.

Table 8-3: Stage 2 NoR 4 operational effects

NoR	Description of modification	Operational Effects	Recommendations (refer Table)
NoR 4	**Landscape Character** The bridge overpasses and road underpasses are noticeable structures associated with the SUP, however provide a low contrast to the existing SH1 overbridges and road infrastructure which already influence the landscape character. The SUP alignment follows parallel to SH1, with minor deviations around drainage swales introduce by motorway widening, providing a very low contrast to the existing receiving environment. The SUP will introduce active transport users (cyclists and pedestrians) between FUZ, rural production and the motorway. Landscape planting adjacent the SUP is considered a positive effect.	Very low	OP1 – Landscape OP2 – Bridge and structures OP3 – Walking and cycling connectivity
NoR 4	**Natural Character:** limited works to existing waterways within culverts	Very Low	
NoR 4	**Visual Amenity** Sensitive visual receptors of the SUP are limited to those few existing residential properties at SH1/GSR as assessed in VP7 and VP8 (refer VIEWPOINT 07 + VIEWPOINT 08). The SUP will be noticeable to motorists on SH1 with the introduction of new SUP bridges, SUPs at interchanges and the SUP parallel to SH1 for approximately 9.5 km. The SUP will form a very limited component of the wider scene resulting in a very low level of modification.	Very Low	Landscape screening vegetation between private property and elevated SUP recommended to screens views to and from SUP structure. Trees to be planted to reinstate avenue of trees to both sides of St Stephen's School realigned driveway. OP1 – Landscape OP2 – Bridge and structures

8.5 Summary of effects

The landscape character and visual effects proposed by the Project within NoR 4, are assessed as below.

- Construction:

  Temporary less than minor landscape effects due to removal of vegetation; and

  Temporary less than minor visual effects to motorists with views of the larger SUP infrastructure.

- Operational (at year 1):

  Less than minor landscape effects with new SUP structures commensurate with, and adjacent to existing road infrastructure. The SUP introduces active transport mode users to the area; and

  Less than minor visual effects with the SUP noticeable to motorists on SH1, presenting little difference to the overall scene.

8.6 Recommendations

Potential **more than minor visual effects** are experienced where SH1 crosses over GSR, due to the SUP proposed in the foreground of their view, as assessed for VIEWPOINT 07 and 08. Construction of the elevated SUP, including batter works will require removal of existing vegetation to the boundary of the residential property and to the tree-lined driveway of St Stephens School, exposing views of the elevated SH1. The elevated positioning of the SUP may also allow users to overlook the private property.

The following is recommended to mitigate effects:

- Further design refinements are undertaken to ensure all works affecting the Notable London Plane trees are minimised, with replacement trees along the realigned driveway planted at an early phase to reinstate landscape amenity; and
- Landscape vegetation screening is recommended to be provided between the SUP and adjacent properties to mitigate both views of the structure from the private property, and of the private property being overlooked from the SUP;

The recommendations have the potential to reduce the landscape and visual effects due to the removal of notable trees, **from more than minor to minor.** This would be further determined through the design of the elevated SUP and the ability of this to be screened by vegetation.

A further opportunity to provide positive landscape character effects through improved connectivity is to:

- Provide a ramp connection from the elevated SUP to GSR to provide an active-mode cross-corridor connection between St Stephen's School (south of SH1) and the Selwyn Memorial reserve, place of the Bishop Selwyn Memorial Cairn historic site (north of SH1).

9 Stage 2 NoR 5 (Drury South Link Road)

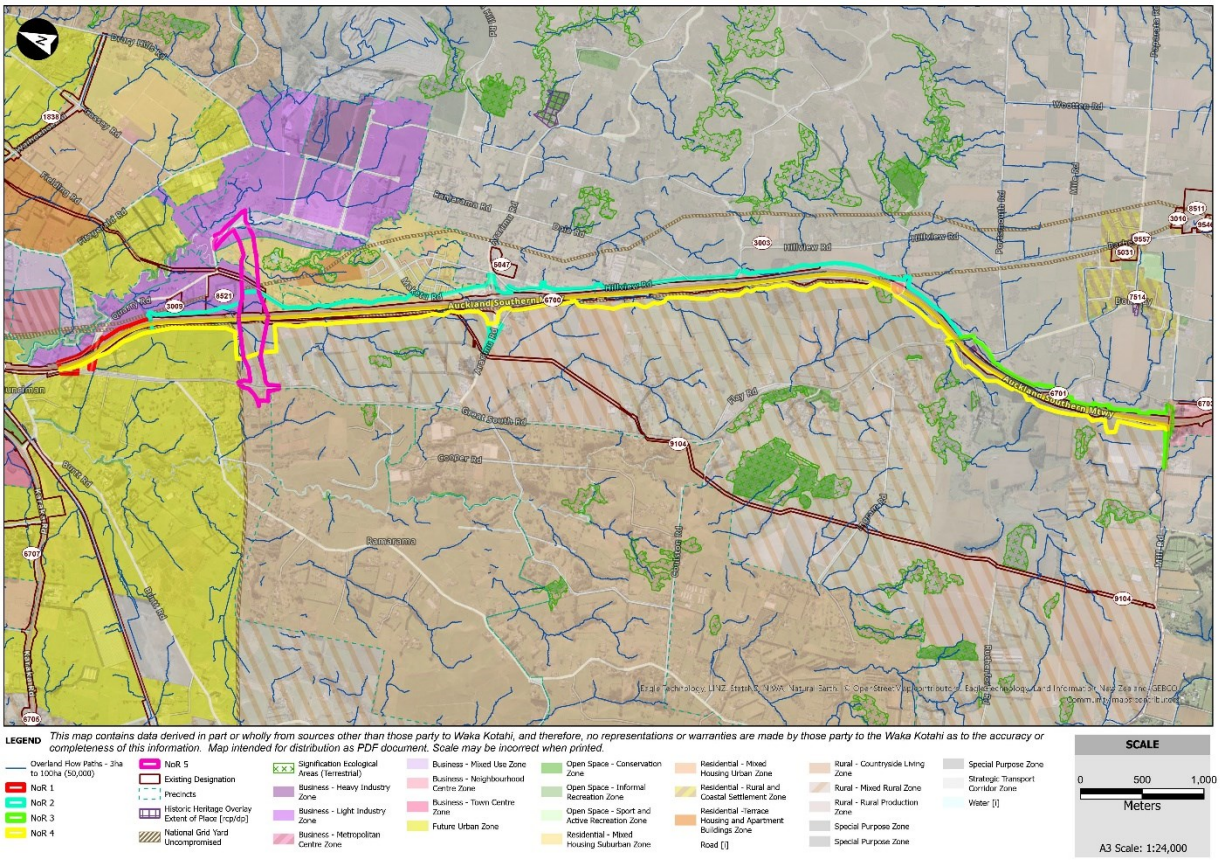
This section assesses the specific landscape and visual matters relation to NoR 5 – Drury South Link Road.

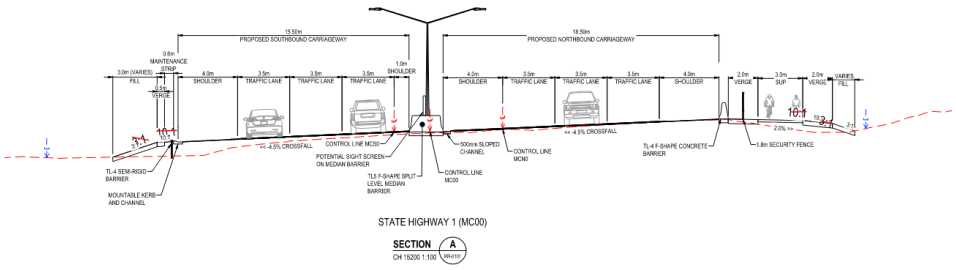
9.1 Overview and description of works

As set out in Table 9-1 below, the proposed works in NoR 5 include the construction of new link roads either side of Drury South Interchange and high-quality walking and cycling facilities:

Table 9-1: Overview of the Drury South Interchange Connections

NoR 5 – Drury South Interchange Connections



Key Features	
Overview	▪ New link roads to the adjacent network (Maketu Road and Great South Road) to tie-into the proposed Drury South Interchange; and ▪ Four traffic lanes, cycle lanes and footpaths on either side.
Structures	▪ Raised viaduct across the Hingaia reserve area.
Speed Environment	▪ N/A
Access Lanes	▪ Accommodation for a special vehicle lane or bus lane within the 4m shoulder
Intersections	▪ Signalised intersection at Maketu Road; and ▪ Round-about intersection tie-in to Great South Road.
Stormwater Infrastructure	▪ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland).
Typical cross sections	

9.2 Existing & receiving environment

For the Drury South Link Road to the east of SH1, the area is undergoing development as per land zoned Light Industry, Mixed Housing Suburban and public open space/stormwater management (occurring along the Hingaia Stream corridor and flood plain) (in accordance with 1410 Drury South Industrial Precinct).

Constraints within this area include:

- Three streams pass through the area across which the proposed connection crosses:
    - Hingaia Stream;
    - Rosslyn Stream; and
    - Harrison Stream.
- The alignment traverses a flood plain;
- The new connection needs to connect with realigned Maketu / Quarry Road; and
- The Drury South substation is located to the east of SH1, north of the proposed link road.

The link road to the west of SH1 connects to GSR in land zoned Mixed Rural. There are a few rural residential properties in the proposed alignment, which are likely to require acquisition for the Project, including:

- 1245 Great South Road, to the east of GSR, within link road alignment; and
- 1240-42 Great South Road, to the west of GSR and within alignment of intersection roundabout.

9.3 Assessment of construction effects

The construction of the bridge will result in temporary effects on landscape character and visual amenity, and will likely include matters such as:

- Vegetation clearance:
  - Within alignment and potentially around stream.
- Earthworks:
  - Changes to ground levels to support road; and
  - Grading, mounding and surface finishing.
- Construction:
  - New 4-lane + SUP bridge over SH1;
  - SUP road underpasses at interchange roundabouts;
  - Civil road works including roundabouts, on and off ramps; and
  - Bridge over Hingaia Stream.
- Landscape planting to adjacent mounds.

Table 9-2 includes the assessment of construction effects for Drury South Link Road, including recommendations to avoid, remedy or mitigate adverse effects:

Table 9-2: Stage 2 NoR 5 construction effects

NoR	Description of modification	Construction Effects	Recommendations (refer Table)
NoR 5	**Landscape Character** The construction of the Drury South Link Road comprises extensive earthworks in a floodplain and sensitive waterways. The receiving environment is one that is highly modified, influenced by SH1, electrical infrastructure and residential urbanisation to the east of SH1, and near to FUZ to the west. The formation of embankments to the road and introduction of bridge piers in a flood plain, present a clear change to the riparian character, though these works are limited to a small area within a broad character zone. Construction works are likely to temporarily disrupt use of open space along the Hingaia Stream corridor.	Moderate	C1-c&d C5 – Construction footprint
	Natural Character The construction of the bridge will have temporary low effects to a localised area of the Hingaia Stream floodplain, with the presence of construction vehicles and installation of bridge and bridge piers.	Low	C5 – Construction footprint

NoR 5	**Visual Amenity** The installation of a bridge over the floodplain and stream will comprise installation of piers and bridge spans, accessed within the floodplain. The alignment to the west of SH1 will comprise demolition of a residential dwelling and works partially visible in the foreground affecting a few residents on GSR. The construction activity within the floodplain is considered a moderate contrast to the future environment (comprising residential and light industry to the east and public open space),	Moderate	C1 – Construction worksites C2 – Public access C5 – Construction footprint

9.4 Assessment of operational effects

The introduction of the link road to Drury South, east and west of SH1, will result in permanent effects on the overall landscape character and visual amenity. The changes include the following new elements:

- New Drury South Link Road between Drury South Interchange and Quarry Road/realigned Maketu Road including:
  - Cycle path and pedestrian path to either side of new road;
  - Embankments to either side of the new road;
- Long-span bridge and four-laned road, perpendicular to Hingaia Stream;
- New link road between Drury South Interchange and Great South Road including:
  - Roundabout at GSR;
  - Four-laned road;
  - Cycle path and pedestrian path to either side of new road; and
  - Embankments to either side of the new road.

Representative viewpoints have been assessed for the effects of the linked road at Great South Road in VIEWPOINT 03, and for the Drury South link Road in VIEWPOINT 15.

Table 9-3 below, includes the assessment of operational effects for Drury South Link Road, including recommendations to avoid, remedy or mitigate adverse effects.

Table 9-3: Stage 2 NoR 5 operational effects

NoR	Description of modification	Operational Effects	Recommendations (refer Table)
NoR 5	**Landscape Character** The new bridge spanning approximately 5m above the Hingaia Stream and adjacent floodplain will be prominent for recreational users within the open space corridor and adjacent (future) mixed residential to the north. Planting in road embankments is located near to intersections where there is an intensity of road infrastructure. The introduction of a 4-laned road to the west of SH1 in land zoned mixed rural, and elevated road in a floodplain to the east, is considerate a low-moderate contrast to the baseline character.	Low-Moderate	Op2 – a) bridge designed as feature b).Contribute to local identity f). reduce bulk and allow visual permeability
	Natural Character The presence of the bridge including bridge piers within the floodplain will have a limited influence on the amenity or quality of the waterways, comprising the floodplain and Hingaia Stream. There would be some but limited overshadowing of the stream.	Low	Bridge piers to be located away from stream embankments
NoR 5	**Visual Amenity** The introduction of a long-span bridge over the floodplain and stream will be a prominent element and contrast to the open space corridor. It is noted that the bridge will be linking highly modified areas (motorway to light industrial/mixed-suburban). For open space users, although the bridge is prominent, views beneath and along the stream will be retained. The Bridge will have limited shading effect to ground plane at 5m height. The road connection to GSR will introduce a new road and wide intersection within an existing road corridor, visible to a few residents (as assessed in VIEWPOINT 03). The link road will be visible to sensitive receptors to the east and west extents, and motorists on SH1 with the introduction of a new overbridge and on/off ramps. The visual contrast of the link road is considered moderate, with the bridge and road connections presenting a recognisable new element across the stream environment.	Moderate	Op2- f). reduce bulk and allow visual permeability

9.5 Summary of effects

The Project introduces new road infrastructure elements experienced to the east by workers and mixed-suburban residential, and to the west by a few rural residential dwellings. The project also proposes to restore the Hingaia Stream open space corridor and surrounding floodplain valued for its natural characteristics in a highly modified area.

The landscape character and visual effects caused by the Project within NoR 5 at year 1 of operation, are assessed as follows:

- Construction:
  - More than minor landscape character effects; and
  - More than minor visual amenity effects.
- Operational:
  - Minor character effects; and
  - More than minor visual amenity effects.

9.6 Recommendations

The long-term landscape and visual effects for NoR 5 are minor landscape effects and more than minor for visual effects. The introduction of a new bridge over a limited region of the Hingaia Stream floodplain contributes to the future highly modified environment.

There is opportunity to enhance the landscape character through the following measures:

- Engagement with Mana Whenua is required be undertaken with the use of preferred Te Aranga Māori design principles to celebrate the cultural value of the landscape and waterways, and to contribute to local identity, demonstrating a sense of place.

The following would help mitigate the visual prominence of the bridge:

- Reduction of overall visual bulk and maximise visual permeability through use of transparent safety barriers and structural design, such as open truss structures; and
- Provide planting of appropriate indigenous plant species within the flood plain to screen views of the bridge from the open space area.

These measures are not expected to reduce the assessed landscape character effects, but provide localised positive landscape character effects.

The visual effects of the bridge would be determined with more accuracy through the design of the bridge structure and the subsequent ability of the design to be screened by vegetation. The recommended mitigation measures where both the visual bulk of the bridge is minimised, and screening vegetation is implemented to limit and soften the view of the bridge structure from within the open space, would likely reduce the residual visual effects from ‘more than minor’, to ‘minor’.

10 Recommendations

The purpose of mitigation is to avoid, reduce or where possible remedy or offset any significant adverse effects on the environment arising from the proposed development. This Section outlines mitigation and management measures for the Project to reduce potential landscape and visual effects during construction and operation.

The recommendations outlined below, consider those proposed treatments included in adjacent project design frameworks including:

- SH1 Papakura to Bombay to support Detailed Business Case - Urban Landscape Design Framework Scoping Report (RevC, Aecom NZ Ltd, December 2017);
- Papakura ki Pukekura - Urban & Landscape Design Framework (Wayfinder, June 2022); and
- Pukekohe Transport Network - Landscape and Visual Effects Assessment (Isthmus, September 2023).

A ULDMP or Landscape Management Plan is recommended as a condition on the respective designations which should include measures to mitigate landscape effects.

Guidance for built structures and landscape design and planting for transport projects must be consistent as provided within the following:

- Bridging the Gap: NZTA Urban Design Guidelines (2013);
- NZTA Landscape and Visual Assessment Guidelines (2013);
- NZTA Bridge Manual (2013); and
- Auckland's Urban Ngahere (Forest) Strategy.

The construction recommendations are consistent with the Design Construction Report (DCR) attached at Appendix C of the application AEE.

10.1 Construction phase recommendations

The below recommended measures to avoid, remedy or mitigation construction effects, provide an approach based on construction access and build sites in proximity to the Project. Table includes recommendations across all Project NoRs.

Table 10-1: Construction recommendations to avoid, remedy or mitigate effects

Key landscape & visual elements	Potential effect	Construction phase recommendations
C-1 **Construction worksites**	Visual effects of construction worksites	a) Installation of temporary screens/site hoardings to minimise exposure of construction areas from local viewpoints; b) High quality hoarding around construction sites within the public realm, with consideration given to the potential for public art integration to soften the visual impact of the hoarding; c) Where feasible and reasonable, the elements within construction sites would be located to minimise visual impact, for example materials and machinery would not be visible above temporary screens; and d) Storage areas and associated works are to be located in cleared or otherwise disturbed areas away from areas of sensitivity i.e. residential, community facilities and waterways.

C-2 **Public access**	Disruption to public access	a) Maintain access within public reserves and shared use paths or provide alternative routes for pedestrians and cyclists that are legible and do not add to a significant length in journey; and b) Provide wayfinding signage where pedestrian and cycling routes are altered.
C-3 **Light pollution**	Construction lighting glare and light spill	a) Where possible, lights will be used at the lowest effective level and would be directed downwards to the work area and away from incoming viewpoints and oncoming traffic; and b) Site lighting is to be designed to minimise glare issues and light spillage into adjoining properties and be generally consistent with the obtrusive effects of outdoor lighting requirements.
C-4 **Vegetation and landscape**	Visual effects from the removal of existing vegetation	a) Existing trees adjacent to the works will be retained and protected where possible to screen construction support sites, minimising clearing where possible; b) Where possible, trees will be trimmed rather than removed. Works would be carried out by a qualified arborist; c) All areas disturbed by construction and not required for operation of the project are to be restored to existing condition; and d) Early planting works are to be considered to provide a screening buffer that has time to mature before the project is fully operational.
C-5 **Construction footprint**	Landscape effects of construction worksites	a) The alignment of the corridor should seek to avoid effects on streams and minimise the extent of earthworks and vegetation removal. In particular of mature native vegetation; and b) Where possible, the balance of fill earthworks should be sourced from cut earthworks along the alignment.

Table includes NoR specific recommendations:

Table 10-2: NoR specific construction recommendations to avoid, remedy or mitigate effects

NoR	Potential effects	Construction phase recommendations across specific NoRs
NoR 1	Nil effects to LCTs Less than minor visual effects	▪ Effects can be managed by those typical recommendations in Table and the DCR.
NoR 2	Minor adverse effects	
NoR 3	Nil effects to LCTs Less than minor visual effects	
NoR 4	Reduction of More than minor adverse landscape character and visual effects	▪ Further design refinements are undertaken to ensure all works affecting the Notable London Plane trees are minimised, and replacement tree planting is reinstated at an early stage to provide screening and reinstate landscape amenity.

NoR 5	More than minor adverse landscape character and visual effects	▪ Effects can be managed by those typical recommendations in Table and the DCR.

10.2 Operational phase recommendations

A Landscape Management Plan is recommended as a condition on the respective designations which should include the following measures to mitigate landscape effects. Table includes recommendations across all Project NoRs:

Table 10-3: Operational recommendations to avoid, remedy or mitigate effects

Key landscape & visual elements	Potential effects	Operational phase recommendations across all Project NoRs
Op1 **Landscape**	Visual prominence and character influence	a) Where possible, frame views of the key features including Hunua ranges, Drury Hills and Ingram Road III tuff ring; through use of vegetation screening peripheral views of built form and open views at SH1 overbridges; b) Configure stormwater wetlands/ponds/swales to a naturalised appearance (avoiding a purely engineered design / form), conforming and integrating with the adjacent landform and future urban context; c) Provide planting of appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function; d) Reinstatement of planting within private property boundaries by negotation if outside designation and where disturbed to minimise contrast and retain screening; and e) The respective Projects are to be designed to integrate into the adjacent urban (including proposed urban) and landscape context. This relates to topography, the urban environment (responding to density and land uses), landscape character, and any open spaces zones.
Op2 **Bridges and structures**	Visual bulk of structures	a) Engagement with Mana Whenua should be undertaken with the use of preferred Te Aranga Māori design principles. Where appropriate, bridges and structures should be designed as features within the landscape and create a threshold experience for users as they transition between urban and rural areas; b) Bridges should be designed to contribute to local identity, demonstrating a sense of place; c) The finish of bridge piers, abutments and retaining walls should be commensurate with the urban design setting; d) Avoiding noise barriers and retaining walls where possible. If these are to be included, they should be designed to integrate into the localised environment to avoid visual prominence and adverse effects; e) Transparent safety barriers on SUP overpasses should be considered to assist with the reduction of bulk and retain visual permeability for desirable view lines; and f) Consider structural options which reduce the bulk and allow for visual permeability, such as through truss structures.

Op3 **Walking and cycling connectivity**	Visual clutter of utilities and furniture	a) Footpath and cycleway connections should be designed in a manner which contributes to the local identity and urban amenity of the landscape and aligned with Mana Whenua preferred design principles; b) Investigate opportunities to integrate with existing and future open space along the proposed designation and within the FUZ areas. This will ensure stronger connections and active mode share across a wider catchment; c) High quality fencing or barriers suitable for parks and public spaces will be used where construction ancillary facilities are located in close proximity to sensitive residential receivers such as residents and users of recreational space; d) There is opportunity to provide integrated cultural design/Mahi toi within infrastructure including wayfinding, pavement, bridge elements, fencing, planting and seating; e) The SUP alignment and associated structures should provide suitable visibility from and towards the SUP to allow surveillance and accessibility for Crime Prevention through Environmental Design (CPTED); f) Provide cross-corridor linkages to create a more connected community and accessibility to significant areas; and g) Use of urban design elements with consistent design language or suite of elements, with previous corridor design phases, and streamline elements through co-placement where possible.
Op4 **Earthworks**	Adverse modification to biophysical character	■ Integrate cut and fill slopes with the surrounding landform, forming a naturalised profile.; a) Modified slopes are to be a suitable gradient of not steeper than 2V:1H to allow terrestrial and riparian planting to be established; b) Treatment of fill slopes and residual land to integrate with adjacent land use patterns (in relation to visual and biophysical aspects); and c) All surfaces are to be finished to ensure sufficient topsoil cover to support landscape planting.
Op5 **Civil design**	Visual clutter of road furniture and disjointed infrastructure between Projects	a) Reinstate driveways, accessways and private fences for existing remaining properties affected by works within the proposed designations; and b) Consideration to the opportunity to combine several above-ground street elements (lighting, traffic signals, overhead wiring etc.) on common use poles to reduce visual clutter and to reduce potential impacts on existing awnings, forecourts and footpaths.

Table includes a summary of the NoR specific recommendations (as provided in each of the Stage 2 NoR Recommendations sections), and the potential for these to have either positive effects or reduce the residual effects.

Table 10-4: Summary of NoR specific operational recommendations to avoid, remedy or mitigate effects

NoR	Potential residual effects	Operational phase recommendations across specific NoRs
NoR 1	Nil to less than minor adverse effects	a) Effects can be managed by those typical recommendations in Table .

NoR 2	Localised positive landscape character effects	a) Frame views towards Drury Hills at motorway bridges (Quarry Road, Drury South Interchange and Ramarama Interchange) through architectural design of the structures and use of streetscape approach planting; and a) New bridges at Drury South and Ramarama Interchanges should be designed as features within the landscape and create a threshold experience for users and contribute to local identity, demonstrating a sense of place.
NoR 3	Nil to less than minor adverse effects	a) Effects can be managed by those typical recommendations in Table .
NoR 4	Reduction in More than Minor visual effects (VP7 – VP8), to Minor visual effects. Localised positive landscape character effects	b) Landscape vegetation screening is recommended to be provided between the SUP and adjacent properties to mitigate both views of the SUP structure from the private property at 1823 Great South Road, and of the private property being overlooked; c) Trees to be planted at an early phase to reinstate avenue of trees to both sides of St Stephen's School realigned driveway. d) New SUP bridges at GSR and Bombay Interchange should be designed as features within the landscape and create a threshold experience for users and contribute to local identity, demonstrating a sense of place. e) Opportunity to provide a ramp connector from the elevated SUP to GSR to provide an active-mode cross-corridor connection between St Stephen's School (south of SH1) and the Bishop Selwyn Memorial Cairn (north of SH1). This would provide improved active mode connection and link historic sites. No works are proposed within the heritage extent of place.
NoR 5	Localised positive landscape & natural character effects Reduction in More than Minor visual effects, to Minor visual effects.	a) Engagement with Mana Whenua should be undertaken with the use of preferred Te Aranga Māori design principles to celebrate the cultural value of the waterways and designed to contribute to local identity, demonstrating a sense of place; b) Reduction of bulk and retain visual permeability through use of transparent safety barriers and structural options which reduce the bulk, such as through truss structures; and c) Provide planting of appropriate indigenous plant species within the flood plain to screen views of the bridge from the open space area.

11 Conclusions

An increase in urbanisation is occurring within the north of the Project area at Drury South and Drury west, as approved through Plan Changes and land use zoning within the Auckland Unitary Plan. These changes in the existing conditions are the baseline for the effects to be assessed against.

Effects to the landscape and natural character, and visual amenity have been assessed at the construction and operational phases, against the baseline conditions. The residual effects have also been provided in Table 11-1 Table 11-2 below, where specific to the recommendations.

Landscape and natural character effects

The Project effects on landscape and natural character result in mainly less than minor long-term effects, except within NoR 5 which results in minor operational effects. This is due to the Drury South Link Road located within the Hingaia Stream floodplain and future open space area, which has landscape, cultural and recreational value.

Table 11-1: Summary of Landscape Character Effects

	Construction Effects	Operational Effects	Residual Effects
NoR 1	Nil effects to LCT 1	Nil effects to LCT 1	LCT 1: Localised positive effects
NoR 2	LCT 1: Less than minor	LCT 1: Less than minor	LCT 1: Localised positive effects
NoR 3	LCT 2: Less than minor	LCT 2: Nil effects	LCT 1: Localised positive effects
NoR 4	LCT 1 & 2: Less than minor	LCT 1 & 2: Less than minor	LCT 1 & 2: Localised positive effects
NoR 5	LCT 2: More than minor	LCT 2: Minor	LCT 2: Localised positive effects

There are limited effects to the natural character of waterways within the Project designation, with potential low modification localised where the Drury Link Road crosses the floodplain and the Hingaia Stream. The bridge design avoids direct interference with waterways, and the future environment comprising a restored open space and wetlands, is likely to enhance the amenity of the floodplain at Drury South.

Positive landscape and natural character effects

The recommended measures outlined in this report have the potential to add positive effects to the landscape and natural character. These measures are not expected to reduce the assessed landscape character effects, but have the potential to provide localised positive landscape and natural character effects. The recommended measures include:

- Extensive planting to either side of SH1, and stormwater wetlands to the west side, providing a green-blue corridor;
- Introduction of the SUP to provide active accessibility for the community and cross-corridor connections;
- Opportunity for improved Akaroa Trail route within SUP; and
- Localised positive effects through:

  Bridge design to celebrate the cultural value of the landscape and waterways, contribute to local identity, demonstrating a sense of place.

Visual effects

The temporary Project effects on visual amenity is **more than minor adverse effects** at VP5, representative of views of the extensive construction works of the Ramarama Interchange. The long-term operational effects at VP5 are **less than mino**r, with the road interchange at a further distance from the viewpoint and the SUP corridor surrounded by planting, providing some screening from the viewpoint.

More than minor adverse visual effects are experienced within NoR 4 and NoR 5 at year one of operation, however, have the potential to be reduced through design mitigation and vegetation screening.

The elevated SUP bridge across GSR will require removal of notable trees which will expose views of SH1, as experienced from private landholders (VP7 and VP8), and lessen the visual amenity provided by the trees. The consenting strategy within St Stephen's School comprises realignment of the entry driveway, retention of existing trees to one side of the driveway and planting of replacement trees to the north side, therefore reinstating the landscape and visual amenity provided by the avenue of trees. Additionally, the embankment is planted with native vegetation to reinstate screening of transport infrastructure (elevated SH1). This minimises the adverse long-term effects as experienced by VP8. The removal of trees located at the boundary between the road reserve and private property to the north of GSR, results in a loss of vegetation screening of the road and SUP infrastructure, resulting in more than minor visual effects for private resident represented by VP7. Replanting of screening vegetation, along with a high-quality façade to the SUP will reduce the adverse visual effects once established.

The introduction of the long-span bridge across the Hingaia Stream floodplain and a future recreational open space area within NoR 5, is assessed from VP15. There will be a noticeable compositional change to the waterway, however the bridge spans between highly modified environments including Drury South Interchange and future Drury South residential and light industrial zones, thus reducing the level of contrast and either side of the link road. The potential to reduce the visual effect of the bridge from the perspective of open space users, will be further determined through bridge design and vegetation screening.

Table 11-2: Summary of Visual Effects

	Construction Effects	Operational Effects	Residual Effects
NoR 1	Less than minor	Less than minor	Localised positive effects
NoR 2	Less than minor	Less than minor	Localised positive effects
	VP 5: More than minor	VP 5: Less than minor	VP 5: Less than minor
NoR 3	Less than minor	Nil effects	Localised positive effects
NoR 4	Less than minor	Less than minor effects	Localised positive effects
	VP 7: More than minor	VP 7: More than minor	VP 7: reduction in visual effects to Minor
	VP 8: More than minor	VP 8: Less than minor effects	VP8: reduction in visual effects to Less than Minor
NoR 5	More than minor	Minor effects	Localised positive effects
	VP 15: More than minor effects	VP 15: More than minor effects	VP 15: potential reduction in visual effects to Minor

Positive visual effects

The Project and recommended measures have the potential for the following positive effects on visual amenity. These measures are not expected to reduce the assessed effects of the Project, however the recommendations have the potential to provide localised positive visual effects.

- Landscape planting increase visual amenity around SH1;
- Extensive landscape planting to motorway structure embankments and planted drainage swales, provides increased visual amenity from within the motorway corridor and adjacent visual receptors; and
- Improved aesthetics of existing bridges:

  Drury South Interchange, Ramarama Interchange, GSR and Bombay Interchange bridges incorporating preferred Te Aranga Māori design principles and potential to provide aesthetic interest for motorists.

12 References

Auckland Council: Drury – Opāheke Structure Plan, August 2019

Auckland Council: Private Plan Change 48, Operative 16 December 2022

Auckland Council: AUP 1410 Drury South Industrial Precinct, Operative in Part

Auckland Council: Information requirements for the assessment of landscape and visual effects, September 2017

Drury South Crossing 'The Masterplan' https://www.drurysouthcrossing.co.nz/masterplan/ (accessed October 2023)

Institution of Lighting Professionals; Guidance Notes for the Reduction of Obtrusive Light, GN01:2011

Landscape Institute and Institute of Environmental Management & Assessment (IEMA, UK); The Guidance for Landscape and Visual Impact Assessment (GLVIA), Third Edition (2013)

New Zealand Transport Agency (NZTA) Waka Kotahi, Bridge manual SP/M/022 3rd edition, May 2016

NZTA Waka Kotahi, Bridging the gap – Urban Design Guidelines, May 2013

NZTA Waka Kotahi, Landscape and Visual Assessment Guidelines, October 2013

New Zealand Institute of Landscape Architects (NZILA); Aotearoa New Zealand Landscape Assessment Guidelines – Te Tangi a te Manu, Version 01 2022

NZILA, Best Practice Note 10.1: Landscape Assessment and Sustainable Management', 2 November 2013

Ministry for the Environment, National Policy Statement for Highly Productive Land, September 2022

Te Araroa Trail – Auckland region trail maps

Waka Kotahi: Papakura ki Pukekura - Urban and Landscape Design Framework (ULDF), June 2022

APPENDICES

Appendix A
Concept Plan

Appendix B
Visual Prominence Rationale

The visual prominence of a development can be determined by understanding the extent to which an object is part of a viewer's static field of view.

The measurement of the field of view is based upon the parameters of human vision outlined below. These provide a basis for assessing and interpreting the visual prominence of a development by comparing the extent to which the development will intrude into the central field of vision (both horizontally and vertically).

These horizontal and vertical fields of view are also interlinked to the viewing distance from the development. The methodology is based on the reduction of the visibility of a development in the distance as the field of view reduces (i.e. the increase in distance between a given viewpoint and the development).

Horizontal line of sight

It is generally accepted that the central field of vision for the human eye covers a horizontal angle of approximately 50 degrees to 60 degrees. Within this angle, both eyes observe an object simultaneously creating a degree of overlap, which is the central field of view (refer to Figure A.1). Within the central field of vision, the viewed image is sharp, colours are separately defined and depth perception occurs.

The visual prominence of a development will vary according to the proportion a development occupies the central field of vision.

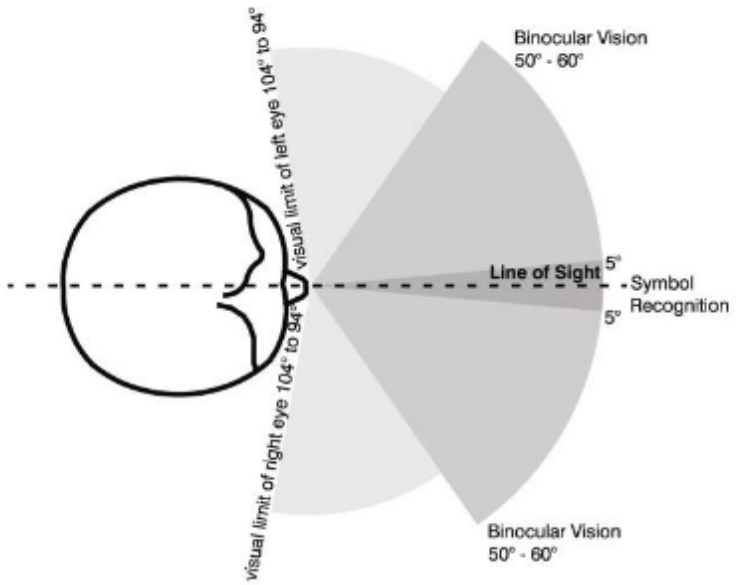


Figure A.1 Horizontal line of sight

Table A.1 outlines the potential visual prominence of a development, dependant upon on how much of the horizontal central field of vision that it occupies.

Degrees of Field of View occupied	Potential visual prominence – horizontal field of view
Less than 5°	**Insignificant - Low visual prominence** The development would not be highly visible in the view, unless it contrasts strongly with the background.
5° – 30°	**Potentially Noticeable – Moderate visual prominence** The development may be noticeable. The degree that it intrudes on the view would be dependent on how well it integrates with the landscape setting.
Greater than 30°	**Potentially Dominant - High visual prominence** The development would be highly noticeable.

Table A.1 Potential visual prominence based on degrees of horizontal field of view occupied

Vertical line of sight

As for the horizontal line of sight, there is also a vertical central field of view. If we assume that the horizon is 0° then the eye clearly defines colour, field of view and has image sharpness for an angle of approximately 25° upwards and 30° downwards. However, in reality, the typical line of sight for a standing person at ground level is approximately 10° below the horizon line (Refer to Figure A.2).

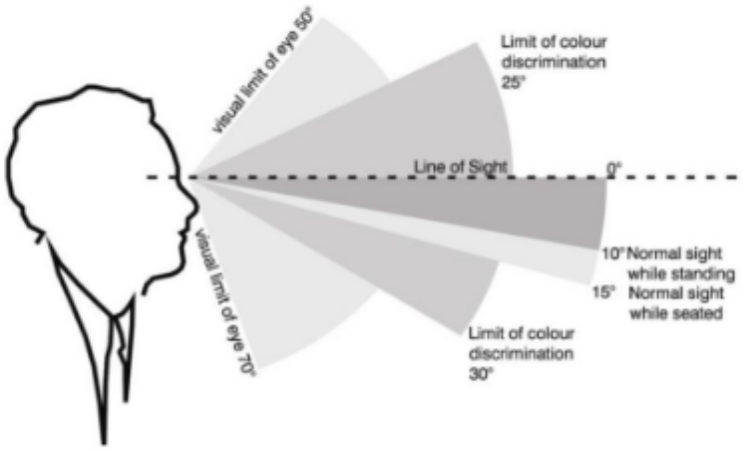


Figure A.2 Vertical line of sight

Objects that occupy a small proportion of the vertical field of view (less than 5^0) are visible but not dominant, particularly when they occur within landscapes that have been modified by human activity.

Table A.2 demonstrates the potential visual prominence of a development, dependant upon on how much of the vertical central field of vision that it occupies.

Degrees of Field of View occupied	Potential visual prominence – vertical field of view
Less than 0.5°	**Insignificant - Low visual prominence** A small thin line in the landscape and is no longer an easily recognisable element.
0.5° – 2.5°	**Potentially Noticeable - Moderate visual prominence** The development may be noticeable. The degree that it intrudes on the view would increase as distance reduces and be dependent on how well it integrates with the landscape setting.
Greater than 2.5°	**Potentially Dominant - High visual prominence** The development would be highly noticeable, although the degree of visual intrusion would depend on the landscape setting and the width / thickness of the object.

Table A.2 Potential visual prominence based on degrees of vertical field of view occupied

Visual prominence in relation to distance and field of view

These horizontal and vertical fields of view are also interlinked to the viewing distance from the development. The viewing distances, foreground, middleground and background, (refer to Table A.3) have been established based on previous field studies undertaken by Aurecon. The distances also relate to the distances for the land use types in the viewer sensitivity assessment methodology.

Distance from a viewer	Potential visual prominence
> 2.0km (background)	**Insignificant** The visibility of the development would progressively diminish over greater distances of 2km with no visibility beyond 5km due to atmospheric conditions.
Between 0.5km & 2.0km (middleground)	**Potentially Noticeable** The development would be noticeable, reducing with distance. The degree that it intrudes on the view would be dependent on topography and the vegetation within the landscape setting and how well it integrates with the surrounding land-uses.
< 0.5km (foreground)	**Potentially Dominant** The development would be highly noticeable, although the degree of visual intrusion would depend on the landscape setting (where not screened by vegetation or buildings) and the width / thickness of the object.

Table A.3 Potential visual prominence based on distance from a viewer

Figure A.3 illustratively demonstrates how the viewshed of a horizontal object is determined by its height and not so much by its width based on the viewing distance from a development. As a viewer moves further away from a horizontal object the width may still be apparent, however the vertical dimension reduces to insignificance.

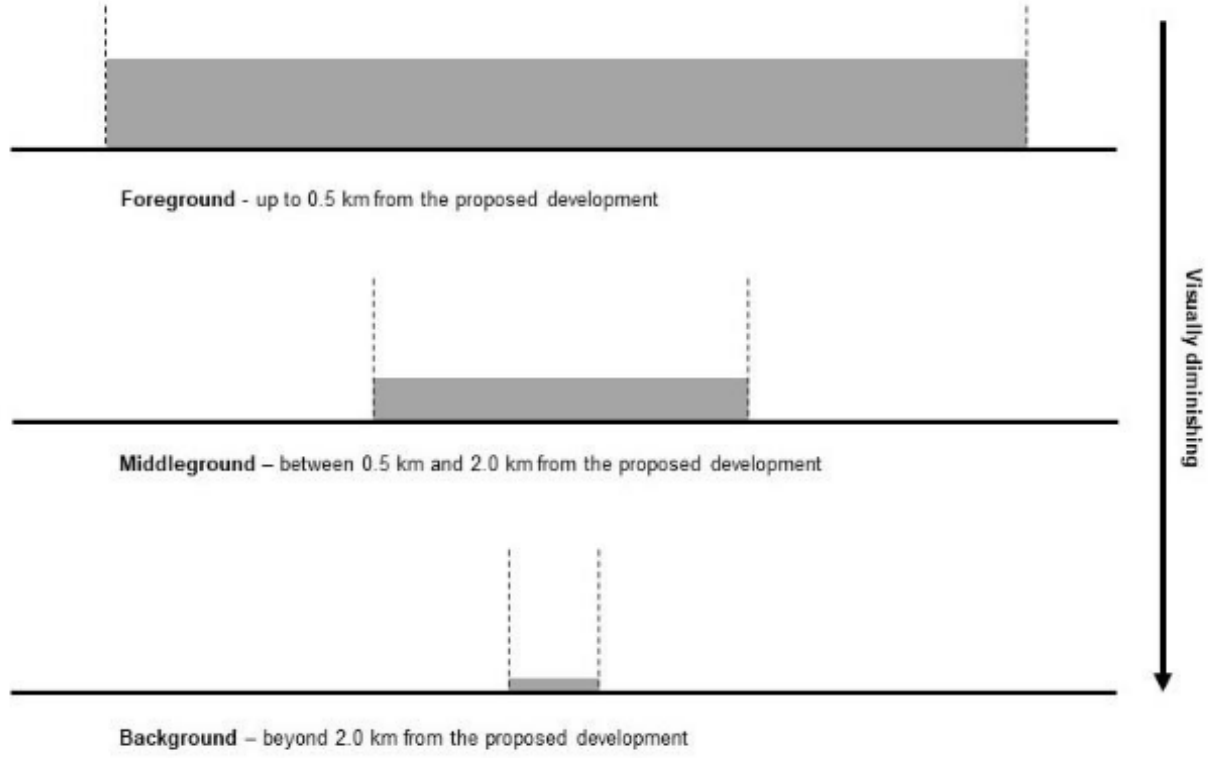


Figure A.3 The reduction in visibility of the horizontal line of sight based on increase in distance from a viewpoint

The same approach can be applied to the vertical field of view. As a viewer moves further away from a vertical object the height may still be apparent, however the vertical dimension reduces to insignificance (refer to Figure A.4).

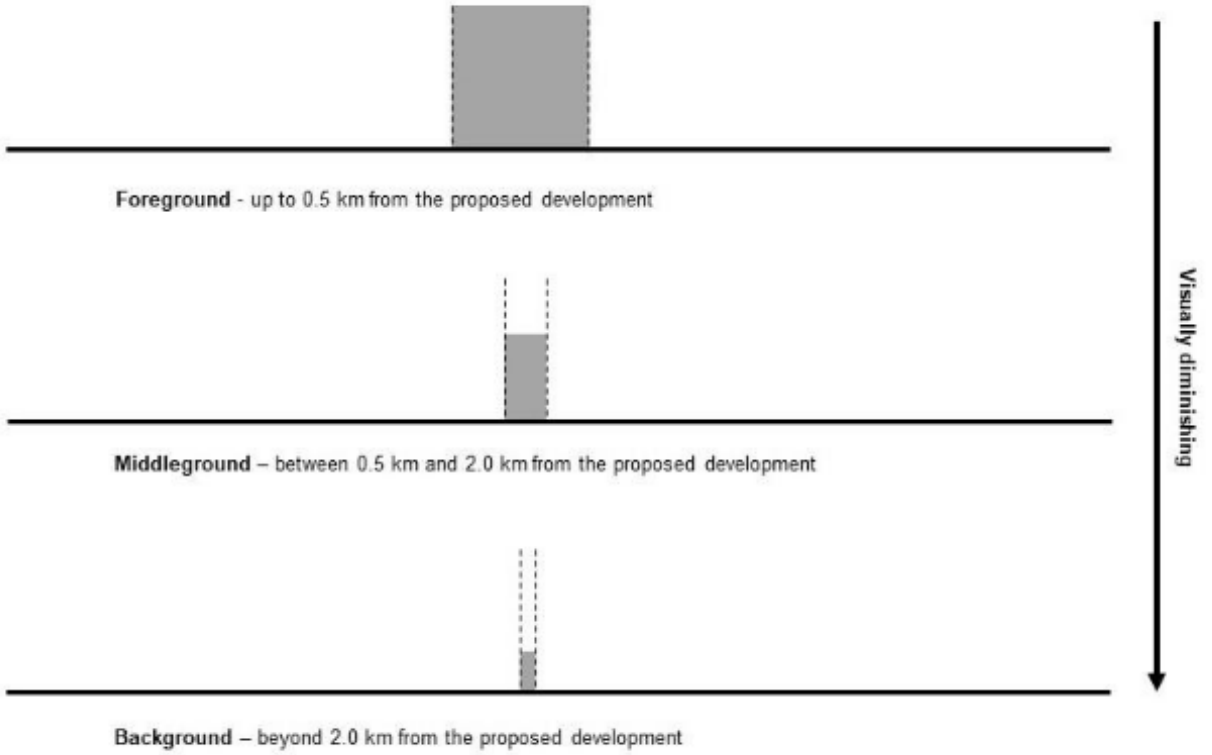
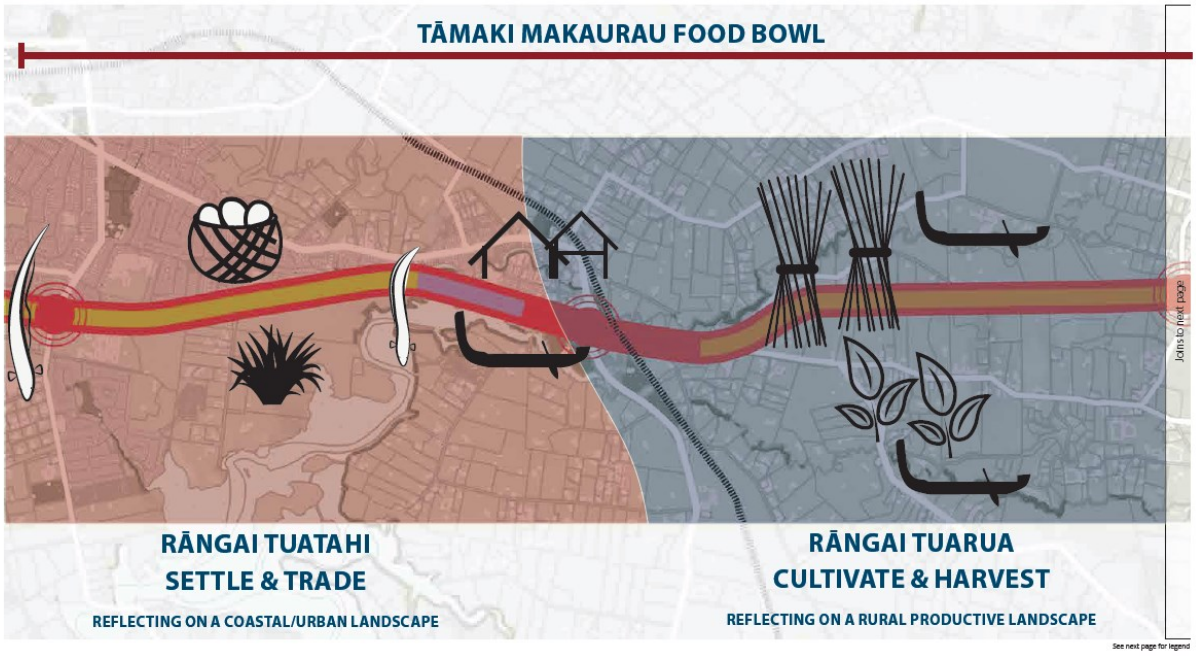
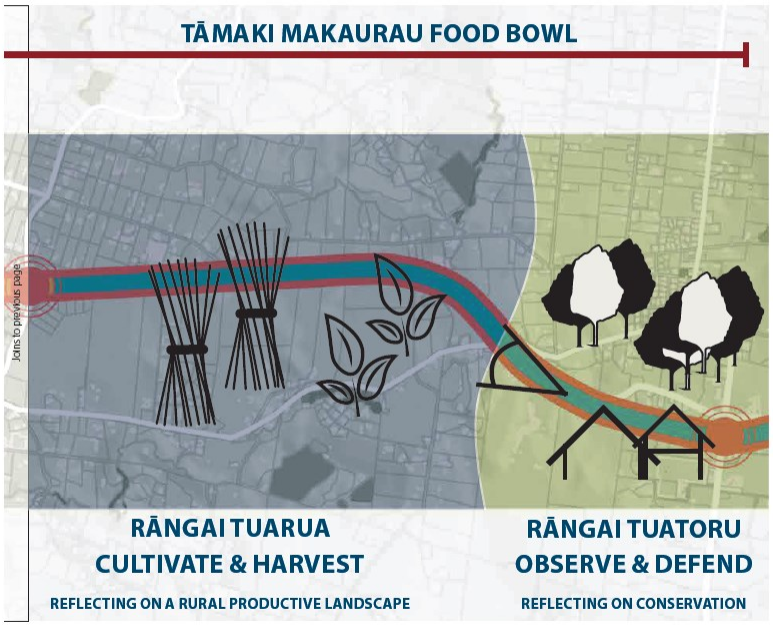


Figure A.4 The reduction in visibility of the vertical line of sight based on increase in distance from a viewpoint

Appendix C
Landscape Character Types



C2: CORRIDOR CHARACTER AREAS



Movement through the corridor follows a change in character and heritage land use from settlement and trading areas, through to rural cultivation ground before heading towards the Waikato over the higher ground. Early settlement patterns provide a model for land use and values.

The combined analysis of the cultural and physical landscape suggests the following character areas across the project:

RĀNGAI TUATAHI: SETTLE AND TRADE - COASTAL / URBAN
The urban areas of Papakura and Drury have been desirable settlements for a long time because of its:
- low ground;
- accessibility; and
- rich resources.

RĀNGAI TUARUA: CULTIVATE AND HARVEST - RURAL / PRODUCTIVE
This character area is a highly productive landscape, both historically and currently. Its desirable qualities include:
- its 'middle ground' location;
- more accessible;
- controlled and protected but traversable; and
- resource-rich for produce and animal husbandry.

RĀNGI TUATORU: OBSERVE & DEFEND - CONSERVATION
The Hūnua Ranges and Pukekura have higher conservation values and commanding views over the Auckland Region. Its attributes are:
- higher ground;
- commanding views;
- defensive;
- inaccessible;
- controlled; and
- resource-rich for tools and inorganic materials.

Whilst the landscape is undergoing significant change, the development of the corridor can be reflective of the existing and historical character, retaining its role as a familiar route through a dynamic landscape.

Figure 12-1: Papakura ki Pukekura Urban Design Landscape Framework – Corridor Character Areas

Appendix D
Land Zone mapping

Appendix E
Overlay mapping

Appendix F

Topography and hydrology mapping

Papakura to Bombay Project Office

Aurecon New Zealand Limited
Level 3, Te Tihi
110 Carlton Gore Road,
Newmarket, Auckland 1023
PO Box 9762, Newmarket, Auckland 1149, New Zealand
New Zealand

T +64 9 520 6019
E auckland@aurecongroup.com
W aurecongroup.com