TE TUPU NGĀTAHI
SUPPORTING GROWTH

Drury Arterial Network Assessment of Landscape and Visual Effects

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WAKA KOTAHI
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1 Glossary of acronyms and defined terms

Table 1-1: Glossary of technical terms / acronyms

Acronym	Term
AEE	Assessment of Effects on the Environment
AT	Auckland Transport
AUPOIP	Auckland Unitary Plan Operative in Part
DOSP	Drury-Ōpāheke Structure Plan
FTN	Frequent Transit Network
FUZ	Future Urban Zone
NIMT	North Island Main Trunk
NoR	Notice of Requirement (under the Resource Management Act 1991)
SH1	State Highway 1
SH22	State Highway 22
Transport Agency	Waka Kotahi NZ Transport Agency
Council	Auckland Council
RC	Resource Consent
RMA	Resource Management Act 1991
ONL	Outstanding Natural Landscape
ONF	Outstanding Natural Feature
ONC	Outstanding Natural Character
HNC	High Natural Character
LCDB	Land Cover Data Base
SEA	Significant Ecological Area
ULDMP	Urban and Landscape Design Management Plan

Table 1-2: Glossary of defined terms

Term	Meaning
Auckland Council	Means the unitary authority for the Auckland Region.
Green Infrastructure	Includes water bodies, forest, planted vegetation and open space areas .
Blue-Green Network	A green infrastructure proposal that combines the Auckland wide policies of Section E3, with specific landscape values of the Drury-Ōpāheke area. Proposed by Auckland Council in the Drury-Ōpāheke Structure Plan to guide future urban growth.

Term	Meaning
Baseline Landscape	The landscape and visual character as it exists at the commencement of the assessment process – i.e. prior to the construction of the proposed development. The analysis for each NoR draws on the contextual analysis and evaluation of sensitivity and Landscape Character Areas as set out in the Drury Structure Plan: Landscape and Visual Assessment Report (DSP:LVA)[1].
Change Management	Identification of ways to enhance the landscape and actions to avoid, remedy or mitigate adverse landscape effects.
Drury Arterial Network	State Highway 22 Upgrade (NoR D1) Jesmond to Waihoehoe West FTN Upgrade (NoR D2) Waihoehoe Road East Upgrade (NoR D3) Ōpāheke North-South FTN Arterial (NoR D4) Ponga Road and Ōpāheke Road Upgrade (NoR D5)
Drury Package	Five Notices of Requirement for the Drury Arterial Network for Auckland Transport and Waka Kotahi NZ Transport Agency.
Drury – Ōpāheke Area	Refers to the contextual landscape study area in which the Drury Package is proposed. Refer Appendix 3 – LP. 01
Designation Boundary	The extent of the proposed NoR.
Landscape	Is the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations[2].
Landscape Character	Is derived from the distinct and recognisable pattern of elements that occur consistently in a particular landscape. It reflects particular combinations of geology, landform, soils, vegetation, land use and features of human settlement. These elements create a unique sense of place defining different areas of the landscape.
Likely Future Environment	The landscape and visual character as a result of the future development proposed in the AUP, including specific precinct plans relating to the Project area. The LFE includes any existing baseline landscape elements (i.e. ONL's, protected vegetation, water ways, landform, sites and/or elements of cultural significance, and existing land-use scenarios) that are likely to endure following anticipated future development resulting from future urban zoning, AUP (OIP) overlays and land development projects (planned and/or under construction).
Landscape Effects	Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape.
Natural Character	The level of natural character (or naturalness) varies within each landscape/seascape and is the result of the combined levels of indigenous nature and perceived nature. These are typically defined by the extent to which natural elements, patterns and processes occur and are legible, and the nature and extent of human modification to the landscape and ecosystems.

[1] Drury Structure Plan: Landscape and Visual Assessment – Background Investigation for Auckland Council. Opus International Consultants Ltd, August 2017

[2] NZILA Landscape Assessment and Sustainable Management Practice Note 10.1.

Term	Meaning
Natural Character Effects	Natural character effects arise from landform modification and subsequent vegetation clearance within water bodies including wetlands, lakes and rivers and their margins[3].
Permanent Effects (Operational Effects)	Describes the effects on the landscape of completed works (including integrated landscape mitigation measures), the significance of physical landscape change and ultimately the resulting effects of the Projects on landscape character, natural character and visual amenity for both public and private viewing audiences.
Project area	Refers to the land being developed within the boundary of each NoR. Includes the carriageway, batter slopes, intersections, bridging, landscape mitigation planting and street trees and construction laydown areas. Refer Appendix 3 – LP. 01
Temporary Effects (Construction Effects)	Describes the anticipated impacts on the bio-physical elements and features of the landscape resource (landform, vegetation and hydrology) resulting from the construction of the Project. It also includes visual amenity effects for both public and private viewing audiences from construction works.
Visual Effects	Visual effects relate to the changes to amenity values of a landscape including the "natural and physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes" [4] .

[3] Resource Management Act 1991 and New Zealand Coastal Policy Statement 2010

[4] Resource Management Act 1991.

2 Executive Summary

This report provides an assessment of potential landscape character, natural character and visual effects associated with the construction, operation and maintenance of the Drury Arterial Network. The Drury Arterial Network includes five Notices of Requirement (NoRs) (Drury Package) for transport corridors within the Drury-Ōpāheke area. The Projects comprising the Drury Package will - overtime - become the defining arterial transport network to support an emerging urban form throughout the Drury-Ōpāheke area.

This assessment has been undertaken in accordance with the NZILA Landscape Assessment and Sustainable Management Practice Note 10.1. and also, with reference to nationally recognised guidance documents outlined in section 4 of this report.

Landscape and visual effects have been assessed for each Project in terms of temporary and permanent effects, as outlined below.

Temporary Effects (Construction Effects): Describes the anticipated impacts on the bio-physical elements and features of the landscape resource (landform, vegetation and hydrology) resulting from the construction of the Project. It also includes visual amenity effects for both public and private viewing audiences from construction works.

Permanent Effects (Operational Effects): Describes the effects on the landscape of completed works (including integrated landscape mitigation measures), the significance of physical landscape change and ultimately the resulting effects of the Projects on landscape character, natural character and visual amenity for both public and private viewing audiences.

The Drury-Ōpāheke area is characteristically a 'wet' drainage landscape that exhibits a substantial level of modification associated with rural and industrial land use and some existing urban development. At various locations throughout Drury – Ōpāheke (including within the Project areas), land modification has been responsible for the re-shaping, realignment or otherwise degradation of natural watercourses, as well as extensive native vegetation removal. As such, many of the sensitive hydrological features within the Project areas remain in a state of degradation; and for much of the terrestrial environment, there is a distinct absence of indigenous vegetation cover.

There are, however, some localised areas within the Project areas where natural character is heightened and where landscape elements (native and exotic) come together to generate a localised identity and heightened degree of landscape character. These areas include the Ngakoroa Stream and associated marine and terrestrial SEAs surrounding the existing Ngakoroa Stream Bridge (NoR D2 Bremner Road section). It also includes the eastern extent of the Ponga Road section of NoR D5, where indigenous vegetation (including remnant kahikatea forest) and mature exotic trees generate a locally distinct landscape character, at the transition between the FUZ and rural zone.

Land adjacent to the Project areas will undergo significant change from rural to urban land use and character over the next 30 years, with the Drury Package being delivered congruently to support the emerging urban development typologies. Some of the defining abiotic features and patterns of the landscape will endure if not define the pattern of future development; these include the riparian and wetland environments associated with Oira Creek, Ngakoroa Stream, Hingaia Stream, Waihoehoe Stream, Waipokapū Stream and Ōtūwairoa Stream. Existing open space areas such as Ngakoroa Reserve, Drury Sports Complex and Ōpāheke Reserve and scheduled features such as the SEAs of

Ngakoroa Stream and the protected trees within the Drury Sports Complex have a greater level of protection under the AUP and therefore are likely to feature within the future urban landscape.

Significant adverse landscape and visual effects have been 'designed out' of the Drury Package through a substantive alternatives assessment process involving specialist inputs and design refinement. As a result, the Projects avoid nationally and regionally significant landscape features and seek to limit physical effects on Significant Ecological Areas (SEAs), streams and other high value landscape features within the local landscape.

Localised landscape and visual effects arising from the proposed NoRs are generally consistent throughout the Drury Package and can be summarised as follows:

- Impacts on the physical landscape resource during construction such as vegetation clearance (within the road reserve and private property boundaries), operation of construction areas, earthworks within existing road corridors and adjacent land and construction of bridge structures within wetland and stream environments (subject to regional consent approvals).
- Potential impacts on private properties including removal and reinstatement of boundary fences, garden plantings and driveway regrades.
- Potential adverse natural character effects arising from earthworks and vegetation impacts within water bodies including within the general coastal environment (Ngakoroa Stream NoR D2), subject to regional consents.
- Potential adverse landscape character effects arising from permanent landscape change within an emerging urban landscape. Consideration of impacts on urban amenity, neighbourhood character and sense of place, generated by the principle elements of the Project.

This landscape assessment concludes that the proposed features and scale of the Projects can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report - implemented through an ULDMP which is recommended as a condition on the proposed designations. The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that the planting proposed under the ULDMP condition is integrated with any future planting required as part of the regional consenting phase of the Project.

Landscape mitigation measures for the Drury Package include recommendations for integrating the proposed bridge structures, walking and cycling connectivity, configuration of stormwater wetlands with future urban form, integration of fill slopes, reinstatement of private property fences and garden plantings and a comprehensive planting plan covering all mitigation treatments.

As outlined above, this landscape assessment takes a precautionary approach by focusing the assessment of construction impacts on the existing landscape resource (which is largely rural in character). It is feasible however, that urban development (on adjacent land) will in some instances occur ahead of, if not congruently with the construction of the Drury Package, which in itself will bring about substantial landscape and visual change. In any case, it is noted that there is flexibility within the design footprint to integrate with adjacent development schemes and in some instances, this will remove the requirement to mitigate individual property impacts from a landscape effects point of view.

Throughout the Project areas, there is generally significant opportunity for natural character values to be improved and opportunities to integrate with the proposed Auckland Council Blue-Green network. These matters are anticipated to be developed through the proposed ULDMP and regional consenting process.

The following paragraphs provide a summary of the existing and likely future landscape for each NoR and the potential physical landscape, landscape character, natural character and visual amenity effects of each Project.

2.1 NoR D1 – Alteration to Designation 6707 - State Highway 22 Upgrade

The Project area for NoR D1 is currently characterised by rural residential and productive rural land use, moderate (localised) natural character values associated with the Ngakoroa Stream and terrestrial SEA classification, and a vegetation framework predominated by exotic shrubs and trees and limited indigenous species within the margins of Ngakoroa Stream. The baseline landscape is further influenced by the FUZ which signals a shift for existing rural residential areas towards a more urbanised form.

The key landscape matters addressed for the State Highway 22 (SH22) Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project with a specific focus on potential effects arising from the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction within the Ngakoroa Stream environment.
- The nature and extent of physical impacts on private properties adjacent to the existing SH22 road corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge re-construction within the Ngakoroa Stream environment. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of landscape amenity effects in relation to Ngakoroa Reserve and Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network at future regional consent stage.

Overall landscape and visual effects range from **low** to **moderate** for the construction phase and **very low** to **moderate-low** for the operational phase.

NoR D1 Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works, finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

2.2 NoR D2 – Jesmond to Waihoehoe West FTN Upgrade

The wider Project area for NoR D2 is currently characterised by rural residential land use, industrial and commercial land use (within Drury Central), open space areas and construction activities associated with Auranga development . There are several bridges such as those over the Ngakoroa Stream, SH1 corridor and Hingaia Stream. It contains moderate (localised) natural character values associated with the Ngakoroa Stream and terrestrial SEA classification, and a vegetation matrix predominated by exotic shrubs and trees and limited indigenous species within the margins of the Ngakoroa Stream. The baseline landscape is further influenced by the FUZ and Drury 1 Precinct which collectively signals a shift for existing rural residential areas towards a more urbanised form.

The key landscape matters addressed for the Jesmond to Waihoehoe West FTN Project (NoR D2) include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction over Ngakoroa Stream, SH1, Hingaia Stream and the NIMT.
- The nature and extent of physical impacts on private properties adjacent to the Project area during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Construction of a new section of road through greenfield land between Jesmond Road and existing Bremner Road (Jesmond to Bremner Link).
- Road widening to integrate the proposed Great South Road / Norrie Road / Waihoehoe Road intersection and Tui Street connection;

- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- Consideration of the potential natural character effects of bridge construction within the Ngakoroa Stream environment (adjacent to the CMA) and Hingaia Stream. Acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change from the widened (partially new) transport corridor (forms part of the Jesmond to Bremner Link) and impacts within the Auranga development area. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of landscape amenity effects in relation to Ngakoroa stream esplanade reserve, Hingaia Stream esplanade reserve and the Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of opportunities to integrate the Project with the proposed Blue-Green network at future regional consent stage.

Overall landscape and visual effects range from **very low** to **moderate-low** for the construction and operational phase.

Jesmond Road FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Low to moderate-low** for private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

Bremner Road FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low to moderate-low**
Effects on Visual Amenity	N/A	**Low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very Low**

Waihoehoe Road West FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	
Temporary Visual Effects	**Low** **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Very low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Very low**

2.3 NoR D3 – Waihoehoe Road East Upgrade

The Project area is currently characterised by rural residential land use, limited hydrological features and a vegetation framework predominated by exotic shrubs and trees. The baseline landscape is further influenced by the FUZ which signals a shift for existing rural residential areas towards a more urbanised form.

The key landscape matters addressed for the Waihoehoe Road East Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance and the scale and location of proposed cut and fill slopes.
- The nature and extent of physical impacts on private properties adjacent to the existing Waihoehoe Road East corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the context of the existing Waihoehoe Road East corridor. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of project works adjacent to waterbodies.
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

Overall, landscape and visual effects range from **low** to **moderate-low** for the construction phase and **negligible** to **moderate-low** for the operational phase.

Waihoehoe Road East Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values		**Negligible**

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low to moderate-low** (reducing over an extended period of time)
Effects on Landscape Character		**Very low**

2.4 NoR D4 – Ōpāheke North-South FTN Arterial

The Project area is currently characterised by limited rural residential development, extensive areas of pastoral landscape, an extensive drainage landscape associated with Waihoehoe Stream and Waipokapū Stream and existing industrial land use within the elevated Boundary Road and Hunua Road catchment. The baseline landscape is further influenced by the FUZ which signals a shift for existing rural residential areas towards a more urbanised form.

The key landscape matters addressed for the Ōpāheke North-South FTN Arterial project include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction through the Waipokapū and Waihoehoe Stream flood plains.
- The nature and extent of physical impacts on the small number of private properties adjacent to the project during the construction period, and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the existing greenfield landscape. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge construction within the Waipokapū and Waihoehoe Stream environments. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

Overall landscape and visual effects range from **very low** to **moderate-low** for the construction phase and **very low** to **moderate-low** for the operational phase.

Ōpāheke North-South FTN Arterial - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very Low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Moderate-low** to **low** (reducing over an extended period of time)
Effects on Landscape Character	N/A	**Low**

2.5 NoR D5 – Ponga Road and Ōpāheke Road Upgrade

The wider Project area is currently characterised by rural residential and lifestyle land use, open space associated with Mangapū Stream and Ōtūwairoa Stream, a purpose built sports complex at Ōpāheke Reserve and associated open space (comprising the drainage landscape associated with Ōtūwairoa Stream) and NIMT crossing and existing urban residential development within the northern end of the Project area. The baseline landscape is further influenced by the FUZ and Ōpāheke 1 Precinct which collectively signals a shift for existing rural residential areas towards a more urbanised form.

The key matters addressed by this landscape character, natural character and visual effects assessment are as follows:

- The nature and extent of temporary physical landscape effects during the construction period of the Project with a specific focus on construction laydown areas, vegetation clearance, bridge construction over Mangapū Stream and Ōtūwairoa Stream, and subsequent cut and fill slopes along the new road corridor.
- Integration of the elevated road corridor (approximately 5m) above existing road surface level on the approach to the Mangapū Stream bridge crossing and the proposed tie-in with the Mill Road corridor at Ponga Road / Jack-Paterson Road intersection.
- Integration of the large-scale fill slopes at CH1780 – 2050 associated with the proposed Mangapū Stream bridge.

- The nature and extent of temporary physical impacts on private properties adjacent to the existing road corridor.
- Potential natural character effects on Mangapū Stream, Ōtūwairoa Stream and the floodplain associated with the bridge construction.
- Potential natural character effects on and areas within the existing wetland of Ōpāheke Reserve;
- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- The potential landscape character, natural character and visual amenity effects arising as a result of permanent landscape change, including how well the principal elements of the Project integrate into the likely future landscape;
- Potential landscape amenity effects on Ōpāheke Reserve and consideration of future opportunities to integrate the Project into the proposed Blue-Green network.
- Landscape and visual effects on the Papakura Cemetery.

Overall landscape and visual effects range from **low** to **moderate** for the construction phase and **very low** to **moderate-low** for the operational phase.

Ponga Road Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate** **Moderate** for affected private properties.	N/A
Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Low**

Ōpāheke Road Rural Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Low** for affected private properties.	
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**Low**
Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Low**

Ōpāheke Road Urban Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Very low** (including for affected private properties).	
Temporary Visual Effects	**Low** for public and private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Low** (moving to beneficial overtime for private and public viewing audiences)
Effects on Landscape Character		**Very low**

3 Introduction

This report has been prepared for the Drury Arterial Network Notices of Requirement (NoRs) for Auckland Transport (AT) and Waka Kotahi NZ Transport Agency (Waka Kotahi) (the "Drury Package"). The NoRs are to designate land for future strategic transport corridors as part of the Supporting Growth Programme to enable the future construction, operation and maintenance of transport infrastructure in the Drury-Ōpāheke area of Auckland.

The Auckland Council Drury-Ōpāheke structure plan area is expected to grow over the next 30 years and is estimated to provide about 22,000 houses and about 12,000 jobs with a population of about 60,000. The Drury Package will provide route protection for the local arterials, which include walking, cycling and public transport (including the Frequent Transit Network (FTN)), needed to support the expected growth in Drury. This report assesses the landscape character, natural character and visual amenity effects of the proposed Projects, that together comprise the Drury Package, as shown in Figure 3-1.

Table 3-1 Drury Package: Notices of Requirement and Projects

Notice	Project
NoR D1	Alteration to NZ Transport Agency designation 6707 - State Highway 22 (SH22) Upgrade
NoR D2	Jesmond to Waihoehoe West FTN Upgrade
NoR D3	Waihoehoe Road East Upgrade
NoR D4	Ōpāheke North-South FTN Arterial
NoR D5	Ponga Road and Ōpāheke Road Upgrade

The Drury Package has been developed through an alternatives assessment. Corridor alternatives and route refinements were assessed by a multi-disciplinary team against a programme wide Multi-Criteria Assessment. This assessment phase was completed in February 2020, and further design changes have been adopted through the Assessment of Environmental Effects (AEE) process for the Drury Package, in response to a range of construction and environmental considerations.

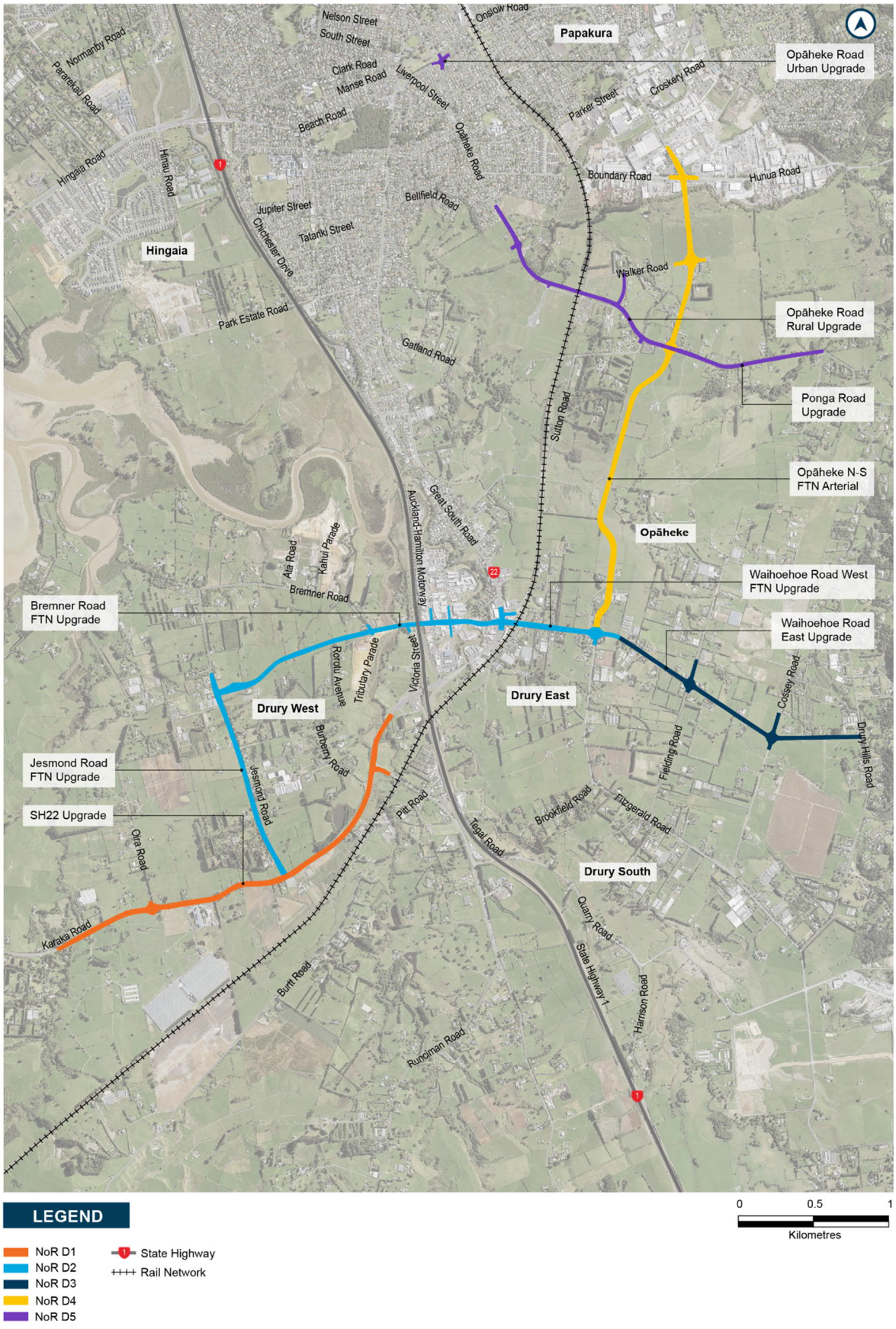


Figure 3-1 Drury Package Projects and Notices of Requirement

3.1 Background

Auckland is New Zealand's largest city, home to approximately 1.65 million people. In 2017, Auckland attracted 36,800 new residents; more than the rest of the country combined. The Auckland Plan 2050 – Development Strategy signals that Auckland could grow by 720,000 people to reach 2.4 million over the next 30 years. This will generate demand for more than 400,000 additional homes and require land for 270,000 more jobs.[5] Most of this growth will go into existing urban areas. However, around a third will go into future urban zone (FUZ) as identified in the Auckland Unitary Plan: Operative in Part (AUPOIP). The FUZ areas are "greenfields", that is, generally rural land identified to be urbanised over time.

The Supporting Growth Programme is a collaboration between AT and Waka Kotahi to plan transport investment in Auckland's future urban zoned areas over the next 10 to 30 years. AT and Waka Kotahi have partnered with Auckland Council, Manawhenua and KiwiRail Holdings Limited (KiwiRail) and are working closely with stakeholders and the community to develop the strategic transport network to support Auckland's growth areas.

The key objective of the Supporting Growth Programme is to protect land for future implementation of the required strategic transport corridors/infrastructure. As a form of route protection, designations will identify and appropriately protect the land necessary to enable the future construction, operation and maintenance of these required transport corridors/infrastructure. A designation is important as it provides certainty for the Requiring Authority that it can implement the work. It also provides property owners, businesses and the community with increased certainty regarding future infrastructure, so they can make informed decisions (if confirmed it will be identified in the AUPOIP). It can also significantly reduce long-term costs for local and central government and enable more effective land use and transport outcomes.

3.2 Drury Package

The Drury Package proposes an arterial network to support the expected future growth in Drury-Ōpāheke. The Drury Package comprises five separate projects which together form the Drury Arterial Network. The network includes provision for general traffic, walking and cycling, and frequent public transport. Overall, the Drury Package aims to improve connectivity within and through the Drury-Ōpāheke area, providing high quality, safe and attractive transport environments.

Each Project within the Drury Package will be designated separately as follows:

- **NoR D1:** Alteration to Waka Kotahi NZ Transport Agency designation 6707 - State Highway 22 (SH22) Upgrade
- **NoR D2:** Jesmond to Waihoehoe West FTN Upgrade
- **NoR D3:** Waihoehoe Road East Upgrade
- **NoR D4:** Ōpāheke North-South FTN Arterial (Ōpāheke N-S FTN Arterial)
- **NoR D5:** Ponga Road and Ōpāheke Road Upgrade

[5] Draft Auckland Plan 2050 Development Strategy: https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/development-strategy/future-auckland/Pages/what-auckland-look-like-future.aspx

3.3 Purpose and Scope of this Report

This report provides an assessment of landscape character, natural character and visual effects associated with the construction, operation and maintenance of the Drury Package. This assessment has been prepared to inform the AEE for the NoRs. The purpose of this report is to:

- Identify and describe the existing and likely future landscape and visual environment;
- Identify and describe the actual and potential landscape and visual effects of the Projects;
- Recommend measures as appropriate to avoid, remedy or mitigate potential adverse landscape and visual effects (including any conditions/management plan required); and
- Present an overall conclusion of the level of potential adverse landscape and visual effects of each of the Projects after recommended measures are implemented.

The key matters addressed in this report are as follows:

- Description of the Projects as they relate to landscape character, natural character and visual amenity;
- Overview of the methodology used to undertake the assessment and identification of the assessment criteria and any relevant standards or guidelines;
- Identification and description of the existing and likely future landscape and visual environment;
- Description of the actual and potential positive effects of each Project;
- Description of the actual and potential adverse landscape and visual effects of operation of each Project;
- Description of the actual and potential adverse landscape and visual effects of construction of each Project;
- Recommended measures to avoid, remedy or mitigate potential adverse landscape and visual effects (including any conditions/management plan required); and
- Overall conclusion of the level of potential adverse landscape and visual effects of each of the Projects after recommended measures are implemented.

3.4 Report Structure

This report is structured to reflect the key matters listed above in Section 3.3.

In order to provide a clear assessment of each Project, descriptions and assessments have been separated to reflect each of the notices sought.

3.5 Preparation for this Report

A number of external reports were reviewed during the preparation of this landscape assessment. They include the Ōpāheke Landscape Assessment report (in support of the structure plan), Stormwater Report, Arborist Report and the Ecological Report prepared as to support the AEE for these Projects.

4 Assessment Criteria

Chapter Summary

This landscape and visual assessment has taken into account a range of statutory and non-statutory guidance in relation to assessing the existing landscape values of the Project areas and the potential landscape effects of the Drury Package, and this guidance has been considered in assessing the potential effects of the Projects.

Section 6 of the RMA sets out the matters of national importance which shall be recognised and provided for in relation to relation to managing the use, development, and protection of natural and physical resources. The New Zealand Coastal Policy Statement (NZCPS 2010) sets out the policy direction for preserving and enhancing the natural character values of the Coastal environment which are relevant to the assessment to natural character effects in relation to NoR D2 (Bremner Road FTN Upgrade section).

Non-statutory guidance by way of the Drury – Ōpāheke Structure Plan and the landscape assessment supporting the structure plan has informed the evaluation of the sensitivity of the Drury – Ōpāheke landscape and the description of the likely future landscape in which the Drury Package will be implemented.

In terms of reducing and mitigating the likely adverse landscape and visual effects of the Projects, a series of relevant design guidelines have been referred to which provide best practice urban design and landscape management examples for transport projects. These include the following:

- Te Tupu Ngātahi Design Framework – Version 1.0
- The Transport Design Manual (TDM) - Auckland Transport
- Bridging the Gap: NZTA Urban Design Guidelines (2013)
- New Zealand Transport Agency Landscape Guidelines (Final Draft, 2014)

4.1 Statutory Guidance

4.1.1 Notice of Requirement

This assessment has been prepared to support the NoR for the Projects. Section 171 of the RMA sets out the matters that must be considered in making a recommendation on a NoR. This includes consideration of the actual or potential effects (including positive effects) on the environment of allowing the requirement under the Resource Management Act 1991 (RMA).

As set out under s 176 of the RMA, the designation once confirmed authorises the activities relating to the Project or work enabled by the designation that would otherwise require a resource consent for land use activities pursuant to s 9(3) of the RMA. Regional resource consents are not currently being sought for the Drury Package and it is understood that the appropriate regional resource consents will be sought at the detailed design stage, prior to construction of the Projects. This assessment therefore focuses on the landscape and visual effects of the land use activities that will be authorised by the proposed designations for the Projects. Landscape and visual effects arising from activities that require future regional consents will be assessed as part of a future consent process.

4.1.2 Resource Management Act (RMA)

Section 6 of the RMA sets out matters of national importance which shall be recognised and provided for in relation to managing the use, development, and protection of natural and physical resources. Section 6(a) recognises the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers[6] and their margins, and the protection of them from inappropriate subdivision, use, and development. Section 6(b) recognises the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development. Section 6(f) recognises the protection of historic heritage from inappropriate subdivision, use and development.

Section 7 of the RMA sets out matters that decision makers shall have particular regard to, including Section 7(c), the maintenance and enhancement of amenity values and Section 7(f), the maintenance and enhancement of the quality of the environment. Section 8 requires that the principals of Tiriti o Waitangi (Treaty of Waitangi) are taken into account in relation to managing the use, development, and protection of natural and physical resources.

4.1.3 New Zealand Coastal Policy Statement 2010

The NZCPS provides the national policy framework for managing the coastal environment under the RMA. The coastal environment is recognised in an RMA context as including (but not limited to) the Coastal Marine Area (CMA); areas where coastal processes, influences or qualities are significant (including coastal lakes, tidal estuaries, wetlands and their margins); coastal vegetation and habitat for migratory birds and elements and features that contribute to the natural character, landscape and visual qualities or amenity values[7].

Ngakoroa Stream (located within NoR D2) is considered to form part of the CMA and the surrounding land is generally considered to form part of the wider coastal environment. Under the RMA this makes the consideration of natural character values in the coastal environment relevant to the landscape assessment of NoR D2.

4.2 Non-Statutory Guidance

4.2.1 Drury – Ōpāheke Structure Plan August 2019

The Drury-Ōpāheke Structure Plan indicates how the future urban environment may develop over time, subject to future plan change processes. As such, it is possible to describe, in general terms, the likely future urban framework for land within and adjacent to the proposed Drury Package. The key outcomes sought by the Drury – Ōpāheke Structure Plan[8] of relevance to landscape planning are outlined as follows and illustrated in Appendix 1 Landscape Plans and Images; Maps 05 and 06.

[6] A 'river' is defined in the RMA as a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse.

[7] New Zealand Coastal Policy Statement 2010 – Policy 1 Extent and Characteristics of the Coastal Environment.

[8] Drury – Ōpāheke Structure Plan. August 2019.

Land Use

Future development of land within the area adjacent to the Drury Package will be guided by the key outcomes sought by the Drury-Ōpāheke Structure Plan. In all cases, there is expected to be a significant shift from rural to urban land uses which means that the existing landscape character and visual amenity surrounding the proposed designations is likely to experience significant change over the next 10-30 years.

The structure plan indicates two town centres in Drury; a large centre in Drury central and a smaller centre in Drury West adjacent to the proposed SH22 Upgrade. A range of housing typologies are also signalled on land within and directly adjacent to the Drury Package Project areas. This includes Mixed Housing Suburban, Mixed Housing Urban, Terrace Housing and Apartment Buildings (THAB) and light industry at the north-eastern extent of the Drury-Ōpāheke Structure Plan boundary, adjacent to NoR D4.

Blue-Green Network

The Blue-Green Network is a green infrastructure proposal developed under the Drury – Ōpāheke Structure Plan that combines the Auckland wide policies of Section E3 Lakes, rivers, streams and wetlands (E.3.3 outlined above), with the specific landscape values of the Drury-Ōpāheke area. In this sense, it offers reasonably robust guidance for enhancing natural character and amenity alongside urban development in the Drury – Ōpāheke area.

The purpose of the blue-green concept is to holistically address the ‘blue’ aspects of the Drury – Ōpāheke area such as the rivers, floodplains, and coastal environments; and the ‘green’ aspects of the environment, such as areas of indigenous biodiversity and ecological significance, and the parks and reserves.

The blue-green network concept is also intended to:

- Provide opportunities for the benefits to be realised in and extend beyond the Drury – Ōpāheke structure plan area
- Provide opportunities to enhance cultural values and sites
- Buffer significant ecological sites and create ecological linkages
- Provide opportunities to restore and enhance the environment
- Assist with management of flooding and the effects of future climate change.

The main components of the Blue-Green Network include the following and are illustrated on the Drury – Ōpāheke Structure Plan overlay - Appendix 1 Landscape Plans and Images; Map 06.

- Te Mānukanuka o Hoturoa / Manukau Harbour and coastline
- Floodplains, streams and their riparian margins including permanent and intermittent streams
- Potential new open space
- Existing open space
- Existing terrestrial and marine significant ecological areas (SEA)
- Ecological linkages

- Ecological restoration opportunities
- Landscape values
- Recreational values including walking and cycling
- Heritage values.

4.2.2 Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment

The Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment Report (DSP:LVA)[9] was commissioned in 2017 with the purpose of identifying the key landscape areas and features to be protected, opportunities to enhance landscape character and visual amenity and opportunities for new landscape interventions to help shape a quality urban environment.

The report provides a comprehensive analysis of the landscape within the Drury-Ōpāheke Structure Plan and draws on landscape analysis from previous studies of the area. The report also provides a description of the broad landscape character of the Drury-Ōpāheke Structure Plan area and further evaluation and identification of 11 specific landscape character areas as illustrated in Appendix 1: Plans and Images: Maps 07- 08.

The DSP:LVA also provides an evaluation of the sensitivity of the landscape and this is mapped out as a graphic across the Drury-Ōpāheke Structure Plan area. The report then goes on to identify the potential landscape and visual effects of urbanisation on each landscape character area.

The DSP:LVA is relevant to this assessment of landscape and visual effects in that it provides a robust analysis and evaluation of the wider baseline landscape and sets out, in general terms, the sensitivity of the landscape to change. This analysis and evaluation has been relied upon to inform the contextual landscape of each NoR and to evaluate the general landscape and visual effects of the Drury Projects.

The landscape values and opportunities identified through this process were carried through into the Drury-Ōpāheke Structure Plan.

The DSP:LVA characterises the Drury-Ōpāheke Structure Plan landscape as follows[10]:

- *Drury is a rural lifestyle area on the southern edge of the Auckland metropolitan area. It is located between the upper, southern reaches of the Manukau Harbour to the north west, the Hunua foothills to the east, the Bombay Hills to the south and the Pukekohe urban settlement to the south west.*
- *The wider landscape is strongly characterised and visually contained by geological features. To the east and south, the Bombay Hills create a distinctive backdrop and containment to the area. To the northeast, the Hunua ranges, which were created by seismic uplift, form a distinctive edge and backdrop to the Drury downlands. To the north west, distant views of the Awhitu Peninsula on the Manukau Harbour place the study area in its wider regional setting.*

[9] Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment – Background Investigation for Auckland Council. Opus International Consultants Ltd, August 2017

[10] Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment – Background Investigation for Auckland Council. Opus International Consultants Ltd, August 2017

- *The Drury study area can be characterised as being heavily influenced by coastal lowlands rising to gently rolling pasture in the south and east.*
- *Drury East is contained by the Papakura urban area to the north, the Hunua foothills to the east, the recently zoned and yet to be developed Business zone to the south, and to the west is SH1.*
- *The Drury East study area itself has a lot of flat land subject to flooding, but also has several low ridges with associated land that does not flood.*
- *Drury West is contained by an upper, tidal arm of the Manukau Harbour to the north, SH1 to the east, a major Transpower transmission line to the south, and to the east the Oira Stream provides the boundary. Drury West is not as well contained as Drury East, and the western and southern boundaries are somewhat arbitrary from a landscape perspective in that the landscape beyond the study area is essentially the same as the landscape immediately within the study area. The Bremner Road SHA, on the north-east boundary of Drury West, is in the process of being developed, and thus this area is in the process of significant change.*
- *The NIMT runs through both the east and west study areas.*
- *Ngakoroa Stream, Drury Creek and Oira Creek provide important valley and harbour context to the Drury West area and have important amenity and ecological values*
- *Flooding has a significant impact in the Drury East area and to a lesser degree in the Drury West area. The ways in which flooding is managed and accommodated as part of urbanisation will significantly influence the new landscape that arises*
- *The Drury Fault at the eastern edge of Drury East creates a sharp juncture between the lowlands and the higher, steeper land associated with the fault. The hills will be a point of contrast and amenity to the future urban areas.*

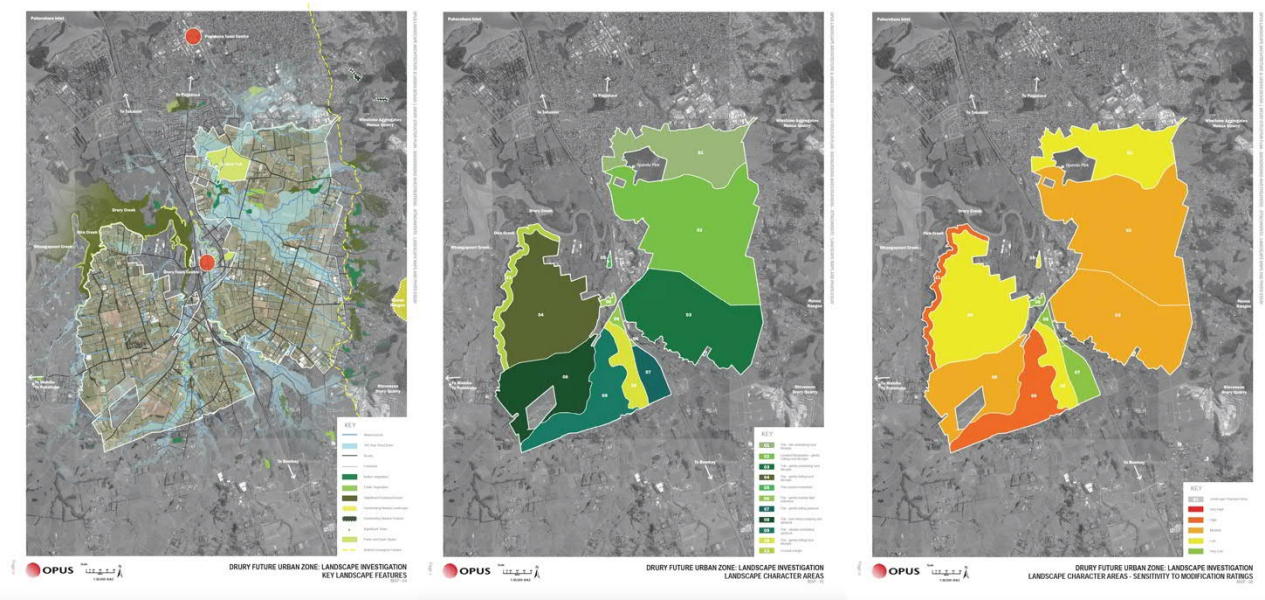


Figure 4-1 Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment Maps

4.2.3 Te Tupu Ngātahi Design Framework – Version 1.0

The Te Tupu Ngātahi Design Framework (Design Framework) provides measurable guidance for outcomes-based decisions throughout each phase of the wider Supporting Growth Programme. The guidelines set out the environmental, cultural and growth context for the Project and principals for implementation. Principals 1.1 through to 2.5 are of particular relevance to this landscape and visual assessment.

4.2.4 The Transport Design Manual (TDM) - Auckland Transport

The Transport Design Manual (TDM) has three sections that allow end user outcomes, engineering design and construction requirements to be clearly identified and designed. The Urban Street and Road Design Guide in section 1 of the TDM is of particular relevance to this landscape and visual assessment.

4.2.5 NZTA Environmental and Social Responsibility (ESR) Policy and Standard

The NZTA ESR exists to ensure that NZTA infrastructure projects meet the requirements of social and environmental responsibility set out in Section 96(1)(a) of the Land Transport Management Act. The following guideline documents sit under the ESR and have particular relevance to landscape and visual assessment.

4.2.5.1 Bridging the Gap: NZTA Urban Design Guidelines (2013)

Bridging the Gap provides relevant landscape guidance for the design and assessment of all transport projects. The Guidelines set out 10 over-arching urban design principals, and guidance on specific elements of transport projects including bridges, retaining walls, earthworks, noise barriers, highway furniture, stormwater management devices, signalised junctions, roundabouts, tunnels, stopping places, landscape planting and public art[11].

The 10 urban design principals are outlined as follows:

- Designing for the context
- Integrating transport and land use
- Contributing to good urban form
- Integrating all modes of movement
- Supporting community cohesion
- Maintaining local connectivity
- Respecting cultural heritage values
- Designing with nature
- Creating a positive road user's experience
- Achieving a low maintenance design

[11] https://www.nzta.govt.nz/assets/resources/bridging-the-gap/docs/bridging-the-gap.pdf

4.2.5.2 Landscape Guidelines: NZTA (Final Draft, September 2014)

The Landscape Guidelines set out 10 over-arching landscape principals, and offer guidance related to policy, assessment methodology and landscape design and maintenance requirements that are relevant to all transport projects[12].

The 10 landscape principals are outlined as follows:

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

4.2.6 Te Rautaki Ngahere ā-Tāone o Tāmaki Makaurau (Auckland's Urban Ngahere (Forest) Strategy

The strategy recognises the ecosystem services as well as economic and cultural benefits delivered by green infrastructure within the urban environment and sets out the following 9 key principles for integrating new plantings into the urban environment.

1. Right tree in the right place
2. Preference for native species
3. Ensure urban forest diversity
4. Protect mature, healthy trees
5. Create ecological corridors and connections
6. Access for all residents
7. Manage urban forest on public and private land
8. Deploy regulatory and non-regulatory tools.

[12] https://www.nzta.govt.nz/assets/resources/nzta-landscape-guidelines/docs/nzta-landscape-guidelines-20140911.pdf

5 Assessment Methodology

Chapter Summary

This assessment was undertaken in accordance with the NZILA Landscape Assessment and Sustainable Management Practice Note 10.1. and also, with reference to nationally recognised guidance documents outlined in section 4 of this report.

The following section outlines the best-practice approach that has been undertaken to identify the landscape values and sensitivity of the Project area and adjacent landscape. This methodology section provides explanatory notes and guidance so that each of the following sections remain concise.

5.1 Overview

The consideration of the sensitivity of a particular landscape or Project area is based on the identification of landscape character and an evaluation of landscape values therein, including regionally significant values such as: Significant Ecological Areas (SEAs), Outstanding Natural Landscapes (ONLs), Outstanding Natural Features (ONFs) and areas of High or Outstanding Natural Character (HNC or ONC). Landscape character is derived from the distinct and recognisable pattern of elements that occur consistently in a particular landscape. It reflects particular combinations of geology, landform, soils, vegetation, land use and features of human settlement. These elements create a unique sense of place defining different areas of the landscape.

A landscape that exhibits a 'high' degree of sensitivity will likely be highly susceptible or vulnerable to potential adverse effects associated with landscape change. Conversely a landscape or site that exhibits a 'low' degree of sensitivity will have more capacity to absorb change without significantly impacting upon existing landscape character and values within a site or broader contextual setting.

Change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways. These changes are both natural and human induced. Within the context of continual landscape change, is the importance of managing human induced change so that significant adverse effects are avoided or sufficiently mitigated to reduce the effects of the change in land use. Furthermore, landscape and visual effects can be temporary or permanent and that also contributes to the significance of landscape and visual effects.

In many cases, landscape change can bring about improvements to the quality of the existing environment. Therefore, the nature of landscape and visual effects generated by any particular project can be:

- Positive (beneficial), contributing to the visual character and quality of the environment;
- Negative (adverse), detracting from the existing character and quality of the environment; or
- Neutral (benign), with essentially no effects on existing character or quality of the environment.

5.1.1 Scale of Effects

In determining the magnitude of potential and actual landscape and visual effects of the Project, a consistent 7-point rating scale has been used that is based on the recommended NZILA Best Practice Guide. The following descriptions are provided which consider both NZILA and Waka Kotahi guidance documents.

7-point rating scale

- Effects that are **very low** are barely discernible. Mitigation is generally not required and in planning terms they are negligible;
- Effects that are **low** are discernible but where they do exist, they are likely too small to generate adverse effects either on their own or cumulatively. Additional mitigation is not required and in planning terms the landscape effects are considered to be less than minor;
- Effects that are **moderate-low** are discernible and where they do exist, they have the potential to generate adverse effects either on their own or cumulatively. Additional landscape mitigation may be required and in planning terms the landscape effects are considered to be minor;
- Effects that are **moderate** are discernible, without being significant on their own. There is the potential for cumulative effects to be more significant, but they can generally be mitigated to an appropriate level. In landscape and visual terms, effects may be acceptable provided an appropriate design/ mitigation response has been adopted. In planning terms moderate landscape effects are more than minor;
- Effects that are **moderate-high** are discernible and have the potential to be significant on their own. There is the potential for cumulative effects to be more significant however there is potential for additional mitigation measures to reduce effects to a lower degree. In planning terms moderate-high landscape effects are more than minor.
- Effects that are **high** are significant on their own and are likely to increase in a cumulative sense. In general, a high degree of effect may represent an unacceptable outcome in landscape and/or visual terms however, there may be potential for additional mitigation measures to reduce effects to a lower degree although these measures will need to be substantial. In planning terms, high effects would be more than minor and considered 'significant' in landscape and visual terms; and
- Effects that are **very high** are significant and in relation to landscape effects, additional mitigation is unlikely to reduce the degree of effect to any discernible degree. In planning terms, very high effects are more than minor and likely to be unacceptable in landscape and visual terms.

5.2 Methodology Breakdown

The methodology that forms the basis for the assessment is set out below:

- Identification of relevant statutory provisions and non-statutory guidance relating to landscape.
- Analysis and description of existing landscape elements, features and character of the existing 'Baseline Landscape' for each NoR.

- Analysis and description of the landscape elements, features and character of the likely future environment for each NoR.
- Analysis and description of perceptual, sensory and associative qualities of each Project area, and the identification of the viewing audience and visual catchment.
- Summary of landscape values for each Project area, including inputs from other specialists such as ecology, stormwater, arboriculture and historic heritage.
- Evaluation of the sensitivity of the landscape for each Project area to landscape change arising from transport infrastructure upgrades.
- Analysis and description of the development proposal including construction methodology, timeline and discussion of avoidance and mitigation measures already integrated through the design.
- Identification of the principal elements of each Project (effects generators) likely to result in landscape, natural character and visual effects.
- Identification of temporary (construction) vs permanent (operational) effects of each Project.
- Identification of general and targeted mitigation measures to reduce the magnitude of likely effects.
- Assessment of effects (adverse, neutral and/or positive) on the bio-physical aspects of the landscape resource, landscape character, natural character and visual amenity, taking account of the proposed mitigation measures.
- Summary of the overall landscape and visual effects of each Project and an overall determination of the significance of landscape and visual effects.

5.3 Landscape Analysis

The landscape analysis that forms the basis for the assessment is derived from the following data collection and field work:

- Online data collection of aerial maps and AUP OIP/GIS overlays (including, but not limited to: SEA's, ONL's, ONF's, ONC, HNC and Land Cover Data Base (LCDB), zones and catchments and hydrology);
- Desktop analysis of roading corridors, urban areas / future urban areas utilising Google Street View.
- Site visits to each of the Project areas with the Project specialists, including some privately owned property associated with proposed NoR D2 and NoR D4.

5.4 Landscape Values

In the absence of any scheduled high value landscape areas (ONLs, ONFs. HNCs or ONCs) at a national, regional or district level within or directly adjacent to the Project areas of the Drury Package, a summary is provided for each NoR/Project area of local landscape values. Local values generally consider three broad categories including: geographic, perceptual and associative values.[13]

5.5 Landscape Sensitivity

The level of sensitivity of the rural areas of the Drury-Ōpāheke landscape to land use change is moderated by the latest planning direction (AUP OIP and Drury-Ōpāheke Structure Plan) that has placed most of the local landscape of each of the NoRs into the Future Urban Zone (FUZ).

Notwithstanding the above, the interface between the land and water (riparian, wetland and coastal margins) is particularly sensitive to landscape change and under Part 2 of the RMA (section 6(a)) and relevant policies of the NZCPS, these areas of the landscape should generally be protected from inappropriate subdivision, use and development.

Other landscape character building attributes may also be sensitive to the effects of landscape change such as topographical and landform features, vegetation (notable trees or patterns of contiguous land cover) and views afforded to noteworthy landmarks and/or landscape features within the contextual landscape.

5.6 Landscape Effects

Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced over time. This may in turn affect the perceived value ascribed to the landscape.

Potential landscape effects in this assessment relate to the following landscape attributes:

- Biophysical - Abiotic: Geophysical processes (landform) and drainage patterns.
- Biophysical – Biotic: Vegetation cover, quality and pattern (native and exotic).
- Human attributes: Land uses, active and passive recreation, amenity and built form.

Landscape and visual effects are assessed in two parts as outlined below; firstly, through the construction period of the Projects where the bio-physical and human attributes within the Project area are required to be modified to implement the Project. Landscape and visual effects during the construction phase are generally considered to be temporary and dynamic in nature and may temporarily be heightened by the intervention of heavy machinery and the use of construction service areas. In the second part (the operational phase of the Projects), the overall significance and value of landscape and visual change is explored and ultimately the Project's impact on landscape character, natural character and visual amenity is assessed.

The two categories of effects are outlined as follows:

[13] Landscape Guideline: Appendix 1: NZTA Landscape and Visual Assessment Guidelines

Temporary Effects (Construction Effects): Describes the anticipated impacts on the bio-physical elements and features of the landscape resource (landform, vegetation and hydrology) resulting from the construction of the Project. It also includes visual amenity effects for both public and private viewing audiences from construction works.

The construction activities required to implement the Project are categorised under the following broad headings:

- **Site enabling works** - site establishment, demolition and vegetation clearance;
- **Project formation works** - bulk earthworks and formation of new road surface and batter slopes, culvert upgrades, stormwater wetlands, private driveway regrades and bridge construction;
- **Finishing works** - lighting, signage, footpath/cycleway details and line markings, streetscape elements and landscaping (including street trees, mitigation planting and riparian/wetland planting (to be determined by detailed design through the ULDMP and by regional resource consents).

Permanent Effects (Operational Effects): Describes the effects on the landscape of completed works (including integrated landscape mitigation measures), the significance of physical landscape change and ultimately the resulting effects of the Projects on landscape character, natural character and visual amenity for both public and private viewing audiences.

5.6.1 Natural Character Effects

Section 6(a) of the RMA requires the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers[14] and their margins, and the protection of them from inappropriate subdivision, use, and development.

Assessing existing natural character is primarily concerned with the degree to which natural processes, natural patterns and natural elements have undergone human modification. Ecological survey and assessment for the Project area generally underpin the landscape evaluation of existing natural character values.

The natural character assessment for this Project applies to the existing water bodies and wetlands associated with the following streams: Ōtūwairoa Stream, Waipokapū Stream, Mangapū Stream, Waihoehoe Stream, Papakura Stream, Hingaia Stream, Ngakoroa Stream (partially within the CMA), Oira Creek and Whangapouri Creek.

5.7 Visual Effects

Visual effects relate to the changes that arise in the composition of available views as a result of changes to the landscape, to people's responses to the changes, and to the overall effects with respect to visual amenity. Visual effects are considered for both temporary (construction effects) and permanent (operational effects) of the Projects.

[14] A 'river' is defined in the RMA as a continually or intermittently flowing body of fresh water; and includes a stream and modified watercourse.

Potential effects considered in this assessment relate to the following visual amenity attributes:

- Visual quality and composition (legibility, coherence, setting, scenic quality)
- Visibility (extent of visibility to and from the Project area)
- Views (viewing audience and views afforded to, from and within the Project area)

The nature and magnitude of the visual effect can be influenced by a number of factors such as:

- The extent to which the Project areas are visible;
- Legibility and whether there are intervening elements in the landscape that restrict views towards the road corridor;
- Whether or not aspects of the Project appear 'at odds' with existing landscape character and composition;
- Distance between the viewer and the Project area;
- The nature of the viewing audience, numbers and extent of the visual catchment.

An important consideration of this visual assessment is the extended timeframes for detailed design and ultimately implementation (10 + years). The transport upgrades and new corridors proposed for each NoR are currently at concept design phase and proposed within an evolving future urban landscape, which in itself will bring about substantial landscape and visual change. Therefore, the visual composition that exists today may change considerably over the course of the next decade, before the proposed transport corridors are implemented; undertaking a full and comprehensive visual assessment throughout the visual catchment would therefore be a theoretical exercise.

On the basis of the above, the visual assessment for each Project focuses on the potential visual effects arising (through the construction and operation of each Project) within the proposed roading corridor and localised landscape. The focus of the assessment is on the nature and significance of effects within the corridor itself and how that translates to effects for immediately adjacent land uses (existing and future, but acknowledging that the existing land uses will change in the future).

The visual effects of the Drury Package have been assessed onsite from the relevant contextual public vantage points as well as from private properties within NoR D2 and NoR D4. Limited visual assessment photography was obtained at the end of February 2020 before the Covid-19 Lockdown period and subsequent levels during late March to the end of May 2020. The viewpoints that were captured onsite were photographed and assessed in variable weather conditions and at standing eye level. The photographs were taken in portrait orientation with a digital SLR camera with a 50mm (and 30mm) lens.

Google Street view (2020 imagery) has been utilised in combination with on-site assessment as a way of illustrating the existing visual composition of each NoR corridor at consistent intervals and to narrow in on specific chainage points (CH) along each alignment.

5.8 Change Management

Change management is the process of identifying ways and opportunities to ensure and enable sustainable landscape management within the existing and future landscape[15]. The Drury Package has been through a route selection process during which landscape and visual effects were tested and any significant effects avoided or 'designed-out' of the Projects in line with specialist landscape input at the time. As a result, the landscape mitigation measures proposed for each NoR respond to the localised effects likely to result from a series of 'effects generators' (construction activities) required to implement the Projects, as well as any potential landscape and visual effects arising from the operational phase of the Projects.

Design refinements through the detailed design phase can further minimise potential landscape and visual effects and enhance the quality of the landscape. These opportunities are captured within each NoR assessment and provided as an addendum to the mitigation sections.

5.9 Limitations

This landscape assessment does not specifically address and respond to Mana Whenua values from a design planning perspective. However, mana whenua knowledge and associative values of the Drury-Ōpāheke landscape has been shared through the separate and parallel engagement between the Project team and mana whenua who have expressed interest in the projects. Mana Whenua values will be incorporated into the principles of the ULDMP and other conditions on the designation.

There are several crossovers with related specialities including urban design, ecology, arboriculture historic heritage and flooding. This report references the latest data available in respect of these matters at the time of issue.

All site assessments have been undertaken from public and private land (where accessible) and supported through detailed desktop GIS mapping and aerial photograph information.

5.10 Project Assumptions

The findings of this landscape and visual assessment are underpinned by the following assumptions:

- For the FUZ areas, it is likely that construction of the transport corridors will occur ahead of, or in parallel to, the urbanisation of these areas. Therefore, the starting assumption is that corridors will be constructed in a rural and in some cases greenfield environment and operate in an urban environment.
- For those areas that are already urbanised, or are planned to be (as per precinct plans in the AUP OIP), construction and operation of the transport corridors will be within an urban environment.
- Although yet to be confirmed via a formal plan change process, the Auckland Council's Drury-Ōpāheke Structure Plan can be used to reasonably inform the indicative likely future environment in which the corridors will operate.

[15] Sustainable Landscape Management recognises and protects the distinctive, representative or typical attributes that define landscape character and values, through the process of integrated assessment, planning and design to meet the needs of both present and future generations. NZILA Best Practice Note, 10.1.

- The proposed designation footprint has sufficient space to enable design changes to occur through the detailed design phase of the Projects, in order to integrate the network from a visual and urban design perspective with adjoining land uses.
- All proposed stormwater wetlands, as illustrated in Appendix 1: Landscape Plans and Images – Maps 09 – 41 will be planted with suitable native species as part of the project works.

6 NoR D1: Alteration to Designation 6707 - State Highway 22 Upgrade

Chapter Summary

The State Highway 22 (SH22) Upgrade (NoR D1) consists of the widening of SH22 to a four-lane arterial with separated walking and cycling facilities. The Project extends approximately 3km from the State Highway 1 (SH1) Drury Interchange in the north east, and the extent of the FUZ between Woodlyn Drive and Oira Road in the south west. The intersections at Jesmond Road and Great South Road will be signalised and a roundabout is proposed at Oira Road. The existing Ngakoroa Stream bridge is proposed to be reconstructed. The Project will likely be constructed within the baseline rural landscape and operate within the likely urban landscape environment

The current defining characteristics of the Project area and local landscape are summarised below:

- Vegetative framework consisting mostly of exotic pasture, cropland, scrub, trees, shelterbelt plantings, private gardens and exotic forest patches associated with rural land use. Minimal indigenous vegetation within the Project area and local landscape, with the exception of the SEA adjacent the Ngakoroa Stream bridge.
- Oira Creek running along the western boundary of the proposed designation and Ngakoroa Stream and tributaries running through the mid to northern extent of the Project area.
- Scattered exotic wetlands predominate within the adjacent land parcels and a large artificial pond is located on private property at the northern end of the proposed designation.
- Moderate (localised) natural character values associated with the Ngakoroa Stream and terrestrial SEA classification
- Rural residential and productive rural land use as well as the existing state highway corridor environment.

The land adjacent to the Project area will witness a significant change from rural to urban land use and character over the next 30 years. A range of housing typologies are signalled by the Drury-Ōpāheke Structure Plan and developer plan change requests including Mixed Housing Suburban, Mixed Housing Urban, Terrace Housing and Apartment Buildings and a new commercial centre adjacent to the existing SH22 / Jesmond Road intersection. Light Industrial is also signalled at the north-eastern extent of the proposed designation.

It is anticipated that some of the more defining abiotic features and patterns of the landscape (including scheduled) features will endure if not define the pattern of future urban development. Such features include the riparian and wetland environments associated with Oira Creek and Ngakoroa Stream and the existing landform and amenity values of open space areas such as Ngakoroa Reserve and Drury Sports Complex (as indicated by the Drury-Ōpāheke Structure Plan proposed Blue-Green Network).

The key landscape matters addressed for the SH22 Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project with a specific focus on potential effects arising from the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed

cut and fill slopes and the likely impacts of bridge construction within the Ngakoroa Stream environment.

- The nature and extent of physical impacts on private properties adjacent to the existing SH22 road corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the context of the existing SH22 corridor. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge re-construction within the Ngakoroa Stream environment. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of landscape amenity effects in relation to Ngakoroa Reserve and Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network at future regional consent stage.

Overall landscape and visual effects range from low to moderate for the construction phase and very low to moderate-low for the operational phase.

This landscape assessment concludes that the proposed features and scale of the Project once operational can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP). The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that the planting proposed under the ULDMP condition for NoR D1 is integrated with any future planting required as part of the regional consenting phase of the Project.

Landscape mitigation measures for NoR D1 include recommendations for integrating the proposed Ngakoroa bridge structure, walking and cycling connectivity, configuration of stormwater wetlands with future urban form, integration of fill slopes, reinstatement of private property fences and gardens plantings and a comprehensive planting plan covering all mitigation treatments.

NoR D1 Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works, finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

6.1 Project Description

6.1.1 Project Overview

The State Highway 22 (SH22) Upgrade (NoR D1) consists of the widening of SH22 to a four-lane arterial with separated walking and cycling facilities. The Project extends approximately 3.08km from the State Highway 1 (SH1) Drury Interchange in the east, and the extent of the FUZ between Woodlyn Drive and Oira Road in the west. The intersections at Jesmond Road and Great South Road will be signalised and a roundabout is proposed at Oira Road. An overview of the concept design is provided in Figure 6-1.

As the surrounding area is urbanised over time and alternative routes are implemented (particularly the proposed Pukekohe Expressway), the function of SH22 will change from a rural state highway to provide an appropriate urban arterial connecting the growth areas of Drury West to the wider network and centres, including providing a frequent transport bus network. This is likely to include a reduction in the speed limit to 50kph. SH22 will improve future connectivity to the proposed Drury West train station which currently forms part of the New Zealand Upgrade Programme (NZUP) project.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade include the following:

- Widening of SH22 from its current general width of 20m to enable a 30m wide four-lane road with separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Demolition and reconstruction of the existing Ngakoroa Stream Bridge
- Proposed new and extended culverts

- Three proposed stormwater wetlands
- Batter slopes and retaining to enable widening of the corridor, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring.

Comparative cross sections are included at section 4.2 of the Urban Design Framework which illustrate the difference between form and function of the existing SH22 corridor and the proposed SH22 upgrade.

6.1.2 Project Features

The key landscape matters addressed for the State Highway 22 (SH22) Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction within the Ngakoroa Stream environment.
- The nature and extent of physical impacts on private properties adjacent to the existing SH22 road corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the context of the existing SH22 corridor. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge re-construction within the Ngakoroa Stream environment. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of landscape amenity effects in relation to Ngakoroa Reserve and Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

Figure 6-1 Overview of SH 22 Upgrade

6.2 Existing and Likely Future Environment

6.2.1 Baseline Landscape

The Project area is situated within the existing SH22 road corridor and extends into adjacent land that is characterised by flat to low rolling cropping and pastoral land to the south and gently rolling rural lifestyle living to the north[16]. Land adjacent to the Project area in the north is influenced by the Ngakoroa flood plains.

The defining characteristics of the Project area and local landscape are summarised below:

- Vegetative framework consisting mostly of exotic pasture, cropland, scrub, trees, shelterbelt plantings, private gardens and exotic forest patches associated with rural land use. Minimal indigenous vegetation within the Project area and local landscape, with the exception of the SEA adjacent the Ngakoroa Stream bridge.
- Oira Creek running along the western boundary of the proposed designation and Ngakoroa Stream and tributaries running through the mid to northern extent of the Project area.
- Scattered exotic wetlands predominate within the adjacent land parcels and a large artificial pond is located on private property at the northern end of the proposed designation.
- Moderate (localised) natural character values associated with the Ngakoroa Stream and terrestrial SEA classification.
- Rural residential and productive rural land use as well as the existing state highway corridor environment.
- Open space areas adjacent to the existing corridor including Ngakoroa Reserve and Drury Sports Complex.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1**: Landscape Plans and Images: **Maps 01 - 06** and **07 - 13**.

Figure 6-2–View north from 373 Karaka Road over flat to low rolling cropping and pastural land.

[16] Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment – Background Investigation for Auckland Council. Opus International Consultants Ltd, August 2017

6.2.1.1 Landform and Hydrology

The landform to the north of the Project area comprises flat to low rolling rural lifestyle blocks with pasture grass as the dominant land cover. The landform slopes away north, east and west, from a ridge that runs in a northeast direction between Oira Rd and Jesmond Rd, towards three tributaries of the Ngakoroa Stream. South of Oira Road, the land slopes south towards Oira Creek.

SH22 crosses the main arm of Ngakoroa Stream, at the northern extent of the designation boundary. The stream and wetland environment directly west of the existing bridge is classified as a Significant Ecological Area (SEA - terrestrial).

Much of the Project area surrounding the bridge and further south into Ngakoroa Reserve, is subject to an extensive floodplain of Ngakoroa Stream.

SH22 crosses Oira Creek directly south of the designation boundary. A small section of the Project intersects Oira Creek at the location of a proposed new culvert outfall. The localised topography surrounding the Project area is defined by several tributaries flowing south towards Oira Creek.

Towards the north of the Project area, an artificial pond has been constructed adjacent to the road side, which several overland flow paths feed into. A row of mature pine trees screen this feature from the road corridor.

The hydrological patterns within and surrounding the Project area eventually drain north towards the classified Marine 2 Significant Ecological Areas associated with Drury and Oira Creek.

Figure 6-3–View south towards the southern extent of the Project area. SH22 crossing of Oira Creek in the background (outside of Project area).

6.2.1.2 Landcover

The vegetative framework (within the Project area) consists mostly of exotic pasture, scrub, trees and exotic shelterbelt plantings, private gardens and exotic forest patches associated with rural land use. Minimal indigenous vegetation exists within the Project area, with the exception of a terrestrial SEA (SEA_T_530b) stretching north of the SH22 Ngakoroa Stream crossing towards the Bremner Road link (NoR D2). Indigenous wetland ecosystems within this SEA contain areas of Raupō reedland

which is an important habitat for threatened indigenous bird and plant species[17]. Cropland and scattered exotic wetlands predominate within the adjacent land parcels.

A range of mature exotic and native trees (including some noteworthy specimens[18]), located along the roadside boundaries of private property contribute to the landscape character of the borrowed landscape surrounding the Project area. Trees protected under District Plan provisions within the Project area include a group of trees within the perimeter of the Drury Sports Complex.

6.2.1.3 Land Use

The Project area takes in the existing north-eastern extent of SH22, otherwise referred to as Karaka Road. It is a main high-speed State Highway that links Glenbrook and Patumahoe in the west to Drury village and SH1. As such, there is considerable severance of activity between the existing road corridor and the surrounding land.

Ngakoroa Reserve (approximately 2.5ha[19]) is located north-east of the proposed designation boundary and forms part of the extensive floodplain associated with the southern arm of Ngakoroa Stream. Drury Sports Complex (9.8ha) is located further north on Victoria Street and is also situated in the Ngakoroa floodplain.

The land use adjacent to SH22 is characteristic of a peri-urban landscape where agricultural activities and rural living predominate with a mix of recently introduced industry and commercial activities which include (but are not limited) to the following:

- Bright Horizons New Zealand Childcare Drury (northern extent)
- Golden Homes Drury
- Red Shed Palazzo
- KPH Transport
- NZ Hothouse.

6.2.1.4 Scheduled Landscape and Ecological Features

Ngakoroa Stream and its margins (north and directly west of the existing bridge) are classified in the AUPOIP as a SEA – Terrestrial habitat. The proposed designation covers an area just over 2,000m^2 of SEA directly west of the bridge crossing.

6.2.1.5 Historical and Cultural Associations

According to the archaeological assessment, there are no recorded historic heritage sites within the proposed SH22 designation.

[17] SGA-004-AEE-TMP-Drury EcIA Report_200420

[18] Noteworthy from a landscape character point of view.

[19] Ōpāheke-Drury Future Urban Zone: Parks and Open Space Report. Version 3: August 2017.

6.2.2 Likely Future Environment

6.2.2.1 Overview

The land adjacent to the Project area will witness a significant change from rural to urban land use and character over the next 30 years. It's anticipated that some of the defining abiotic features and patterns of the landscape will endure if not define the pattern of future development; these include the riparian and wetland environments associated with Oira Creek and Ngakoroa Stream and the existing landform and amenity values of open space areas such as Ngakoroa Reserve and Drury Sports Complex. Scheduled features such as the SEAs of Ngakoroa Stream and the protected trees within the Drury Sports Complex have a greater level of protection under the AUP and therefore are likely to feature within the future urban landscape.

Conversely, it's expected that the biotic (land cover) features of the landscape will undergo significant change alongside future development through the likely implementation of street tree plantings, public open space design and general landscaping within the private yards of future housing development.

The quality and natural character values of riparian and wetland environments are generally anticipated to be retained and, in some instances, enhanced as urban development progresses, in accordance with the policy direction of the AUPOIP which generally seeks to protect and enhance these landscape features.

6.2.2.2 Drury-Ōpāheke Structure Plan

The Drury-Ōpāheke Structure Plan provides general guidance for how the FUZ land adjacent to the Project area should be developed over time. The structure plan is illustrated in **Appendix 1**: Landscape Plans and Images – **Maps 07** and **08**.

Land Use

The Drury-Ōpāheke Structure Plan indicates a range of urban environments either side of the Project area. Housing typologies range from Mixed Housing Suburban and Mixed Housing Urban at the western extent of the designation and Terrace Housing and Apartment Buildings at the Jesmond Road intersection. To the northeast of the intersection a new centre is indicated and that appears to tie in with the proposed Blue-Green Network[20].

Light Industrial development is signalled at the north-eastern extent of the proposed designation and this is surrounded by the coastal inundation zone associated with Ngakoroa Stream. The existing Drury Sports Complex is situated at the northern extent of the proposed designation.

Blue-Green Network

The proposed Blue-Green Network signals an integrated landscape amenity and ecological framework throughout the Drury-Ōpāheke area to compliment the emerging urban landscape. NoR D1 intersects with the proposed Blue-Green network at the following locations:

- Southern extent near the Oira Creek crossing
- The boundary of 6 Karaka Road

[20] Refer to section 5. Landscape Background and Context (5.1.2 Drury-Ōpāheke Structure Plan August 2019).

- The Ngakoroa Stream crossing.

6.2.3 Viewing Context

The viewing audience for the Project is largely comprised of a transient public audience (i.e. vehicles currently travelling at 60 - 80km/h) with the location representing a short portion of their journey travelling either east towards SH1 or west in the direction of Glenbrook. It also includes a relatively small private viewing audience comprising views from rural residential and lifestyle dwellings as well as from limited commercial and agricultural businesses located either directly adjacent to the existing road corridor or set back some distance from the Project area.

Over time, the audience is likely to grow to include residents of future urban developments within the FUZ area. Given that SH22 is a regular commuting corridor, the proposed changes for the traveling public are likely to register over a period of time through regular and fleeting 'close up' views.

The NoR D1 viewing context is characterised by the following:

- Limited and distant views east towards the Hunua Ranges foothills, afforded through gaps in existing vegetation and within the road corridor at the southern extent of NoR D1.
- Closer (backdrop) views east to the Hunua Ranges foothills between the approach towards the Jesmond Road intersection and from the Ngakoroa Stream crossing.
- Immediate views into the adjacent low, rolling landform.
- Expansive views from the elevated areas of land near the Oira Road intersection.
- Coherent rural lifestyle landscape character although this is expected to change to an urban land use pattern overtime.
- Limited public vantage points along SH22 due to existing vehicle speed and few stopping points.

6.2.4 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or proximate to the proposed designation boundary.

Within the local context of SH22, the low rolling topography and distant views to the Hunua Foothills contribute to the visual amenity (and the picturesque qualities) of the landscape. The indigenous wetland ecosystems and terrestrial SEA environment of the Ngakoroa Stream as well as the Oira Creek riparian edge (at the southern boundary of the Project area) contribute to the natural character values of the landscape.

Open space areas such as Ngakoroa Reserve and the Drury Sports Complex are currently poorly connected. This is likely to improve through the operational phase of the Project through the implementation of the proposed active modes of transport.

6.2.5 Landscape Sensitivity

NoR D1 is situated within a broader landscape that has been assessed by the AUPOIP as being suitable for urbanisation. The proposed upgrade of SH22 to a four-lane arterial standard will form a

small yet integral section of the future urban form and on that basis the Project area is assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the SH22 landscape are as follows:

- Ngakoroa Stream terrestrial SEA (SEA_T_530b and the adjoining riparian environment.
- Oira Creek riparian edge at the location of the proposed culvert outlet associated with wetland 3.
- Minor riparian areas running parallel to the existing SH22 corridor.
- Ngakoroa Reserve.
- Protected trees[21] within the perimeter of the Drury Sports Complex.

6.3 Assessment of Landscape and Visual Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

6.3.1 Positive Effects

A number of positive landscape and visual effects are anticipated as a result of the operation of the Project (including proposed mitigation).

Positive effects are likely to include:

- A streetscape to match the emerging urban form within adjacent land;
- Improved and/or new opportunities for active modes of transport and the ability to provide improved connectivity to Ngakoroa Reserve and the Drury Sports Complex. Also, the ability to tie into the proposed Greenways and recreational corridors anticipated by the Drury -Ōpāheke Structure Plan, Blue-Green Network;
- Net increase in green infrastructure within the Project area associated with street trees, berm and stormwater plantings and planted stormwater wetlands, resulting in improved visual amenity for road users and adjacent audiences.
- Slower speed limits adjacent to existing dwellings and commercial activities improving on the experiential qualities of the corridor for users and well as private properties adjacent to the road corridor.

[21] Meaning that resource consent is required for removal and/or works within the dripline.

6.3.2 Assessment of Construction Effects

6.3.2.1 Site Enabling Works

Construction Areas

Site compound and construction areas are to be established at 5 locations within the Project area. Construction traffic will be heightened at these locations through the construction period of the Project.

- Site compound (bridge construction yard) located between CH1600 and CH1700, adjacent to the Ngakoroa Stream and approximately 2000m² to 3000m²
- Construction area located adjacent to proposed stormwater wetland 1 (CH1800)
- Site compound and construction area located adjacent to proposed stormwater wetland 2 (CH2900)
- Site compound located at chainage 2000 adjacent to Great South Road
- Construction area located adjacent to proposed stormwater wetland 3 (CH4550)

The proposed site compound and construction areas are located within pastoral land that is already somewhat modified by existing rural land use.

It is recommended that all areas be grassed (reinstated) at the completion of the construction period.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **low.**

Vegetation Clearance

Broad areas of street-side vegetation are proposed to be removed to accommodate the wider road corridor and batter slopes. This consists entirely of trees and shrubs (including some noteworthy specimen trees) located within the road-side boundaries of private properties, within the Project area. Exotic pasture, trees, shelterbelt plantings, private gardens, exotic forest patches and cropland make up the majority of vegetation to be removed.

The proposed corridor and associated fill slopes may also impact on exotic grassed, low value wetlands adjacent to the existing road corridor, within the Project area. Localised areas of indigenous terrestrial and riparian vegetation, within the construction footprint of the proposed Ngakoroa Stream bridge upgrade, will also be required to be removed (subject to future regional resource consent approvals).

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from vegetation clearance within the Project area is assessed as **moderate-low.**

6.3.2.2 Project formation Works

Structures and Earthworks

The new Ngakoroa Stream bridge will be widened to the south-east to accommodate the additional vehicle, cycle and pedestrian lanes of the upgraded corridor and to avoid encroaching into the SEA environment north-west of the existing bridge. This is an important design choice made through options assessment that will minimise the physical landscape effects on a regionally significant ecological area. The proposed earthworks associated with the Ngakoroa Bridge crossing will result in a carriageway that is approximately 2m above existing road surface.

Overall, the proposed cut and fill slopes range in scale from very small (1m wide) to large (30m wide), and will alter the existing marginal pastoral landform of the SH22 road corridor and adjacent properties.

Larger fill slopes between CH 3650 – 3200, 2000 (Great South Road) and CH 1700-1800 (Ngakoroa Stream Bridge) will be shaped to integrate into the surrounding modified landform.

It is recommended that a condition on the designation is included that promotes the re-use of topsoil from pastoral land impacted by the proposed earthworks[22].

Overall, impacts on the physical landscape to implement the proposed earthworks and structures is likely to be **low**.

Stormwater wetlands and features

Three stormwater wetlands are proposed within the Project area. Wetland 1 is proposed at the northern extent of the designation at 15 Burberry Road (CH 1900). Wetland 2 is located at 110 Karaka Road and wetland 3 is proposed at the southern extent of the Project area at 435 Karaka Road (CH 4550). The wetlands will require earthworks to re-shape the land and achieve optimal depths and edge profiles, which will be determined as part of the resource consent phase.

Wetlands 1 and 3 are proposed within open pastoral areas, outside of existing waterways, within land that is already modified by rural land use. Wetland 2 is proposed within an existing agricultural property and will require demolition of a private dwelling and adjacent greenhouses (in consultation with land owners). On that basis, impacts on the physical landscape to implement the proposed stormwater wetlands is considered to be **low**.

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;

[22] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 11 existing dwellings are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects in section 6.3.4.3 below.

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **moderate-low**.

6.3.2.3 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

6.3.2.4 Temporary Visual Effects

The construction of the Project is anticipated to be staged within five construction zones along the proposed corridor, over a period of 2 to 2.5 years. Visual effects are anticipated to occur progressively through the Project area and transient viewing audiences may concurrently experience adverse visual effects from two or more of the proposed zones through the construction period.

The consideration of visual effects through the construction phase acknowledges the full range of activities (and their resultant visual impact), required to implement the upgraded road corridor.

It is anticipated that construction activities required to implement the Project will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within a main arterial corridor. Another important consideration is that landscape change by way of vegetation removal and land modification (on private rural property), albeit at a lesser scale, forms part of the expected backdrop of the existing environment.

Notwithstanding the above, some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase due to the magnitude of vegetation removal and/or earthworks proposed. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries.
- CH1600 – 2100 where the existing Ngakoroa Stream bridge is proposed to be upgraded and a construction yard is proposed to be located. This is also the location of proposed wetland 1 where the removal of a row of pine trees converges with the construction of the proposed wetland behind.
- CH3300-3500 where vegetation removal and larger batter slopes converge on an elevated section of the road corridor.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within arterial roads;
- The SH22 carriageway is already a dominant element within the visual composition of the Project area;
- The existing road corridor landscape has already been modified by previous works required to shape the existing SH22 road corridor.
- The construction phase is expected to last no longer than 2.5 years and is proposed to be implemented in 5 separate zones which is expected to allow efficient access to the construction zones while maintaining continued access for the intersecting roads and existing private and commercial driveways.

Representative viewpoint images are provided in **Appendix 2**: NoR D1 – Representative Viewpoint Images. The supporting commentary for each photograph outlines the existing visual composition of the Project and the visual changes through the construction and operation phase.

Overall, adverse visual effects for the transient public viewing audience are likely to be **low** through the construction phase**,** taking into account those areas listed above where adverse effects are likely to be heightened during the temporary construction period.

Adverse visual effects during the construction phase are likely to be heightened for the private viewing audience directly adjacent the Project area on the basis of more direct and prolonged engagement with the construction activities of the Project. This will include the presence of heavy machinery and the visible disturbance of both the road corridor and also individual private interface with the road.

Therefore, visual effects are likely to range between **moderate-low to moderate** during the construction phase for private viewing audiences.

6.3.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The mitigation measures for all activities and built elements during construction are outlined below. An Urban and Landscape Design Management Plan (ULDMP) is recommended as a condition on the designation which should include the following matters:

- Site compounds and construction yards: reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.
- Vegetation clearance: wherever possible, limit the removal of noteworthy trees and indigenous vegetation.
- Wherever possible, re-use topsoil from existing pastoral land (within the Project area), impacted by the proposed earthworks[23].

[23] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

6.3.4 Assessment of Operational Effects

6.3.4.1 Natural Character Effects

Natural character forming elements, features and processes include the water body and terrestrial margins of the Ngakoroa Stream and its unnamed tributaries, particularly in the vicinity of the SH22 Ngakoroa Stream bridge. Given the SEA classification in this area and heightened influence from Drury Creek, this section of the proposed designation is considered to have moderate, localised natural character value. Indigenous vegetation is limited throughout the unnamed tributaries of the Ngakoroa Stream, therefore, the natural character values through those systems is comparatively low.

As discussed above, limited indigenous vegetation clearance is expected to occur within the wetland and riparian margins of Ngakoroa Stream (subject to future regional resource consent approvals), as a consequence of the Ngakoroa bridge re-construction. Removal of indigenous vegetation within wetland and stream environments (albeit limited) has the potential to alter the character of these areas by heightening the impression of further human modification.

As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected (within the Ngakoroa Stream and wetland environment) will be determined. It is anticipated that reinstatement and mitigation planting at the completion of works will assist with mitigating any landscape and natural character effects arising from the Ngakoroa Stream bridge crossing.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

On the basis of the above (allowing for future landscape mitigation of riparian areas), adverse natural character effects are likely to be **low.**

6.3.4.2 Visual Amenity Effects

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor.

Very low residual adverse visual effects are anticipated for some private properties, where as a direct result of the Project, residents may experience some level of material change to the visual composition and residential amenity of the road corridor as perceived from private property.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading (outlined above), potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered

within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Public viewing audiences will continue to engage with a similar transport environment, within the backdrop of an increasingly urban neighbourhood character. Over time, visual effects are anticipated to be positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

On that basis, visual effects within the Project area are likely to be **very low** and **moving to beneficial** for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **moderate-low** to **low**, reducing over an extended period of time.

6.3.4.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing SH22 road corridor and adjacent landscape. The existing corridor is currently distinctively rural in character owing to the limited streetscape features, unstructured hedgerow and shelter belt plantings and the existing rural land uses adjacent to the corridor. At the completion of the Project, the upgraded corridor will resemble that of an urban arterial on account of the additional vehicle lanes, active modes of transport, reduced speed limit, structured street tree plantings, integrated stormwater management and engineered roading elements that are inherently urban in aesthetic.

The Project is anticipated to enter the operational phase within the context of increased urbanisation as adjacent FUZ land is progressively live-zoned and urbanised. Although it is not possible to anticipate the exact future urban land use pattern, developer plans and the Drury-Ōpāheke Structure Plan suggests that high density housing and a neighbourhood centre will be focussed through the middle of the Project area at the intersection with Jesmond Road. Housing densities are indicated to reduce towards the southern extent of the Project area while the existing industrial zoning to the north remains in place, alongside existing open space areas that are not likely to undergo land use change. On that basis, the magnitude and nature of landscape change proposed by the Project is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing and proposed SH22 upgrade form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

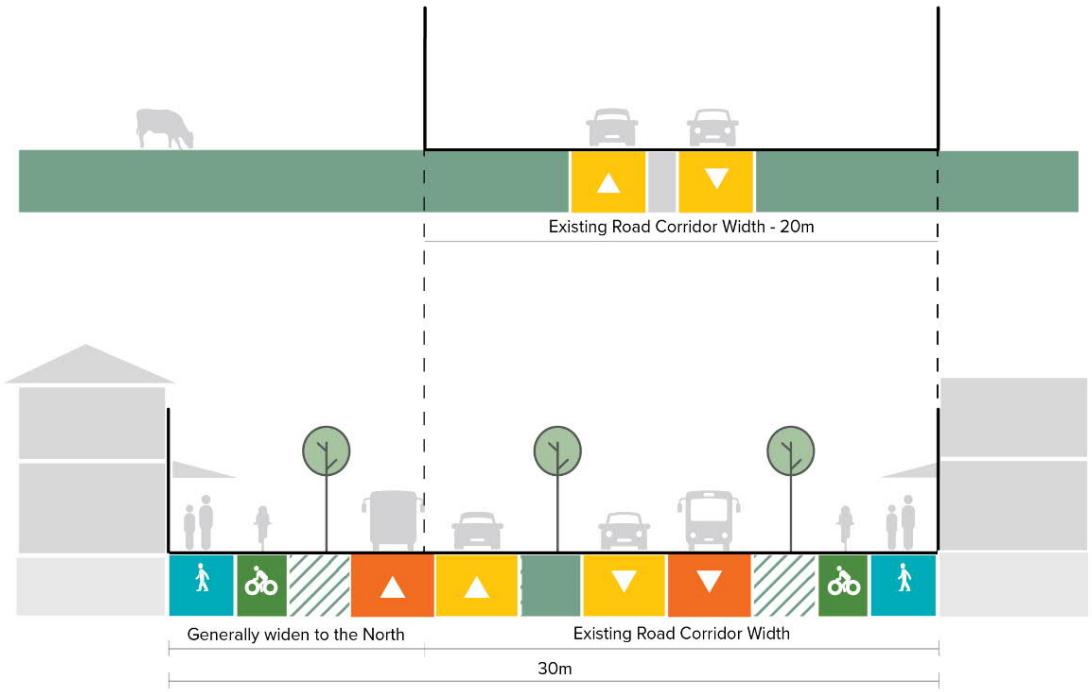


Figure 6-4–SH22 Upgrade – Typical Cross Section

As outlined earlier, broad areas of street-side vegetation (within private property), including some noteworthy trees are proposed to be removed through the Project works. While most of this vegetation is not considered significant on an individual basis, collectively it contributes to the visual amenity of the road corridor and provides a degree of screening and privacy for properties adjacent to the road. Therefore, it is recommended (as a matter for detailed design) that the footpaths and cycleways within these localised areas be refined to either avoid or integrate noteworthy trees within the berm (if practicable). This measure is included within the condition for construction effects and will allow the potential to retain the landscape character values afforded by some noteworthy trees within the Project area.

It is recommended that a condition on the designation is included that requires new street trees to be planted along the full length of the proposed SH22 corridor in conjunction with shrubs and ground cover species appropriate within stormwater wetlands and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that new street tree plantings, in conjunction with stormwater wetlands and berm plantings, will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area.

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood

character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution in the ULDMP.

- **SH22 Ngakoroa Bridge design –** the new bridge should be designed to visually integrate into the landscape context and contribute to the sense of place. This will involve relating the structure to the character and scale of surrounding future urban form and proposed landscape treatments.
- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas (existing and proposed through the Blue-Green Network). It is recommended that through the ULDMP, that existing open space areas and those identified through the Blue-Green Network be identified and connection opportunities investigated. These areas include the Ngakoroa Reserve and Drury Sports Complex.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with the proposed Ngakoroa Bridge should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.

- Fill slopes, if not otherwise integrated back into the adjacent urban development parcel, are likely to read as left-over spaces and will do little to enhance the amenity of the future urban neighbourhood. There are specific locations within the SH22 corridor where it is recommended that site-specific landscape design would provide one or more of the following benefits: additional green infrastructure to the road corridor, visual and ecological integration and reduced maintenance requirements. It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:
    - CH600 – CH1850 in the vicinity of the proposed Ngakoroa Stream bridge crossing. Planting proposed within terrestrial margins (to integrate with wetland and riparian planting subject to regional consent stage).
    - CH2000 associated with the Great South Road future tie-in
    - CH3300 – CH3480 through the steeper section of the road corridor
    - CH2000 – CH2400 along the perimeter of the Ngakoroa Reserve and Drury Sports Complex.
- **Stormwater Wetlands** - Stormwater wetlands form part of the 'landscape aesthetic' and with site-specific design and planting have the potential to make a positive contribution to green infrastructure and urban amenity. Wetlands with shallow and vegetated edges will integrate as a perceived natural feature more so than deep ponds that may be required to be fenced. It is recommended that the proposed stormwater wetlands be planted with appropriate (low maintenance) native species and integrated into the surrounding urban landscape context, so that they provide a hydrological and ecological function and are safe places to visit.
- **The proposed Blue-Green Network** – as expressed through the Urban Design Framework – Urban Design Review, the proposed SH22 corridor is capable of responding to natural

landscape identify drivers. This might feasibly include integration of the proposed Blue-Green Network - where it intersects with the Project area - and involve specific plant species selection (terrestrial and riparian) within the Project area to reinforce the wider vegetation patterns of the local landscape, and creating connections to proposed Greenways, as outlined above under walking and cycling connectivity.

- **Impacts on private property** – the Project is anticipated to impact on existing property features in the following ways:
  - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
  - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
  - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if the land it to remain within the road reserve, then native planting is considered a better option to permanently integrate residual land and improve the overall green infrastructure of the upgraded road corridor.

6.3.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principal elements of the Project that are likely to give rise to permanent adverse effects on landscape character, natural character and visual amenity. It is recommended that a ULDMP is a condition on the proposed designation which should include the following measures to mitigate landscape and visual effects.

There is clear guidance around the approach for built structures and landscape design and planting for transport projects within the Bridging the Gap: NZTA Urban Design Guidelines (2013). The following matters to be included within the ULDMP should demonstrate consistency with these design guidelines.

Refer to **Appendix 1**. Landscape Plans and Images: **Maps 09-13** which illustrate the general location of recommended mitigation measures.

1. **Bridges and structures:** demonstrate visual integration and sense of place considerations based on Mana Whenua preferred design principles for the proposed bridge structure over Ngakoroa Stream.
2. **Walking and cycling connectivity:** investigate opportunities to integrate with existing and future open space, including Ngakoroa Reserve and Drury Sports Complex.
3. **Stormwater wetlands:** configure stormwater wetlands to a natural appearance, conforming to landform and future urban context. Plant with appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function.
4. **Permanent earthworks** – shape all fill slopes to a natural profile and integrate into the surrounding natural landform. Fill slopes associated with the proposed Ngakoroa Bridge should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
5. **Private properties** – reinstate driveways, accessways, private fences and garden plantings for existing remaining properties temporarily affected by Project works. Design elements to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
6. **Planting design details:** landscape design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:
    a. Street trees along the full length of SH22 in conjunction with shrubs and ground cover species appropriate for the use within stormwater treatment areas and berms. Species and tree stature should be selected to correspond with adjacent land use and blue-green areas, in accordance with the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy,
    b. Reinstatement planting within private property boundaries
    c. Treatment of fill slopes and residual land, to integrate with adjacent land use and areas where the Project intersects with the proposed Blue-Green Network.
    d. Stormwater wetland design and planting
    e. Integration of Mana Whenua preferred design principles in relation to planting, structures and hard landscape elements.
    f. Site preparation, implementation and maintenance requirements for all planting typologies.

The proposed mitigation measures should where practicable be integrated with any revegetation requirements of future regional consent processes. Opportunities for integration of landscape mitigation works with the proposed Blue-Green Network, indicated by the Drury – Ōpāheke Structure Plan should also be considered. Future resource consent considerations outlined in Section 11 should also be considered in preparing the ULDMP.

6.4 Conclusions

This landscape, natural character and visual assessment finds that the proposed features and scale of the Project are able to be integrated into the existing landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP) adequate to remedy the potential adverse effects arising from the Project.

FUZ development areas on adjacent land will overtime substantially change the scale and character of the adjacent landscape as experienced from within the road, and will absorb the landscape and visual changes proposed within the Project area.

The following table provides a summary of the potential landscape character, natural character and visual effects of the construction and operational phases of the Project, with the mitigation measures implemented as recommended in this report

Table 6-1 – NoR D1 Summary of Landscape Effects

	Temporary Effects - Construction (with mitigation implemented)	**Permanent Effects – Operation (with mitigation implemented)**
Physical Landscape Effects (site enabling works, project formation works, finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

7 NoR D2: Jesmond to Waihoehe West FTN Upgrade

Chapter Summary

The Jesmond to Waihoehe West FTN Upgrade (NoR D2) includes, an approximately 4.1km long four-lane FTN arterial route along Jesmond Road, through a new greenfields link between Jesmond Road and the existing Bremner Road, Bremner Road, Norrie Road and Waihoehe Road West. It primarily involves upgrading and widening existing transport corridors with the exception of the new link between Jesmond Road and the existing Bremner Road and the new bridge connection over Hingaia Stream. The Project will likely be constructed within the baseline rural and emerging urban landscape and operate within the likely urban landscape environment.

The current defining characteristics of the Jesmond to Waihoehe West FTN Project area and local landscape are summarised below:

- Modified rural landscape surrounding Jesmond Road, Bremner Road and Waihoehe Road West, associated with residential and agricultural activities.
- Existing industrial land use within the Drury village.
- Heavy modification of stream environments, particularly Hingaia Stream within the industrial area of Drury.
- Limited indigenous species throughout the Project area with high-value indigenous vegetation including Oioi restiad reedland concentrated along the banks of the Ngakoroa Stream.
- Some noteworthy trees located within the Makomako Plant Centre, Drury Sports Complex, the boundary of Aroha Cottage and English Oak trees within the Project area of Waihoehe Road West.
- Auranga development area where a comprehensive masterplan is being implemented.
- Heightened natural character values associated with the greater coastal environments of Oira Creek, Drury Creek and the arms of the Ngakoroa Stream.
- Open space associated with the Ngakoroa Stream bridge crossing and the Drury Sports complex.
- Clustered residential development located around the intersections of Flanagan and Fitzgerald Roads adjacent to the Waihoehe West section.
- The existing bridge over SH1.

Most of the land adjacent to Project area will witness a significant change from rural to urban land use and character over the next 30 years. The Bremner Road section is the first area to experience land use change associated with the Auranga Development area. A range of housing typologies are signalled by the Drury-Ōpāheke Structure Plan including Mixed Housing Suburban, Mixed Housing Urban, Terrace Housing and Apartment Buildings and a main commercial centre north and south of the Waihoehe Road West section.

It is anticipated that some of the more defining abiotic features and patterns of the landscape (including scheduled) features will endure if not define the pattern of future urban development. Such features include the riparian and wetland environments associated with Ngakoroa Stream and Hingaia Stream and

the existing landform and amenity values of open space areas such as Drury Sports Complex (as indicated by the Drury-Ōpāheke Structure Plan proposed Blue-Green Network).

The key landscape matters addressed for the Jesmond to Waihoehoe West FTN Project (NoR D2) include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction over Ngakoroa Stream, SH1, Hingaia Stream and the NIMT.
- The nature and extent of physical impacts on private properties adjacent to the Project area during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Construction of a new section of road through greenfield land between Jesmond Road and existing Bremner Road (Jesmond to Bremner Link).
- Road widening to integrate the proposed Great South Road / Norrie Road / Waihoehoe Road intersection and Tui Street connection;
- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- Consideration of the potential natural character effects of bridge construction within the Ngakoroa Stream environment (adjacent to the CMA) and Hingaia Stream. Acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change from the widened (partially new) transport corridor and impacts within the Auranga development area. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of landscape amenity effects in relation to Ngakoroa stream esplanade reserve, Hingaia Stream esplanade reserve and the Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of opportunities to integrate the Project with the proposed Blue-Green network at future regional consent stage.

Overall landscape and visual effects range from very low to moderate-low for the construction and operational phase.

This landscape assessment concludes that the proposed features and scale of the Project once operational can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP). The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that the planting proposed under the ULDMP condition for NoR D2 is integrated with any future planting required as part of the regional consenting phase of the Project.

Landscape mitigation measures for NoR D2 include recommendations for integrating the proposed bridge structures, walking and cycling connectivity, configuration of stormwater wetlands with future urban form, integration of fill slopes, reinstatement of private property fences and gardens plantings and a comprehensive planting plan covering all mitigation treatments.

Jesmond Road FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Low to moderate-low** for private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

Bremner Road FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A

Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low to moderate-low**
Effects on Visual Amenity	N/A	**Low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very Low**

Waihoehoe Road West FTN Upgrade Section - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	
Temporary Visual Effects	**Low** **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Very low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Very low**

7.1 Project Description

7.1.1 Project Overview

The Jesmond to Waihoehoe West FTN Project (NoR D2) includes, an approximately 4.1km long four-lane FTN arterial route along Jesmond Road, through a new greenfields link between Jesmond Road and the existing Bremner Road, Bremner Road, Norrie Road and Waihoehoe Road West. It primarily involves upgrading and widening existing transport corridors with the exception of the new link between Jesmond Road and the existing Bremner Road and the new bridge connection over Hingaia Stream. The functional intent of the Project is to provide an appropriate urban arterial connecting the growth areas of Drury West to the wider network and centres, including providing a frequent transport bus network. Generally, a 30m wide transport corridor will be provided with two general traffic lanes, two bus lanes and separated walking and cycling facilities on both sides of the road corridor. The urban arterials will have a likely speed limit of 50kph.

For assessment purposes, the Project has been separated into three sections, as shown in Figure 7-1, including:

- Jesmond Road FTN Upgrade;
- Bremner Road FTN Upgrade (including the Jesmond to Bremner link through the Auranga Development, Bremner Road and Norrie Road); and
- Waihoehoe Road West FTN Upgrade including the Great South Road intersection.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade common to each Project section include the following:

- A typically 30m wide road with four lanes and separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Batter slopes and retaining to enable widening of the corridor and/or wetland construction, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring.

Further details of each Project section are provided below.

Comparative cross sections are included at sections 5.2 / 5.6 and 5.10 of the Urban Design Framework that illustrate the change in form and function between the existing road corridors and those proposed by the Jesmond to Waihoehoe West FTN Project.

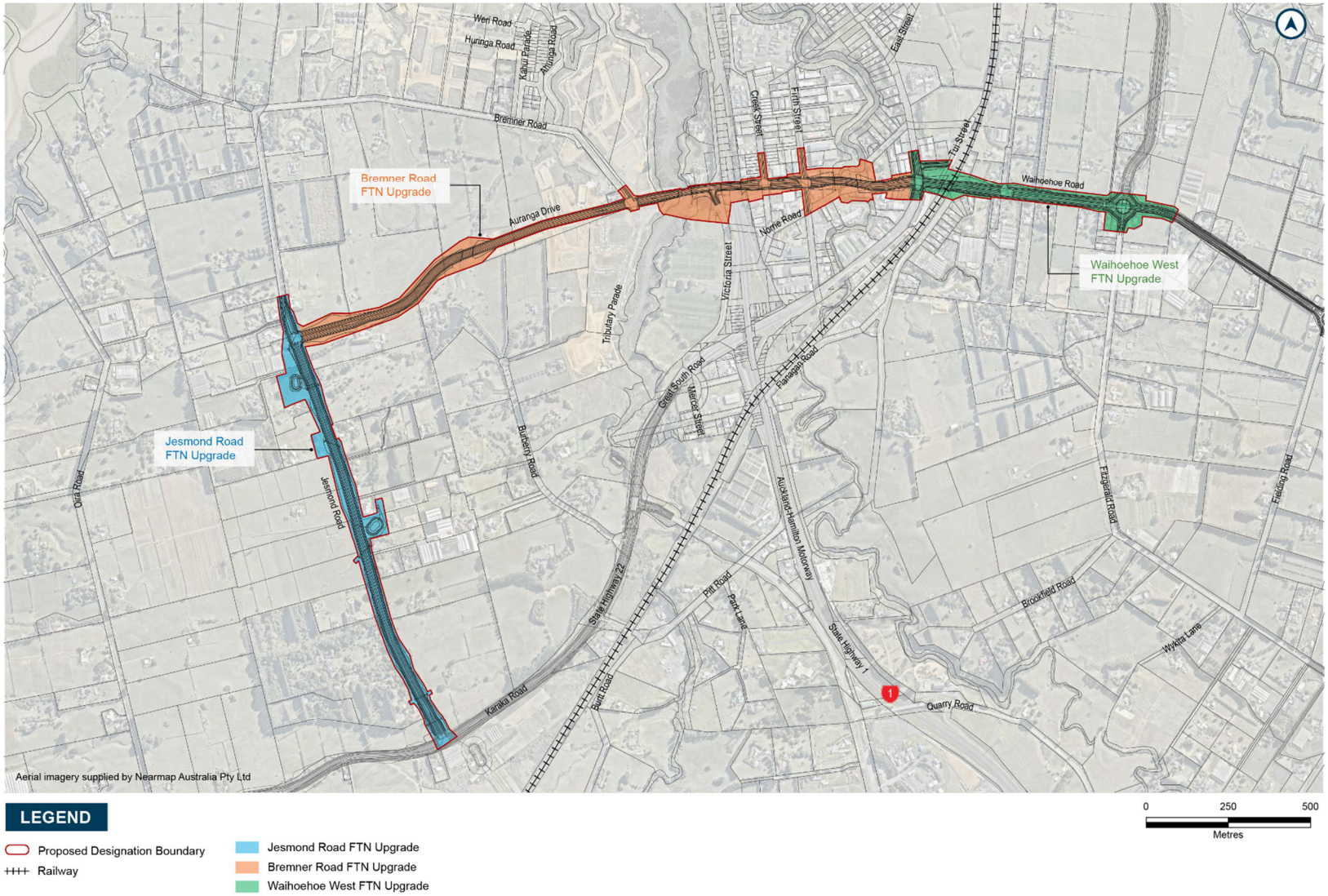


Figure 7-1 Overview of NoR D2

7.1.2 Jesmond Road FTN Upgrade

7.1.2.1 Section Overview

The Jesmond Road corridor provides greater accessibility via a north-south link that connects Bremner Road to the proposed Drury West Station and town centre, forming a key public transport and active mode spine through Drury West. An overview of the proposed design is provided in Figure 7-2.

In addition to those listed above, the key features of the Jesmond Road section include:

- Signalised intersections at SH22 and the new Jesmond to Bremner Link
- New and extended pipe culverts for cross drainage
- Two stormwater wetlands.

Figure 7-2 Overview of Jesmond Road FTN Upgrade Section

7.1.3 Bremner Road FTN Upgrade

7.1.3.1 Section Overview

The Bremner Road FTN Upgrade section extends from Jesmond Road in the west, approximately 1.98km to the end of Norrie Road in the east. This section involves the construction of a new road from Jesmond Road to the existing Bremner Road referred to as the "Jesmond to Bremner Link" and widening, and direct connection via a new bridge over Hingaia Stream, of Bremner Road and Norrie Road to enable the four-lane FTN arterial. The functional intent of this section provides greater east-west accessibility that connects Jesmond Road to Great South Road and town centre, forming a key public transport and active mode spine.

An overview of the concept design is provided in Figure 7-3.

In addition to those listed above, the key features of the Bremner Road FTN Upgrade section include:

- Signalised intersections on Bremner Road with Auranga Road 1, Creek Street and Firth Street
- Between Jesmond and Bremner Roads (Jesmond to Bremner Link):
  - A new road from Jesmond Road to an unnamed stream at the Auranga Development.
  - Forming of two additional lanes for the FTN within the Auranga "Road 1" from the unnamed stream to Bremner Road)
- A new bridge over an unnamed stream within the Jesmond to Bremner Link
- Widening of the two existing bridges crossing Ngakoroa Stream and SH1. These two bridges are proposed to be reconstructed in the near future as part of the SH1 widening by the Papakura to Bombay Waka Kotahi Project which forms part of the New Zealand Upgrade Programme.
- A new bridge connection from Bremner Road to Norrie Road across Hingaia Stream
- Removal of Norrie Road Bridge and closure of Norrie Road west
- Removal of access to Bremner Road from Creek Street (south).

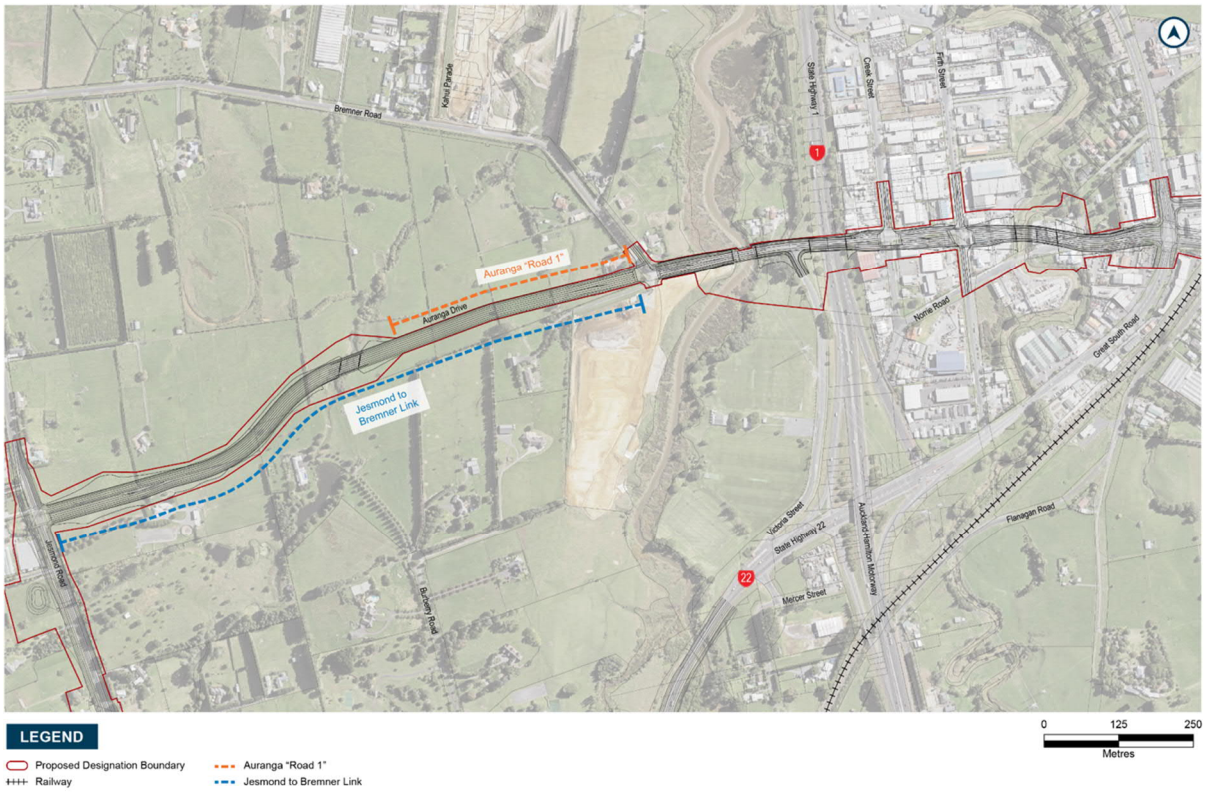


Figure 7-3 Overview of Bremner Road FTN Upgrade Section

7.1.4 Waihoehoe Road West FTN Upgrade

7.1.4.1 Section Overview

The Waihoehoe Road West FTN Upgrade section extends from Great South Road in the west, approximately 800m east to just past Fitzgerald Road in the east and involves widening the existing two-lane rural road to enable the four-lane FTN arterial. The functional intent for the section provides a strategic east-west link between strategic north-south and east-west corridors (Norrie Road, Great South Road and the Ōpāheke N-S FTN Arterial) that connects Waihoehoe Road to the Drury Central Station (and associated park and ride facilities) and town centre, forming a key public transport and active mode spine through Drury West. An overview of the concept design is provided in Figure 7-4.

In addition to those listed above, the key features of the Waihoehoe Road West FTN Upgrade section include:

- Realignment of Tui Street to Great South Road
- Upgraded and signalised intersection at Great South Road
- Reconstruction of the bridge crossing the NIMT rail line
- Relocation of the Waikato 1 watermain. The point of re-location to be agreed with Watercare at future detailed design.

Figure 7-4 Overview of Waihoehoe Road West FTN Upgrade Section

7.1.5 Project Features

The key landscape matters addressed for the Jesmond to Waihoehoe West FTN Project (NoR D2) include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction over Ngakoroa Stream, SH1, Hingaia Stream and the NIMT.
- The nature and extent of physical impacts on private properties adjacent to the Project area during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Construction of a new section of road through greenfield land between Jesmond Road and existing Bremner Road (Jesmond to Bremner Link).
- Road widening to integrate the proposed Great South Road / Norrie Road / Waihoehoe Road intersection and Tui Street connection;
- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- Consideration of the potential natural character effects of bridge construction within the Ngakoroa Stream environment (adjacent to the CMA) and Hingaia Stream. Acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change from the widened (partially new) transport corridor and impacts within the Auranga development area. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of landscape amenity effects in relation to Ngakoroa stream esplanade reserve, Hingaia Stream esplanade reserve and the Drury Sports Complex;
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of opportunities to integrate the Project with the proposed Blue-Green network at future regional consent stage.

7.2 Existing and Likely Future Environment

7.2.1 Jesmond Road FTN Upgrade section

7.2.1.1 Baseline Landscape

The Project area is situated within the existing Jesmond road corridor and extends into adjacent land that is characterised by flat to gently rolling lifestyle living[24].

The local landscape characteristics of the Jesmond Road section are summarised below;

- Vegetation cover comprising stand-alone elements of indigenous vegetation, exotic grassland and wetlands, hedge rows, shelter belts and exotic specimen trees.
- The landscape is characterised by land modification associated with the surrounding rural residential and productive rural land use.
- Landscape character value is low within the margins of the existing road reserve. There is potential to enhance this aspect of the landscape.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 01- 06 and 14**.

7-5–View north from outside the Red Shed Palazzo, 16 Jesmond Road.

7.2.1.1.1 Landform and Hydrology

Jesmond Road traverses gently undulating topography that is slightly elevated to the west, with a high point located roughly halfway along the existing road corridor.

Jesmond Road crosses four tributaries of the Ngakoroa Stream, all of which are culverted. Land to the east of the Project, between 41-221 Jesmond Road is relatively low lying and subject to flooding associated with tributaries of Ngakoroa Stream.

[24] Drury-Ōpāheke Structure Plan: Landscape and Visual Assessment – Background Investigation for Auckland Council. Opus International Consultants Ltd, August 2017

7-6–View south from 125 Jesmond Road into a tributary of the Ngakoroa Stream.

7.2.1.1.2 Landcover

The landscape east and west of Jesmond Road is characterised by isolated elements of indigenous vegetation, exotic grassland, hedgerows, shelterbelts and amenity plantings along property boundaries. Exotic specimen trees predominate and define the landcover pattern on both sides of the road corridor and within the surrounding rural properties. Exotic wetlands are present within the adjoining land. Areas of open pasture are located directly adjacent the road corridor at the south-east and mid-west of the designation boundary.

A range of mature exotic and native trees (including some noteworthy specimens[25]), located within the road reserve and along the roadside boundaries of private property contribute to the landscape character of the borrowed landscape surrounding the Project area. These include some mature exotic trees at the entrance to Makomako Plant Centre and a row of young oak trees at the north-western extent of the designation boundary. The land at the Red Shed Palazzo and Makomako Plant Centre features extensive rows of mature shelter belt planting and various species of mature exotic trees within the centre of the properties and towards the road frontage.

Trees protected under District Plan provisions in this section are limited to approximately 30 Japanese cedar (*Cryptomeria japonica*) trees in one row adjacent to Aroha Cottage, 201 Jesmond Road, because they are within the scheduled historic extent of place.

7.2.1.1.3 Land Use

The existing Jesmond Road corridor is approximately 20m wide and zoned ‘Road’ under the AUPOIP.

Land use either side of the existing road reserve is rural and features residential and agricultural activities and a handful of commercial activities such as the Red Shed Palazzo, Makomako Plant Centre and Jesmond Hybrids Ltd.

The Drury 1 Precinct is located at the north eastern extent of the Project area.

[25] Noteworthy from a landscape character point of view.

7-7–View north from 221 Jesmond Road into low lying land and flood plain.

7.2.1.1.4 Scheduled Landscape and Ecological Features

There are no scheduled landscape or ecological features within or proximate to the Project area.

7.2.1.1.5 Historic and Cultural Associations

Aroha Cottage (201 Jesmond Rd) is situated directly adjacent to the Project and while the proposed works will not affect the property directly, the driveway entry is proposed to be re-graded as part of the Project works (and this area is included in the proposed designation boundary).

7-8–View north from outside of the Cottage. Existing Japanese cedar along property boundary. Existing driveway proposed to be re-graded.

7.2.1.2 Likely Future Environment

7.2.1.2.1 Overview

The land adjacent to the Project will witness a significant change from rural to urban land use and character over the next 30 years. It is anticipated that some of the more extensive abiotic features of the landscape will endure if not define the pattern of future development; these include the Ngakoroa

tributaries and associated floodplain environment to the east of the Project area between 41-221 Jesmond Road.

Conversely, it is anticipated that the biotic (land cover) features of the landscape will undergo significant change alongside future development through the likely removal of existing trees, implementation of street tree plantings, public open space design and general landscaping within the private yards or future housing development.

7.2.1.3 Drury-Ōpāheke Structure Plan

The Drury-Ōpāheke Structure Plan provides general guidance for how the FUZ land adjacent to the Project area should be developed over time. The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07- 08**.

Land Use

The Drury-Ōpāheke Structure Plan indicates Terrace Housing and Apartment Buildings either side of the corridor in the southern extent of the Project. A new centre is indicated along the south-east extent of Jesmond Road at the intersection with SH22.

Mixed Housing Urban is signalled on both sides of Jesmond Road along the northern extent of the Project area. Drury Precinct 1 is located along the north-eastern edge of the Project area at the intersection with the Bremner Road section.

Proposed Blue-Green Network

The Project intersects with the proposed Blue-Green network at the following three locations:

- A tributary of the Ngakoroa Stream in the south (131 Jesmond Road);
- A tributary of the Ngakoroa Stream in the north (235-221 Jesmond Road); and
- The Makomako Plant Centre (64 Jesmond Road), where a potential neighbourhood park (0.3-0.5ha) is indicated.

7.2.1.4 Viewing Context

The viewing audience for the Jesmond Road section is largely comprised of a transient public audience (i.e. vehicles travelling at 80km/h), with the location representing a short portion of their journey between Bremner Road and SH22. Over time, the audience is anticipated to include residents of future urban developments, including from within the Auranga development.

The Jesmond Road viewing context is characterised by the following:

- Contained views within the existing road corridor, framed by the dominant vegetation framework and undulating topography.
- More expansive views from the elevated areas of land to the mid-west of the designation boundary.
- Coherent rural lifestyle landscape character.

7.2.1.5 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or proximate to the proposed designation boundary.

The low rolling topography and Ngakoroa Stream tributaries contribute to the landscape values of the local setting. Noteworthy mature exotic trees at the Makomako Plant Centre and a row of young oak trees at the north-western extent of the designation also contribute to the localised landscape character. There is likely a connection between the mature specimen trees located at the Makomako Plant Centre and the indication of a potential new neighbourhood park at that same location within the Blue-Green Network map, Refer **Appendix 1.** Landscape Plans and Images: **Map 07**.

7.2.1.6 Landscape Sensitivity

Jesmond Road is situated within a broader landscape that has been assessed by the AUPOIP as being suitable for urbanisation. The proposed upgrade of Jesmond Road to a four-lane arterial standard forms a small yet integral section of the future urban form and so on that basis the Project area is assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Jesmond Road section are as follows:

- Tributaries of the Ngakoroa Stream in the north and south of the designation
- Mature trees located along the boundary of the Makomako Plant Centre.

7.2.2 Bremner Road FTN Upgrade section

7.2.2.1 Baseline Landscape Characteristics

The Bremner Road section passes through a range of existing land use zones. The land situated between Jesmond Road to the west and the Ngakoroa Stream to the east lies within the Drury 1 Precinct. The Drury Sports Complex is located directly south of the Ngakoroa bridge and forms part of a linear recreational and landscape amenity character area between Drury Creek to the north and Ngakoroa Reserve approximately 2km south.

To the east of SH1, the Bremner Road section passes through the light industrial area of Drury Village, over the Hingaia Stream and terminates at the Norrie / Great South Road intersection. The intersection demarcates the edge of the light industrial area to the west and the town centre zone to the east (which is further confined by the NIMT).

The defining characteristics of the Bremner Road section are summarised below;

- Heightened natural character values associated with the greater coastal environments of Oira Creek, Drury Creek and the arms of the Ngakoroa Stream. The northern side of the existing Ngakoroa Stream bridge defines the southern extent of the Coastal Marine Area (CMA).
- The western extent of the designation (Jesmond to Bremner Link) comprises rural lifestyle blocks within the Drury 1 Precinct Plan 2 area.
- The central section of the designation is situated in the existing Auranga development area (Plan 1). The Auranga development is ongoing and includes completed roads, streetscape

elements and riparian planting along the Ngakoroa Stream that opened to the public in July 2019.

- The existing Ngakoroa Stream Bridge crossing includes a shared pedestrian and cycleway component comprising some subtle bespoke design features. Given the location of the bridge (at the eastern entrance to the emerging Auranga neighbourhood) and the cultural and ecological values of the Ngakoroa Stream, the upgraded bridge structure could become a feature in the landscape that highlights the culmination of a series of landscape and cultural values.
- Open space and esplanade reserves associated with the Ngakoroa Stream bridge crossing / Drury Sports Complex intersection.
- Drury Town Centre, surrounding Great South Road, holds a mix of businesses including food outlets, retail gym, a church and cemetery in the area.
- The Hingaia Stream environment is heavily modified by industrial land use.

The existing baseline features of the Project area and local landscape are illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 01- 06 and 15 - 16**.

7.2.2.1.1 Landform and Hydrology

The Bremner Road section traverses gently undulating topography that is slightly elevated to the west at the intersection with Jesmond Road. The elevation reduces along the alignment to the east towards the Ngakoroa Stream environment.

The Bremner Road section crosses the Ngakoroa Stream and its tributaries at four locations to the west of SH1. It also crosses the Hingaia Stream in the industrial zone to the east.

Floodplains represent a notable landscape constraint in this section of NoR D2 with the Hingaia floodplain being particularly extensive.

7-9– Ngakoroa Stream Bridge

7.2.2.1.2 Landcover

The vegetative framework consists mostly of exotic grassland, shrubs and specimen trees, some shelterbelt plantings and cleared ground (associated with the Auranga development).

The smaller Ngakoroa Stream tributaries contain limited indigenous species with Oioi, restiad reedland present in greater concentrations within the main arm of Ngakoroa Stream, adjacent to the

existing Bremner Road – Ngakoroa Stream bridge. A marine 1 SEA (SEA-M1-29b) and several terrestrial SEAs (SEA_T_530 / SEA_T_530b) are located north and south of the existing bridge.

The secondary arm of the Ngakoroa Stream, north of the designation at the existing Bremner Road crossing, has been planted extensively with native riparian species, as part of the Auranga development.

The Hingaia Stream has been severely modified by industrial land use over an extended period of time and as such, there is very little native vegetation within this part of the Project area.

A range of mature exotic and native trees (including some noteworthy specimens[26]), located within the road reserve, open space areas and the roadside boundaries of private property contribute to the landscape character of the borrowed landscape surrounding the Project area. Protected trees[27] within the Project area include a range of mature exotic tree species including Japanese cedar *Cryptomeria japonica* 'Elegans'), willow (*Salix* alba), poplar (*Populus yunnanensis*), Melia (*Melia azadarach*), silver birch (*Betula pendula*), English Oak, pine (*Pinus radiata*), pin oak (*Quercus palustris*), London plane (*Platanus X acerifolia*) and Mexican fan palms (*Washingtonia robusta*).

7.2.2.1.3 Land Use

The area of land within the Drury 1 Precinct (Plan 2) consists of rural lifestyle blocks. The Auranga development (Plan 1) is under construction and the near-future land use of this area is described in section 7.2.2.8 below.

The Bremner Esplanade Reserve intercepts with the designation at the west and eastern side of the existing Ngakoroa Stream Bridge. The Drury Sports Complex is located directly south of the Ngakoroa Stream crossing. The Transpower high voltage lines pass over the Project area, above the existing Ngakoroa Stream bridge.

Land use to the east of SH1 is industrial and includes a variety of businesses adjacent and within the designation boundary. The proposed designation crosses the Hingaia Esplanade Reserve along the western side of the proposed bridge.

Twin Transpower overhead lines pass over the existing Ngakoroa Bridge and Victoria Street in a northwest to southeast direction.

7.2.2.1.4 Scheduled Landscape and Ecological Features

The main arm of the Ngakoroa Stream (on the northern side of the bridge) is classified as a Marine 1 SEA (SEA-M1-29b). Areas along the margins of the stream to the north and south are classified as terrestrial SEAs (SEA_T_530 / SEA_T_530b).

The Bremner Road section is located within the coastal environment and the northern side of the existing Ngakoroa Stream bridge defines the southern extent of the Coastal Marine Area (CMA).

[26] Noteworthy from a landscape character point of view.

[27] Protected by District Plan provisions - refer to the specialist Arboriculture Report for the Project.

7-10– Hingaia Stream Bridge (known as the Norrie Road Bridge)

7.2.2.1.5 Historical and Cultural Associations

According to the archaeological assessment, there are historical sites of interest proximate to the Ngakoroa Stream Bridge including the waka Tauranga and the site of Runciman's Homestead. Immediately to the north on the opposite side of Bremner Road is Redoubt Wharf, a scheduled heritage site.

Further to the east within the Drury Industrial zone, the former Drury Cheese and Casein Factory and St. John's Anglican Church are located on Norrie Road.

Figure 02 –View southwest from the eastern side of the existing Ngakoroa Stream bridge.

7.2.2.2 Likely Future Environment

7.2.2.3 Drury 1 Precinct

The land adjacent to the Project area (between Jesmond Road and Ngakoroa Stream) will witness a significant change from rural to urban land use and character in the foreseeable future. This has been accelerated under the AUPOIP by the Drury 1 Precinct (Precinct Plan 1) through the approval of the Auranga Development. Stage 1 of the development is in the early stages of construction, which so far includes the completion of the local road network, stormwater infrastructure, a neighbourhood

playground and revegetation planting of an unnamed tributary of the Ngakoroa Stream, approximately 300m west the existing Ngakoroa Stream bridge crossing.

7-11- View northeast from within the Auranga development area (Bremner Road)

7-12-Auranga Development Master Plan Overlay[28]

The Auranga development masterplan indicates a village centre, apartment buildings and medium and low density residential typologies. It also features a central park, community gardens, cycle paths and an extensive esplanade reserve network.

28 https://www.auranga.co.nz/

The proposed Bremner Road section enters the Auranga development at the southwest boundary, within a 28m wide corridor set aside within the masterplan to include the future upgrade to four lanes for the Project. The entry point is located at the southern extent of the proposed central park which runs north to south along what is effectively the proposed Blue-Green network given effect through the Auranga masterplan. As depicted in the artist impression below, the proposed Bremner Road section will pass through medium to lower density residential living and apartment buildings, towards the Ngakoroa stream bridge.

7-13- Artist impression of Auranga Development.

The remaining western extent of the Project (outside of the Auranga masterplan) is likely to be developed in a similar way with the Drury 1 Precinct (Plan 2) indicating Residential – Mixed House Urban either side of the proposed corridor. As with the FUZ land adjacent to NoR D1, it is anticipated that the defining abiotic features of the landscape (stream tributaries) will define the general pattern of development, in accordance with the objectives and policy 9 of the Drury 1 Precinct that seeks the enhancement (through riparian planting) of waterways.

Conversely, it is anticipated that the biotic (land cover) features of the landscape will undergo significant change alongside future development through the likely implementation of street tree plantings, public open space design and planting of private yards.

The existing open space, coastal and esplanade environments associated with the Drury Sports Complex and the Ngakoroa and Hingaia Streams are not anticipated to change from a land use perspective, but may experience landscape enhancement as a result of localised urban development adjacent to these areas.

7.2.2.4 Viewing Context

The viewing audience for the Bremner Road section comprises a mix of transient public audiences, including motorists travelling between 50-70km/h and cyclists and pedestrians within the open space

areas in and around the Project area. The transient public viewing audience will initially consist of commuters traveling along Jesmond Road in the location of the proposed Bremner Road intersection and people passing through the recently developed local roads of the Auranga development. It will also include motorists traveling at high speed along SH1 beneath the Project works and visitors to the Drury Industrial area. Over time, the public transient viewing audience is anticipated to grow to include motorists, cyclists and pedestrians passing through and traveling within the Auranga development area.

The private viewing audience comprises a small number of local residents and businesses near the proposed Jesmond / Bremner Road intersection, a handful of rural lifestyle properties further along to the east (adjacent to the proposed corridor), five residential properties located directly north of the Ngakoroa Bridge section and businesses located along Bremner Road, Norrie Road, Firth Street and Creek Street within the Drury Industrial area. Overtime, the private viewing audience is anticipated to grow substantially to include future residents of the Auranga development area and the Precinct Plan 2 area (Drury 1 Precinct) who will either overlook the proposed Bremner Road corridor from adjacent housing or at ground level (as illustrated in figure 7-13).

As development intensifies along the Bremner Road corridor, Ngakoroa Stream Bridge is likely to become a visual focal point, at the end of the corridor and as a gateway feature creating a threshold between the high-density residential living to the west and the Ngakoroa Esplanade reserve.

The Bremner Road viewing context is characterised by the following:

- Distant and intermittent views east from the Jesmond Road intersection towards the Hunua Ranges foothills.
- Intermittent views to the Hunua Ranges foothills from elevated and exposed areas of land within the greenfield section between Jesmond Road and the Auranga development area.
- Coherent rural lifestyle landscape character at the Jesmond Road end.
- Existing (temporary) construction activities associated with Auranga development area.
- Heightened natural character values associated with the recently revegetated tributary of the Ngakoroa River (within the Auranga development area).
- Heightened natural character values within the main arm of the Ngakoroa Stream, particularly to the north into the marine SEA flowing out towards Drury Creek.
- Temporary juxtaposition in visual character between existing greenfield and Auranga development area, which will evolve over time.
- Low visual amenity within the existing industrial zone and very low perceived natural character value associated with the Hingaia Stream corridor.

7.2.2.5 Landscape Values

There are no ONLs, ONFs or ONCs within or proximate to the proposed designation boundary. However, the main tributary of the Ngakoroa Stream (north of the bridge) is located in the General Coastal Marine Zone and the surrounding landscape is generally influenced by the coastal environment elevating the perceived natural values of the localised landscape.

Mana whenua have a long association with the Drury-Ōpāheke landscape. The vast waterways and former wetlands sustained food crops and fishing camps while the headlands and promontories

around the Pahekeheke awa (Drury Creek) were used as pā, papa papakāinga, and wāhi nohoanga on a seasonal basis. This demonstrates that there are also important associative values within this landscape setting.

The highest landscape values are attributed to the Ngakoroa Stream coastal environment and the areas classified as SEAs; also the historical and cultural sites of interest and associative values within and proximate to this section of the Project. The ecological and cultural features (those seen and unseen) in the landscape combine to create a localised landscape of relatively high value.

The riparian environments of the tributaries of the Ngakoroa Stream, including those recently planted through the Auranga development area, also contribute to the overall landscape values of the Project area.

The Drury Sports Complex located southeast of the Ngakoroa Stream Bridge is a valuable community resource and this is expressed through the Auranga Master Plan as an integral part of the recreational values associated with the margins of the Ngakoroa Stream.

7.2.2.6 Landscape Sensitivity

The extent of the Project area within the Drury 1 Precinct is considered to have very low sensitivity to landscape change on the basis of existing urban development and that which will follow, as indicated in the Auranga master plan. Similarly, the Project area within the existing Drury industrial area is considered to have very low sensitivity to the type of landscape change proposed through the Project.

However, the Ngakoroa Stream and its margins, despite being modified in the past, remains a sensitive landscape feature being within the coastal environment with SEA classifications and heightened natural character values. For the Ngakoroa Stream, the recommended landscape management approach is to limit (as much as possible) disturbance of the margins and water body and to repair areas impacted by the project works.

Conversely, for Hingaia Stream to the east of the Project area, the recommended landscape management approach could involve a ‘modify and repair’ approach. This is because the stream has been significantly modified over time and a designed intervention will be required to restore the ecological values of the riparian environment. Future landscape mitigation measures for the Project (subject to regional consent processes) are anticipated to enhance the quality of the stream environment and therefore the natural character values for this section of the Project.

7.2.3 Waihoehoe Road West FTN Upgrade section

7.2.3.1 Baseline Landscape Characteristics

The Waihoehoe Road West section is situated within the existing road corridor and extends into adjacent land that is characterised by the edge of the Drury industrial area, Great South Road intersection, NIMT and gently rolling landform accommodating rural lifestyle housing.

The defining characteristics of the Waihoehoe West section are summarised below;

- A high concentration of transport infrastructure and industrial land use within the western extent of the section.

- Rural lifestyle character with smaller property sizes and clusters of residential development located around the intersections of Flanagan and Fitzgerald Roads.
- Low natural character values.
- Views towards the Hunua Ranges foothills through the existing corridor.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1**: Landscape Plans and Images: **Maps 01- 06** and **17**.

7-14– View east from 18 Waihoehoe Road.

7.2.3.1.1 Landform and Hydrology

The Waihoehoe West section traverses a minor ridge that is gently undulating and rises from the west after the NIMT to the east towards a gentle knoll located at the end of the designation boundary.

Being relatively elevated, the proposed designation does not cross any streams or water bodies.

7.2.3.1.2 Landcover

Exotic grassland, hedgerows, shelterbelts and exotic specimen trees associated with private properties predominate and define the landcover pattern on both sides of the existing road corridor.

A range of mature exotic and native trees (including some noteworthy specimens[29]), located within the road reserve and the roadside boundaries of private property contribute to the landscape character of the borrowed landscape surrounding the Project area. Protected trees[30] within this section include three English oak (*Quercus robur*) in the road reserve of Waihoehoe Road, outside 236 Great South Road.

[29] Noteworthy from a landscape character point of view.

[30] Protected by District Plan provisions - refer to the specialist Arboriculture Report for the Project.

7.2.3.1.3 Land Use

Existing residential development is of a finer grain along the Waihoehoe West section; with smaller property sizes and clusters of residential development located around the intersections of Flanagan and Fitzgerald Roads.

Waihoehoe Road West cross the NIMT in the western extent of the Project area. The NIMT creates a distinct edge between the existing Drury industrial area and the existing rural landscape to the east.

7.2.3.1.4 Scheduled Landscape and Ecological Features

There are no scheduled landscape or ecological features within or proximate to the designation boundary.

7.2.3.1.5 Historical and Cultural Associations

Heritage sites recorded within this section of the NoR include features associated with historic railway activities.

7.2.3.2 Likely Future Environment

Land within and adjacent to the Waihoehoe Road West section will, over time, witness a significant change from rural to urban land use and character. Some of the abiotic features and patterns of the wider contextual landscape are anticipated to endure and define the pattern of future urban development. However, the existing land cover features within the Project area are anticipated to undergo significant change alongside future development along the Waihoehoe Road West corridor.

7.2.3.2.1 Developer Interest and the Drury-Ōpāheke Structure Plan

Developers are seeking the rezoning of FUZ land on the southern side of Waihoehoe Road to allow for urban development. The land use they are seeking is generally in line with the Drury-Ōpāheke Structure Plan. Developers are also seeking development in Drury East on either side of Waihoehoe Road West section of NoR D2. The proposed land use is broadly in line with that proposed in the Drury-Ōpāheke Structure Plan. It is likely that plan change proceedings to rezone the land will be undertaken in early 2021.

Land Use

The Drury-Ōpāheke Structure Plan signals development of the main commercial centre north and south of the Waihoehoe Road West corridor, within the western extent of the Project area. Adjacent land to the north and south of the Project area towards the east is signalled as Terrace Housing and Apartment Buildings.

The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07 - 08**.

7.2.3.3 Viewing Context

The public viewing audience for the Waihoehoe Road West section is largely mobile (i.e. vehicles travelling between 50-70km/h) between Drury's existing business/industrial zone and the rural residential neighbourhoods of Drury East. Over time, the public viewing audience is expected to grow

to include residents of future urban developments, including people frequenting the main commercial centre.

The private viewing audience is concentrated in three clusters along the southern side of the Project area. The first cluster is located along Flanagan Road, directly south of the railway line. The second cluster features a row of houses opposite Kath Henry Lane, with the third cluster situated near the Fitzgerald / Waihoehoe Road intersection. There are 5 dwellings along the northern side of the Project area which are set back some distance from the road.

The Waihoehoe Road West viewing context is characterised by the following:

- Consistent backdrop views east towards the Hunua Ranges foothills
- Coherent rural residential landscape character to the south of the Project area.
- Coherent rural lifestyle landscape character north of the Project area.
- Dense shelterbelt and property boundary vegetation.
- A larger private viewing audience relative to the length of the NoR section.

7.2.3.4 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or proximate to the proposed designation boundary in this section.

The low rolling topography of the existing road corridor together with legible views towards the Hunua Ranges and heritage sites associated with the rail corridor contribute to the local sense of place and local values of the Waihoehoe Road West environment.

7.2.3.5 Landscape Sensitivity

Waihoehoe Road West section is situated within a broader landscape that has been assessed by the AUPOIP as being suitable for urbanisation. The proposed upgrade of the Waihoehoe Road section to a four-lane arterial standard forms a small yet integral section of the future urban form and on that basis is assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Waihoehoe Road West section are as follows:

- The gentle undulating topography.
- The protected English oak (*Quercus robur*) in the road reserve of Waihoehoe Road, outside 236 Great South Road.
- Heritage sites.

7.3 Assessment of Landscape and Visual Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

7.3.1 Positive Effects

A number of positive landscape and visual effects are anticipated as a result of the operation of the Project (including proposed mitigation).

Positive effects are likely to include:

- A streetscape to match the emerging urban form within adjacent land;
- Improved and/or new opportunities for active modes of transport and the ability to generate better connectivity with open space areas such as the Drury Sports Complex and the esplanade reserves associated with Ngakoroa and Hingaia Streams. Also, the ability to tie into the proposed Greenways and recreational corridors anticipated by the Drury-Ōpāheke Structure Plan, Blue-Green Network;
- Net increase in green infrastructure within the Project area associated with new street trees, berm and stormwater plantings and planted stormwater wetlands, resulting in improved visual amenity for road users and adjacent audiences;
- Slower speed limits adjacent to existing dwellings and commercial activities improving on the experiential qualities of the corridor for users and well as private properties situated adjacent tie the road;
- Improved form and function of the proposed bridges over Ngakoroa and Hingaia Stream, SH1 and NIMT, reducing flood risk and potential adverse effects on natural character values. Also, the opportunity to visually integrate new bridge structures and generate sense of place values through site-specific design.

7.3.2 Assessment of Construction Effects

7.3.2.1 Jesmond Road FTN Upgrade section

7.3.2.1.1 Site Enabling Works

Construction Areas

The Project will require site compound and construction areas to be established at 3 locations throughout the Project area, to facilitate the Project works. Construction traffic will be heightened at these locations through the construction period of the Project.

- A stockpile and laydown area associated with stormwater wetland 2 at 224 Jesmond Road
- A site compound (approx. 2000m2) located at 256 Jesmond Road.

The proposed site compound and construction areas are located within pastoral land that is already somewhat modified by existing rural land use.

It is recommended that all areas be grassed (reinstated) at the completion of the construction period.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas on modified land within the Project area is assessed as **low.**

Vegetation Clearance

Broad areas of street-side vegetation and private garden plantings are required to be removed as a result of the proposed earthworks. Exotic grassland, hedgerows, shelterbelts and amenity plantings including exotic specimen trees along property boundaries make up the majority of vegetation to be removed. It will also include some noteworthy exotic trees including mature exotic trees at the entrance to Makomako Plant Centre (64 Jesmond Rd) and a row of young oak trees at the north-western extent of the designation boundary (262 Jesmond Rd).

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects resulting from vegetation clearance within the Project area is assessed as **moderate-low**.

7.3.2.1.2 Project formation Works

Structures and Earthworks

The proposed cut and fill slopes range in scale from very small (1m wide) to moderate (10m wide), and will generally be absorbed within the existing modified roadside environment.

The proposed earthworks will result in a carriageway that is approximately 1.5m above existing GL at the Jesmond / SH22 intersection and generally no more than 0.5m above existing GL for the rest of the alignment. All cut and fill slopes are expected to be absorbed within the existing modified road corridor environment and marginal pastoral land adjacent to the road corridor.

It is recommended that a condition on the designation is included that encourages the re-use of topsoil from pastoral land impacted by the proposed earthworks[31].

Overall, impacts on the physical landscape to implement the proposed earthworks is likely to be **low**.

Stormwater wetlands and features

Existing culverts are proposed to be upgraded to accommodate the wider alignment. The outlets and localised small fill slopes will generally be integrated back into the existing modified road side environment. One additional culvert is proposed at CH 3160 in front of Aroha Cottage at 201 Jesmond Road. The proposed RL of the carriageway at this location is approximately 0.6m above existing RL and a small batter slope is required to integrate the grade separation. The proposed fill slope and culvert outlet may necessitate the removal of one or more of the existing mature Japanese cedar trees which are planted as a row in front of Te Aroha Cottage.

Stormwater wetlands are proposed at two locations along the Jesmond Road section. The first wetland is proposed on private property at 131 Jesmond Road (CH2700) in low lying land that is subject to the 100 year flood plain. A second wetland is proposed at the northern extent of the designation at 224 Jesmond Road (CH3200) within comparatively elevated land, opposite a highly

[31] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

modified tributary of the Ngakoroa stream. Both areas are identified as key corridors in the proposed Blue-Green Network.

The stormwater wetlands are proposed within open pastoral areas, outside of existing waterways, within land that is already modified by rural land use. Overall, impacts on the physical landscape to implement the proposed stormwater wetlands is considered to be **low.**

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 16 private properties are proposed to be impacted by the Project works. Landscape mitigation measures are proposed under visual amenity and residential character effects and are outlined in section 7.3.5

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **moderate-low**.

7.3.2.1.3 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

7.3.2.1.4 Temporary Visual Effects

The construction of the Project is anticipated to be completed within a 12-18 month period and visual effects are anticipated to occur progressively through the Project area.

The consideration of visual effects through the construction phase acknowledges the full range of activities (and their resultant visual impact), required to implement the upgraded road corridor. This includes site enabling works, including: site establishment, demolition and vegetation clearance; bulk earthworks and surface formation; bridge construction and also the ‘finishing works’ period where it is anticipated that street trees, lighting, footpath/cycleway details and line marking will be implemented, alongside any other infrastructural elements of the Project.

It is anticipated that construction activities required to implement the Project will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within a main arterial corridor. Another important consideration is that

landscape change by way of vegetation removal and land modification (albeit at a lesser scale) forms part of the expected backdrop of the rural environment, particularly one that is expected to transition, over time, into an urban neighbourhood.

Notwithstanding the above, some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase due to the magnitude of vegetation removal and/or earthworks proposed. These areas are outlined below:

- Private properties where notable physical landscape effects will occur along property.
- CH2000 – 2100 at the intersection of SH22 and Jesmond Road where visual effects could potentially be compounded by the construction works along SH22.
- CH2300 along the boundary of Makomako Plant Centre, where mature trees are required to be removed.
- CH2950 at the boundary of Aroha Cottage where mature Japanese Cyprus are required to be removed to install the new culvert.
- CH3200-3400 at location of the proposed wetland, site compound area and the Bremner Road intersection. This localised area will witness heightened physical landscape effects resulting in adverse visual amenity effects associate with the removal of high value Oak trees, demolition of buildings and private driveway regrading.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within existing roads;
- The construction phase is expected to last no longer than 18 months.

Representative viewpoint images are provided in **Appendix 2.** NoR D2 – Representative Viewpoint Images. The supporting commentary for each location outlines the existing visual composition of the Project and the visual changes that have the potential to translate into adverse visual effects during the construction and operation periods.

Overall, adverse visual effects for the public viewing audience are likely to be **very low** through the construction phase**.**

For the private viewing audience, directly adjacent the road corridor, adverse visual effects are likely to be heightened on the basis of more direct and prolonged engagement with the construction activities of the Project. On that basis, visual effects are likely to range from **moderate-low** during the construction phase for private viewing audiences.

7.3.2.2 Assessment of Operational Effects

7.3.2.2.1 Natural Character Effects

Natural character forming elements, features and processes include the four tributaries of the Ngakoroa Stream, all of which are notably modified and culverted beneath the existing road corridor, On that basis, they contribute a low degree of natural character to the Project area. The low lying flood plains to the east (within and adjacent to the Project area) are similarly modified and contribute low natural character value to the local landscape.

Potential effects on natural character arise from localised earthworks and limited vegetation clearance within riparian areas associated with the proposed culvert outlets (subject to regional consent).

As the detailed design progresses and regional consents are sought, the full extent of proposed works and impacts on indigenous vegetation will be determined. It is anticipated that reinstatement and mitigation planting at the completion of works will assist with mitigating any landscape and natural character effects arising from the culvert outlets.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

On the basis of the above (allowing for future landscape mitigation of riparian areas), adverse natural character effects are likely to be **very low.**

7.3.2.2.2 Visual Amenity Effects

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor.

Very low residual adverse visual effects are anticipated for some private properties, where as a direct result of the Project, residents may experience some level of material change to the visual composition and residential amenity of the road corridor as perceived from private property.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading (outlined in section 7.3.2.1.2 above), potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Once the Project is completed, transient public viewing audiences will continue to engage with a similar visual environment to which currently exists along the Jesmond Road corridor, within the backdrop of an increasingly urban landscape. Over time, visual effects are anticipated to be positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

On that basis, visual effects within the Project area are likely to be **very low** and **moving to beneficial** for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **low** to **moderate-low**, reducing over an extended period of time.

7.3.2.2.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing Jesmond Road corridor and adjacent landscape. The existing corridor is currently distinctively rural in character owing to the limited streetscape features, unstructured hedgerow and shelter belt plantings and the existing rural land use adjacent to the corridor. At the completion of the Project, the upgraded corridor will resemble that of an urban arterial on account of the additional vehicle lanes, active modes of transport, reduced speed limit, structured street tree plantings, integrated stormwater management and engineered roading elements that are inherently urban in aesthetic.

The Project is anticipated to enter its operational phase within the context of increased urbanisation within adjacent FUZ land. Developer interest and the Drury-Ōpāheke Structure Plan indicates that a commercial centre will develop at the southeast extent of the Project area, adjacent to the SH22 and to the east of the SH22Jesmond Road intersection. Terrace housing and apartment buildings are signalled on both sides of the alignment with a smaller area of mixed housing urban towards the northern section of the Project area. On that basis, the magnitude and nature of landscape change proposed by the Project is considered to accord with that which will occur throughout the localised landscape over time.

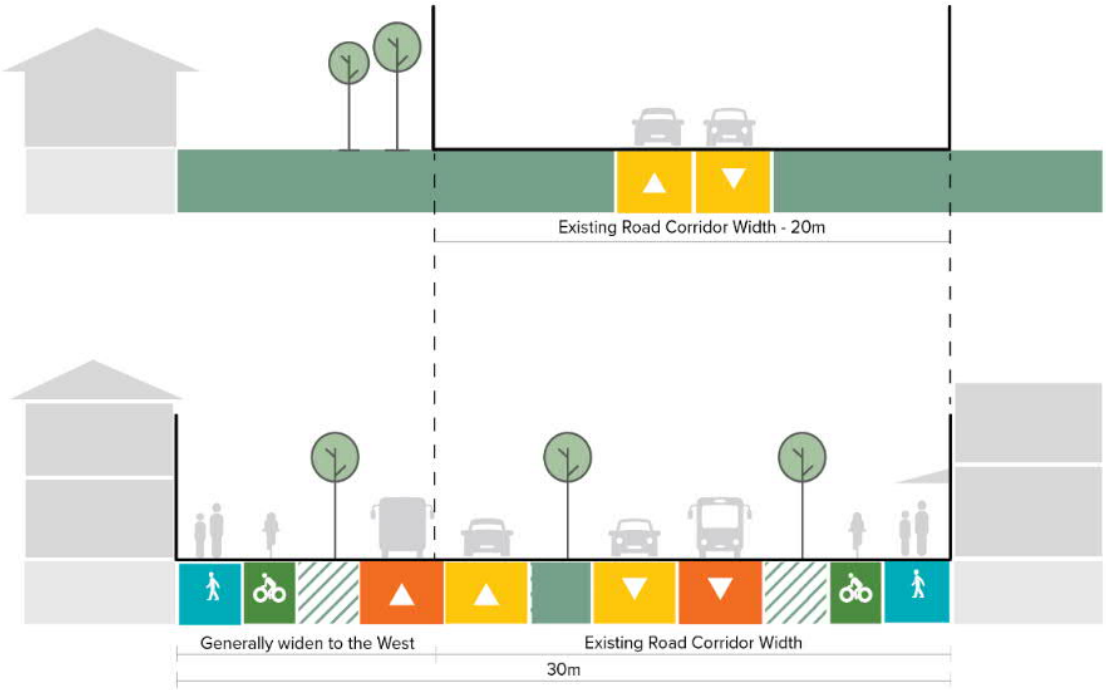


Figure 7-15 Jesmond Road FTN corridor typical cross section

The comparative cross section above illustrates the existing and proposed Jesmond Road FTN upgrade form and function within the context of emerging urban form, adjacent to the road corridor.

Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

As outlined earlier, broad areas of street-side vegetation (including noteworthy trees) are proposed to be removed through the Project works. The proposed alignment of the Jesmond Road section is such that it may not be feasible to retain trees within the new corridor. Therefore, new street tree plantings along the length of the upgraded corridor will be solely relied upon to mitigate (from a landscape character perspective) for the loss of noteworthy trees. It is noted that for the loss of mature trees, the mitigation timeline is typically longer (15-30 years) as opposed to 5-10 years for revegetation planting.

It is recommended that a condition on the designation is included that requires new street trees to be planted along the full length of the Jesmond Road corridor in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that the new street tree plantings, in conjunction with stormwater management and berm plantings, will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area.

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas proposed through the Blue-Green Network. It is recommended that through the ULDMP, open space areas identified through the Blue-Green Network be identified and connection opportunities investigated within the proposed designation.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform.
- **Stormwater Wetlands** - Stormwater wetlands form part of the 'landscape aesthetic' and with site-specific design and planting have the potential to make a positive contribution to green infrastructure and urban amenity. Wetlands with shallow and vegetated edges will integrate as a perceived natural feature more so than deep ponds that may be required to be fenced. It is recommended that the proposed stormwater wetlands be planted with appropriate (low maintenance) native species and integrated into the surrounding urban landscape context, so that they provide a hydrological and ecological function and are safe places to visit.

- **The proposed Blue-Green Network** – as expressed through the Urban Design Framework – Urban Design Review, the proposed Jesmond Road FTN corridor is capable of responding to natural landscape identify drivers. This might feasibly include integration of the proposed Blue-Green Network - where it intersects with the Project area – and involve specific plant species selection (terrestrial and riparian) within the Project area to reinforce the wider vegetation patterns of the local landscape.
- **Impacts on private property** – the Project could potentially impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects potentially arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if land is to remain within the road reserve then native planting is considered a better option to permanently integrate residual land and build upon the overall green infrastructure of the upgraded road corridor.

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **very low**.

7.3.3 Bremner Road FTN Upgrade section

7.3.3.1 Assessment of Construction Effects

7.3.3.1.1 Site Enabling Works

Construction Areas

The Project will require site compound and construction areas to be established at 5 locations throughout the Project area, to facilitate the Project works. Construction traffic will be heightened at these locations through the construction period of the Project.

- A construction area is proposed at alongside the proposed culvert at chainage 650, opposite the Auranga Central Park.
- Two bridge construction areas are proposed on the southern side of the Ngakoroa Stream bridge at both ends of the bridge.
- A site compound and bridge construction area is proposed on the eastern end of the SH1 bridge on industrial land south of the corridor.
- A bridge construction area is located at the western end of the Hingaia Stream bridge on industrial land south of the corridor.
- A site compound is proposed at the eastern end of Norrie Road on industrial land south of the corridor.

The proposed site compound and construction areas are located within land that is already somewhat modified by existing land use (including industrial land), and outside of the CMA and SEA areas.

It is recommended that all areas be grassed (reinstated) at the completion of the construction period. Mitigation planting is likely to be implemented within the bridge construction areas adjacent to Ngakoroa and Hingaia Stream as part of the regional consents process.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **moderate-low**.

Vegetation Clearance

Vegetation clearance through the Bremner Road section is likely to be limited to localised areas within the Project area as follows:

- Exotic grasslands and shelter belt planting through the Jesmond to Bremner Link corridor;
- Limited areas of native riparian and exotic vegetation at CH600 within the unnamed tributary crossing of the Ngakoroa Stream.
- Various trees growing within the road reserve of Bremner Road and Creek Street, including nine recently planted London plane in the new road reserve at the western approach to the Ngakoroa Stream Bridge and two Melia street trees in Creek Street.
- Trees within the open space zone at the northern end of the Drury Sports Complex, including a group of large pine trees.
- Limited areas of indigenous wetland, riparian and terrestrial vegetation (within the coastal environment) within the construction footprint of the Ngakoroa Stream bridge.

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from vegetation clearance within the Project area is assessed as **moderate-low**.

7.3.3.1.2 Project formation Works

Structures and Earthworks

The existing Ngakoroa Stream Bridge and SH1 crossing are proposed to be demolished and replaced with structures able to accommodate the wider corridor. Norrie Road bridge is also proposed to be demolished with a new bridge crossing the Hingaia Stream proposed further north. Both the existing Ngakoroa and Hingaia bridges are susceptible to flooding and the Norrie Road bridge is known to overtop during extreme rainfall events[32], meaning the proposed upgrades are likely to result in positive effects on the natural character of the stream environments.

The proposed Ngakoroa Stream bridge will span 50m; long enough to bridge over the stream bed and avoid physical effects from siting piers on the stream bed and channel. It will be elevated to a height of approximately 5m above natural ground level at the terrestrial margins of the stream. Retaining walls are proposed along the northern side of the bridge (at each end) which will significantly reduce the physical impacts on the existing wetland and terrestrial environments of the marine SEA and avoid the CMA. A retaining wall is also proposed along the southwest side of the bridge in the same effort to reduce the physical impacts on the terrestrial SEA south of the bridge. Through options assessment, an alignment was selected that aimed to reduce impacts on the marine SEA and coastal environment.

Another retaining wall is proposed along the north-eastern end of the bridge between the northern abutments of Ngakoroa bridge and the SH1 crossing. This will reduce the physical impacts on existing properties directly north of the bridge (31 and 37 Bremner Road). A large scale (30m wide) fill slope is proposed along the southeast side of the bridge, into the northern section of the Drury Sports Complex and Victoria Street. This area of land is largely grassed and the fill slopes will be required to integrate into the riparian margins of the Ngakoroa Stream.

The construction process is likely to require temporary staging platforms to be constructed within the terrestrial margins of the stream which will have a temporary effect on the existing landform of the riparian environment. Landscape impacts will be required to be remedied through riparian landform and native reinstatement planting (at regional consent stage).

The new Hingaia bridge will span 70m, long enough to bridge over the stream bed and avoid effects from siting piers on the stream bed and channel. The bridge will be elevated approximately 4m above natural ground level at the terrestrial margins of the stream. As with the Ngakoroa Stream Bridge structure, the construction process is likely to require temporary staging platforms to be constructed within the terrestrial margins and possibly over the stream bed. Landscape impacts will be required to be remedied through riparian landform and native reinstatement planting (at regional consent stage).

[32] SGA-004-AEE-RPT-Drury Flooding Assessment of Effects, section 6.3.2.2

The proposed cut and fill slopes range in scale from very small (1m wide) to large (40m wide), and will alter the existing modified landform and pastoral areas of the landscape.

The proposed earthworks through the Jesmond to Bremner Link will result in a carriageway up to 6m below natural ground level (NGL) at the Jesmond Road intersection, then levelling out to then rise approximately 1.8m above NGL at the approach to the first bridge crossing (Ngakoroa stream tributary). Given the open pastural nature of the landscape within the Jesmond-Bremner Link section (CH0-700), cut and fill slopes are expected to be absorbed within the existing modified pastoral landform.

The road corridor between CH700 – CH1100 – Auranga 'Road 1' will be development through the ongoing Auranga development activities. As such, this section of the Project is not designated for construction, rather two additional lanes will be retrofitted into the road reserve in the future.

Fill slopes are proposed at the eastern end of the SH1 crossing, along the edges of the proposed Hingaia bridge and into the adjacent industrial properties. These fill slopes range from small to medium in scale and will be able to be integrated into the adjacent modified landform.

Overall, impacts on the physical landscape to implement the proposed bridge crossings are likely to be **moderate-low,** acknowledging the avoidance of the CMA, the general setting of the coastal environment and the presence of terrestrial and marine SEAs within and proximate to the construction footprint of the Ngakoroa bridge.

It is recommended that a condition on the designation is included that encourages the re-use of topsoil from pastoral land (greenfield areas) impacted by the proposed earthworks[33].

The proposed cut and fill slopes are expected to be absorbed within the existing modified landscape impacts on the physical landscape are likely to be **low**.

Private Properties

Residential, industrial and commercial properties (within the Drury industrial area) either partially or fully designated, will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 8 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under visual amenity and residential character effects and are outlined in section 7.3.6 below.

[33] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

Overall, it is assessed that the physical landscape effects on private properties (partially designated) is likely to be **moderate-low** and can be adequately remedied from a landscape perspective with mitigation measures proposed under the operational phase.

7.3.3.2 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

7.3.3.3 Temporary Visual Effects

The construction of the Project is anticipated to be completed over 3 to 3.5 years in two zones. Zone 1 is situated within the greenfields and Auranga development area while zone two takes in the Drury commercial/industrial area.

Visual effects are anticipated to occur progressively through the Project area and transient viewing audiences may concurrently experience adverse visual effects from two or more of the proposed zones through the construction period.

It is anticipated that construction activities required to implement the Bremner Road section will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within the existing transport corridors and industrial areas within the Project. The physical works are also anticipated to occur within a broader landscape where urban development is either already underway or imminent within the balance areas of the Drury 1 Precinct.

Notwithstanding the above, viewers from some vantage points within the Project area are likely experience heightened adverse visual effects through the construction phase due to the nature of the project works proposed. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries.
- CH0 – 300 where the proposed cut faces into the existing rolling landform might, for a period of time, appear incongruous to the surrounding pastoral land form.
- CH600 where the first bridge crossing is proposed (Ngakoroa stream tributary), within the vicinity of the proposed Auranga central park (refer to master plan, figure 7-12).
- CH1200 – CH1500 within the vicinity of the proposed Ngakoroa Stream bridge and SH1 bridge reconstruction and widening. Construction works will be visible from a larger receiving audience through this section such as the open space areas of Drury Sports Complex, Ngakoroa esplanade reserve and SH1.
- CH1700-1800 with the demolition of Norrie Road bridge and the construction of the new Hingaia Stream bridge.

It is fair to say that for the Bremner Road section, the overall scale of temporary adverse visual effects arising from the range of construction ‘nodes’ located in close proximity are likely to give rise to some moderate adverse visual effects during the construction period of the Project. This is largely due to

the strategic nature of the Bremner Road section that will, over time, strengthen the already important link between the different land use areas of the Drury Ōpāheke area. It is also due to the wider receiving audience as noted above.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- The presence of existing bridges and the likelihood of maintenance works being carried out from time to time;
- The existing dynamic nature of the land use activities and urban development within and proximate to the Project area;
- Existing construction activities associated with the Auranga development and the likelihood of future development within the balance areas of the Drury 1 precinct area contributing further to the existing construction activities within the local landscape.
- Generally low visual amenity through the existing Drury commercial/industrial area;
- Elevated bridge sections are visually contained within the local street composition. Wider views shafts were tested along Great South Road (through the Hingaia riparian corridor), but views to the bridge crossing are intercepted by foreground buildings and trees.

Representative viewpoint images are provided in **Appendix 3**: NoR D2 - Representative Viewpoint Images. The supporting commentary for each photograph outlines the existing visual composition of the Project and the visual changes through the construction and operation phase.

Overall, adverse visual effects for the transient public viewing audience are likely to be **moderate-low** through the construction phase**,** taking into account those areas listed above where adverse effects are likely to be heighted during the temporary construction period.

Adverse visual effects during the construction phase are likely to be heightened for the private viewing audience directly adjacent to the Project area on the basis of more direct and prolonged engagement with the construction activities of the Project. This will include the presence of heavy machinery and the visible disturbance of both the road corridor and also individual private interface with the road.

Therefore, visual effects are likely to range from **moderate-low to moderate** during the construction phase for private viewing audiences.

7.3.3.4 Assessment of Operational Effects

7.3.3.4.1 Natural Character Effects

Natural character forming elements, features and processes include the water bodies and associated margins of the Ngakoroa Stream and its unnamed tributaries and Hingaia Stream.

Despite obvious human modification around the terrestrial margins (including reclamation and the presence of the existing bridge), Ngakoroa Stream is considered to hold moderate to heightened localised natural character values on account of the terrestrial and marine SEA habitat values and the physical and visual connection with the CMA, Drury Creek and the wider coastal environment to the north.

Conversely, human modification is more pronounced and indigenous wetland and riparian vegetation very limited throughout the unnamed tributaries of Ngakoroa Stream and Hingaia Stream, with the exception of recent revegetation implemented through the Auranga development within the lower catchments (outside of the Project area). Natural character values are therefore considered to be comparatively low through the remaining areas of the Bremner Road section.

The proposed designation between CH1200 – CH1270 follows the existing Auranga development reclamation which extends into the marine SEA along the north-western side of the corridor. No further encroachment of marine SEA is proposed by this Project. It is understood that the existing Ngakoroa Bridge will be replaced by the Waka Kotahi Papakura to Bombay project ahead of the Jesmond to Waihoehoe West FTN Upgrade. The Jesmond to Waihoehoe West FTN Upgrade will add an additional two lanes on the southern side in the future to provide for the FTN. By extending south upon existing infrastructure, no works in the Marine SEA and CMA are proposed. This is an important design decision, decided through the alternatives assessment process, that will minimise the natural character effects within the sensitive coastal environment.

The proposed 2 lane extension to the southern side of the existing Ngakoroa bridge is anticipated to bring about localised landform modification and subsequent clearance of wetland, riparian and terrestrial vegetation within the construction footprint of the project works (subject to future regional resource consent approvals). These types of impacts have the potential to temporarily or permanently alter the natural character of waterbodies by heightening the impression of further human modification. Adverse natural character effects are likely to be **moderate-low** within the Ngakoroa Stream environment, acknowledging the heightened levels of natural character associated with the Project area and wider coastal environment.

Landform modification and very limited vegetation loss (also subject to future regional resource consent approvals) is anticipated for the minor tributaries of Ngakoroa Stream and Hingaia Stream. Given that these features are already heavily modified by rural and industrial land use (respectively), potential natural character effects are anticipated to be **very low** within these two hydrological environments.

According to the Drury Flooding Assessment Report, the existing Ngakoroa bridge and Hingaia bridge pose significant flood risks during extreme rain events. Induced flooding events can have adverse impacts on natural character forming processes, therefore bridge reconstruction and raising of the soffit heights (in general terms) is likely to have a positive impact on the long-term natural character values of Ngakoroa Stream and Hingaia Stream.

As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected (within the Ngakoroa and Hingaia Stream environments) will be determined. Given the existing level of modification within the stream environments and the success of recent restoration efforts throughout the Ngakoroa catchment, reinstatement and mitigation planting at the completion of works is expected to adequately mitigate the landscape and natural character effects arising from this Project.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

7.3.3.4.2 Visual Amenity Effects

The existing visual environment of the Bremner Road FTN Upgrade section comprises existing areas of urbanisation and prominent infrastructure such as the Transpower pylons, SH1 and existing bridge crossing over SH1 and Ngakoroa and Hingaia Streams. These elements are visible to the public viewing audience from existing open space areas such as the Drury Sports Complex and the Ngakoroa and Hingaia esplanade reserves areas.

Once the Project is completed, transient public viewing audiences will continue to engage with a similar visual environment to which currently exists along the corridor, within the backdrop of ongoing urban development and industrial land use activities. Over time, visual effects are anticipated to be positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and accessibility to active modes of transport.

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor. While low, residual adverse visual effects are anticipated for some private residential and industrial properties, whereas a direct result of the Project, viewers may experience some level of material change to the visual composition and amenity of the road corridor.

For some properties directly adjacent to the Project area (from which land is required), visual amenity effects will be heightened as a direct result of the construction impacts including driveway/accessway regrading, potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to dwellings and buildings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any long-term residual visual effects of the Project.

On that basis, visual effects within the Project area are likely to be **low** for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **moderate-low** to **low**, reducing over an extended period of time.

7.3.3.4.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing landscape within the Project area. As noted earlier, this will impact on a range of existing neighbourhood characters including greenfield areas adjacent to the Jesmond-Bremner link, balance areas of the Drury 1 Precinct, Drury Sports complex, Ngakoroa esplanade reserve, SH1 and commercial and industrial land uses within Drury village.

By the time the Project is operational it can be reasonably assumed that further sections of the Drury Precinct 1 area will have urbanised, alongside further progress of the Auranga development area. This might include additional enhancement to the Ngakoroa Esplanade and stream adjacent to the

Drury Sports Complex. The Drury-Ōpāheke industrial area is not anticipated to change from a land use perspective which means the Hingaia Stream is likely to remain in its existing modified state for the foreseeable future. With that in mind, the Project is expected to have a neutral, if not positive impact on existing landscape character values.

The comparative cross section below illustrates the existing and proposed Bremner Road FTN form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

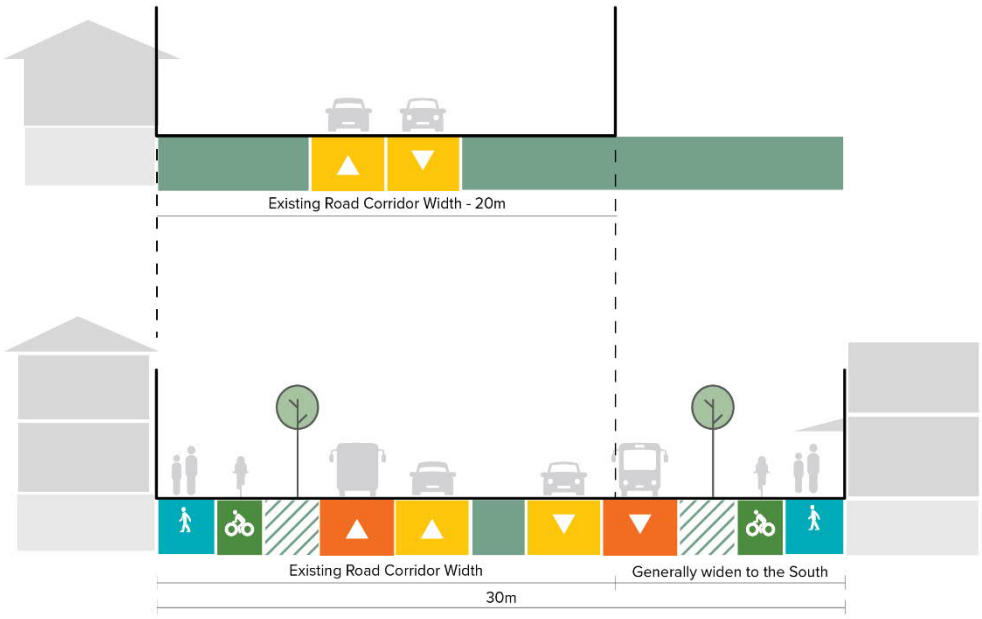


Figure 7-16 Bremner Road FTN typical cross-section

It is recommended that a condition on the designation is included that requires new street trees to be planted along the full length of the proposed Bremner Road FTN Upgrade section in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that the new street tree plantings (alongside any other vegetation within the berm) will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area.

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban

environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **Ngakoroa Stream Bridge (Bremner Road)** – the existing bridge is situated within 'gateway' location and it likely to become a focal point within the local landscape. On that basis, the new bridge should be designed to visually integrate into the landscape context and contribute to the sense of place. This will involve relating the structure to the character and scale of surrounding future urban form and proposed landscape treatments.
- **Ngakoroa tributary bridge crossing (CH600)** – the proposed bridge will register as a prominent feature within the proposed Auranga central park, spanning approximately 40m across and sitting approximately 3m above natural ground level. Therefore, the new bridge should be designed to visually integrate into the proposed parkland environment and contribute to the local sense of place.
- **Hingaia Stream Bridge / SH1 bridge** – these bridge structures are should be designed to visually integrate into the landscape context and contribute to the local sense of place. Given the location of these structures (over SH1 and within industrial land use), there is less emphasis on these structures as character features within the landscape.
- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas (existing and proposed through the Blue-Green Network). It is recommended that through the ULDMP, that existing open space areas and those identified through the Blue-Green Network be identified and connection opportunities investigated within the proposed designation. These areas include the Ngakoroa esplanade reserve, Drury Sports Complex, the proposed central park (Auranga Development CH600) and the Hingaia esplanade reserve.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with stream crossings should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established (subject to regional consents).

It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:

- CH00 – CH300 where cut slopes are proposed into rolling landform.
- CH580 – CH680 in relation to the Ngakoroa tributary crossing and the Auranga Central Park development.
- CH1300 – CH1400 in relation to the Ngakoroa bridge batter slopes into the northern extent of Drury Sports Complex and the Ngakoroa esplanade reserve.
- CH1700 – CH180 in relation to the Hingaia Stream bridge crossing the Hingaia esplanade reserve.

- **The proposed Blue-Green Network** – as expressed through the Urban Design Framework – Urban Design Review, the proposed Bremner Road FTN Upgrade corridor is capable of responding to natural landscape identify drivers. This might feasibly include the integration of the proposed Blue-Green Network - where it intersects with the Project area – and involve specific plant species selection (terrestrial and riparian) within the Project area to reinforce the wider vegetation patterns of the local landscape, and creating connections to proposed Greenways, as outlined above under walking and cycling connectivity.
- **Impacts on private property** – the Project could potentially impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if the land is to remain within the road reserve, then native planting is considered a better option to permanently integrate residual land and build upon the overall green infrastructure of the upgraded road corridor.

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **very low.**

7.3.4 Waihoehoe Road West FTN Upgrade section

7.3.4.1 Assessment of Construction Effects

7.3.4.1.1 Site Enabling Works

Construction Areas

The Waihoehoe West Road section will require site facilities and services to support the construction of the upgraded corridor. Construction work areas comprise the following:

- Site compound (approx. 1500m2) located on existing business/industrial land, at the northern intersection of Great South Road, Waihoehoe Road and Tui Street.
- Bridge construction areas either side of the NIMT – on the northern and southern side of Waihoehoe Road.

The proposed site compound and construction areas are located within suburban and industrial land that is already somewhat modified by existing land use. It is recommended that all areas be grassed (reinstated) at the completion of the construction period.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **low.**

Vegetation Clearance

Broad areas of street-side vegetation and private garden plantings are required to be removed as a result of the earthworks. Exotic pasture, trees (including some noteworthy specimens), shelterbelt plantings and private gardens make up the majority of vegetation to be removed.

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from vegetation clearance within the Project area is assessed as **low.**

7.3.4.1.2 Project Formation Works

Structures and Earthworks

Structures and built form are concentrated around the proposed Great North Road / Tui Road and Norrie Road intersection and the proposed NIMT crossing. The proposed intersection will generally conform to existing ground levels while the NIMT crossing will raise the existing road profile by approximately 2.5m on the western side and approximately 4m on the eastern side. The new crossing alignment will then descend to a new road surface level roughly 0.5m – 1m above existing levels through the remainder of the corridor.

Retaining walls are proposed within the abutments of the bridge crossing and along the southern Waihoehoe Road West alignment between CH120 – CH220.

The proposed bridge structures and retaining walls are proposed within the heavily modified eastern extent of the Drury industrial area and within the existing NIMT corridor. The retaining walls along the

southern side of Waihoehoe Road West are proposed to preserve existing housing adjacent to the Project area.

Larger fill slopes (up to 20m wide) are proposed either side of the NIMT crossing, on the northern and southwest sides of the alignment. Smaller fill slopes are concentrated along the northern side of Waihoehoe Road West and the proposed Fitzgerald Road roundabout. All fill slopes are likely to be absorbed within the existing modified road corridor environment and marginal pastoral or rural residential land adjacent to the existing road corridor.

Overall, impacts on the physical landscape to implement the proposed earthworks and structures is likely to be **low**.

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 14 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects below.

Overall, it is assessed that the magnitude of physical landscape effects on the partially designated private properties is likely to be **moderate-low**.

7.3.4.2 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

7.3.4.2.1 Temporary Visual Effects

The construction of the Project is expected to take 2 to 2.5 years to complete and visual effects are anticipated to occur progressively through the Project area.

It is anticipated that construction activities required to implement the Project will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within a main arterial corridor. Another important consideration is that landscape change by way of vegetation removal and land modification (albeit at a lesser scale) forms part of the expected backdrop of the rural environment, particularly one that is expected to transition, over time, into an urban neighbourhood.

Notwithstanding the above, some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase due to the magnitude of vegetation removal and/or earthworks proposed. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries, particularly the receiving audience south of the proposed retaining wall (CH120 – 220).
- CH0- CH200 in the vicinity of the Great South Road intersection and NIMT bridge construction area.
- CH500-700 in the vicinity of the proposed Fitzgerald Road roundabout.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within existing roads;
- The existing Waihoehoe Road West carriageway and NIMT crossing are already dominant elements within the visual landscape, visual amenity is relatively low within the industrial landscape.

Representative viewpoint images are provided in **Appendix 3**. NoR D2 - Representative Viewpoint Images. The supporting commentary for each photograph outlines the existing visual composition of the Project and the visual changes through the construction and operation phase.

Overall, adverse visual effects for public viewing audiences is likely to be **low** through the construction phase.

Adverse visual effects during the construction phase are likely to be heightened for the private viewing audience directly adjacent the Project area on the basis of more direct and prolonged engagement with the construction activities of the Project. This will include the presence of heavy machinery and the visible disturbance of both the road corridor and also individual private interface with the road.

Therefore, temporary visual effects are likely to range between **moderate-low** during the construction phase for private viewing audiences.

7.3.4.3 Assessment of Operational Effects

7.3.4.3.1 Natural Character Effects

There are **no natural character effects** associated with the construction of the Waihoehoe West section.

7.3.4.3.2 Visual Amenity Effects

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor.

Very low residual adverse visual effects are anticipated for some private properties, where as a direct result of the Project, residents may experience some level of material change to the visual composition and residential amenity of the road corridor as perceived from private property.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading (outlined in section 6.3.3.1 above), potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Public viewing audiences will continue to engage with a similar transport environment, within the backdrop of an increasingly urban neighbourhood character. Over time, visual effects are anticipated to be positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

On that basis, visual effects within the Project area are likely to be **very low** for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **moderate-low** to **low**, reducing over an extended period of time.

7.3.4.3.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing Waihoehoe Road west road corridor and adjacent landscape. The Project is anticipated to enter its Operational phase within the context of increased urbanisation within adjacent FUZ land. The proposed Drury-Ōpāheke Structure Plan indicates a commercial centre at the western extent of the designation and THAB development along the reminder of the corridor. On that basis, the scale and nature of the change to existing landscape character within the Project area is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing and proposed Waihoehoe Road West RTN form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

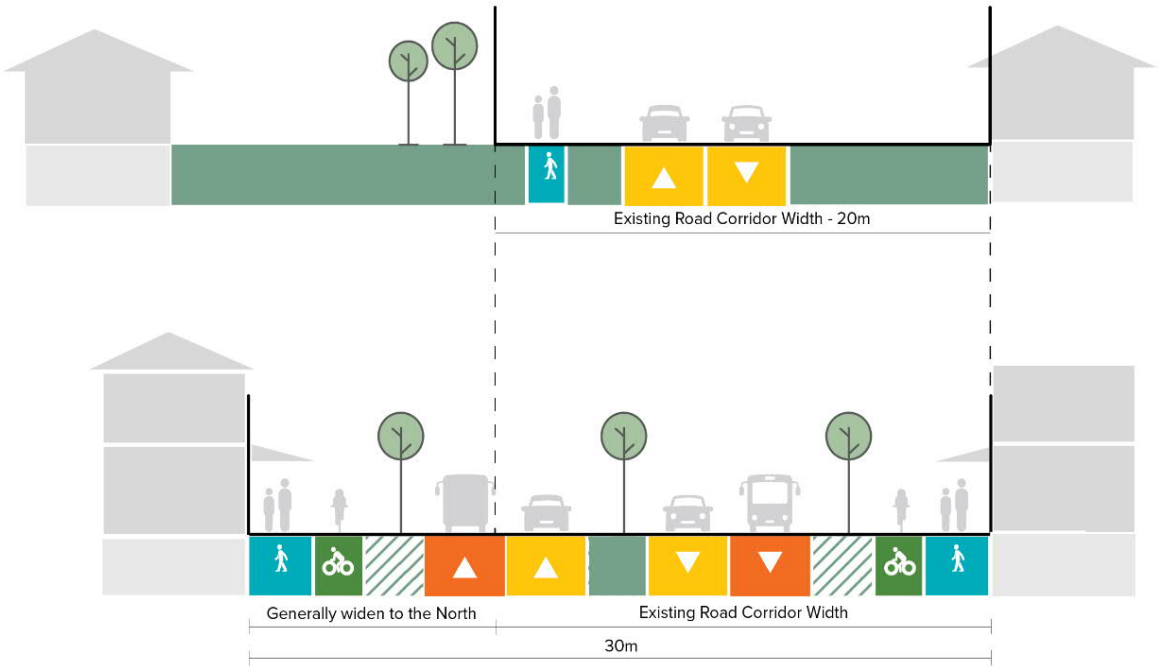


Figure 7-17 Waihoehoe Road West FTN typical cross section

As outlined earlier, broad areas of street-side vegetation (including noteworthy trees) are proposed to be removed through the Project works. While most of this vegetation is not considered significant on an individual basis, collectively it contributes to the visual amenity of the road corridor and provides a degree of screening and privacy for properties adjacent to the road. Therefore, it is recommended (as a matter for detailed design) that the footpaths and cycleways within these localised areas be refined to either avoid or integrate noteworthy trees within the berm (if practicable). This measure is included within the condition on the designation for construction effects and will provide the opportunity to retain the landscape character values afforded by some noteworthy trees within the Project area.

It is recommended that a condition on the designation is included that requires new street trees be planted along the full length of the proposed Waihoehoe Road West corridor in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that the new street tree plantings (alongside any other vegetation within the berm) will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area.

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood

character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **NIMT bridge** – the NIMT bridge crossing should be designed to visually integrate into the landscape context and contribute to the local sense of place. Given the location of this structure (at the edge of industrial land use and within the existing NIMT corridor), there is less emphasis on the structure being designed as a character feature within the landscape.
- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas proposed through the Blue-Green Network. It is recommended that through the ULDMP, that planed open space areas be identified and connection opportunities investigated within the proposed designation.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform.
- It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:
    - CH00-300 in the vicinity of the NIMT crossing and future commercial centre.
- **Impacts on private property** – the Project could potentially impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if the land it to remain within the road reserve, then native planting is considered a better option to permanently integrate residual land and build upon the overall green infrastructure of the upgraded road corridor.

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **very low**.

7.3.5 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The mitigation measures for all activities and built elements during construction are outlined below. An Urban and Landscape and Design Management Plan (ULDMP) is recommended as a condition on the designation which should include the following matters:

- Site compounds and construction yards: reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.
- Vegetation clearance: wherever possible, limit the removal of noteworthy trees and indigenous vegetation.
- Wherever possible, re-use topsoil from existing pastoral land (within the Project area), impacted by the proposed earthworks[34].

7.3.6 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principal elements of the Project that are likely to give rise to permanent adverse effects on landscape character, natural character and visual amenity. It is recommended that a ULDMP is a condition on the proposed designation which should include the following measures to mitigate landscape and visual effects.

There is clear guidance around the approach for built structures and landscape design and planting for transport projects within the Bridging the Gap: NZTA Urban Design Guidelines (2013). The following matters to be included within the ULDMP should demonstrate consistency with these design guidelines.

1. **Bridges and structures:** demonstrate visual integration and sense of place considerations for the proposed bridge structures over Ngakoroa Stream (and tributary CH600), SH1, Hingaia Stream and the NIMT. This will involve relating the structures to the character and scale of surrounding future urban form and proposed landscape treatments, with potential for Ngakoroa bridge to celebrate the gateway context and associative values of the landscape.
2. **Walking and cycling connectivity:** investigate opportunities to integrate with existing and future open space within the proposed designation, including Ngakoroa esplanade reserve, Drury Sports Complex, the proposed central park (Auranga Development CH600), Hingaia esplanade reserve and future open space proposed within the Green-Blue Network.
3. **Stormwater wetlands:** configure stormwater wetlands to a natural appearance, conforming to landform and future urban context. Plant with appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function.

[34] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

4. **Permanent earthworks** – shape all fill slopes to a natural profile and integrate into the surrounding natural landform. Fill slopes associated with the proposed Ngakoroa and Hingaia Stream crossings should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
5. **Private properties** – reinstate driveways, accessways, private fences and garden plantings for existing remaining properties temporarily affected by Project works. Design elements to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
6. **Planting design details:** landscaping design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:
    a. Street trees along the full length of Project areas in conjunction with shrubs and ground cover species appropriate for the use within stormwater treatment areas and berms. Species and tree stature should be selected to correspond with adjacent land use and blue-green areas, in accordance with the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy,
    b. Reinstatement planting within private property boundaries
    c. Treatment of fill slopes and residual land, to integrate with adjacent land use and areas where the Project intersects with the proposed Blue-Green Network.
    d. Stormwater wetland design and planting
    e. Integration of Mana Whenua preferred design principles in relation to planting, structures and hard landscape elements.
    f. Site preparation, implementation and maintenance requirements for all planting typologies.

The proposed mitigation measures should where practicable be integrated with revegetation requirements of future regional consent processes. Opportunities for integration of landscape mitigation with the proposed Blue-Green Network, indicated by the Drury – Ōpāheke Structure Plan should also be considered at regional consent stage. Future resource consent considerations, outlined in section 11, should also be considered in preparing the ULDMP.

Jesmond Road - **Appendix 1**. Landscape Plans and Images: **Maps 18-20** illustrate the general location of the mitigation measures.

Bremner Road - **Appendix 1**. Landscape Plans and Images: **Maps 21-23** illustrate the general location of the mitigation measures.

Waihoehoe Road West - **Appendix 1**. Landscape Plans and Images: Maps **24-25** illustrate the general location of the mitigation measures.

7.4 Conclusions

This landscape, natural character and visual assessment finds that the proposed features and scale of the Project are able to be integrated into the existing landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP) adequate to remedy the potential adverse effects arising from the Project.

FUZ development areas on adjacent land will overtime substantially change the scale and character of the adjacent landscape as experienced from within the road, and will absorb the landscape and visual changes proposed within the Project.

The following tables provides a summary of the potential landscape character, natural character and visual effects of the construction and operational phases of the Project, with the mitigation measures implemented as recommended in this report.

Table 7-1 - Jesmond Road Summary of Landscape and Visual Effects.

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Low to moderate-low** for private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very low**

Table 7-2 – Bremner Road Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate-low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Very low to moderate-low**
Effects on Visual Amenity	N/A	**Low** for public viewing audiences (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Very Low**

Table 7-3 – Waihoehoe West Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	
Temporary Visual Effects	**Low** **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Very low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Very low**

8 NoR D3: Waihoehoe Road East Upgrade

Chapter Summary

The Waihoehoe Road East Upgrade (NoR D3) consists of the widening of Waihoehoe Road to a two-lane arterial with walking and cycling facilities from the proposed intersection with Ōpāheke North-South Arterial in the east, to Drury Hills Road in the east. The Project will likely be constructed within the baseline rural landscape and operate within the likely urban landscape environment.

The current defining characteristics of the Project areas and local landscape are summarised below:

- Modified rural landscape surrounding the existing Waihoehoe Road East corridor, associated with residential and agricultural.
- Elevated road corridor within the localised setting.
- Prominent views through the road corridor towards the Hunua Range Foothills.
- No hydrological features within the Project area.

The land in the wider Project area will witness a significant change from rural to urban land use and character over the next 30 years. A range of housing typologies are proposed by developers and in the Drury-Ōpāheke Structure Plan including Terrace Housing and Apartment Buildings within the western extent, Mixed Housing Urban through the middle and Mixed Housing Suburban towards the eastern extent of the proposed designation. It is understood that the Project will be constructed within the baseline landscape and operate within the likely future landscape environment.

It is anticipated that most of the existing vegetation patterns (within private properties) will make way, or be absorbed into new urban development, which will likely include street tree plantings, public open space design and planting within private yards.

The key landscape matters addressed for the Waihoehoe Rod East Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance and the scale and location of proposed cut and fill slopes.
- The nature and extent of physical impacts on private properties adjacent to the existing Waihoehoe Road East corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the context of the existing Waihoehoe Road East corridor. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of project works adjacent to waterbodies.
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

Assessment of Landscape and Visual Effects

Overall, landscape and visual effects range from low to moderate-low for the construction phase and negligible to moderate-low for the operational phase.

This landscape assessment concludes that the proposed features and scale of the Project once operational can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP). The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that the planting proposed under the ULDMP condition for NoR D3 is integrated with any future planting required as part of the regional consenting phase of the Project

Landscape mitigation measures for NoR D3 include recommendations for integrating future walking and cycling connectivity, integration of fill slopes, reinstatement of private property fences and gardens plantings and a comprehensive planting plan covering all mitigation treatments.

Waihoehoe Road East Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values		**Negligible**
Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low to moderate-low** (reducing over an extended period of time)
Effects on Landscape Character		**Very low**

8.1 Project Description

8.1.1 Project Overview

The Waihoehoe Road East Upgrade (NoR D3) consists of the widening of Waihoehoe Road to a two-lane arterial with walking and cycling facilities from the proposed intersection with Ōpāheke North-South Arterial in the east, to Drury Hills Road in the east. The functional intent of the Project is to provide strategic east-west connectivity between the strategic north-south corridors (Great South Road, the Ōpāheke N-S FTN Upgrade (NoR D4) and Mill Road), providing multi-modal access to the wider network for the planned growth area as well as providing access to the existing Drury township and proposed rail station (an NZUP project).

The eastern extent of the Project will tie into the future Mill Road corridor which forms a separate NZUP project. The intersection with Ōpāheke North-South is proposed to be signalised, but this work forms part of NoR D2. Roundabouts are proposed at the intersections with Appleby Road and Cossey Road. The road will be an urban arterial with a likely reduced speed limit of 50kph. An overview of the proposed design is provided in Figure 8-1.

Figure 8-1 Overview of Waihoehoe Road East Upgrade

Comparative cross sections are included at section 6.2 of the Urban Design Framework which illustrate the proposed form and function of the proposed Waihoehoe Road East upgrade.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade include the following:

- Widening of Waihoehoe Road from its current general width of 20m to enable a 24m wide two-lane cross-section including separated walking and cycling facilities
- Localised widening around the existing intersections to accommodate for the two proposed roundabouts
- Batter slopes to enable widening of the corridor, and associated cut and fill activities.
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, the re-grade of driveways and construction traffic manoeuvring.

8.1.2 Project Features

The key landscape matters addressed for the Waihoehoe Rod East Upgrade include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance and the scale and location of proposed cut and fill slopes.
- The nature and extent of physical impacts on private properties adjacent to the existing Waihoehoe Road East corridor during the construction period and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the context of the existing Waihoehoe Road East corridor. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of project works adjacent to waterbodies.
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

8.2 Existing and Likely Future Environment

8.2.1 Baseline Landscape Characteristics

The Project area is situated within the existing Waihoehoe Road East road corridor and extends into adjacent land that is characterised by lowland floodplains north of the corridor and flat to gently undulating landform to the south, both accommodating rural lifestyle land use.

The defining characteristics of the Project areas and local landscape are summarised below:

- Modified rural landscape surrounding the existing Waihoehoe Road East corridor, associated with residential and agricultural land use.
- Elevated road corridor within the localised setting.
- Prominent views through the road corridor towards the Hunua Range Foothills.

- Limited hydrological features within the Project area.

The existing baseline features of the Project area and local landscape are illustrated in **Appendix 1** Landscape Plans and Images: **Maps 01- 06** and **26**.

Figure 8-2– View east towards the Hunua Ranges Foothills.

8.2.1.1 Landform and Hydrology

Waihoehoe Road East occupies a gentle spur that extends west from the Hunua Ranges foothills. The spur is gently undulating and lowers in elevation towards the eastern end of NoR D2. The local landform north and south of the Project area is influenced by the drainage catchment associated with Waihoehoe Stream in the north and Hingaia Stream in the south. Two unnamed tributaries associated with the two streams run parallel with the existing road corridor at the eastern extent of the Project area. A modified exotic wetland (dominated by exotic species) is located within the western extent of the site immediately adjacent to Appleby Road.

8.2.1.2 Landcover

Vegetation cover within and proximate to the Project area consists primarily of pasture, planted amenity vegetation (native and exotic), some shelterbelt plantings and food crops located on the slightly elevated northwest facing slopes at the eastern end of the proposed designation.

Noteworthy vegetation contributing to the existing residential street character and borrowed landscape of the Project area includes: One water gum (*Tristaniopsis laurina*) in the road reserve outside 185 Waihoehoe Road, a semi mature English Oak tree, American sweet gum trees (*Liquidambar styraciflua*), Japanese cedar trees (*Cryptomeria japonica*) in the road reserve outside 272 Waihoehoe Road, a row of mature silver birch trees within the private property of 297 Waihoehoe Road and a group of mature exotic specimen trees (magnolia) within the private property of 68 Waihoehoe Road.

8.2.1.3 Land Use

The existing corridor for Waihoehoe Road East is generally 20m wide and zoned 'Road' under the AUPOIP. The land adjacent to the existing corridor is predominately rural in character with land being used for rural residential activities as well some isolated agricultural/horticultural activities such towards the eastern extent of the Project area.

8.2.1.4 Scheduled Landscape and Ecological Features

There are no scheduled landscape features within or proximate to the NoR D3 boundary. However, the Hunua foothills, which form the immediate backdrop to the road corridor, contain extensive areas of Terrestrial SEAs and an area of Outstanding Natural Character within the elevated foothills directly east of the Project area.

8.2.1.5 Historical and Cultural Associations

According to the archaeological assessment, there are no recorded sites within 200m of the proposed designation. Associative values have been explored with Manu Whenua through the process of option design, development design and assessment.

8.2.2 Likely Future Environment

8.2.2.1 Overview

The land either side of the Project area is zoned FUZ and will therefore witness a significant change in land use over the coming decades from rural to urban. It is anticipated that most of the existing vegetation patterns (within private properties) will make way, or be absorbed into new urban development, which will likely include street tree plantings, public open space design and planting within private yards.

8.2.2.2 Mill Road Corridor

The proposed Mill Road designation intersects with the NoR D3 in the east, at the intersection of Waihoehoe Road and Drury Hills Road. The proposed Mill Road corridor represents a substantial infrastructure project that is likely to further delineate the landscape character of the FUZ land in the west and the Rural Countryside Living zone east of this corridor. The project has funding under the NZUP programme.

8.2.2.3 Developer Interest and the Drury-Ōpāheke Structure Plan

Developers are seeking the rezoning of FUZ land on the southern side of Waihoehoe Road to allow for urban development. The land use they are seeking is generally in line with the Drury-Ōpāheke Structure Plan. The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07- 08**.

Land Use

The Drury-Ōpāheke Structure Plan indicates a range of urban environments north and south of the existing Waihoehoe Road East corridor. This includes Terrace Housing and Apartment Buildings within the western extent, Mixed Housing Urban through the middle and Mixed Housing Suburban towards the eastern extent of the designation.

Proposed Blue-Green Network

A potential New Neighbourhood Park, associated with an unnamed tributary of Waihoehoe Stream, is indicated within the Blue-Green Network adjacent to the northern designation boundary of Cossey Road. Another potential New Neighbourhood Park, associated with the drainage landscape of Waihoehoe Stream, is indicated by the Blue-Green Network at the northern designation boundary of Appleby Road.

8.2.3 Viewing Context

The public viewing audience for NoR D3 is largely mobile (i.e. vehicles travelling at 80km/h) east and west between the rural zoned land of the Hunua Ranges foothills and Drury Village. The Waihoehoe Road East corridor represents a short yet presumably regular portion of the user journey. Over time, the audience will grow to include residents of future urban developments within the FUZ areas either side of the existing corridor. The private viewing audience comprises private dwellings adjacent to the existing road corridor.

The Waihoehoe Road East viewing context is characterised by the following:

- Elevated gently undulating pastoral land accommodating rural residential properties.
- Prominent backdrop views to the Hunua Ranges foothills through the existing road corridor.
- Rolling pastoral landscape north of the existing corridor, framed by mature native and exotic trees.
- Likely some overview from private rural residential properties within the Hunua Ranges foothills immediately east of the Project area.
- The high natural character values of the Hunua foothills backdrop contributes to the experiential qualities of the existing corridor environment.

8.2.4 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or immediately adjacent to the proposed designation boundary.

As mentioned above, the Hunua Ranges foothills provide a pleasant backdrop to the existing corridor and that in combination with the elevated undulating topography adds to the landscape values of the local setting. While the ecological features of the NoR are limited, the visual amenity aspects of the Waihoehoe East corridor are relatively heightened. Views towards the Hunua Ranges foothills are likely to endure urban development as a viewshaft through the upgraded corridor.

8.2.5 Landscape Sensitivity

Waihoehoe Road East is situated within a broader landscape that has been assessed by the AUPOIP as being suitable for urbanisation. The proposed upgrade of the Waihoehoe Road East corridor to a two-lane arterial standard forms a small yet integral section of the future urban form and on that basis the Project area assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Waihoehoe Road East landscape are:

- Noteworthy trees within the road corridor and private properties.
- Elevated and undulating natural landform.
- Consistent views of the Hunua foothills backdrop.

8.3 Assessment of Landscape and Visual Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

8.3.1 Positive Effects

A number of positive landscape and visual effects are anticipated as a direct result of the operation of the Project (including proposed mitigation)

Positive effects are likely to include:

- A streetscape to match the emerging urban form within adjacent land;
- Net increase in green infrastructure within the Project area associated with street trees, berm and stormwater attenuation plantings (within berms), resulting in improved visual amenity for road users and adjacent audiences.
- Slower speed limits adjacent to existing dwellings improving on the experiential qualities of the corridor for users and well as private properties adjacent to the road corridor.

8.3.2 Assessment of Construction Effects

8.3.2.1 Site Enabling Works

Construction Areas

Site compound and construction areas are proposed to be established at two locations within the Project**.** Construction traffic will be heightened at these locations through the construction period of the Project.

- A site compound directly adjacent to the proposed Waihoehoe Road and Appleby Road roundabout (CH1300)
- A construction area directly adjacent to the proposed Cossey Road and Waihoehoe Road roundabout (CH2000).

The site compound and construction areas are proposed within modified residential and pastoral land. It is recommended that all areas be grassed (reinstated) at the completion of the construction period.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas on modified land within the Project area is assessed as **low**.

Vegetation Clearance

Broad areas of street-side vegetation are proposed to be removed to accommodate the wider road corridor and batter slopes. This includes trees (including some noteworthy specimen trees) and shrubs located within the road reserve and within the road-side boundaries of private properties

located adjacent to the road. Exotic pasture, planted amenity vegetation (native and exotic), some shelterbelt plantings and food crops make up the majority of vegetation to be removed.

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from vegetation clearance within the Project area is assessed as **low.**

8.3.2.2 Project Formation Works

Earthworks

The proposed cut and fill slopes range in scale from very small (1m wide) to moderate (20m wide), and will alter the existing modified landform of the road corridor and adjacent land adjacent to the road corridor. In all cases, the fill slopes will be shaped to integrate into the adjacent landform, which for the most part will occur within modified and marginal pastoral land within the existing road reserve or private properties. The proposed corridor will generally maintain existing ground levels with filled section reaching no greater than 1m above existing road surface levels.

Two new roundabouts are proposed at the existing intersections of Appleby Road and Cossey Road. Road widening associated with Appleby roundabout will impact on four private properties adjacent to the existing intersection; all are required by the proposed designation. The batter slopes associated with this roundabout are able to be integrated into the surrounding pastoral landscape.

The Cossey Road roundabout will generate small fill slopes along the southern edge of the corridor and require small cut slopes into the existing modified roadside of Cossey Road. The proposed landform modification will be absorbed into the existing modified pastoral land.

It is recommended that a condition on the designation is included that encourages the re-use of topsoil from pastoral land impacted by the proposed earthworks[35].

Overall, impacts on the physical landscape to implement the proposed earthworks is likely to be **low**.

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

[35] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

Approximately 20 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects in section 8.3.5 below.

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **moderate-low**.

8.3.2.3 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

8.3.2.4 Temporary Visual Effects

It is anticipated that construction activities required to implement the Project will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within a main transport corridor. Another important consideration is that landscape change by way of vegetation removal and land modification (on private property), albeit at a lesser scale, forms part of the expected backdrop of the rural environment.

Notwithstanding the above, some vantage points within the Project area are likely to experience heightened adverse visual effects through the construction phase. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries, particularly between CH800-1100.
- CH1300-1400 in the vicinity of the Appleby Road roundabout.
- CH1900 - 2100 in the vicinity of Cossey Road roundabout.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within arterial roads;
- The existing Waihoehoe Road carriageway is already a dominant element within the visual composition of Project area;
- The proposed cut and fill batters are at a scale that will be easily integrated into the adjacent modified pastoral landscape.

Representative viewpoint images are provided in **Appendix 4** – NoR D3 Representative Viewpoints. The supporting commentary for each photograph outlines the existing visual composition of the Project and the visual changes through the construction and operation phase.

8.3.3 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The mitigation measures for all activities and built elements during construction are outlined below. An Urban and Landscape and Design Management Plan (ULDMP) is recommended as a condition on the designation which should include the following matters:

- Site compounds and construction yards: reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.
- Vegetation clearance: wherever possible, limit the removal of noteworthy trees and indigenous vegetation.
- Wherever possible, re-use topsoil from existing pastoral land (within the Project area), impacted by the proposed earthworks[36].

8.3.4 Assessment of Operational Effects

8.3.4.1 Natural Character Effects

The local landform north and south of the Project area is influenced by the drainage catchment associated with Waihoehoe Stream in the north and Hingaia Stream in the south. Two unnamed tributaries associated with the two streams run parallel with the existing road corridor at the eastern extent of the Project area. A modified exotic wetland (dominated by exotic species) is located within the western extent of the site immediately adjacent to Appleby Road. These features are included within the proposed Blue-Green Network.

These features are almost devoid of indigenous vegetation and are heavily modified by rural and residential land use. On that basis, natural character effects are considered **negligible** within these hydrological environments.

As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected will be determined. It is anticipated mitigation planting at the completion of works will assist with mitigating any landscape and natural character effects arising from project impacts on these features.

8.3.4.2 Visual Amenity Effects

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor.

Very low residual adverse visual effects are anticipated for some private properties, where as a direct result of the Project, residents may experience some level of material change to the visual composition and residential amenity of the road corridor as perceived from private property.

[36] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading (outlined in section 6.3.3.1 above), potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Public viewing audiences will continue to engage with a similar transport environment, within the backdrop of an increasingly urban neighbourhood character. Over time, visual effects are anticipated to be positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

Overall, visual amenity effects on public and private viewing audiences is likely to be remedied and mitigated by measures implemented during the completion of the construction period that will mature through the operational phase of the Project to adequately reduce any long-term residual effects of the Project.

On that basis, visual effects within the Project area are likely to be **low** and moving to beneficial for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **low** to **moderate-low**, reducing over an extended period of time.

8.3.4.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing Waihoehoe Road corridor and adjacent landscape. At the completion of the Project, the upgraded corridor will resemble that of an urban arterial on account of the additional vehicle lanes, active modes of transport, reduced speed limit, structured street tree plantings and integrated stormwater management and engineered roading elements that are inherently urban in aesthetic

The Project is anticipated to operate within the context of increased urbanisation within adjacent FUZ land. For Waihoehoe Road, that is likely to include high density living in the west and medium to low density urban development towards the eastern extent of the designation, towards the rural countryside living zone. On that basis, the magnitude and nature of change to the existing landscape character within the Project area is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing and proposed Waihoehoe Road East Upgrade form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

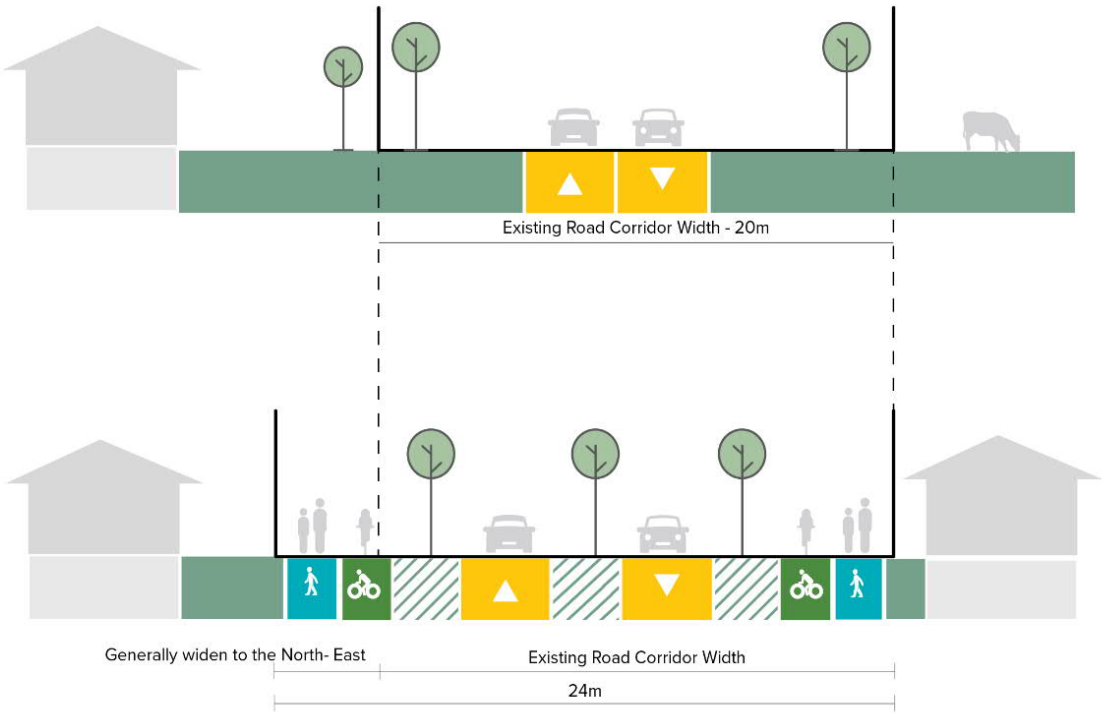


Figure 8-3 Waihoehoe Road East Upgrade corridor typical cross section

As outlined earlier, broad areas of street-side vegetation (including noteworthy trees) are proposed to be removed through the Project works. While most of this vegetation is not considered significant on an individual basis, collectively it contributes to the visual amenity of the road corridor and provides a degree of screening and privacy for properties adjacent to the road. Therefore, it is recommended (as a matter for detailed design) that the footpaths and cycleways within these localised areas be refined to either avoid or integrate noteworthy trees within the berm (if practicable). This measure is included within the condition for construction effects and will provide the opportunity to retain the landscape character values afforded by some noteworthy trees within the Project area.

It is recommended that a condition on the designation is included that requires new street trees be planted along the full length of the proposed Waihoehoe Road East corridor in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that the new street tree plantings (alongside any other vegetation within the berm) will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area.

In terms of landscape character effects, the following aspects have been considered and are recommended for inclusion in the ULDMP.

- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas proposed through the Blue-Green Network. It is recommended that through the

ULDMP, that existing open space areas and those identified through the Blue-Green Network be identified and connection opportunities investigated within the proposed designation.

- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform.
- It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:
- **Impacts on private property** – the Project is anticipated to impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if the land it to remain within the road reserve, then native planting is considered a better option to permanently integrate residual land and build upon the overall green infrastructure of the upgraded road corridor.

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **very low.**

8.3.5 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principal elements of the Project that are likely to give rise to permanent adverse effects on landscape character, natural character and visual amenity. It is recommended that a ULDMP is a condition on the proposed designation which should include the following measures to mitigate landscape and visual effects.

There is clear guidance around the approach for built structures and landscape design and planting for transport projects within the Bridging the Gap: NZTA Urban Design Guidelines (2013). The

following matters to be included within the ULDMP should demonstrate consistency with these design guidelines.

Refer to **Appendix 1**. Landscape Plans and Images. **Maps 27-29** which illustrates the general location of recommended mitigation measures.

1. **Walking and cycling connectivity:** investigate opportunities within the proposed designation to integrate with future open space proposed within the Green-Blue Network.
2. **Permanent earthworks** – shape all fill slopes to a natural profile and integrate into the surrounding natural landform.
3. **Private properties** – reinstate driveways, accessways, private fences and garden plantings for existing remaining properties temporarily affected by Project works. Design elements to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
4. **Planting design details:** landscape design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:
    a. Street trees along the full length of Waihoehoe Road East upgrade corridor in conjunction with shrubs and ground cover species appropriate for the use within stormwater treatment areas and berms. Species and tree stature should be selected to correspond with adjacent land use, in accordance with the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy,
    b. Reinstatement planting within private property boundaries
    c. Treatment of fill slopes and residual land, to integrate with adjacent land use.
    d. Integration of Mana Whenua preferred design principles in relation to planting, structures and hard landscape elements.
    e. Site preparation, implementation and maintenance requirements for all planting typologies.

8.3.6 Conclusions

This landscape, natural character and visual assessment finds that the proposed features and scale of the Project are able to be integrated into the existing landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP) adequate to remedy the potential adverse effects arising from the Project.

FUZ development areas on adjacent land will overtime substantially change the scale and character of the adjacent landscape as experienced from within the road, and will absorb the landscape and visual changes proposed within the Project area.

The following table provides a summary of the potential landscape character, natural character and visual effects of the construction and operational phases of the Project, with the mitigation measures implemented as recommended in this report.

Table 8-1 Waihoehoe Road East Section - Summary of Landscape Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values		**Negligible**
Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low to moderate-low** (reducing over an extended period of time)
Effects on Landscape Character		**Very low**

9 NoR D4: Ōpāheke North-South FTN Arterial

Chapter Summary

The Ōpāheke North-South FTN Arterial (NoR D4) is a new 30m four-lane FTN arterial with separated walking and cycling facilities between Hunua Road in the north and Waihoehoe Road in the south. The road will be an urban arterial with a likely speed limit of 50kph.

The current defining characteristics of the Project area and local landscape are summarised below:

- Extensive drainage landscape influenced by Waihoehoe Stream and Waipokapū Stream.
- Limited vegetation cover (by comparison to local context) comprising exotic grassland, isolated areas of planted native vegetation, exotic treeland and planted vegetation (gardens, hedgerows and shelterbelts) associated with rural properties.
- Two patches of high value kahikatea forest (including a notable stand) to the west of the Project area. These features were actively avoided through options assessment.
- Low-lying landscape with expansive views out towards the Hunua Ranges Foothills.

The land adjacent to the Project area will undergo a significant change from rural to urban land use and character over the next 30 years. A range of housing typologies are proposed by developers and signalled by the Drury-Ōpāheke Structure Plan including Terrace Housing and Apartment Buildings either side of the corridor in the southern extent of the Project area, Mixed Housing Urban around the intersection with existing Ponga Road and Heavy and Light Industrial at the northern extent.

The quality and natural character values of the extensive stream and floodplain environments are anticipated to be enhanced as urban development progresses. This will likely be in recognition of the challenging site conditions posed by the floodplain landscape for high density development, in combination with the policy direction of the AUPOIP, which generally seeks to protect and enhance water bodies within the urban landscape.

The key landscape matters addressed for the Ōpāheke North-South FTN Arterial project include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction through the Waipokapū and Waihoehoe Stream flood plains.
- The nature and extent of physical impacts on the small number of private properties adjacent to the project during the construction period, and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the existing greenfield landscape. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge construction within the Waipokapū and Waihoehoe Stream environments. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.

- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

Overall landscape and visual effects range from very low to moderate-low for the construction phase and very low to moderate-low for the operational phase.

This landscape assessment concludes that the proposed features and scale of the Project once operational can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP). The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that the planting proposed under the ULDMP condition for NoR D4 is integrated with any future planting required as part of the regional consenting phase of the Project.

Landscape mitigation measures for Ōpāheke North-South FTN Arterial include recommendations for integrating the proposed bridge structures, walking and cycling connectivity, configuration of stormwater wetlands with future urban form, integration of fill slopes, reinstatement of private property fences and gardens plantings (for limited numbers affected properties) and a comprehensive planting plan covering all mitigation treatments.

Ōpāheke North-South FTN Arterial - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very Low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Moderate-low** to **low** (reducing over an extended period of time)
Effects on Landscape Character	N/A	**Low**

9.1 Project Description

9.1.1 Project Overview

The Ōpāheke North-South FTN Arterial is a new 30m four-lane FTN arterial with separated walking and cycling facilities between Hunua Road in the north and Waihoehoe Road in the south. The road will be an urban arterial with a likely speed limit of 50kph. The functional intent of the Project from a transport perspective is to increase connectivity and provide for good people-movement and public transport function through the FUZ. The Project will also support SH1, Great South Road and the proposed Mill Road corridor by providing a new corridor which will cater more to local north-south trips in Drury.

The road traverses greenfields zoned FUZ, crossing approximately seven streams (or tributaries of streams) and areas of flood plain, providing a new north-south connection between Drury and Papakura. The intersection with Hunua/Boundary Roads will be signalised, and roundabouts are proposed at Ōpāheke Road / Ponga Road, Walker Road and Waihoehoe Road. The intersection at Waihoehoe Road is not included in this project extent (it is included within NoR D2). An overview of the proposed design is provided in Figure 9-1.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposal include the following:

- A new road to enable a 30m wide four-lane cross section including bus lanes and separate walking and cycling facilities
- Localised widening around intersections with existing roads to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Proposed new culverts
- Four proposed stormwater wetlands
- Two proposed bridges over Waipokapū Stream (approximately 120m) and Waihoehoe Stream and floodplain (approximately 265m)
- Batter slopes and retaining to enable construction of the corridor, and associated cut and fill activities
- Vegetation removal
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring.

An indicative cross section is included at section 7.2 of the Urban Design Framework which illustrates the form and function of the proposed Ōpāheke North-South FTN Arterial.

9.1.2 Project Features

The key landscape matters addressed for the Ōpāheke North-South FTN Arterial project include:

- The nature and extent of impacts on the landscape as a physical resource during the construction period of the Project. A specific focus on the location of construction laydown areas, extent of vegetation clearance, the scale and location of proposed cut and fill slopes and the likely impacts of bridge construction through the Waipokapū and Waihoehoe Stream flood plains.

- The nature and extent of physical impacts on the small number of private properties adjacent to the project during the construction period, and measures to reinstate boundary fences, driveways and gardens.
- Consideration of the potential landscape character effects and urban amenity issues in relation to permanent landscape change within the existing greenfield landscape. Specific evaluation of how the principal elements of the Project will integrate into the future urban environment.
- Consideration of the potential natural character effects of bridge construction within the Waipokapū and Waihoehoe Stream environments. In doing so, acknowledgement of the likely impacts on existing wetland and riparian vegetation (subject to regional consents) and future mitigation thereof.
- Consideration of landscape mitigation measures to be included within an Urban and Landscape Design Management Plan (ULDMP) as a condition on the proposed designation to address the potential landscape and visual effects arising from the operation the Project.
- Consideration of future opportunities to integrate the Project with the proposed Blue-Green network.

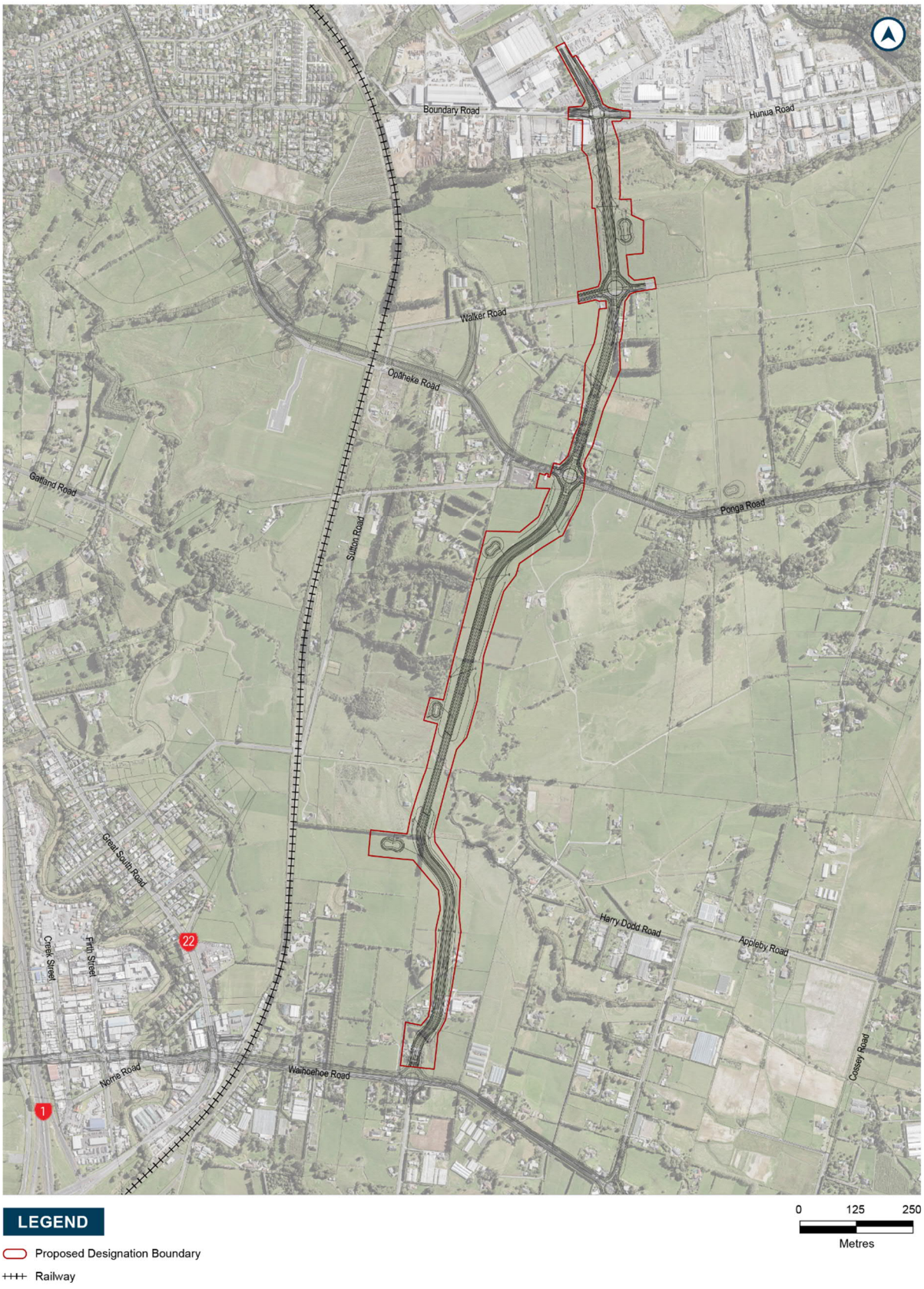


Figure 9-1 Overview of Ōpāheke N-S FTN Arterial

9.2 Existing and Likely Future Environment

9.2.1 Baseline Landscape

The Ōpāheke N-S FTN Arterial upgrade is proposed through greenfield land that is characterised by lowland floodplains and gently rolling landform accommodating rural lifestyle land use.

The defining characteristics of the Project area and local landscape are summarised below:

- Extensive drainage landscape influenced by Waihoehoe Stream and Waipokapū Stream.
- Limited vegetation cover (by comparison to local context) comprising exotic grassland, isolated areas of planted native vegetation, exotic treeland and planted vegetation (gardens, hedgerows and shelterbelts) associated with rural properties.
- Two patches of high value kahikatea forest (including a notable stand) to the west of the Project area. These features were actively avoided through options assessment.
- Low-lying landscape with expansive views out towards the Hunua Ranges Foothills.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1**: Landscape Plans and Images: **Maps 01- 06** and **30 - 32**.

Figure 9-2– View south from 31 Ponga Road (location of proposed roundabout) towards the proposed corridor (CH1800-2200).

9.2.1.1 Landform and Hydrology

The proposed corridor begins in the south within a localised ridge system at the intersection with NoR D2. From there it traverses the low-land floodplains associated with Waihoehoe Stream and gently rolling pastoral landform that is largely undeveloped. The Project area intersects with Ponga Road within elevated terrain then continues north through the drainage catchment landform associated with Waipokapū Stream. The corridor terminates in the north within the elevated industrial area surrounding Hunua Road. The main tributary of Waipokapū Stream demarcates the southern boundary of the existing industrial area of east Papakura.

The Project area intersects approximately nine tributaries of Waihoehoe Stream in the south and Waipokapū Stream in the north. Many of the waterbodies are culverted and all have been heavily modified by vegetation clearance and agricultural land use.

According to ecological survey, Waihoehoe Stream is the most significant ecological feature in the Project area and comprises a large floodplain that would originally have been dominated by floodplain forest habitat prior to clearance for agriculture. The Mangapū Stream corridor feeds into the Waihoehoe Stream floodplain east of the Waihoehoe NIMT rail bridge (outside of the Project area).

As discussed in the NoR D5 Ponga Road section, the Mangapū Stream corridor comprises a locally distinct and cohesive vegetation pattern that extends southwest from the Hunua Ranges foothills along the margins of Mangapū Stream down into the Waihoehoe Stream floodplain landscape. This landscape feature forms a significant part of the borrowed landscape contributing to the landscape character of the Project area. The existing landscape character is generally perceived as being vast and low lying with expansive views of the Hunua Ranges Foothills and other noteworthy landscape features (outside of the Project area) within the contextual landscape such as the beforementioned kahikatea forest areas.

9.2.1.2 Landcover

The vegetative framework within the Project area is limited and consists predominately of exotic grassland, isolated areas of planted native vegetation, exotic treeland and planted vegetation (gardens, hedgerows and shelterbelts) associated with private property.

Noteworthy vegetation contributing to the landscape character of the Project area includes a grouping of mature exotic trees (including English Oak) within the private properties of 28, 36, 68 and 48 Ponga Road.

9.2.1.3 Land Use

The existing land use along the new Ōpāheke North-South FTN Arterial is mostly rural and rural residential with business zoned areas at Hunua / Boundary Road and an Open Space – Conservation Zone associated with Waipokapū Stream, directly south of Boundary and Hunua Road.

9.2.1.4 Scheduled Landscape and Ecological Features

There are no scheduled landscape features within the designation boundary.

9.2.1.5 Historical and Cultural Associations

According to the archaeological assessment, historic heritage sites of interest include a utility building dating back to the 1940s. Associative values have been explored with Manu Whenua through the process of option design, development design and assessment.

9.2.2 Likely Future Environment

9.2.2.1 Overview

The land adjacent to the Project area (east and west) is zoned FUZ and will therefore undergo a significant change in land use over the coming decades from rural to urban. It is likely that the

Waihoehoe Stream flood plain will endure future development and perhaps even underpin much of the localised urban framework either side of the Project area.

Conversely, it's expected that the less defining vegetative features of the Project area and local landscape will make way for new urban and industrial development, which will likely include large lots, street tree plantings, public open space design and planting within private yards.

The quality and natural character values of the extensive stream and floodplain environments are anticipated to be enhanced as urban development progresses. This will likely be in recognition of the challenging site conditions posed by the floodplain landscape for high density development, in combination with the policy direction of the AUPOIP which generally seeks to protect and enhance water bodies within the urban landscape.

9.2.2.2 Developer Interest and Drury-Ōpāheke Structure Plan

There is developer interest in land at the southern extent of the Project area. The land use proposed is generally in line with the Drury-Ōpāheke Structure Plan. The structure plan also provides general guidance for how the FUZ land adjacent to the rest of the Project area may be developed over time. The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07-08**.

Land Use

The Drury-Ōpāheke Structure Plan indicates a range of urban environments either side of the Project area. These range from Terrace Housing and Apartment Buildings either side of the corridor in the southern extent of the Project area, Mixed Housing Urban around the intersection with existing Ponga Road and Heavy and Light Industrial at the northern extent.

Blue-Green Network

The proposed Blue-Green Network is indicated to intersect with the Project area through the Waihoehoe floodplain landscape. A potential New Suburb Park (3 – 5ha) is also indicated at the northern end of the Project area, adjacent to the commercial centre which is indicated directly east of the Ōpāheke North-South and Ponga Road roundabout. Another potential New Suburb Park is indicated at the intersection with Waihoehoe Road East.

9.2.3 Viewing Context

The viewing audience for the new Ōpāheke North-South corridor will predominately consist of private landowners within the visual catchment of the Project area. It will also comprise visitors to the existing business/industrial areas along Hunua and Boundary Roads who will be largely mobile (i.e. in vehicles travelling at 50km/h) with the location representing a short portion of their journey. Similarly, a largely mobile audience (80km/h) will have intermittent views of the new corridor between 120- 128 Ponga Road and between 160-168 Waihoehoe Road.

Over time, the viewing audience will grow to include residents of future urban developments within the surrounding FUZ land, although that is not expected to be the case for the land directly adjacent to the new corridor until the corridor itself is complete, or at least scheduled for completion.

Overall, the NoR D4 viewing context is characterised by:

- Similar to the Waihoehoe East corridor, the foothills of the Hunua Ranges are the most distinctive external landmark.
- Likely some overview from private rural residential development located on the foothills of the Hunua Ranges, although superior views from elevated vantage points take in the wider landscape and provide greater visual context for the Project area.
- The heightened landscape character and visual amenity of the Hunua Ranges foothills backdrop contributes to the experiential qualities of the corridor environment.
- Limited public viewing audience.
- Limited private viewing audience through large sections of the corridor with clusters of private dwellings located around intersecting road corridors (Ponga Road and Waihoehoe Road).

9.2.4 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or immediately adjacent to the proposed designation boundary.

As mentioned above, the Hunua Ranges foothills provide an expansive and scenic backdrop to the lowland environment of the Project area. The landscape features attributed the highest values include the Waihoehoe Stream and associated floodplain and the Waipokapū Stream and associated floodplain. These noteworthy landscape features, although heavily modified represent a significant future opportunity to enhance the natural character values within the Project area and that of the future urban neighbourhoods indicated to develop at the edges of the floodplain landscape.

9.2.5 Landscape Sensitivity

The Ōpāheke North South FTN Arterial is situated within a broader landscape that has been assessed through the AUPOIP as being suitable for urbanisation. The proposed development of a new 30m four-lane FTN arterial on greenfield land is seen to form an integral part of the future urban form and strategic transport corridor and on that basis the Project area is assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Project area are as follows:

- Waihoehoe Stream and floodplain and it's connection with the Mangapū Stream riparian corridor and floodplain leading north towards Ponga Road.
- Waipokapū Stream located directly south of the heavy industrial land surrounding Boundary and Hunua Road.

9.3 Assessment of Landscape and Visual Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

9.3.1 Positive Effects

A number of positive landscape and visual effects are anticipated as a result of the operation of the Project (including proposed mitigation).

Positive effects are likely to include:

- A streetscape to match the emerging urban form of adjacent land.
- New opportunities for active modes of transport to link in with the Waihoehoe Stream and Waipokapū Stream riparian corridors, as envisaged by the proposed Blue-Green Network.
- Net increase in green infrastructure within the Project area associated with new street trees, berm and stormwater plantings and planted stormwater wetlands, resulting in improved visual amenity for road users and adjacent audiences.
- Provision of extensive bridge structures to reduce flooding risks and adverse effects on the natural patterns and processes of the drainage floodplain.
- Eventual enhancement of natural character values within water bodies (subject to regional consent processes and mitigation planting).

9.3.2 Assessment of Construction Effects

9.3.2.1 Site Enabling Works

Construction Areas

Site compound and construction areas are proposed at 8 locations within the Project area. Construction traffic will be heightened at these locations through the construction period of the Project.

- Bridge construction areas either side of the proposed Waipokapū Stream bridge crossing (CH650 – 850).
- A site compound directly west of the northern section of proposed Waipokapū Stream bridge (CH650).
- A site compound directly north-east of the proposed Walker Road roundabout (CH1100)
- A site compound south-west of the Ponga Road / Ōpāheke Road roundabout (CH1850)
- A construction area adjacent to proposed wetland 2 (CH2200).
- Bridge construction areas either side (east and west) of the Waihoehoe Stream bridge crossing (CH2800 – 2900).
- A construction area directly west of the proposed stormwater wetland 4 (CH3100).
- A site compound north-west of the Waihoehoe Road roundabout (CH3700).

The Waihoehoe Stream bridge construction areas are proposed east and west of the bridge crossing, within the heavily modified floodplain environment. Physical landscape effects are likely to be negligible considering the degradation that is present within the stream and floodplain environment.

Likewise, for the Waipokapū Stream bridge crossing, the construction area to the southwest is proposed within heavily modified pastoral land and physical effects are also likely to be negligible in this location.

For the Waipokapū Stream bridge construction area and site compound located within industrial land above the stream corridor, the physical effects are of a different nature, relating to land requirement. As these sites are already heavily modified by industrial activities, therefore, the physical landscape effects are likely to be negligible.

It is recommended that all areas be grassed (reinstated) at the completion of the construction period.

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **low.**

Vegetation Clearance

Vegetation clearance requirements are limited for this Project due to the predominate land use being agricultural and noteworthy vegetation occurring towards the extremities if the Project area in relation to rural residential development. Nevertheless, some shelterbelt plantings, private gardens and mature trees, located on private property and within the road reserve of Hunua and Boundary Road will need to be removed.

The proposed corridor, bridge construction areas and associated fill slopes are anticipated to impact on small, localised areas of indigenous terrestrial and riparian vegetation (subject to future regional resource consent approvals).

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from vegetation clearance within the Project area is assessed as **low.**

9.3.3 Project Formation Works

Structures and Earthworks

The proposed Waipokapū Stream bridge has a central span of approximately 30m which is long enough to bridge over the stream bed and avoid effects from siting piers on the stream bed and channel.

The Waihoehoe Stream bridge spans approximately 265 m across Waihoehoe Stream floodplain environment, immediately downstream of the junction with Mangapū Stream. The structure consists of 8 spans and spill through abutments and represents a notable construction project with inherent complexities associated with working within an extensive floodplain environment. Nevertheless, the receiving landscape is heavily modified and sparsely vegetated, therefore the temporary physical landscape effects associated with construction are assessed as low.

Several new culverts are proposed within the Project area. It is proposed that the culvert inlets and outlets be planted in indigenous species (subject to regional consents) to ameliorate the physical landscape effects likely to arise within the localised riparian corridor and to visually integrate the culvert wingwalls.

The proposed cut and fill slopes range in scale from very small (1m wide) to large (30m wide), and will alter the low-lying and gently rolling pastoral landscape. Fill slopes along Hunua and Boundary road will alter the existing modified landform of the road corridor.

In all cases, the fill slopes will run into existing modified pastoral land where there will be an opportunity to grade the slopes gently and establish an appropriate gradient for native riparian planting to follow.

Overall, impacts on the physical landscape to implement the proposed earthworks and structures is likely to be **low**.

Stormwater Wetlands

Stormwater wetlands are proposed at four locations along the Ōpāheke N-S FTN Arterial alignment and all will require earthworks to re-shape the land and achieve optimal depths and edge profiles. All of the proposed stormwater wetlands are positioned within open pastoral areas, outside of existing waterways, within land that is already modified by rural land use. On that basis, the physical landscape effects of constructing the proposed wetlands is expected to be **low**.

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 14 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects in section 9.3.5.1 below.

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **moderate-low**.

9.3.3.1 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

9.3.3.2 Temporary Visual Effects

The construction phase is anticipated to be staged of a period of 3.5 to 4 years. Construction through the proposed new corridor will be entirely offline, except for the small section in the north that is proposed within an existing industrial zone. On that basis, the viewing audience will consist solely of existing private viewing audiences within the visual catchment of the Project area and a transient viewing audience within the Ponga Road and Waihoehoe intersections.

An important consideration when assessing landscape change within the rural environment, particularly within predominately agricultural areas, is that landscape change by way of vegetation removal and land modification (on private property), albeit at a lesser scale, forms part of the expected backdrop of the rural environment.

Notwithstanding the above, some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase such as:

- Viewpoints 1-4. Hunua Road Industrial zone (CH 400 - 700) where the proposed alignment will widen through the existing road corridor and impacting on the existing road reserve trees and generate a new viewshaft through the Boundary Road Industrial sites, out over the lower flood plain landscape.
- Viewpoint 5. Walker Road (CH1200) in the vicinity of the proposed Walker Road / Ōpāheke N-S roundabout.
- Viewpoint 6 and 7. Ponga Road (views northeast and southeast) (CH1800) in the vicinity of the proposed Ponga Road / Ōpāheke N-S roundabout. This is also the location of a cluster of mature exotic trees required to be removed.
- Viewpoint 8. 205 Sutton Road (CH2700 – 3000) where public views are afforded towards the proposed Waihoehoe Stream bridge.
- Viewpoint 9. 128 Waihoehoe Road (CH3800) where the Project intersects with NoR D2 (Waihoehoe Road West section).

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Limited viewing audience through the central section of the designation.
- Public viewing audiences from the Industrial zone are not considered to be sensitive.
- The project will be constructed offline.

Representative viewpoint images are provided in **Appendix 5** – NoR D4 Representative Viewpoint Images. The supporting commentary for each location outlines the existing visual composition of the Project and the visual changes that have the potential to translate into adverse visual effects during the construction and operation periods.

Overall, adverse visual effects for the transient public viewing audience are likely to be **very low** through the construction phase considering that the Project is proposed to be constructed offline and public vantage points will be limited.

Visual effects are likely to be heightened for private viewing audiences within or directly adjacent to the Project area, on the basis of more direct and prolonged engagement with the construction activities of the Project. On that basis, visual effects for private properties is assessed as **moderate-low.**

9.3.4 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The mitigation measures for all activities and built elements during construction are outlined below. An Urban and Landscape and Design Management Plan (ULDMP) is recommended as a condition on the designation which should include the following matters:

- Site compounds and construction yards: reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.

- Vegetation clearance: wherever possible, limit the removal of noteworthy trees and indigenous vegetation.
- Wherever possible, re-use topsoil from existing pastoral land (within the Project area), impacted by the proposed earthworks[37].

9.3.5 Assessment of Operational Effects

9.3.5.1 Natural Character Effects

Natural character forming elements, features and processes include the water body and terrestrial margins of the Waipokapū Stream and Waihoehoe Streams. As discussed earlier, these landscape features have been heavily modified by historic vegetation clearance and rural land use such that they remain in a state of degradation with no management.

Potential effects on natural character arise from landform modification and vegetation clearance associated with the bridge construction areas, retaining walls and fill slopes within the drainage landscape. As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected will be determined. It is anticipated that reinstatement and mitigation planting at the completion of works will assist with mitigating any landscape and natural character effects arising from the Waipokapū Stream and Waihoehoe Stream crossings.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **low.**

9.3.5.2 Visual Amenity Effects

Once the Project is completed, the new corridor will start to service the growing urban neighbourhoods within the local landscape and transient public viewing audiences will engage with a similar visual environment to that of other roads within the Drury Ōpāheke landscape.

Very low residual adverse effects are anticipated from some private properties, where as a direct result of the Project, residents will experience some level of material change to the visual composition and residential amenity of private space and entryways. For existing properties proximate to the Project area (from which land is required), residual amenity effects may be heightened by the new carriageway and footpaths/cycleways to property boundaries and the permanent loss of yard space.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any long-term residual visual effects of the Project.

[37] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

Visual effects, over time, are anticipated to move to the positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and accessibility to active modes of transport.

On that basis, visual effects within the Project area are likely to be **very low** and moving to beneficial for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **moderate-low** to **low**, reducing over an extended period of time.

9.3.5.3 Landscape Character Effects

The Project is anticipated to operate in the context of increased urbanisation within the wider Drury-Ōpāheke landscape and the new corridor will support urbanisation within the land adjacent to the Project area. Urbanisation proximate to the Project area is likely to include existing and new (extended areas) of heavy industrial development within the northern section of the Project area and, high density housing concentrated within the southern section near Waihoehoe Road and Mixed Housing Urban and Suburban zones through the middle of the Project area. On that basis, the magnitude and nature of change to the existing landscape character within the Project area is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing landscape and the proposed Ōpāheke N-S FTN corridor form and function within the context of emerging urban form. Although indicative, it also illustrates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

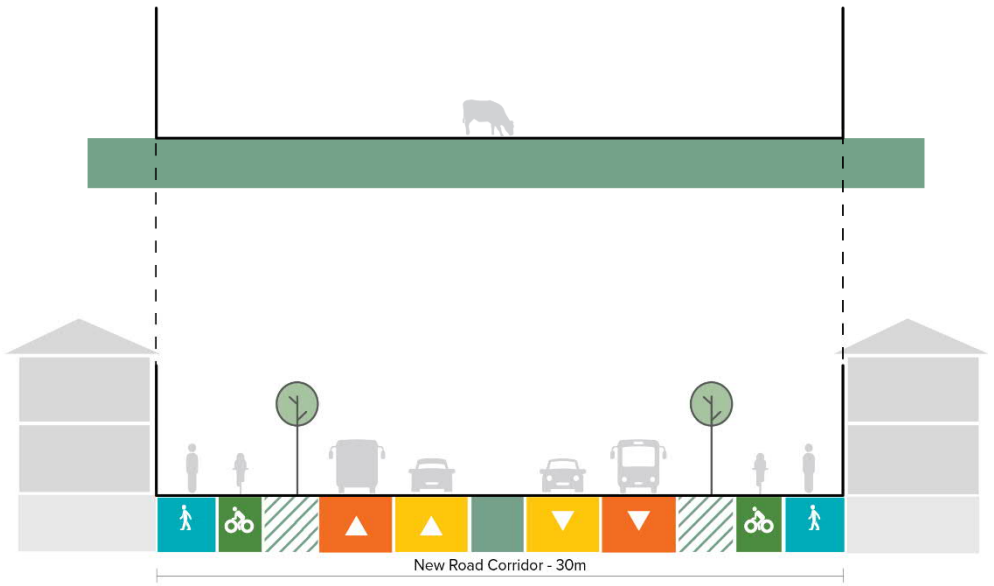


Figure 9-3 Ōpāheke N-S FTN corridor typical cross section

As outlined earlier, some street-side vegetation (including noteworthy trees) are proposed to be removed through the Project works. While most of this vegetation is not considered significant on an individual basis, collectively it contributes to the visual amenity of the existing landscape and provides a degree of screening and privacy for properties adjacent to existing roads within the Project area. Therefore, it is recommended (as a matter for detailed design) that the footpaths and cycleways within Hunua and Boundary Road be refined to either avoid or integrate noteworthy trees within the berm (if practicable). A similar approach might be achievable where the Project area intersects several other groupings of mature trees such as the Ponga Road roundabout. This measure is included within the condition for construction effects and will provide the opportunity to retain the landscape character values afforded by some noteworthy trees within the Project area.

It is recommended that a condition on the designation is included that requires new street trees to be planted along the full length of the proposed Ōpāheke N-S FTN Arterial upgrade corridor in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that the new street tree plantings, in conjunction with stormwater management and berm plantings, will generally mitigate the landscape character effects associated with vegetation clearance within the Project area.

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **Waipokapū Stream Bridge and Waihoehoe Stream Bridge design -** will be elevated approximately 9m and 6m (respectively) above existing stream-bed levels and influence the character and visual amenity of the road corridor and that of the future urban neighbourhoods and esplanade reserves adjacent to the Project area. The bridge structures also have the potential to celebrate the vast views afforded from within the Project area of the surrounding Hunua Ranges Foothills. Given the proposed scale of each bridge – it is proposed that viewing platforms be integrated into the design and that the bridges be designed as landmarks within the landscape that contribute to the local sense of place and urban amenity of the future urban landscape.
- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas (existing and proposed through the Blue-Green Network). It is recommended that through the ULDMP, that existing open space areas and those identified through the Blue-Green Network be identified and connection opportunities investigated within the

proposed designation. These areas include the Waihoehoe Stream corridor and Waipokapū Stream esplanade reserve.

- **Integration of fill slopes** – it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with the proposed bridge structures should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
- Fill slopes, if not otherwise integrated back into the adjacent urban development parcel, are likely to read as left-over spaces and will do little to enhance the amenity of the future urban neighbourhood. There are certain areas within the Ōpāheke N-S FTN Arterial upgrade corridor where it is recommended that site-specific landscape design would provide one or more of the following benefits: additional green infrastructure to the road corridor, visual and ecological integration and reduced maintenance requirements. It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:
    - CH680 – CH100 in relation to the Waipokapū Stream Bridge and associated riparian areas.
    - CH1500 / CH2200 / CH3500 / CH3700 – in relation to the proposed culverts.
    - CH2500 – CH3100 in relation to the Waihoehoe Stream Bridge and associated floodplain.
- **Stormwater Wetlands** - Stormwater wetlands form part of the 'landscape aesthetic' and with site-specific design and planting have the potential to make a positive contribution to green infrastructure and urban amenity. Wetlands with shallow and vegetated edges will integrate as a perceived natural feature more so than deep ponds that may be required to be fenced. It is recommended that the proposed stormwater wetlands be planted with appropriate (low maintenance) native species and integrated into the surrounding urban landscape context, so that they provide a hydrological and ecological function and are safe places to visit.
- **The proposed Blue-Green Network** – as expressed through the Urban Design Framework – Urban Design Review, the Ōpāheke N-S FTN Arterial upgrade corridor is capable of responding to natural landscape identify drivers. This might feasibly include integration of the proposed Blue-Green Network - where it intersects with the Project area – and involve specific plant species selection (terrestrial and riparian) within the Project area to reinforce the wider vegetation patterns of the local landscape, and creating connections to proposed Greenways, as outlined above under walking and cycling connectivity.
- **Impacts on private property** – the Project could potentially impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project

works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.

- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate adverse visual amenity effects potentially arising from residual land).

Based on the above considerations and recommended mitigation measures, adverse character effects are assessed as **low.**

9.3.6 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principal elements of the Project that are likely to give rise to permanent adverse effects on landscape character, natural character and visual amenity. It is recommended that a ULDMP is a condition on the proposed designation which should include the following measures to mitigate landscape and visual effects.

There is clear guidance around the approach for built structures and landscape design and planting for transport projects within the Bridging the Gap: NZTA Urban Design Guidelines (2013). The following matters to be included within the ULDMP should demonstrate consistency with these design guidelines.

1. **Waipokapū Stream Bridge and Waihoehoe Stream Bridge:** demonstrate visual integration and sense of place considerations based on Mana Whenua preferred design principles. Design in a manner that leverages the visual prominence within the localised setting and provides public views to the Hunua Ranges foothills.
2. **Walking and cycling connectivity:** investigate opportunities within the proposed designation to integrate with future open space proposed within the Green-Blue Network.
3. **Stormwater wetlands:** configure stormwater wetlands to a natural appearance, conforming to landform and future urban context. Plant with appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function.
4. **Permanent earthworks** – shape all fill slopes to a natural profile and integrate into the surrounding natural landform. Fill slopes associated with bridge and culverts to be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
5. **Private properties** – reinstate driveways, accessways, private fences and garden plantings for existing remaining properties temporarily affected by Project works. Design elements to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
6. **Planting design details:** landscape design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:

a. Street trees along the full length of Ōpāheke N-S FTN Arterial upgrade corridor in conjunction with shrubs and ground cover species appropriate for the use within stormwater treatment areas and berms. Species and tree stature should be selected to correspond with adjacent land use and blue-green areas, in accordance with the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy,

b. Reinstatement planting within private property boundaries

c. Treatment of fill slopes and residual land, to integrate with adjacent land use and areas where the Project intersects with the proposed Blue-Green Network.

d. Stormwater wetland design and planting

e. Integration of Mana Whenua preferred design principles in relation to planting, structures and hard landscape elements.

f. Site preparation, implementation and maintenance requirements for all planting typologies.

The proposed mitigation measures should where practicable be integrated with any revegetation requirements of future regional consent processes. Opportunities for integration of landscape mitigation works with the proposed Blue-Green Network, indicated by the Drury – Ōpāheke Structure Plan should also be considered. Future resource consent considerations, outlined in Section 11, should also be considered in preparing the ULDMP.

Refer to **Appendix 1**. Landscape Plans and Images: **Maps 33-37** which illustrates the general location of recommended mitigation measures.

9.3.7 Summary and Conclusions

This landscape, natural character and visual assessment finds that the proposed features and scale of the Project are able to be integrated into the existing landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP) adequate to remedy the potential adverse effects arising from the Project.

FUZ development areas on adjacent land will overtime substantially change the scale and character of the adjacent landscape as experienced from within the road, and will absorb the landscape and visual changes proposed within the Project.

The following table provides a summary of the potential landscape character, natural character and visual effects of the construction and operational phases of the Project, with the mitigation measures implemented as recommended in this report.

Table 9-1 - Ōpāheke North-South FTN Arterial Summary of Landscape and Visual Effects

	Temporary Effects – Construction (taking account general mitigation)	Permanent Effects – Operation (taking account general mitigation)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Moderate-low** for affected private properties.	N/A
Temporary Visual Effects	**Very Low** **Moderate-low** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Very low** (moving to beneficial overtime) **Moderate-low** to **low** (reducing over an extended period of time)
Effects on Landscape Character	N/A	**Low**

10 NoR D5: Ponga and Ōpāheke Road Upgrade

Chapter Summary

As the Drury-Ōpāheke area is urbanised it is proposed to upgrade a 4.15km section of Ponga Road and Ōpāheke Road, from Great South Road in the north, to Jack Paterson Road and the future Mill Road corridor (which forms a separate NZUP project) in the southeast, to a two-lane arterial with separated walking and cycling facilities. The Project has been separated into three sections as outlined below:

- Ponga Road Upgrade: from Ōpāheke Road to Jack Paterson Road.
- Ōpāheke Road Rural Upgrade: from the northern extent of the FUZ to Ponga Road
- Ōpāheke Road Urban Upgrade: north of the FUZ. The majority of the upgrade can fit within the existing road reserve – therefore only discrete areas are proposed to be designated.

The current defining characteristics of the Project areas and local landscape are summarised below:

- For Ponga Road, an elevated and undulating road corridor bordered on the south by the drainage landscape associated with Mangapū Stream.
- For Ponga Road - vegetation cover comprising areas of remnant indigenous forest (outside of the Project area), mature English Oak trees (*Quercus sp)*, a mature Pohutukawa tree (*Metrosideros excelsa),* private gardens, manicured hedgerows and wetlands (dominated by exotic species).
- Elevated (localised) rural character values within the eastern section of the Ponga Road Project area associated with rural lifestyle blocks and notable mature native and exotic trees.
- Ōpāheke Road Rural Upgrade**,** a peri urban landscape character with transitional rural land increasingly to urban towards the northern extent of the corridor adjacent to Bellfield Estate.
- An open and expansive road corridor through the Ōpāheke Road Rural section; slightly elevated overlooking low-lying pastoral land to the south.
- Heightened landscape amenity through the Ōpāheke Road section associated with Ōpāheke Reserve and recently upgrade sporting facilities.
- For the Ōpāheke Road Rural Upgrade section a vegetation cover comprising exotic grassland and wetlands (dominated by exotic species), brownfields, exotic shrubs and planted vegetation associated with private gardens, mature native and exotic trees within the Ōtūwairoa Stream riparian corridor and constructed wetland with native planting within Ōpāheke Reserve.
- Ōpāheke Road Urban – established urban environment with the main Project works proposed adjacent to Papakura cemetery.

The land adjacent to the Ponga Road and Ōpāheke Road Rural corridor will undergo a significant change from rural to urban land use and character over the next 30 years.

A range of urban land uses are indicated either side of the Ponga Road section, including Mixed Housing Urban at the western extent of the proposed designation and Light Industry and Mixed Housing Suburban north and south (respectively) of the corridor, at the eastern end of the proposed designation.

For the Ōpāheke Road Rural road section, some existing land use will endure future development. This includes Bellfield Estate (Ōpāheke Precinct 1), located immediately northwest of the Ōtūwairoa Stream bridge crossing. It also includes Ōpāheke Reserve, zoned Open Space – Sport and Active Recreation,

which has recently been upgraded with purpose built sporting facilities. Ōpāheke Reserve covers a large area of land adjacent to the Project and comprises a substantial portion of the drainage landscape associated with Ōtūwairoa Stream. The remaining land either side of the existing corridor is expected to be developed as Mixed Housing Urban north and south of the Project area, light industrial to in the north and a small section of Mixed Housing Urban at the northern boundary of the proposed designation as indicated in the Drury-Ōpāheke Structure Plan.

The key matters addressed by this landscape character, natural character and visual effects assessment are as follows:

- The nature and extent of temporary physical landscape effects during the construction period of the Project with a specific focus on construction laydown areas, vegetation clearance, bridge construction over Mangapū Stream and Ōtūwairoa Stream, and subsequent cut and fill slopes along the new road corridor.
- Integration of the elevated road corridor (approximately 5m) above existing road surface level on the approach to the Mangapū Stream bridge crossing and the proposed tie-in with the Mill Road corridor at Ponga Road / Jack-Paterson Road intersection.
- Integration of the large-scale fill slopes at CH1780 – 2050 associated with the proposed Mangapū Stream bridge.
- The nature and extent of temporary physical impacts on private properties adjacent to the existing road corridor.
- Potential natural character effects on Mangapū Stream, Ōtūwairoa Stream and the floodplain associated with the bridge construction.
- Potential natural character effects on and areas within the existing wetland of Ōpāheke Reserve;
- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- The potential landscape character, natural character and visual amenity effects arising as a result of permanent landscape change, including how well the principal elements of the Project integrate into the likely future landscape;
- Potential landscape amenity effects on Ōpāheke Reserve and consideration of future opportunities to integrate the Project into the proposed Blue-Green network.
- Landscape and visual effects on the Papakura Cemetery.

Overall landscape and visual effects range from **low to moderate** for the construction phase and **very low to moderate-low** for the operational phase.

This landscape assessment concludes that the proposed features and scale of the Project once operational can integrate into the existing and likely future landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP). The recommended measures will be adequate to remedy the potential adverse landscape and visual effects arising from the Project activities authorised by the designation.

Potential impacts on wetland and riparian areas and therefore natural character values will be assessed in further detail and mitigated accordingly through a future regional consent process. It is recommended that

the planting proposed under the ULDMP condition for NoR D5 is integrated with any future planting required as part of the regional consenting phase of the Project.

Landscape mitigation measures for NoR D5 include recommendations for integrating the proposed bridge structures, walking and cycling connectivity, configuration of stormwater wetlands with future urban form, integration of fill slopes, reinstatement of private property fences and gardens plantings and a comprehensive planting plan covering all mitigation treatments.

Ponga Road Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate** **Moderate** for affected private properties.	N/A
Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Low**

Ōpāheke Road Rural Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Low** for affected private properties.	
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**Low**

Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Low**

Ōpāheke Road Urban Upgrade - Summary of Landscape and Visual Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Very low** (including for affected private properties).	
Temporary Visual Effects	**Low** for public and private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Low** (moving to beneficial overtime for private and public viewing audiences)
Effects on Landscape Character		**Very low**

10.1 Project Description

As the Drury-Ōpāheke area is urbanised it is proposed to upgrade a 4.15km section of Ponga Road and Ōpāheke Road, from Great South Road in the north, to Jack Paterson Road and the future Mill Road corridor (which forms a separate NZUP project) in the southeast, to a two-lane arterial with separated walking and cycling facilities. The functional intent of the Project is a multimodal corridor that provides access to the proposed Mill Road corridor, FUZ in Papakura and employment areas to the north. The Project has been separated into three sections as shown in Figure 10-1:

- Ponga Road Upgrade: from Ōpāheke Road to Jack Paterson Road
- Ōpāheke Road Rural Upgrade: from the northern extent of the FUZ to Ponga Road
- Ōpāheke Road Urban Upgrade: north of the FUZ
    - While the overall plan for the urban area of Ōpāheke Road is to upgrade the walking and cycling facilities from Ōpāheke Road Rural Upgrade in the south to Great South Road, Papakura in the north, generally, the upgrade can fit within the existing road reserve, therefore only the areas affecting land outside the existing road reserve are proposed to be designated.

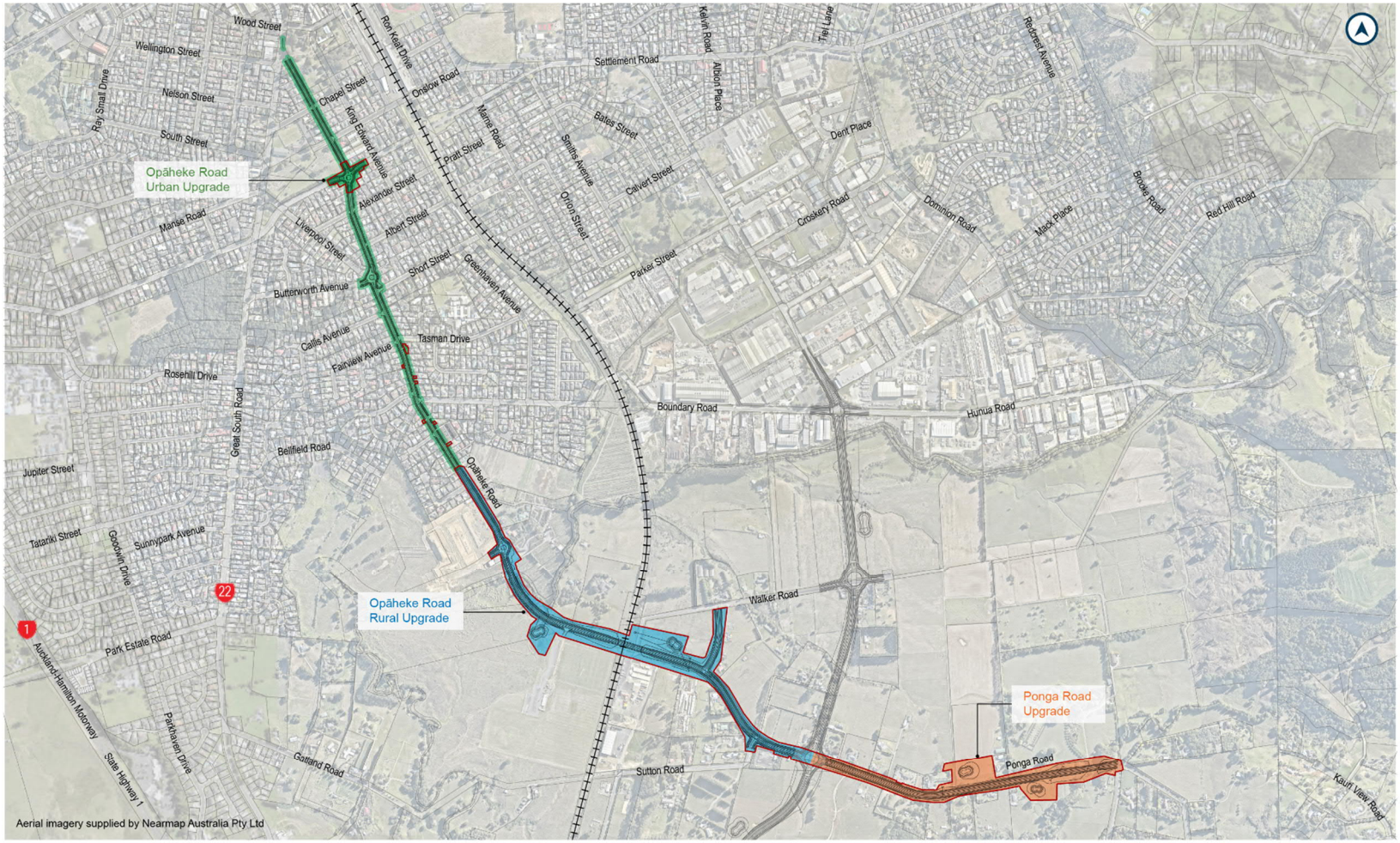
For the Ponga Road and the Ōpāheke Road Rural upgrade sections it is proposed to widen the existing roads to 24m wide two-lane urban arterials with separated walking and cycling facilities. As the Ōpāheke Road urban section is an existing and constrained urban environment, it is proposed to upgrade the existing road to a 20m wide two-lane urban arterial with separated walking and cycling facilities mostly within the existing legal road.

The indicative alignment has been prepared for assessment purposes, and to indicate what the final design of the Project may look like. The final alignment will be refined and confirmed at the detailed design stage. Key features of the proposed upgrade common to each Project section include the following:

- A typically 24m or 20m wide road with two lanes and separated walking and cycling facilities
- Likely posted speed of 50kph
- Localised widening around the existing intersections to accommodate for vehicle stacking and tie-ins and walking and cycling facilities/crossings
- Batter slopes and retaining to enable widening of the corridor and/or wetland construction, and associated cut and fill activities
- Vegetation removal along the existing road corridor
- Areas identified for construction related activities including site compounds, construction laydown, bridge works area, the re-grade of driveways and construction traffic manoeuvring

Further details of each Project section are provided below.

Comparative cross sections are included at section 8.2 / 8.6 and 8.10 of the Urban Design Framework which illustrate the proposed form and function of the proposed Ponga and Ōpāheke Road Upgrade.



Works shown for the Ōpāheke Road Urban Upgrade outside of the proposed designation boundary are indicative and will be subject to a separate statutory approvals process (if required) in the future. Only those works within the designation boundary are assessed.

Figure 10-1 Overview of NoR D5

10.1.1 Ponga Road Upgrade Section

10.1.1.1 Section Overview

The Ponga Road Upgrade section is a 1km long upgrade extending from the proposed intersection with Ōpāheke North-South FTN Arterial in the west, to Jack Paterson Road in the east. In the future Ponga Road will tie into the proposed Mill Road corridor which forms a separate NZUP project. An overview of the concept design is provided in Figure 10-2.

Figure 10-2 Overview of Ponga Road Arterial Upgrade Section

In addition to those listed above, the key features of the Ponga Road Upgrade section include:

- Roundabout tying into the proposed Ōpāheke N-S FTN Arterial (NoR D4) and Ōpāheke Road Rural Upgrade section
- A bridge over Mangapū Stream
- Extension of existing pipe culverts
- Two stormwater wetlands.

10.1.2 Ōpāheke Road Rural Upgrade section

10.1.2.1 Section Overview

It is proposed to widen, and realign a portion of the existing road within the Ōpāheke Road Rural Upgrade section to a 24m urban arterial. The Ōpāheke Road Rural Upgrade section extends 1.6km from the extent of the FUZ in the north to Ponga Road in the south. An overview of the concept design is provided in Figure 10-3.

In addition to those listed above, the key features of the Ōpāheke Road Rural Upgrade section include:

- Roundabouts at Bellfield Estate and Ōpāheke N-S FTN Arterial / Ponga Road
- Realignment of a section of Ōpāheke Road and grade separation of the NIMT to avoid the Waikato 1 watermain and Ōpāheke Sports Fields and to allow the bridge to be constructed offline
- New road connection to Walker Road (and closure of a section of the existing Ōpāheke Road – replaced by the new NIMT bridge)
- Two walking and cycling bridges adjoining each side of the existing Ōtūwairoa Stream road bridge
- Two stormwater wetlands. One is an extension of an existing wetland located within Ōpāheke Reserve.

Figure 10-3 Overview of Ōpāheke Road Rural Section

10.1.3 Ōpāheke Road Urban Upgrade section

10.1.3.1 Section Overview

While the overall plan for the urban area of Ōpāheke Road is to upgrade the walking and cycling facilities from Ōpāheke Road Rural Upgrade in the south to Great South Road, Papakura in the north, only the areas affecting land outside the existing road reserve are proposed to be designated and assessed as part of this assessment. The Ōpāheke Road Urban Upgrade section of NoR D5 includes the regrading of nine driveways along Ōpāheke Road and the upgrade of the Ōpāheke Road / Settlement Road intersection to a roundabout. An overview of the proposed designation areas is provided in Figure 10-4.

The key features of the Ōpāheke Road Urban Upgrade section include:

- Upgrade of the Ōpāheke Road / Settlement Road intersection to a roundabout to provide for separated walking and cycling facilities, including crossing facilities
- Re-grade of nine driveways.

Figure 10-4 Overview of Ōpāheke Road Urban Section

10.1.4 Project Features

The key matters addressed by this landscape character, natural character and visual effects assessment are as follows:

- The nature and extent of temporary physical landscape effects during the construction period of the Project with a specific focus on construction laydown areas, vegetation clearance,

bridge construction over Mangapū Stream and Ōtūwairoa Stream, and subsequent cut and fill slopes along the new road corridor.

- Integration of the elevated road corridor (approximately 5m) above existing road surface level on the approach to the Mangapū Stream bridge crossing and the proposed tie-in with the Mill Road corridor at Ponga Road / Jack-Paterson Road intersection.
- Integration of the large-scale fill slopes at CH1780 – 2050 associated with the proposed Mangapū Stream bridge.
- The nature and extent of temporary physical impacts on private properties adjacent to the existing road corridor.
- Potential natural character effects on Mangapū Stream, Ōtūwairoa Stream and the floodplain associated with the bridge construction.
- Potential natural character effects on and areas within the existing wetland of Ōpāheke Reserve;
- The nature and scale of visual amenity effects on private and public viewing audiences, arising from the construction of the Project.
- The potential landscape character, natural character and visual amenity effects arising as a result of permanent landscape change, including how well the principal elements of the Project integrate into the likely future landscape;
- Potential landscape amenity effects on Ōpāheke Reserve and consideration of future opportunities to integrate the Project into the proposed Blue-Green network.
- Mitigation measures to be included as conditions of the designation that will address the likely temporary and permanent landscape and visual effects arising from the construction and operation phase of the Project.

10.2 Existing and Likely Future Environment

10.2.1 Ponga Road Upgrade section

10.2.1.1 Ponga Road Baseline Landscape

The Ponga Road section is situated within the existing Ponga Road corridor and extends into adjacent land that is characterised by flat and low undulating landform and rural lifestyle development to the south and lowland floodplains and gently rolling landform accommodating rural lifestyle to the north.

The defining characteristics of the Project area and local landscape are summarised below:

- Elevated and undulating road corridor bordered on the south by the drainage landscape associated with Mangapū Stream.
- Vegetation cover comprising noteworthy areas of remnant indigenous forest (outside of the Project area), mature English Oak trees (*Quercus sp)*, a mature Pohutukawa tree (*Metrosideros excelsa),* private gardens, manicured hedgerows and wetlands (dominated by exotic species).

- Elevated (localised) rural character values within the eastern section of the Project area associated with rural lifestyle blocks and notable mature native and exotic trees.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1**: Landscape Plans and Images: Maps **01- 06** and **38**.

Figure 10-5– View north from 198 Ponga Road into Mangapū Stream

10.2.1.2 Landform and Hydrology

The Ponga Road section travels along a locally elevated spur that extends west from the Hunua Range foothills. The topography either side of the existing road corridor is undulating with several elevated sections influencing the long section of the existing road corridor.

The existing road corridor crosses Mangapū Stream in the eastern extent of the proposed designation. The stream passes beneath the road corridor via twin culverts and into the lower Mangapū Stream flood plain. The floodplain is roughly 100m wide directly south of the road corridor and widens significantly through the low-land environment, south towards the localised drainage landscape associated with NoR D4.

The proposed designation also intersects a minor tributary of Waipokapū Stream along the northern edge of the corridor at 126 Ponga Road.

Figure 10-6– View southwest from 215 Ponga Road, into Mangapū Stream flood plain and Kahikatea forest (outside of the Project area).

10.2.1.3 Landcover

A locally distinct and cohesive native and exotic vegetation pattern extends southwest from the Hunua Range foothills along the margins of Mangapū Stream, crossing the Project area within the eastern extent of the proposed designation. The vegetative feature connects the Kauri View Reserve SEA in the north with the SEA extending through 101 and 109 Ponga Road in the south. It comprises some noteworthy vegetation including several venerable English Oak trees (*Quercus sp.*) within private properties (198 and 215 Ponga Road), a mature Pohutukawa tree (*Metrosideros excelsa* and remnant Kahikatea Forest and Taraire Tawa podocarp Forest.

The vegetative framework (within the Project area) consists primarily of exotic pasture, grassland and wetlands (dominated by exotic species), planted vegetation associated with private gardens, manicured hedgerows and mature exotic trees along private boundaries. Noteworthy vegetation contributing to the existing residential street character and borrowed landscape of the Project area includes:

- A small stand of critically endangered Pūriri Forest[38] (198 Ponga Road)
- One good quality mature English oak specimen and a mature pohutukawa at 215 Ponga Road.
- A row of mature English Oak (*Quercus sp.*) along the southern boundaries of 126, 154, 174 and 198 Ponga Road.
- A single English oak (*Quercus robur*) within the road reserve adjacent to 31 Ponga Road.

10.2.1.4 Land Use

The existing corridor for Ponga Road is 20m wide and zoned ‘Road’ under the AUP OIP. Land use is predominately rural residential and rural lifestyle. The elevated land either side of the existing road corridor accommodates rural lifestyle blocks.

[38] Ecological survey, July 2020

10.2.1.5 Scheduled Landscape and Ecological Features

There are no scheduled landscape features within the designation boundary.

As mentioned above, a terrestrial SEA is located adjacent to the Project area, within the southern boundaries of 101 and 109 Ponga Road. The habitat is classified as Kahikatea Forest and Taraire Tawa podocarp Forest and is described in more detail in the specialist ecological report.

10.2.1.6 Historical and Cultural Associations

According to the archaeological assessment, historic heritage sites within and proximate to the Project area include: Ōpāheke Railway Station, US Military Camp (sites 17017 / 17016), Ōpāheke Sale Yards, Historic Villa (R12/1144) and Historic Villa (R12/1145).

Associative values have been explored with Manu Whenua through the process of option design, development design and assessment.

10.2.1.7 Likely Future Environment

10.2.1.7.1 Overview

The land adjacent to the Project area (north and south) is zoned FUZ and will therefore witness a significant change in land use over the coming decades from rural to urban. It is likely that the Mangapū Stream flood plain and the defining mature vegetation will endure future development and perhaps even underpin much of the localised urban framework either side of the Project area.

Conversely, it's expected that the less defining vegetative features of the Project area and local landscape will make way for new urban development, which will likely include street tree plantings, public open space design and planting within private yards.

The quality and natural character values of riparian and wetland environments are generally anticipated to be retained and, in some instances, enhanced as urban development progresses, in accordance with the policy direction of the AUPOIP which generally seeks to protect and enhance these landscape features.

10.2.1.7.2 Mill Road Corridor

The proposed Mill Road designation intersects with the NoR D5 in the east, at the intersection of Ponga Road and Jack Paterson Road. The proposed Mill Road corridor represents a substantial infrastructure project that is likely to further delineate the landscape character of the FUZ land in the west and the Rural Countryside Living zone east of this corridor. The project has funding under the NZUP programme.

10.2.1.7.3 Drury-Ōpāheke Structure Plan

The Drury-Ōpāheke Structure Plan provides general guidance for how the FUZ land adjacent to the Project area should be developed over time. The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07-08**.

Land Use

A range of urban land uses are indicated including Mixed Housing Urban at the western extent of the proposed designation and Light Industry and Mixed Housing Suburban north and south (respectively) of the corridor, at the eastern end of the proposed designation.

Blue-Green Network

The proposed Blue-Green Network is indicated to intersect with the Project area through the Mangapū Stream floodplain in the east. A potential New Suburb Park (3 – 5ha) is also indicated at the western end of the proposed designation, adjacent to the commercial centre which is indicated directly east of the Ōpāheke North-South roundabout. However it is noted that the location of future parks is less definitive within the context or future urban development.

10.2.1.8 Viewing Context

The viewing audience for the Ponga Road section is largely mobile (i.e. vehicles travelling at 50-70km/h) east and west between the Hunua Ranges Foothills and Ōpāheke Road. Ponga Road makes up a small section of the journey and the eastern end of Ponga Road represents the transition between the FUZ areas to the west and the Mixed Rural zone to the east. Retaining some of the rural-character forming elements in this part of the local landscape (i.e. rolling topography and mature trees) would assist with creating a 'visual transition' between urban and rural zones.

Over time, the eastern Ponga Road Upgrade section will continue to serve as a transition between future urban and rural land uses, and the audience is expected to expand to include residents of future local urban development adjacent to the Ponga Road corridor.

For visitors from within the developing FUZ areas, the proposed changes are likely to register over a period of time through frequent visits and fleeting 'close up' views. However, for visitors more familiar with the local landscape (i.e. regular commuters through the corridor), the changes are likely to register more abruptly and translate to a more heightened perception of adverse visual effects during the initial phases of the construction phase.

The Ponga Road viewing context is characterised by the following:

- A relatively enclosed road corridor bordered on both sides by rural lifestyle blocks and domestic gardens including rows of mature trees and ornamental hedgerows and post and batten fences.
- Closer (backdrop) views east to the Hunua Ranges foothills through the existing road corridor.
- Coherent rural lifestyle landscape character.
- Heightened visual amenity along the existing road corridor in the east, associated with groupings and rows of mature exotic and native mature trees.

10.2.1.9 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs, HNC or ONCs) within or proximate to the proposed designation boundary. However, several SEAs are located outside of the Project area and enrich the landscape character values of the contextual setting of NoR D5. They include the SEA along the southern boundary of 101 and 109 Ponga Road and the extensive areas of

indigenous forest within the elevated Hunua Ranges foothills directly east of the designation, forming the backdrop to the local landscape.

The Mangapū Stream flood plain, although currently heavily modified represents a significant future opportunity to enhance the natural character values within the Project area and that of the future urban neighbourhood that is likely to develop south of the corridor.

10.2.1.10 Landscape Sensitivity

NoR D5 is situated within a broader landscape that has been assessed by the AUPOIP as being suitable for urbanisation. The proposed upgrade of Ponga Road forms a small yet integral section of the future urban form and on that basis the Project area is assessed to hold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Ponga Road section include:

- Mangapū Stream riparian corridor and floodplain.
- The distinct and cohesive native and exotic vegetation feature comprising venerable English Oak trees and remnant secondary stands of Kahikatea Forest.
- The semi-mature stand of regenerating native Taraire Tawa podocarp forest[39].

10.2.2 Ōpāheke Road Rural Upgrade section

10.2.2.1 Baseline Landscape Characteristics

The Project area is situated within the existing Ponga Road / Ōpāheke Road corridor and extends into adjacent land that is characterised by flat to low undulating rural lifestyle blocks.

The defining characteristics of the Project area and local landscape are summarised below:

- Rural / transitional land use, increasingly urban towards the northern extent of the corridor adjacent to Bellfield Estate.
- Open and expansive road corridor, slightly elevated overlooking low-lying pastoral land to the south.
- NIMT
- Heightened landscape amenity associated with Ōpāheke Reserve and recently upgrade sporting facilities.
- Vegetation cover comprising exotic grassland and wetlands (dominated by exotic species), brownfields, exotic shrubs and planted vegetation associated with private gardens, mature native and exotic trees within the Ōtūwairoa Stream riparian corridor and constructed wetland with native planting within Ōpāheke Reserve.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 01- 06 and 39.**

[39] Drury ecological assessment: Table 16 Vegetation types present within the Ponga Road / Ōpāheke Road arterial upgrade, categorized according to Singers *et al*. (2017).

Figure 10-7–View northwest from Ōpāheke Road towards south Papakura.

10.2.2.2 Landform and Hydrology

Ōpāheke Road travels along locally elevated land that is elevated along the northern side of the corridor and low-lying along the southern and south-west margins the road. The local landscape south of the road corridor is best described as complex low- land floodplains while the land to the north can be described as gently rolling rural lifestyle.

Ōpāheke Road crosses Ōtūwairoa Stream and several smaller (culverted) tributaries in the northwest section of the proposed designation. The Ōtūwairoa Stream floodplain is fairly extensive and heavily influences the localised pastoral landscape pattern south of the Project area, through Ōpāheke Reserve and down towards Ngakoroa Stream.

The Ōtūwairoa Stream bridge currently provides a single-lane crossing over the floodplain, in each direction with no provision for separated walking and cycling.

10.2.2.3 Landcover

The vegetative framework within and adjacent to the Project area consists primarily of exotic grassland and wetlands (dominated by exotic species), brownfields, exotic shrubs and planted vegetation associated with private gardens, mature native and exotic trees within the Ōtūwairoa Stream riparian corridor and constructed wetland with native planting within Ōpāheke Reserve.

Noteworthy vegetation contributing to the existing residential street character and borrowed landscape of the Project area includes:

- Six swamp cypress (*Taxodium distichum*) and one Japanese cedar (*Cryptomeria japonica*) growing within the road reserve outside the Public Open Space land at 165 Ōpāheke Road.
- A group of four mature English oak at 28 Ponga Road.
- An early mature rimu specimen tree at 231 Ōpāheke Road.
- Mature native trees within the riparian margin of Ōtūwairoa Stream, extending from within the Project area northeast towards Waipokapū Stream.
- Two titoki (*Alectryon excelsus*) street trees outside 122 Ōpāheke Road.

10.2.2.4 Land Use

The existing Ōpāheke Road corridor is 20m wide and zoned 'Road' under the AUPOIP. The land adjacent to the corridor is predominately rural in character with land being used for agricultural and rural residential activities as well some isolated commercial activities such as a storage facility at 211 Ōpāheke Road and a plant nursery at 122 Ōpāheke Road.

Ōpāheke Reserve is zoned Open Space – Sport and Active Recreation and has recently been upgraded with purpose built sporting facilities. It is covering a large area adjacent to the Project and comprises a substantial portion of the drainage landscape associated with Ōtūwairoa Stream.

Bellfield Estate (Ōpāheke Precinct 1) is located immediately northwest of the Ōtūwairoa Stream bridge crossing. The area is currently under development and earthworks have started on Stage 1 adjacent to Ōpāheke Road. The precinct area is expected to accommodate over 500 dwellings across 22 hectares.

The Ōpāheke Precinct 1 features an Open Space – Conservation Zone along the southern perimeter of the development parcel and along the northern perimeter of Ōtūwairoa Stream. This area has recently been planted in native riparian species, presumably as part of the conditions for land development.

10.2.2.5 Scheduled Landscape and Ecological Features

There are no scheduled landscape features within the designation boundary.

10.2.2.6 Historical and Cultural Associates

According to the archaeological assessment, historic heritage sites within and proximate to NoR D5 designation include: Ōpāheke Railway Station, US Military Camp (sites 17017 / 17016), Ōpāheke Sale Yards, Historic Villa (R12/1144) and Historic Villa (R12/1145). Field survey results are discussed further in the archaeological report. Associative values have been explored with Manu Whenua through the process of option design, development design and assessment.

10.2.2.7 Likely Future Environment

10.2.2.7.1 Overview

The majority of the land either side of the Project area is zoned FUZ and will therefore witness a significant change in land use over the coming decades from rural to urban. Over time, the urban development pattern north of the Project area will connect with the existing neighbourhoods towards the northern extent of the Project area. Ōpāheke Reserve and Bellfield Estate are unlikely to experience land use change.

Ōtūwairoa Stream and the existing mature native and exotic trees along the margins are likely to endure future development and underpin the proposed Blue-Green Network that is likely to become the focus of ecological enhancement and landscape amenity within the local area. Natural character values of the Ōtūwairoa Stream environment are anticipated to be enhanced as urban development progresses, in accordance with the policy direction of the AUPOIP which generally seeks to protect and enhance these landscape features through urban development. This can already be observed through recent planting of the Open Space – Conservation Zone along the southern perimeter of Bellfield Estate.

Conversely, it is expected that the less defining vegetative features of the Project area and local landscape will make way for new urban development, which will likely include street tree plantings, public open space design and planting within private yards.

10.2.2.7.2 Drury-Ōpāheke Structure Plan

The Drury-Ōpāheke Structure Plan provides general guidance for how the FUZ land adjacent to the Project area should be developed over time. The structure plan is illustrated in **Appendix 1.** Landscape Plans and Images: **Maps 07-08**

Land Use

The Drury-Ōpāheke Structure Plan indicates a range of urban environments either side of Ōpāheke Road. This includes Mixed Housing Urban north and south of the Project area, light industrial to in the north and a small section of Mixed Housing Urban at the northern boundary of the proposed designation.

Blue-Green Network

The proposed Blue-Green Network intersects with the Project area through the Ōtūwairoa Stream corridor. A new suburban park is also indicated at 211 Ōpāheke Road, although the location of future parks is less definitive within the context of future urban development.

10.2.2.8 Viewing Context

The viewing audience for the Ōpāheke rural section is largely mobile (i.e. vehicles travelling between 50-70km/h) east and west between the Hunua Ranges Foothills and Ōpāheke. Ōpāheke Road and Ponga Road offer the only vehicle route through the northern extent of the Drury – Ōpāheke Structure Plan area which means that the Project area is also well travelled by the resident community of the Hunua Ranges foothills.

Over time, the upgraded Ōpāheke Rural section will service the future neighbourhoods adjacent to the Ōpāheke N-S FTN Arterial and Bellfield Estate, substantially increasing the localised transient viewing audience.

For the local viewing audience, the proposed changes are likely to register within the context of recent and ongoing changes within the landscape, such as the upgrade of Ōpāheke Reserve and the ongoing development of Bellfield Estate. It can be said that existing landscape change within this section of NoR D5 is more dynamic than localised areas through the Ponga Road section.

The Ōpāheke Road viewing context is characterised by the following:

- A dynamic local landscape with existing development and a mixture of land use.
- Proximity to the established Ōpāheke neighbourhood to the north.
- Low lying and open landscape character south of the existing corridor.
- Backdrop views to the Hunua Ranges foothills.
- Heightened visual amenity on account of mature trees.
- Rolling pastoral landscape north of the existing corridor, framed by mature native and exotic trees.

10.2.2.9 Landscape Values

There are no regionally or nationally significant landscapes (ONLs, ONFs or ONCs) within or proximate to the proposed designation boundary. Ōpāheke Reserve and its proximity to Ōtūwairoa Stream contribute to the localised landscape and natural character values of the Project area.

10.2.2.10 Landscape Sensitivity

The Ōpāheke Road section is situated within a broader landscape that has been assessed through the AUPOIP as being suitable for urbanisation. The proposed upgrade of the existing road corridor and Ōtūwairoa Stream bridge is a small yet integral part of the future urban form and on that basis the Project area is assessed to fold low sensitivity to landscape change.

The landscape elements and features attributed the highest level of sensitivity within the Ōpāheke Road section are as follows:

- High value trees listed above.
- Ōtūwairoa Stream corridor, including the mature trees and recently planted conservation area.

10.2.3 Ōpāheke Road Urban Upgrade section

10.2.3.1 Baseline Landscape

Ōpāheke Road Urban is situated within the existing road corridor, within an established residential area. The southern section consists of stand-alone sections of the proposed designation, over private property so that existing driveways can be regarded to integrate with the proposed works. Private properties included within the designation include: 80, 72, 77, 66, 64, 57 and 54 Ōpāheke Road.

Existing topography though this section is generally flat and open and landscape features include typical residential elements such as boundary fencing, garden plantings and roadside vegetation (within the road reserve and private property boundaries) as well as the existing streetscape elements of the road corridor.

The northern extent of the proposed designation includes Papakura Cemetery and the adjacent intersection of Ōpāheke Road and Settlement Road. Landscape features within this section also includes typical residential elements such as boundary fencing, garden plantings and roadside vegetation (within the road reserve and private property boundaries). Papakura Cemetery is a prominent feature within the visual composition of the existing intersection. Burials feature within the lower topography of the site (at the southern boundary) and continue up towards the elevated areas of the site where they are combined with mature specimen trees, purposefully planted within the setting of the memorial landscape. There are no obstructing elements along the southern boundary of the cemetery land, adjacent to the existing footpath.

The existing land use along the Ōpāheke Road (Urban) corridor is largely established low to medium density residential with a few local shops. Papakura Cemetery is located at the intersection of Ōpāheke Road and Settlement Road.

Land north of the designation, around the Papakura train station (on the eastern side of the Project areas) has recently been rezoned through the AUPOIP and will be development as terraces housing

and apartment buildings (THAB). As such, a more compact form of urban development is anticipated to evolve within the local context of the Project area.

The existing landscape features of the Project area and surrounding landscape are illustrated in **Appendix 1**: Landscape Plans and Images: **Maps 01- 06** and **40**.

10.3 Assessment of Landscape and Visual Effects and Measures to Avoid, Remedy or Mitigate Actual or Potential Adverse Effects

10.3.1 Positive Effects

A number of positive landscape and visual effects are anticipated as a result of the operation of the Project (including proposed mitigation).

Positive effects are likely to include:

- A streetscape to match the emerging urban form within adjacent land.
- Improved and/or new opportunities for active modes of transport and the ability to provide improved connectivity to the proposed Greenways and recreational corridors anticipated by the Drury -Ōpāheke Structure Plan, Blue-Green Network.
- Net increase in green infrastructure within the Project areas associated with street trees, berm and stormwater plantings and planted stormwater wetlands, resulting in improved visual amenity for road users and adjacent audiences.
- Slower speed limits adjacent to existing dwellings and commercial activities improving on the experiential qualities of the corridor for users and well as private properties situated adjacent to the road.
- Improved connectivity with Ōpāheke Reserve.
- ‘Breathing space’ along the southern boundary of Papakura Cemetery adjacent to the proposed roundabout upgrade.

10.3.2 Ponga Road Upgrade section

10.3.2.1 Assessment of Construction Effects

10.3.2.1.1 Site Enabling Works

Construction Areas

Site compound and construction areas are proposed at 3 locations within the Project area. Construction traffic will be heightened at these locations through the construction period of the Project.

- Site compound located at CH1600, adjacent to proposed stormwater wetland 1.
- Construction area located at CH1750, adjacent to proposed stormwater wetland 2.
- Bridge construction areas, located either side of the Mangapū Stream bridge location, within the floodplain environment.

The proposed site compound and construction areas adjacent to the proposed stormwater wetlands are located within pastoral land that is already somewhat modified by existing rural land use.

The Mangapū Stream bridge construction areas are proposed north and south of the bridge crossing, within the heavily modified stream and floodplain environment. Physical landscape effects are likely to be negligible considering the degradation that is present within the stream and the hydrological improvements sought by upgrading the existing culvert to a bridge. However, the limited vegetation present (including some native riparian species) will need to be removed and construction activities are likely to impact upon the mature English Oak trees adjoining the construction areas. These trees are also impacted by the road corridor itself and those impacts are discussed further below.

It is recommended that the bridge construction areas are reinstated with grass as mitigation for the existing quality of the floodplain, however this is likely to be upgraded to riparian planting (through the regional consent process).

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **moderate-low.**

Vegetation Clearance

Broad areas of street-side vegetation are proposed to be removed to accommodate the wider road corridor and batter slopes. This includes trees and shrubs located within the road reserve and within the road-side boundaries of private properties located adjacent to the road. Exotic pasture, grassland and wetlands (dominated by exotic species), planted vegetation associated with private gardens, manicured hedgerows and mature exotic trees make up the majority of vegetation to be removed.

A number of noteworthy trees are included in the proposed vegetation removals, which includes a row of mature English Oak (*Quercus sp.*) along the south-eastern boundary 198 Ponga Road, two mature English Oak (*Quercus sp.*) and a single mature Pohutukawa tree (*Metrosideros excelsa* along the northern boundary of 215 Ponga Road, two mature English Oak (*Quercus sp.*) on the southern boundary of 126 Ponga Road and a single English Oak (*Quercus sp.*) along the northern boundary of 61 Ponga Road.

Project works are likely to be undertaken beneath the driplines of the remaining English Oak trees and along the edge of the critically endangered Pūriri Forest[40] located within the private boundaries of 101, 198 and 154 Ponga Road (respectively). Impacts on these trees have been reduced through alternatives assessment and design.

It is recommended that a designation condition is included that seeks to retain existing trees and indigenous vegetation where practicable, with specific mention of existing mature Oak trees and Puriri forest.

As the detailed design progresses and regional consents are sought, the extent and type of indigenous vegetation effected (within the margins and floodplain of Mangapū Stream) will be determined.

[40] Ecological survey, July 2020

Overall, the physical landscape effects likely to arise from vegetation clearance within the Ponga Road section is assessed as **moderate,** taking into account the quantities of trees likely to be removed and the maturity of some noteworthy trees.

10.3.2.1.2 Project Formation Works

Structures and Earthworks

The proposed Mangapū Stream bridge features retaining walls on both sides of the crossing. As discussed earlier in relation to the construction works area, the flood plain environment (albeit heavily modified) will be disturbed to make way for the new structures. Given that the stream environment is already heavily modified, the construction of retaining walls is expected to have negligible impacts on the existing stream and floodplain environment.

The proposed cut and fill slopes range in scale from very small (1m wide) to large (30m wide), and will alter the existing modified landform of the road corridor and some adjacent property boundaries. The small to moderate cut and fill slopes will be shaped to integrate into the adjacent landform and occur through most of the proposed corridor between CH 1000 at the proposed Ōpāheke North-South FTN Arterial (NoR D4) roundabout through to CH 1750 at the location of proposed wetland 2. The proposed earthworks through this section of the corridor will result in a new carriageway approximately 0.2m – 1m above existing ground level (EGL).

Larger fill slopes between CH 1750 – 2050 are required to integrate the elevated section of Ponga Road, which is expected to be raised to tie into the proposed Mill Road vertical alignment immediately to the east. The elevated corridor also serves to increase the freeboard of the new bridge above the Mangapū Stream floodplain, which is known to overtop the existing road corridor. As with the smaller fill slopes, the larger slopes will be shaped to integrate into the surrounding pastoral landform. All proposed cut and fill slopes will be absorbed into the existing modified road corridor and pastoral landscape.

It is recommended that a condition on the designation is included that encourages the re-use of topsoil from pastoral land impacted by the proposed earthworks[41].

Overall, impacts on the physical landscape to implement the proposed earthworks and structures is likely to be **moderate-low**.

Stormwater Wetlands and features

Stormwater wetlands are proposed at two locations along the Ponga Road section. The smaller of the two is proposed within the northwest boundary of 215 Ponga Road adjacent to Mangapū Stream. The larger stormwater wetland is proposed further west within the private property of 154 Ponga Road and is proposed to discharge to a minor tributary of Waipokapū Stream. The wetlands will require earthworks to re-shape the land and achieve optimal depths and edge profiles. Both wetlands are proposed within open pastoral areas, outside of existing waterways, within land that is already modified by rural land use.

[41] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

Impacts on the physical landscape to implement the proposed stormwater wetlands is considered to be **low.**

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 18 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects and are outlined in section 10.3.4 below.

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **moderate**.

10.3.2.2 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

10.3.2.3 Temporary Visual Effects

The construction of the Project is anticipated to be staged over a period of 12-18 months. Visual effects are anticipated to occur progressively through the Project area and transient viewing audiences may concurrently experience adverse visual effects from two or more of the proposed construction areas within the Project area.

It is anticipated that construction activities required to implement the Project will be generally consistent in nature and scale to road works and infrastructure activities commonly anticipated by transient viewing audiences within a main arterial corridor. Another important consideration is that landscape change by way of vegetation removal and land modification (on private rural property), albeit at a lesser scale, forms part of the expected backdrop of the rural environment.

Notwithstanding the above, some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase due to the magnitude of vegetation removal and/or earthworks proposed. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries, particularly 198 Ponga Road.

- CH1700 – 2050 where wetland 2 and the Mangapū Stream bridge are proposed and where the elevated road corridor will result in large-scale batter slopes (approximately 5m high and 30m wide). The bridge construction yard is also within this location.
- CH1500 – CH1600 where the larger wetland 1 is proposed.
- CH1380 – CH1500 where the upgraded road corridor is proposed to be elevated approximately 1m above existing road surface level and small to medium-scale batter slopes will necessitate the removal of hedgerows and mature English Oak trees.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within existing roads;
- The existing Ponga Road carriageway is already a dominant element within the visual composition of Project area;
- The construction phase is expected to last no longer than 12-18 months resulting in temporary impacts on the visual amenity of the road corridor for the transient viewing audience.

Representative viewpoint images are provided in **Appendix 6 – NoR D5** Representative Viewpoint Images. The supporting commentary for each location outlines the existing visual composition of the Project and the visual changes that have the potential to translate into adverse visual effects during the construction and operation periods.

Overall, adverse visual effects for the transient public viewing audience are likely to be **moderate-low** through the construction phase**,** taking into account those areas listed above where adverse effects are likely to be heighted during the temporary construction period.

Adverse visual effects during the construction phase are likely to be heightened for the private viewing audience directly adjacent the Project area and in particular those properties where noteworthy trees are proposed to be removed. This will include the presence of heavy machinery and the visible disturbance of both the road corridor and also individual private interface with the road. On that basis, visual effects are likely to range from **moderate-low** to **moderate** during the construction phase for private viewing audiences.

10.3.3 Assessment of Operational Effects

10.3.3.1 Natural Character Effects

Natural character forming elements, features and processes include the water body and terrestrial margins of the Mangapū Stream floodplain. As discussed earlier, this landscape feature has been heavily modified by rural land use but is connected through the hydrological corridor by the cohesive vegetation pattern consisting of remnant kahikatea forest and mature exotic trees that extends north and south beyond the Project area.

Potential effects on the natural character of the stream margins arise from landform modification and vegetation clearance associated with the bridge construction areas, retaining walls and fill slopes (subject to regional consent approvals).

As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected (within the Mangapū Stream floodplain) will be determined. It is anticipated that reinstatement and mitigation planting at the completion of works will assist with mitigating any landscape and natural character effects arising from the Mangapū Stream bridge crossing.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

On the basis of the above (allowing for future landscape mitigation of riparian areas), adverse natural character effects are likely to be **low.**

10.3.3.2 Visual Amenity Effects

Overall, there are likely to be a range of visual amenity effects on public and private viewing audiences relative to proximity to the corridor. For existing properties set back from the Project area, the visual amenity effects will be a small incremental increase in existing effects from the road corridor.

Very low residual adverse visual effects are anticipated for some private properties, where as a direct result of the Project, residents may experience some level of material change to the visual composition and residential amenity of the road corridor as perceived from private property.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading (outlined above), potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Once the Project is completed, transient public viewing audiences will continue to engage with a similar visual environment to which currently exists along the corridor, within the backdrop of an increasingly urban landscape. Visual effects, over time, are anticipated to move to the positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

On that basis, visual effects within the Project area are likely to be **low** and moving to **beneficial** for transient viewers through the operational phase of the Project. For the private viewing audience, the visual effects are likely to be **low** to **moderate-low**, reducing over an extended period of time.

10.3.3.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing Ponga Road corridor and adjacent landscape. The existing corridor is distinctively rural in character owing to the limited urban streetscape features, unstructured hedgerow and shelter belt planting and the rural lifestyle properties adjacent on both sides of the corridor. At the completion of the Project, the upgraded corridor will resemble that of an urban arterial on account of the additional vehicle lanes, active modes of transport, reduced speed limit, structured street tree plantings, integrated stormwater management and engineered roading elements that are inherently urban in aesthetic.

The Project is anticipated to operate within the context of increased urbanisation within adjacent FUZ land. For Ponga Road that is likely to include light industrial development along the north-eastern side of the road and mixed housing urban adjacent to the road within the western extent of the Project area. It is also likely to include revegetation of the Mangapū Stream flood plain as indicated by the Drury-Ōpāheke Structure Plan, Blue-Green Network. On that basis, the magnitude and nature of change to the existing landscape character within the Project area is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing and proposed Ponga Road form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor.

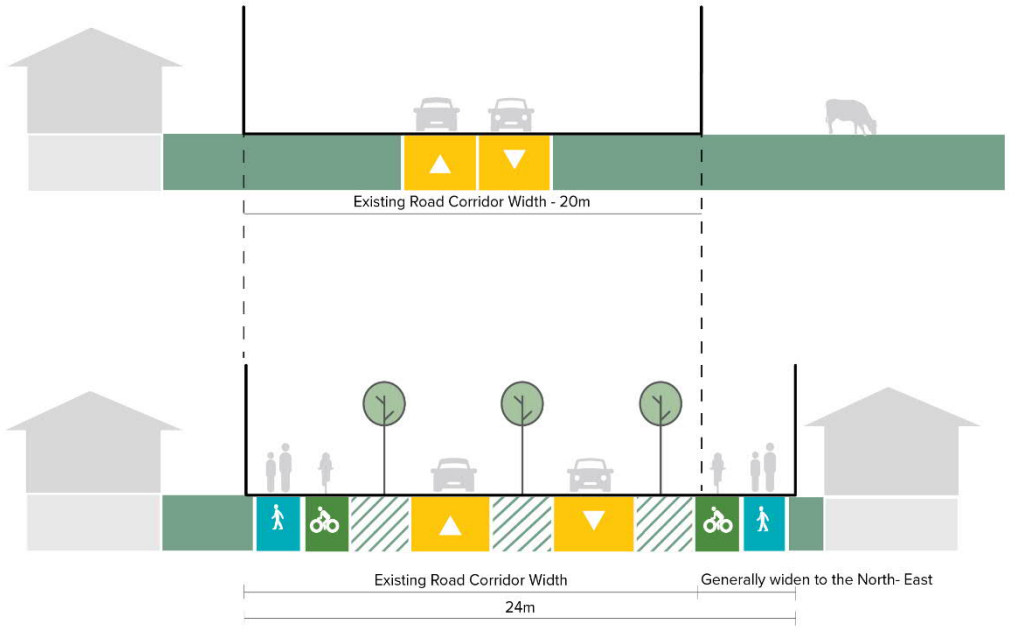


Figure 10-8 Ponga Road FTN corridor typical cross section

As outlined earlier, broad areas of street-side vegetation (including mature, noteworthy trees) are proposed to be removed through the Project works. The existing vegetation (in particular mature trees), contributes to the visual amenity of the road corridor and provides a degree of screening and privacy for properties adjacent to the road. It is noted that the proposed separated footpath and

cycleway lanes are proposed beneath the driplines therefore it might be possible to steepen the batter slopes or utilise low retaining walls in combination with localised bridging over tree roots to reduce the impacts of working beneath the drip line of the mature trees and native forest. This measure will allow the potential to retain the landscape character values afforded by some noteworthy trees within the Project area. Any native vegetation damaged or requiring removal as a result of the project works (i.e. at 154 Ponga Road) should be reinstated during the finishing works phase.

The extent of vegetation removal, although notable (in relation to mature specimen trees) is not considered to impact adversely on the cohesive landscape pattern identified through the local landscape and Project area. This landscape pattern is locally prominent and is expected to remain largely intact through future urban development.

It is recommended that a condition on the designation is included that requires new street trees be planted along the full length of the proposed Ponga Road section in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

New street tree plantings within the berms of the upgraded corridor are expected to generally compensate (from a landscape character perspective) for the loss of noteworthy trees. However it is noted that for the loss of mature trees, the mitigation timeline is typically longer (30+ years).

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **Mangapū Stream Bridge** will sit approximately 5m above the existing road surface level and influence the character and visual amenity of the road corridor and that of future urban neighbourhoods adjacent to the road corridor to the south and the industrial hub to the north. It will also signal for many road users the transition from rural (to the east) and urban (to the west). On that basis there is opportunity to design the bridge as a feature in the landscape and create a threshold experience for users as they transition between urban and rural areas.
- **Walking and cycling connectivity** - Connectivity is addressed though the vertical alignments of the Project but there are future opportunities to integrate with adjacent open space areas (existing and proposed through the Blue-Green Network). It is recommended that through the ULDMP, existing open space areas and those proposed through the Blue-Green Network be identified and connection opportunities investigated within the proposed designation. This might include connection with the Greenways network, associated with the Mangapū Stream corridor.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with the proposed

Mangapū Stream Bridge should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.

- Fill slopes, if not otherwise integrated back into the adjacent urban development parcel, are likely to read as left-over spaces and will do little to enhance the amenity of the future urban neighbourhood. There are specific locations within the SH22 corridor where it is recommended that site-specific landscape design would provide one or more of the following benefits: additional green infrastructure to the road corridor, visual and ecological integration and reduced maintenance requirements. It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:
    - CH1750 – CH2200 - batter slopes associated with the Mangapū Stream bridge and floodplain
- **Stormwater Wetlands** - Stormwater wetlands form part of the 'landscape aesthetic' and with site-specific design and planting have the potential to make a positive contribution to green infrastructure and urban amenity. Wetlands with shallow and vegetated edges will integrate as a perceived natural feature more so than deep ponds that may be required to be fenced. It is recommended that the proposed stormwater wetlands be planted with appropriate (low maintenance) native species and integrated into the surrounding urban landscape context, so that they provide a hydrological and ecological function and are safe places to visit.
- An opportunity exists for the terrestrial margins of proposed wetland 1 to integrate with the mature Oak trees along the southern boundary of 154 Ponga Road to generate localised urban amenity and so that it does not appear incongruous with the local landscape character.
- **Impacts on private property** – the Project could potentially impact on existing property features in the following ways:
    - Encroachment into some private yards, impacting on residential amenity and existing entrance way design;
    - Surface level changes between private property and the upgraded road corridor and subsequent regarding of some driveways and private accessways;
    - Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes.
- For partially affected properties, where existing dwellings are assumed to remain, it is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. Noise mitigation measures and/or retaining walls (if proposed) are recommended to integrate with private boundary fencing reinstatement and any reinstatement planting required to replace vegetation lost through the Project works (i.e. to avoid double layering of noise walls and boundary fences). These features should be designed to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, the remnant land be grassed and maintained within the road corridor to mitigate potential adverse visual amenity effects arising from un-managed residual land, until such land is reintegrated into adjacent land use. Conversely, if the land it to remain within the road reserve, then native planting is

considered a better option to permanently integrate residual land and build upon the overall green infrastructure of the upgraded road corridor

Based on the above considerations and recommended mitigation measures, adverse landscape character effects are assessed as **low**.

10.3.4 Ōpāheke Road Rural Upgrade section

10.3.4.1 Assessment of Construction Effects

10.3.4.1.1 Site Enabling Works

Construction Areas

Site compound and construction areas are to be established at three locations within the Project area. Construction traffic will be heightened at these locations through the construction period of the Project. The existing Ōpāheke Road section is proposed to be closed during the construction period.

- Site compound adjacent to proposed stormwater wetland 2 (CH2450).
- Bridge construction area either side of the proposed NIMT bridge, adjacent to Walker Road (CH2400)
- Bridge construction area either side of the proposed Ōtūwairoa Stream bridge upgrade (CH 1900).
- Construction area adjacent to the Bellfield development roundabout (CH1850).

The proposed site compound and construction areas are located within pastoral land that is already somewhat modified by existing rural land use (with the exception of the Ōtūwairoa Stream bridge construction area).

The Ōtūwairoa Stream bridge construction areas are proposed on either side of the existing bridge within the terrestrial margins of the stream environment. Mature poplar trees are present within the western side of the bridge and on the east, a plant nursery. Physical landscape effects are likely to be negligible considering the degradation that is present within the margins of the stream and the sporadic nature of existing vegetation which includes exotic shrubs and trees interspersed with very few native species (within the Project area).

It is recommended that all areas be grassed (reinstated) at the completion of the construction period. The Ōtūwairoa bridge construction areas are likely to be included within future riparian planting areas (subject to regional consent approvals).

Overall, the physical landscape effects resulting from establishment and use of the construction work areas within the Project area is assessed to be **low.**

Vegetation Clearance

Broad areas of street-side vegetation are proposed to be removed to accommodate the wider road corridor and batter slopes. This includes trees and shrubs located within the road reserve and within the road-side boundaries of private properties located adjacent to the road. Exotic pasture, grassland and wetlands (dominated by exotic species), planted vegetation associated with private gardens, manicured hedgerows and mature exotic trees make up the majority of vegetation to be removed.

Some of the noteworthy vegetation is included in the proposed vegetation removals, including the swamp cypress (*Taxodium distichum*) and one Japanese cedar (*Cryptomeria japonica*) growing within the road reserve outside the Public Open Space zoned land at 165 Ōpāheke Road. It also includes four mature English oak within the private boundary of 28 Ponga Road and several mature tree species within the private boundary of 174 Ōpāheke Road.

As the detailed design progresses and regional consents are sought, the extent and type of indigenous vegetation impacted within the margins Ōtūwairoa Stream will be determined.

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from the vegetation clearance within the Ōpāheke Road rural section is assessed as **low.**

10.3.4.1.2 Project Formation Works

Structures and Earthworks

The small to moderate cut and fill slopes between the proposed Ōpāheke North-South FTN Arterial (NoR D4) roundabout and proposed Walker Road connection will be shaped to integrate into the adjacent landform, which for the most part will occur within private pastoral land along the northern side of the existing road corridor. The proposed corridor through this section will generally maintain existing ground levels.

The Walker Road connection is proposed at CH 26500 and will extend into greenfield land to connect with Walker Road in the north. The connection is proposed within pastoral land and the physical landscape effects are likely to be negligible.

Larger fill slopes are proposed between CH 2600 and 2100 to integrate the proposed NIMT bridge crossing which will separate the road corridor above existing surface level by approximately 8m at the highest point. As with the smaller fill slopes, the larger slopes will be able to be shaped to integrate into the surrounding pastoral landform.

Two active mode bridges are proposed either side of the existing Ōtūwairoa Stream bridge crossing. The bridge will include spill through abutments with driven piles either side of the stream banks. The road corridor is proposed to narrow through the existing crossing and maintain existing ground levels at either side. As discussed above, physical landscape effects are likely to be negligible with regards to the existing condition of the stream and the sporadic nature of existing vegetation.

It is recommended that a condition on the designation is included that encourages the re-use of topsoil from pastoral land impacted by the proposed earthworks[42].

Overall, impacts on the physical landscape to implement the proposed earthworks and structures is likely to be **low**.

[42] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

Stormwater Wetlands and features

Stormwater wetlands are proposed at two locations along the Ōpāheke Road section. Wetland 1 is proposed to be integrated into the existing constructed wetland at Ōpāheke Reserve which is managed by the Council's Healthy Waters team. This will extend the size and profile of the wetland environment and provide an opportunity to increase the capacity of the existing wetland and enhance the planting typologies currently implemented within the reserve.

Proposed wetland 2 is located further east within the private property of 202 Ōpāheke Road adjacent to an unnamed tributary of Ōtūwairoa Stream which is currently culverted beneath the existing road corridor. As mentioned earlier, this general location is identified in the Blue-Green Network as a potential neighbourhood park.

Wetland 1 is located within a constructed (heavily modified) wetland environment that is not yet self-sustaining and proposed wetland 2 is proposed within modified pastoral land. On that basis, the physical landscape effects of constructing the proposed wetlands is expected to be **low**.

Private Properties

Residential properties within and adjacent to the Project area (either partially or fully designated) will be impacted by the Project in the following ways:

- Surface level changes between private property boundaries and the upgraded road corridor, requiring existing driveways and private accessways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and trees, ancillary buildings and boundary fences;
- Potential construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties)

Approximately 5 residential properties are proposed to be impacted by the project works. Landscape mitigation measures are proposed under residential character effects outlined in section 10.3.6.5 below.

Overall, it is assessed that the magnitude of physical landscape effects on private properties (partially designated) is likely to be **low**.

10.3.4.1.3 Site Finishing Works

Finishing works are expected to include grassing of exposed earth, lighting, signage, line markings, footpath/cycleway details and reinstatement of private property fences and gardens. Streetscape elements and landscaping, including that required as mitigation will also be implemented. These activities are to be determined by detailed design and will occur within the already modified areas of the Project. Physical landscape effects are expected to be negligible through this final phase of the construction process.

10.3.4.2 Temporary Visual Effects

Some vantage points within the Project area are likely to witness heightened adverse visual effects through the construction phase due to the magnitude of vegetation removal and/or earthworks proposed. These areas are outlined below:

- Private properties where physical landscape effects will occur along roadside boundaries, particularly 28 Ponga Road, 235, 216 and 122 Ōpāheke Road, and other lesser effects properties.
- CH1850 – 2100 either side of the proposed Ōtūwairoa Stream bridge upgrade and within the vicinity of the proposed construction areas.
- CH2100 in the vicinity of proposed stormwater wetland 1
- CH2200 to 2600 through the elevated section of the corridor and NIMT bridge crossing, where larger batter slopes are proposed.

The nature and significance of the potential adverse visual effects is considered to be moderated through the Project area by the following aspects:

- Road works and construction activities can generally be expected to occur within existing roads;
- The existing Ōpāheke Road carriageway and NIMT is already a dominant element within the visual composition of Project area;
- The construction phase is expected to last no longer than 2.5 years resulting in temporary impacts on the visual amenity of the road corridor for the transient viewing audience.

Representative viewpoint images are provided in **Appendix 6** – NoR D5 Representative Viewpoint Images. The supporting commentary for each location outlines the existing visual composition of the Project and the visual changes that have the potential to translate into adverse visual effects during the construction and operation periods.

Overall, adverse visual effects for the transient public viewing audience are likely to be **low** through the construction phase**,** taking into account those areas listed above where adverse effects are likely to be heighted during the temporary construction period.

Adverse visual effects during the estimated 2.5-year construction phase are likely to be heightened for the relatively small private viewing audience directly adjacent the Project area on the basis of more direct and prolonged engagement with the construction activities of the Project. Visual effects are likely to be **moderate-low** during the construction phase for small private viewing audience.

10.3.5 Assessment of Operational Effects

10.3.5.1 Natural Character Effects

Natural character forming elements, features and processes include the water body and terrestrial margins of the Ōtūwairoa Stream. As discussed earlier, this landscape feature has been heavily modified by rural land use and native species are limited within the margins of the stream, within the Project area.

Potential effects on natural character arise from landform modification and vegetation clearance associated with the bridge construction areas, retaining walls and fill slopes (subject to regional consent approvals). As the detailed design progresses and regional consents are sought, the full extent and type of indigenous vegetation affected (within the Ōtūwairoa Stream environment) will be determined. It is anticipated that reinstatement and mitigation planting at the completion of works will

assist with mitigating any landscape and natural character effects arising from the proposed bridge construction.

A planting plan is recommended under the ULDMP which will be developed as part of the detailed design of the Project. It is recommended that any planting proposed as mitigation through the regional consents process is integrated with the planting plan as recommended through this assessment under the ULDMP. This will ensure that natural character values are preserved as an outcome of the Project.

On the basis of the above (allowing for future landscape mitigation of riparian areas), adverse natural character effects are likely to be **low.**

10.3.5.2 Visual Amenity Effects

The NIMT bridge crossing, although of considerable height in relation to the existing road surface levels, is expected to be visually absorbed into the emerging urban neighbourhood that will develop adjacent to it. Given the proposed Drury-Ōpāheke Structure plan zoning, future urban form is likely to include 2-3 story town housing and apartment buildings.

For some properties directly adjacent to the Project area (from which land is required), visual amenity and residential character effects will be heightened as a direct result of the construction impacts including driveway regrading, potential loss of yard space and by the greater proximity of the carriageway and footpaths/cycleways to private dwellings. It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting the property. These mitigation measures should be considered within the ULDMP under the lens of neighbourhood character and as such are discussed further in the following section.

Once the Project is completed, transient public viewing audiences will continue to engage with a similar visual environment to which currently exists along the road corridor, within the backdrop of an increasingly urban landscape. Visual effects, over time, are anticipated to move to the positive for the public viewing audience, based on improved visual amenity and appeal for users associated with streetscape design, maturing street trees and berm plantings and accessibility to active modes of transport.

Overall, visual effects are anticipated to be mitigated by measures implemented during the finishing phase of the construction period (within the road corridor and private property boundaries), that will mature through the operational phase of the Project to adequately reduce any potential long-term residual visual effects of the Project.

Based on the above, visual effects within the Project area are likely to be **low** and moving to **beneficial** for transient viewers. For the private viewing audience, the visual effects are likely to be **low**, reducing over an extended period of time.

10.3.5.3 Landscape Character Effects

The principal elements of the Project will permanently alter the character of the existing Ōpāheke Road corridor and adjacent landscape. Although much of the local landscape can be described as rural, the Projects proximity to the established neighbourhood of Ōpāheke, mix of land uses (including large sporting complex) and development at Bellfield Estate results in a character more akin to a peri urban landscape.

At the completion of the Project, the upgraded corridor will resemble that of an urban arterial road on account of the additional vehicle lanes, active modes of transport, reduced speed limit, structured street tree plantings, integrated stormwater management and an improved landscape amenity within the corridor itself. With urban development underway at Bellfield Estate and more to follow within the FUZ land, the magnitude and nature of change to the existing landscape character within the Project area is considered to accord with that which will occur throughout the localised landscape over time.

The comparative cross section below illustrates the existing and proposed Ōpāheke Road corridor form and function within the context of emerging urban form, adjacent to the road corridor. Although indicative, it also indicates the available space within the road corridor for green infrastructure elements such as street trees and berms where low impact stormwater devices and associated planting can be accommodated. These features are expected to improve landscape and urban amenity within the corridor

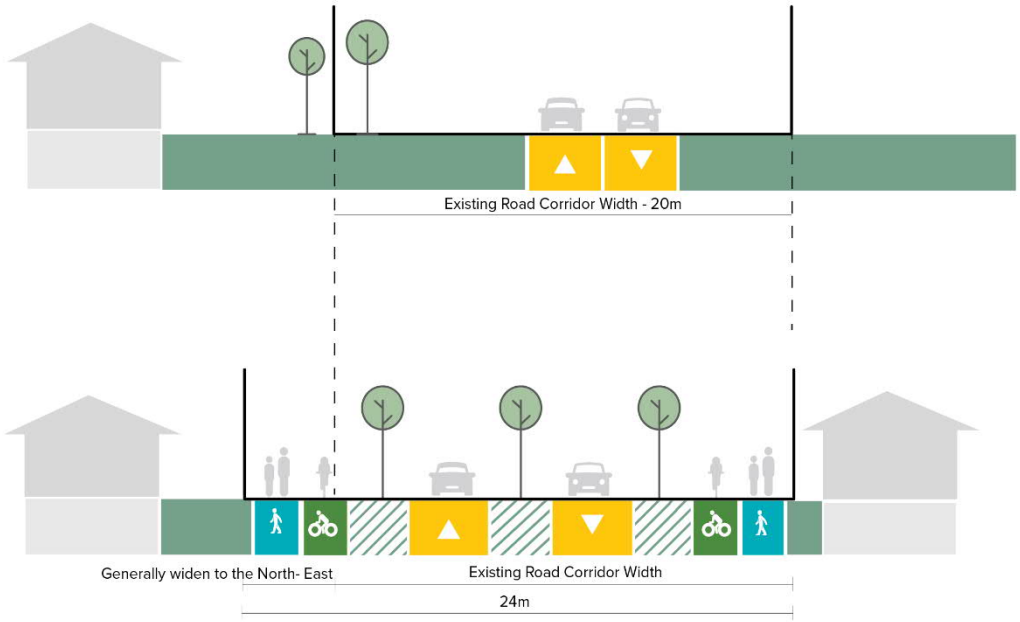


Figure 10-9 Ōpāheke Road (Rural) corridor typical cross section

As outlined earlier, broad areas of street-side vegetation (within private property), including some noteworthy trees are proposed to be removed through the Project works. While most of this vegetation is not considered significant on an individual basis, collectively it contributes to the visual amenity of the road corridor and provides a degree of screening and privacy for properties adjacent to the road. Therefore, it is recommended (as a matter for detailed design) that the footpaths and cycleways within these localised areas be refined to either avoid or integrate noteworthy trees within the berm (if practicable). This measure is included within the condition for construction effects and will provide the opportunity to retain the landscape character values afforded by some noteworthy trees within the Project area.

It is recommended that a condition on the designation is included that requires new street trees to be planted along the full length of the proposed Ōpāheke Road Rural corridor in conjunction with shrubs and ground cover species appropriate within stormwater treatment areas and berms. Species should be selected to integrate with adjacent land use and ecological context (particularly where the corridor

intersects with the proposed Blue-Green network and where ecological values have been identified). Tree stature and growth rates will be a relevant consideration in achieving contextual integration, alongside the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy.

It is assessed that new street tree plantings, in conjunction with stormwater management and berm plantings, will generally mitigate the landscape character effects associated with broad vegetation clearance within the Project area

There are a number of interrelated landscape and urban design issues to be considered when assessing potential landscape character effects of a transport corridor Project within a future urban environment. The following issues are also addressed through the Urban Design Framework for the Project and from a landscape perspective are expressed through the consideration of neighbourhood character, urban amenity and sense of place. Accordingly, specific landscape and urban design interventions such as furniture, lighting, signage and materials will be developed through the proposed ULDMP. In terms of mitigating potential landscape character effects, the following aspects have been considered and are recommended for specific design resolution through the ULDMP.

- **The NIMT Bridge** will be elevated approximately 8m above existing road surface level and will influence the character and visual amenity of the road corridor and that of the adjacent future urban neighbourhoods as well as views from Ōpāheke Reserve. On that basis, the new bridge should be designed to visually integrate into the landscape context and contribute to the sense of place. This will involve relating the structure to the character and scale of surrounding future urban form and proposed landscape treatments.
- **The Ōtūwairoa Stream bridge** is situated within a key landscape and ecological corridor, i.e. directly adjacent to the Ōtūwairoa Stream Open Space – Conservation Zone and within the proposed Blue-Green Network. Given its key location, the footpath and cycleway connections should be designed in a manner that contributes to the local identity and urban amenity of the landscape.
- **Walking and cycling connectivity** - It is recommended that through the ULDMP, that existing open space areas and those identified through the Blue-Green Network be identified and connection opportunities investigated within the proposed designation. These areas will include the Auckland Council Greenways crossing that is intended to link the Boundary Road reserve area in the north through to the Ngakoroa Stream environment in the south, via the Project area and adjacent Ōpāheke Reserve. The Greenway alignment is indicative and will be developed by local boards in the future. However, there is a strong link to the Ōtūwairoa Stream corridor and a crossing is likely to be required over Ōpāheke Road to link into the northern end of Ōpāheke Reserve, through the drainage landscape.
- **Integration of fill slopes –** it is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with the proposed Ōtūwairoa Stream bridge crossing should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
- There are specific locations within the Ōpāheke Road corridor where it is recommended that site-specific landscape design would provide one or more of the following benefits: additional green infrastructure to the road corridor, visual and ecological integration and reduced maintenance requirements. It is recommended as a matter for the ULDMP that the following areas (where fill slopes are proposed) be assessed against adjacent land use and integrated through specific landscape treatment:

- CH1800-CH1900 in the vicinity of the proposed roundabout
- CH2200 – CH2550 - large batter slopes associated with the NIMT bridge crossing. These fill slopes are unlikely to be absorbed into buildable areas due to their proposed gradient and height, not to mention proximity to the rail line itself. Given that they will be visually prominent within the local setting it is proposed that they be planted in native shrubs (known to thrive on steep exposed slopes).
- It is proposed that planting for proposed wetland 2 integrate with the batter slope planting along the northern side of the bridge approach (CH2450-2550). As mentioned earlier, this general area is indicated by the proposed Blue-Green Network as a potential new neighbourhood park and the opportunity exists to design the batter slopes and stormwater as a landscape feature within the vicinity of the potential park.

- Stormwater Wetlands - Stormwater wetlands form part of the 'landscape aesthetic' and with site-specific design and planting have the potential to make a positive contribution to green infrastructure and urban amenity. Wetlands with shallow and vegetated edges will integrate as a perceived natural feature more so than deep ponds that may be required to be fenced. It is recommended that the proposed stormwater wetlands be planted with appropriate (low maintenance) native species and integrated into the surrounding urban landscape context, so that they provide a hydrological and ecological function and are safe places to visit.
- The proposed Blue-Green Network – as expressed through the Urban Design Framework – Urban Design Review, the proposed Ōpāheke Road rural corridor is capable of responding to natural landscape identify drivers. This might feasibly include integration of the proposed Blue-Green Network - where it intersects with the Project area – and involve specific plant species selection (terrestrial and riparian) within the Project area to reinforce the wider vegetation patterns of the local landscape, and creating connections to proposed Greenways, as outlined above under walking and cycling connectivity.

Based on the above considerations, adverse landscape character effects are assessed as **low,** with general mitigation measures included in the Project works.

10.3.6 Ōpāheke Road Urban Upgrade section

10.3.6.1 Assessment of Construction Effects

Vegetation Clearance

Localised vegetation clearance in private property may occur as a result of construction activities required to regrade existing driveways along the existing Ōpāheke Road corridor. Construction activities are likely to only impact individual trees through the southern extent of the Project area, while a cluster of roadside trees will be impacted along the southern side of the proposed Ōpāheke / Settlement Road roundabout.

Vegetation within Papakura Cemetery grounds will not be impacted.

Small fill slopes are proposed along the south-eastern side of the new roundabout which (along with the road surface) will encroach into private property.

Low retaining walls are proposed at separated intervals along the road corridor to reduce impacts on adjacent properties.

Papakura cemetery will not be impacted by proposed earthworks, with the exception of the low retaining wall proposed along the eastern boundary of the grounds.

It is recommended that a condition on the designation is included that limits the removal of noteworthy trees and indigenous vegetation (where practicable).

Overall, the physical landscape effects likely to arise from the Project are likely to be **very low.**

Temporary Visual Effects

The project work areas each have a limited receiving audience, with proposed works assumed to take place within the context of the adjoining sections of the road upgrade. As such, visual effects for private landowners is anticipated to be **low**. Representative viewpoint images are provided in **Appendix 6** – NoR D5 – Representative Viewpoint Images.

10.3.6.2 Assessment of Operational Effects

The key features of the Ōpāheke Road Urban Upgrade section include:

- Upgrade of the Ōpāheke Road / Settlement Road intersection to a roundabout to provide for separated walking and cycling facilities, including crossing facilities.
- Re-grading of nine driveways along the existing Ōpāheke Road corridor.
- A comparative cross section of the proposed works is provided below .

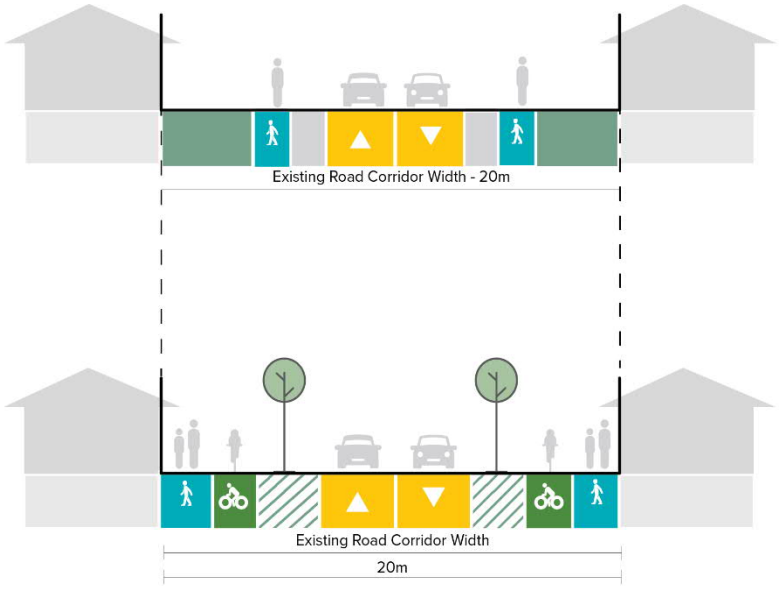


Figure 10-10 Ōpāheke Road (Urban) corridor typical cross section

It is recommended that boundary fences and garden plantings (removed through the Project works) be reinstated on completion of the works affecting private properties.

It is recommended that new street trees be planted within the berms of the new roundabout. Tree stature and growth rates will be a relevant consideration in achieving contextual integration. New street tree plantings (alongside any other vegetation within the berm) will mitigate the landscape

character effects associated with the removal of existing trees within the southern extent of the roundabout.

For affected properties (from which land is required), visual amenity and residential character will remain the same, with any heightened effects resulting from new driveway regrade integration and the potential loss of garden plantings (removed through the Project works) reinstated on completion of the works affecting the property.

It is recommended that the residual land created along the southern boundary of Papakura Cemetery (within the existing road corridor) be designed to integrate with the cemetery grounds in a way that enhances the landscape amenity of the memorial landscape.

Public viewing audiences will continue to engage with a similar transport environment, with overall improvements associated with accessibility to active modes of transport.

Overall, landscape character and visual amenity effects are assessed as **very low** and **low** (respectively) for the Ōpāheke Road Urban section.

10.3.7 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The mitigation measures for all activities and built elements during construction are outlined below. An Urban and Landscape and Design Management Plan (ULDMP) is recommended as a condition on the designation which should include the following matters:

- Site compounds and construction yards: reinstate construction and site compound areas by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.
- It is recommended (where practicable) to limit the removal and/or disturbance on the remaining mature Oak trees and Puriri forest and limit the removal of noteworthy trees and indigenous vegetation in general.
- Wherever possible, re-use topsoil from existing pastoral land (within the Project area), impacted by the proposed earthworks[43].

10.3.8 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principal elements of the Project that are likely to give rise to permanent adverse effects on landscape character, natural character and visual amenity. It is recommended that a ULDMP is a condition on the proposed designation which should include the following measures to mitigate landscape and visual effects.

There is clear guidance around the approach for built structures and landscape design and planting for transport projects within the Bridging the Gap: NZTA Urban Design Guidelines (2013). The

[43] Refer to NZTA Landscape Guidelines (September 2014), Section 4.12 Topsoil for additional information regarding best practice guidelines for topsoil management and soil stripping.

following matters to be included within the ULDMP should demonstrate consistency with these design guidelines.

1. **Mangapū Stream Bridge:** to be designed in a manner that contributes to the local identify and urban amenity of the landscape and aligned with Mana Whenua preferred design principles, noting the opportunity to design the bridge as a feature in the landscape and create a threshold experience for users as they transition between urban and rural areas.
2. **The NIMT Bridge** will be elevated approximately 8m above existing road surface level and will influence the character and visual amenity of the road corridor and that of the adjacent future urban neighbourhoods as well as views from Ōpāheke Reserve. On that basis, the new bridge should be designed to visually integrate into the landscape context and contribute to the sense of place, and aligned with Mana Whenua preferred design principles. This will involve relating the structure to the character and scale of surrounding future urban form and proposed landscape treatments.
3. **The Ōtūwairoa Stream bridge** is situated within a key landscape and ecological corridor, i.e. directly adjacent to the Ōtūwairoa Stream Open Space – Conservation Zone and within the proposed Blue-Green Network. Given its key location, the footpath and cycleway connections should be designed in a manner that contributes to the local identity and urban amenity of the landscape, and aligned with Mana Whenua preferred design principles.
4. **Walking and cycling connectivity:** investigate opportunities within the proposed designation to integrate with existing open space areas and those identified through the Blue-Green Network. These areas will include the Auckland Council Greenways crossing that is intended to link the Boundary Road reserve area in the north through to the Ngakoroa Stream environment in the south, via the Project area and adjacent Ōpāheke Reserve.
5. **Stormwater wetlands:** configure stormwater wetlands to a natural appearance, conforming to landform and future urban context. Plant with appropriate indigenous plant species for long term sustainability, maintenance and hydrological and ecological function.
6. **Permanent earthworks** – shape all fill slopes to a natural profile and integrate into the surrounding natural landform. Fill slopes associated with the proposed Ngakoroa Bridge should be shaped to a suitable gradient to allow terrestrial and riparian planting to be established.
7. **Private properties** – reinstate driveways, accessways, private fences and garden plantings for existing remaining properties temporarily affected by Project works. Design elements to minimise visual amenity effects on residents, integrate with the layout and design of outdoor living spaces and in consideration of streetscape character.
8. **Planting design details:** landscape design and planting design details should be prepared for the Project that demonstrate (but are not limited to) the following:
    a. Street trees along the full length of the Project areas in conjunction with shrubs and ground cover species appropriate for the use within stormwater treatment areas and berms. Species and tree stature should be selected to correspond with adjacent land use and blue-green areas, in accordance with the 9 key principles outlined in the Auckland's Urban Ngahere (Forest) Strategy,
    b. Reinstatement planting within private property boundaries.

c. Treatment of fill slopes and residual land, to integrate with adjacent land use and areas where the Project intersects with the proposed Blue-Green Network.

d. Stormwater wetland design and planting.

e. Integration of Mana Whenua preferred design principles in relation to planting, structures and hard landscape elements.

f. Site preparation, implementation and maintenance requirements for all planting typologies.

The proposed mitigation measures should where practicable be integrated with any revegetation requirements of future regional consent processes. Opportunities for integration of landscape mitigation works with the proposed Blue-Green Network, indicated by the Drury – Ōpāheke Structure Plan should also be considered. Future resource consent considerations, outlined in Section 11, should also be considered in preparing the ULDMP.

Ponga Road - **Appendix 1**. Landscape Plans and Images: **Maps 44-42** which illustrate the general location of the mitigation measures.

Ōpāheke Road Rural - **Appendix 1**. Landscape Plans and Images: **Maps 43-44** which illustrate the general location of recommended mitigation measures.

Ōpāheke Road Urban - **Appendix 1**. Landscape Plans and Images: **Maps 45-46** which illustrate the general location of recommended mitigation measures.

10.3.9 Conclusions

This landscape, natural character and visual assessment finds that the proposed features and scale of the Project are able to be integrated into the existing landscape, with the landscape mitigation measures proposed in this report (implemented through an ULDMP) adequate to remedy the potential adverse effects arising from the Project.

FUZ development areas on adjacent land will overtime substantially change the scale and character of the adjacent landscape as experienced from within the road, and will absorb the landscape and visual changes proposed within the Project.

The following tables provides a summary of the potential landscape character, natural character and visual effects of the construction and operational phases of the Project, with the mitigation measures implemented as recommended in this report

Table 10-1 – Ponga Road Summary of Landscape Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation **(with mitigation implemented)**
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low to moderate** **Moderate** for affected private properties.	N/A
Temporary Visual Effects	**Moderate-low** **Moderate-low to moderate** for private viewing audiences	N/A
Effects on Natural Character Values	N/A	**Low**
Effects on Visual Amenity	N/A	**Low** (moving to beneficial overtime) **Moderate-low to low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character	N/A	**Low**

Table 10-2 - Ōpāheke Road Rural Section - Summary of Landscape Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Low** **Low** for affected private properties.	
Temporary Visual Effects	**Low** for public viewing audiences **Moderate-low** for private viewing audiences	
Effects on Natural Character Values		**Low**
Effects on Visual Amenity		**Low** (moving to beneficial overtime) **Low** private viewing audiences (reducing over an extended period of time).
Effects on Landscape Character		**Low**

Table 10-3 - Ōpāheke Road Urban Section - Summary of Landscape Effects

	Temporary Effects – Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects (site enabling works, project formation works and finishing works)	**Very low** (including for affected private properties).	
Temporary Visual Effects	**Low** for public and private viewing audiences	
Effects on Natural Character Values		**N/A**
Effects on Visual Amenity		**Low** (moving to beneficial overtime for private and public viewing audiences)
Effects on Landscape Character		**Very low**

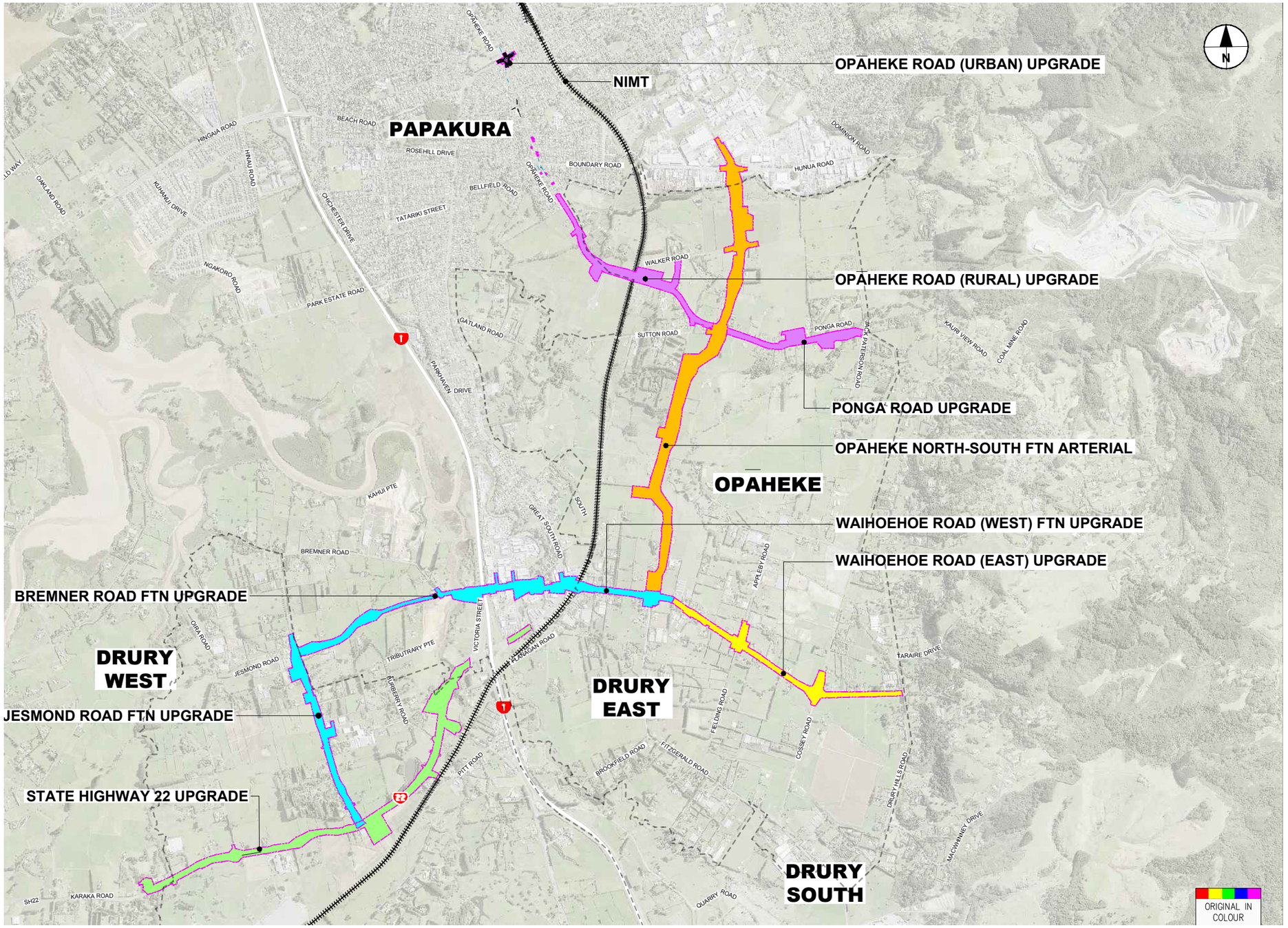
11 Future Resource Consent Considerations

There is significant opportunity to enhance the landscape character, natural character and visual amenity of the Project area, specifically where the Project intersects with the proposed Blue-Green Network.

The following landscape opportunities are recommended for consideration in future regional consent processes

- Integrate and connect mitigation planting (within the Project areas) with the proposed Blue-Green Network (refer Appendix 1. Landscape Plans and Images; Map 06).
- Include landscape and urban design elements within these areas (way finding, furniture, walkway surface treatments) to signal connections to walking / cycling tracks and proposed greenways.
- Expand riparian and wetland mitigation planting beneath all proposed bridges to include a greater extent of wetland and riparian margin to preserve and enhance the natural character values of waterbodies.
- Ngakoroa River (CMA). Improve the natural character values of the Ngakoroa Stream by extending mitigation planting to include enrichment planting along broad sections of the Project area.
- For the Ponga Road section – Integrate the proposed stormwater wetland design with ‘parkland character’ of Oak Trees. Integrate the margins of proposed wetland 1 to integrate with the remaining mature Oak trees along the southern boundary of 154 Ponga Road to generate localised urban amenity and so that it does not appear incongruous with the local landscape character.
- Landscape mitigation proposals for water wetland and riparian planting (within all projects) design should ‘design-in’ opportunities for habitat improvement.
- Consider riparian enhancement planting at the culvert outlets to connect with the proposed Blue-Green Network.

Appendix 1. Landscape Plans and Images



LEGEND

Drury-Ōpāheke Structure Plan Boundary

TE TUPU NGĀTAHI Supporting Growth

AT

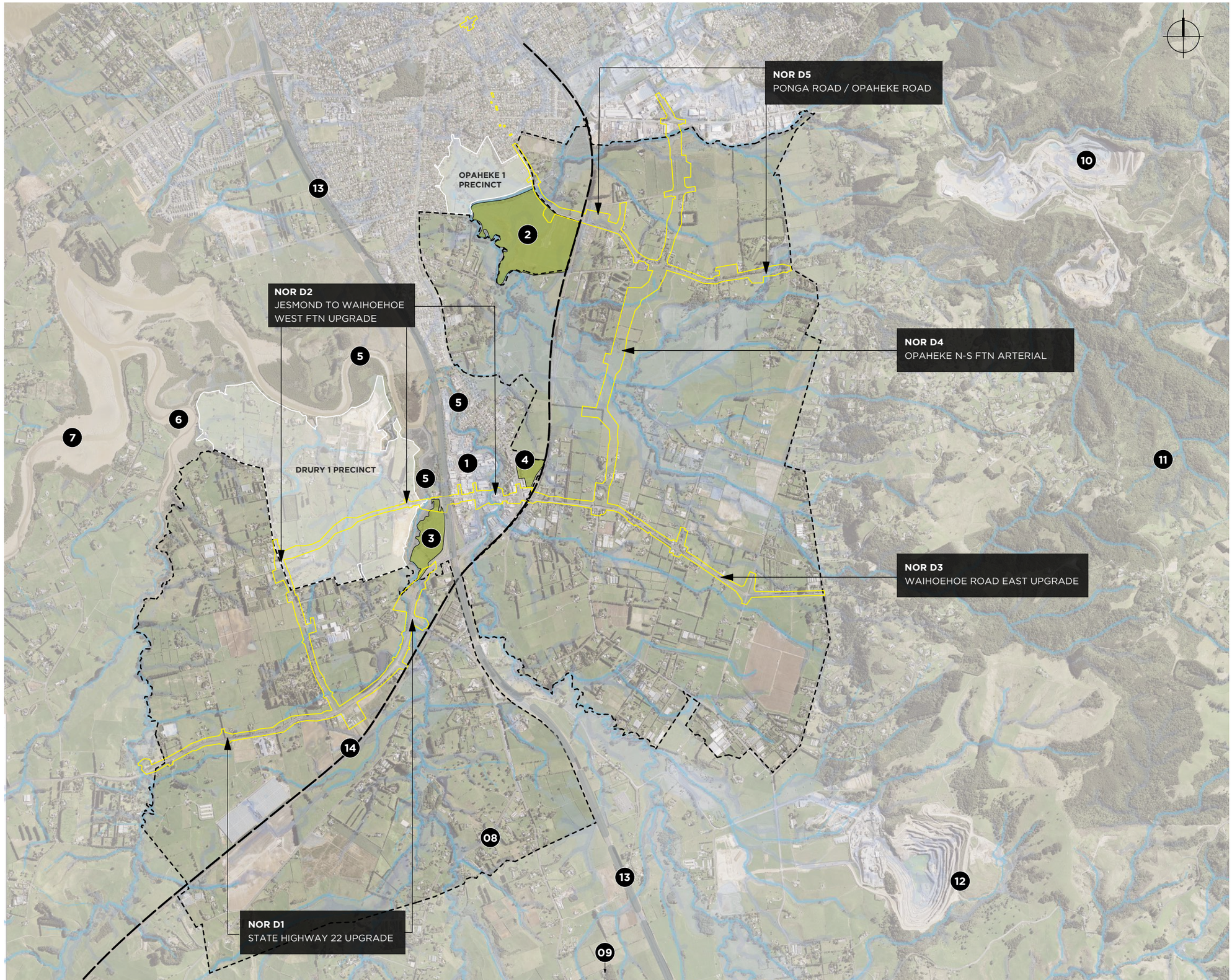
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

NoR Key Plan

Drury-Ōpāheke area

01



LEGEND

- Drury-Ōpāheke Structure Plan Boundary
- Drury Arterial Network - Proposed Designation Boundaries
- Existing Open Space
- Streams - Overland Flow Paths - Floodplains
  AUPOIP GIS Portal

01 - Drury Village

02 - Opaheke Reserve

03 - Drury Sports Complex

04 - Drury Domain

05 - Ngakoroa Stream

06 - Oira Creek

07 - Whangapouri Creek

08 - Runciman

09 - Ramarama

10 - Winstone Aggregate Hunua Quarry

11 - Hunua Ranges

12 - Stevenson Drury Quarry

13 - State Highway 1 (SH1)

14 - North Island Main Trunk (NIMT)

TE TUPU NGĀTAHI Supporting Growth

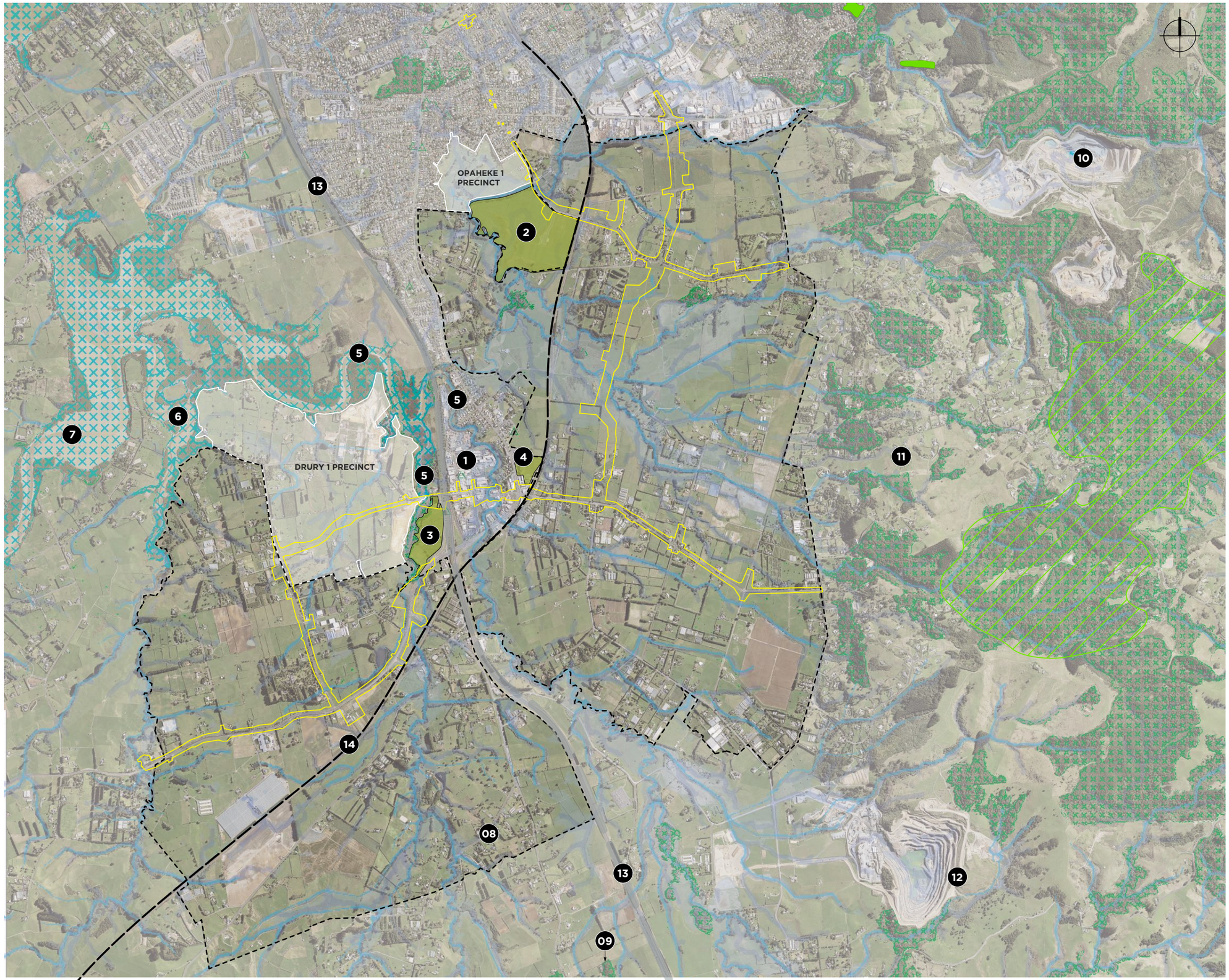
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Contextual Aerial

Drury-Ōpāheke area

02



LEGEND

- Drury-Ōpāheke Structure Plan Boundary
- Drury Arterial Network - Proposed Designation Boundaries
- Existing Open Space
- Streams - Overland Flow Paths - Floodplains
  AUPOIP GIS Portal
- Terrestrial SEAs
- Marine SEAs
- Outstanding Natural Landscape (ONL)
- Outstanding Natural Features (ONF)

01 - Drury Village

02 - Opaheke Reserve

03 - Drury Sports Complex

04 - Drury Domain

05 - Ngakoroa Stream

06 - Oira Creek

07 - Whangapouri Creek

08 - Runciman

09 - Ramarama

10 - Winstone Aggregate Hunua Quarry

11 - Hunua Ranges

12 - Stevenson Drury Quarry

13 - State Highway 1 (SH1)

14 - North Island Main Trunk (NIMT)

TE TUPU NGĀTAHI Supporting Growth

AT

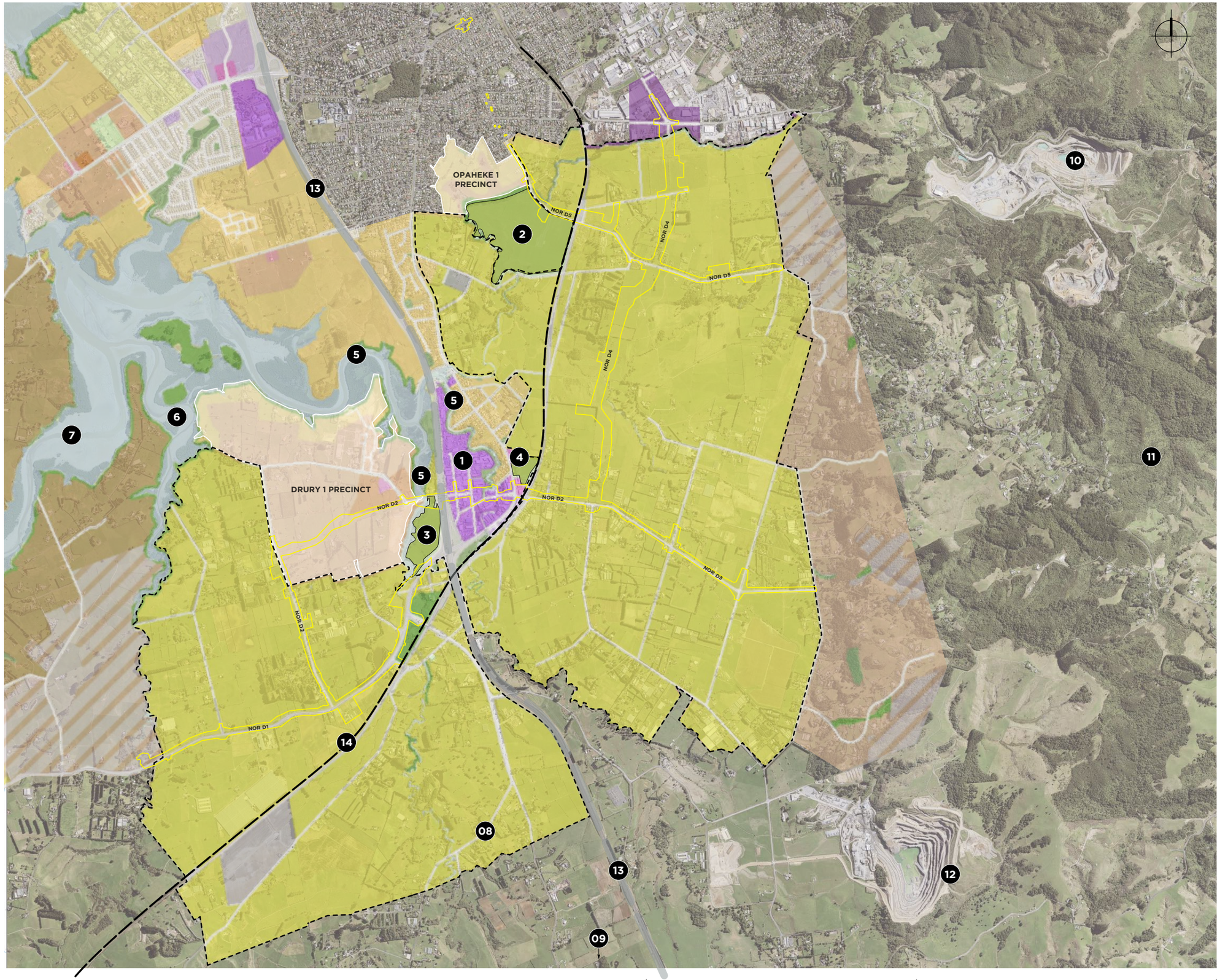
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Features

Drury-Ōpāheke area

03



LEGEND

- Drury-Ōpāheke Structure Plan Boundary
- Drury Arterial Network - Proposed Designation Boundaries
- Existing Open Space
- Future Urban Zone (FUZ) AUPOIP GIS Portal

01 - Drury Village

02 - Opaheke Reserve

03 - Drury Sports Complex

04 - Drury Domain

05 - Ngakoroa Stream

06 - Oira Creek

07 - Whangapouri Creek

08 - Runciman

09 - Ramarama

10 - Winstone Aggregate Hunua Quarry

11 - Hunua Ranges

12 - Stevenson Drury Quarry

13 - State Highway 1 (SH1)

14 - North Island Main Trunk (NIMT)

TE TUPU NGĀTAHI Supporting Growth

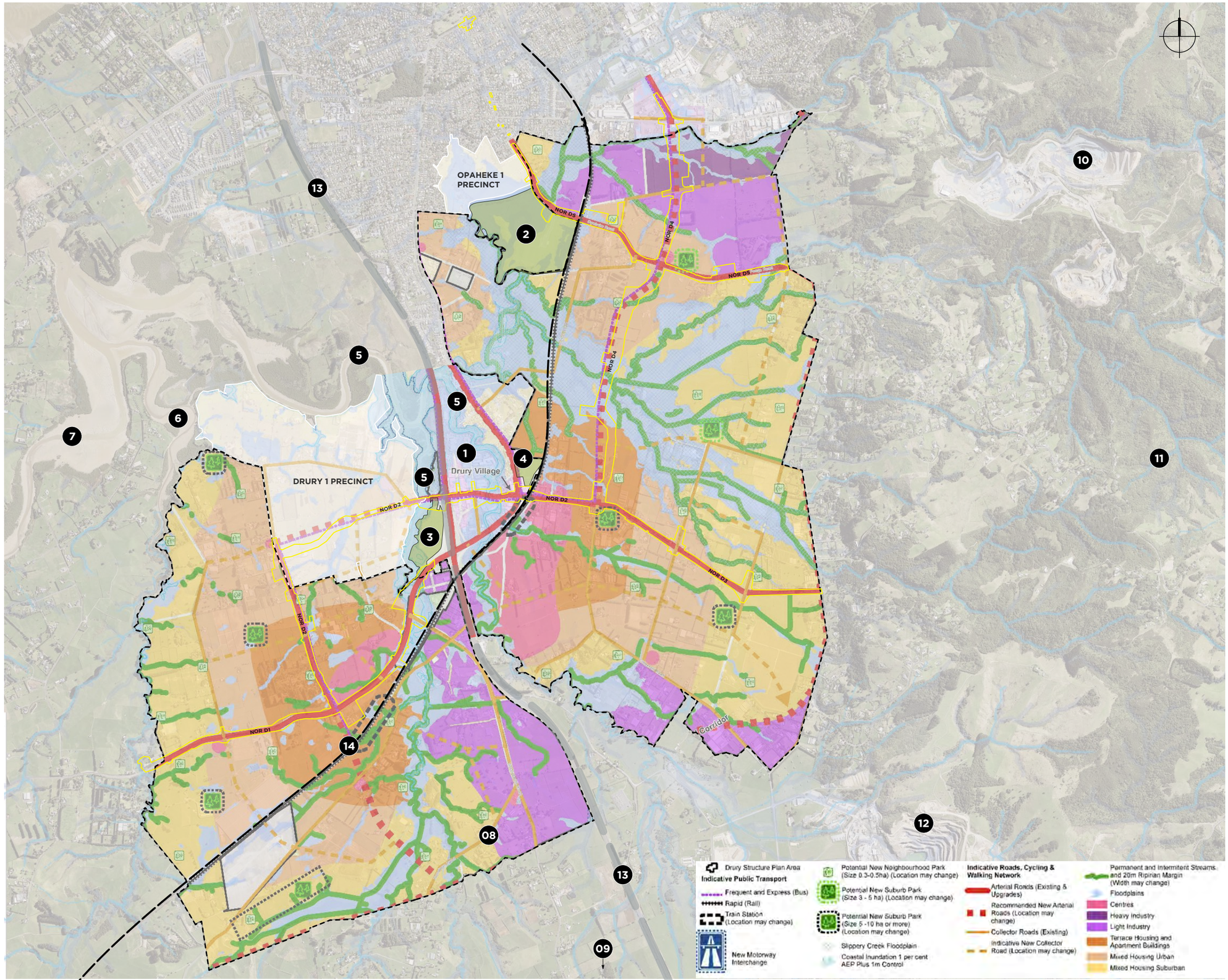
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

AUPOIP Zones

Drury-Ōpāheke area

04



LEGEND

- Drury-Ōpāheke Structure Plan Boundary
- Drury Arterial Network - Proposed Designation Boundaries
- Existing Open Space

01 - Drury Village

02 - Opaheke Reserve

03 - Drury Sports Complex

04 - Drury Domain

05 - Ngakoroa Stream

06 - Oira Creek

07 - Whangapouri Creek

08 - Runciman

09 - Ramarama

10 - Winstone Aggregate Hunua Quarry

11 - Hunua Ranges

12 - Stevenson Drury Quarry

13 - State Highway 1 (SH1)

14 - North Island Main Trunk (NIMT)

TE TUPU NGĀTAHI Supporting Growth

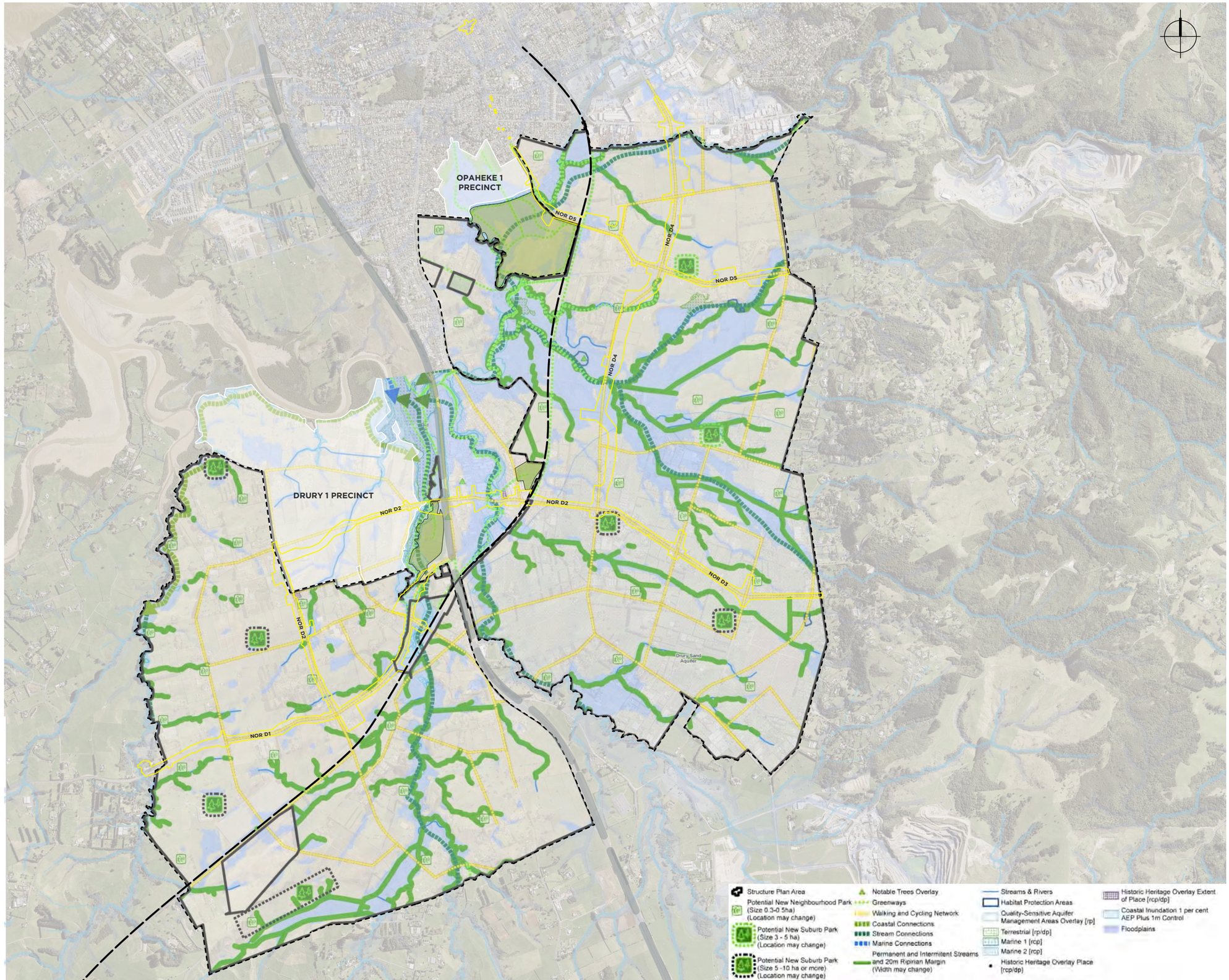
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Drury-Ōpāheke Structure Plan

Drury-Ōpāheke area

05



LEGEND

- Drury-Ōpāheke Structure Plan Boundary
- Drury Arterial Network - Proposed Designation Boundaries
- Existing Open Space

01 - Drury Village

02 - Opaheke Reserve

03 - Drury Sports Complex

04 - Drury Domain

05 - Ngakoroa Stream

06 - Oira Creek

07 - Whangapouri Creek

08 - Runciman

09 - Ramarama

10 - Winstone Aggregate Hunua Quarry

11 - Hunua Ranges

12 - Stevenson Drury Quarry

13 - State Highway 1 (SH1)

14 - North Island Main Trunk (NIMT)

TE TUPU NGĀTAHI Supporting Growth

AT

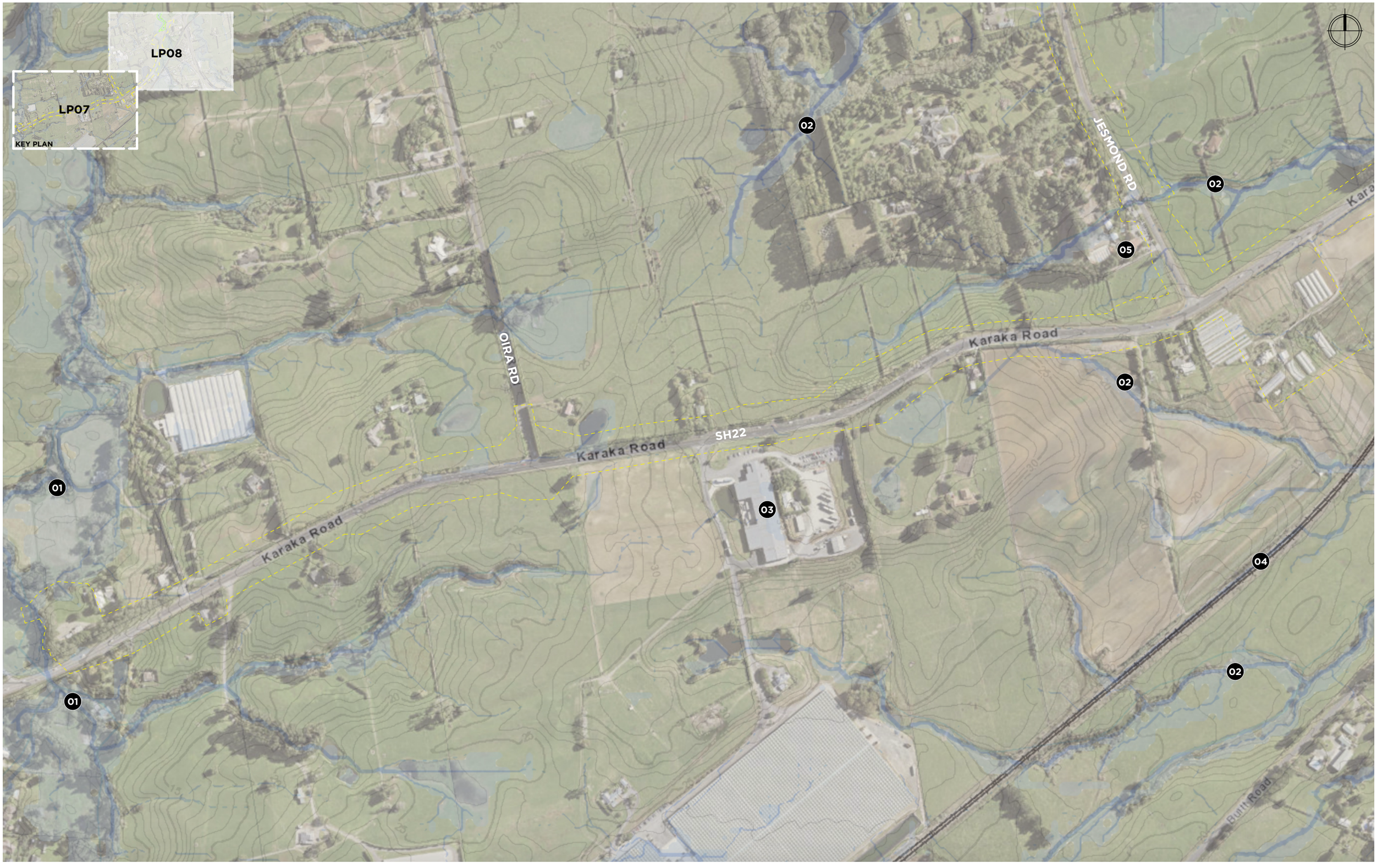
WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:30,000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Drury-Ōpāheke Blue-Green Network

Drury-Ōpāheke area

06



TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	OIRA CREEK
02	NGAKAROA STREAM TRIBUTARIES
03	KPH TRANSPORT / NZ HOT HOUSE
04	NORTH ISLAND MAIN TRUNK (NIMT)
05	RED SHED PALAZZO

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D1 - SH22 Upgrade - Southern Section

07

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	NGAKAROA STREAM
02	NGAKAROA STREAM BRIDGE
03	HINGAIA STREAM
04	NORTH ISLAND MAIN TRUNK (NIMT)
05	GOLDEN HOMES DRURY

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D1 - SH22 Upgrade - Northern Section

08

GREAT SOUTH ROAD ON RAMP

GREAT SOUTH ROAD

VICTORIA STREET

MERCER STREET

1400

1500

1600

1700

1800

1900

2000

EXISTING SH1 DESIGNATION 6706

DRURY SPORTS COMPLEX

NoR D1

EXISTING SH22 DESIGNATION 6707

GREAT SOUTH ROAD TIE-IN WITH

TIE-IN WITH GREAT SOUTH ROAD

FILL SLOPES - plant/integrate with adjacent Ngakoroa Reserve. Consider walking and cycling connectivity

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

SITE COMPOUND

02 NGAKOROA RESERVE

EXISTING SH22 DESIGNATION

NoR D1

NGAKOROA STREAM

KARAKA ROAD

NGAKOROA STREAM BRIDGE - demonstrate visual integration and sense of place considerations .

SITE COMPOUND AND CONSTRUCTION AREA

FILL SLOPES - shape to natural profile at a suitable gradient to allow terrestrial and riparian planting to establish. Planting proposed within terrestrial margins to integrate with wetland and riparian planting.

01

STATE HIGHWAY 22 WETLAND 1

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

03

GREAT SOUTH ROAD

KEY PLAN

1 2 3 4 5

N

MATCHLINE - REFER DRG-SHT-004-CI-6102

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G FIRST GAS TRANSMISSION LINES
- W WATERCARE (MAIN)
- OH TRANSPOWER OVERHEAD LINES
- LV COUNTIES POWER LOW VOLTAGE CABLE
- MV COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV COUNTIES POWER HIGH VOLTAGE CABLE
- WW WASTEWATER (MAIN)
- FO SPARK FIBRE OPTIC

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

TE TUPU NGĀTAHI Supporting Growth

AT

WAKA KOTAHI NZ TRANSPORT AGENCY

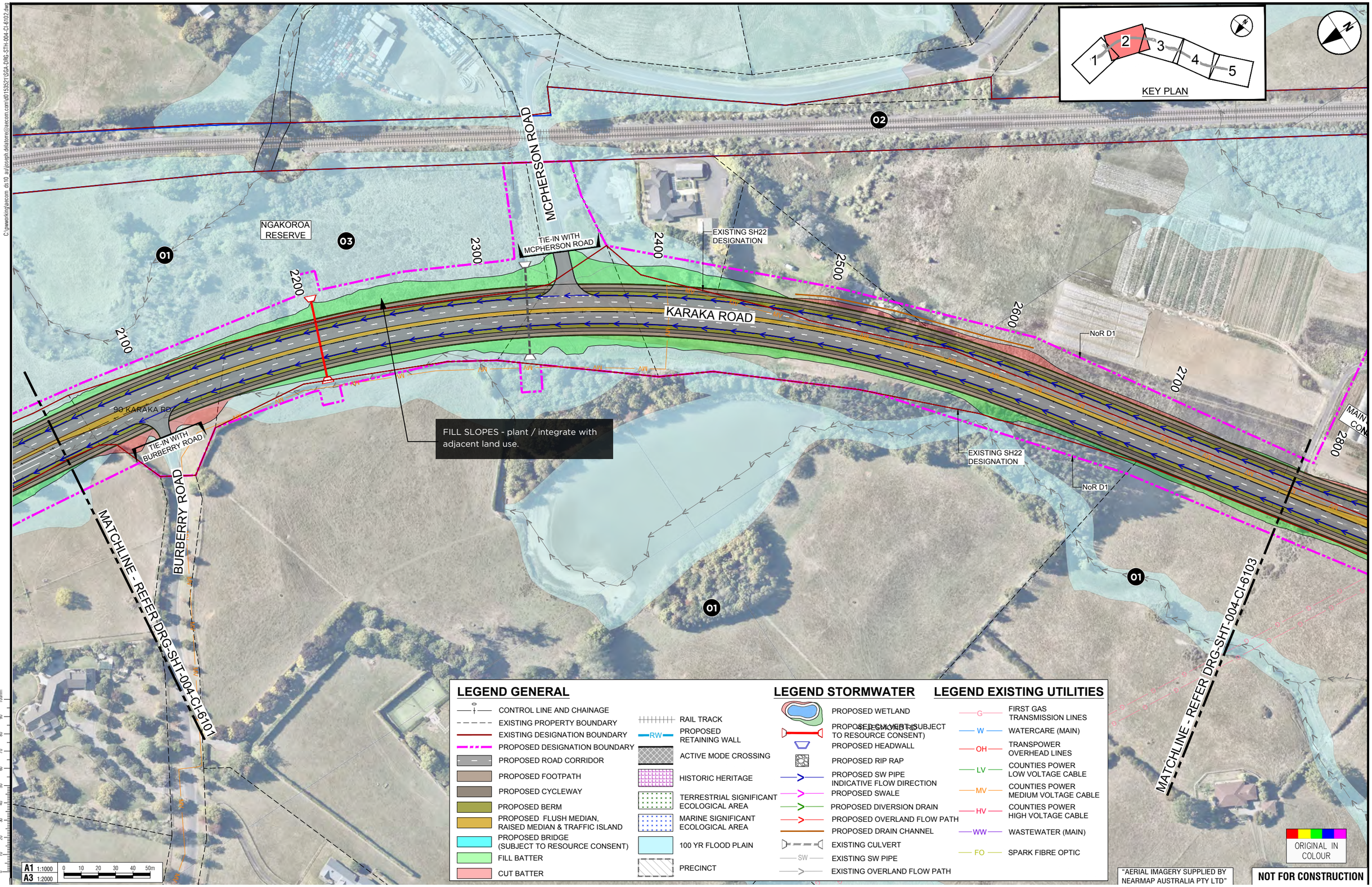
01	NGAKAROA STREAM
02	NGAKAROA RESERVE
03	NIMT

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Landscape Mitigation Plan

NoR D1 - SH22 Upgrade - Sheet 1 of 5

09



LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERTS (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM TRIBUTARIES
02	NIMT
03	NGAKAROA RESERVE

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Landscape Mitigation Plan

NoR D1 - SH22 Upgrade - Sheet 2 of 5

10

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STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

STATE HIGHWAY 22 WETLAND 2

MAIN SITE COMPOUND AND CONSTRUCTION AREA

FILL SLOPES - CH 3300 - CH3480 consider planting treatment to integrate steep fill slopes with adjacent land on lower contour.

EXISTING SH22 DESIGNATION

TIE-IN WITH JESMOND ROAD

STATE HIGHWAY 22

JESMOND ROAD

NoR D1

EXISTING SH22 DESIGNATION

MATCHLINE - REFER DRG-SHT-004-CI-6102

MATCHLINE - REFER DRG-SHT-004-CI-6104

2800 2900 3000 3100 3200 3300 3400 3500

01

KEY PLAN

1 2 3 4 5

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01 NGAKAROA STREAM TRIBUTARIES

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Landscape Mitigation Plan

NoR D1 - SH22 Upgrade - Sheet 3 of 5

11

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3 4 5

N

MATCHLINE - REFER DRG-SHT-004-CI-6105

3500 3600 3700 3800 3900 4000 4100 4200 4300

EXISTING SH22 DESIGNATION

EXISTING SH22 DESIGNATION

FILL SLOPES - plant / integrate with adjacent land use.

KARAKA ROAD

NoR D1

TIE-IN WITH OIRA ROAD

OIRA ROAD

MATCHLINE - REFER DRG-SHT-004-CI-6103

A1 1:1000
A3 1:2000

0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Landscape Mitigation Plan

NoR D1 - SH22 Upgrade - Sheet 4 of 5

12

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RURAL URBAN BOUNDARY
- RAIL TRACK
- PROPOSED RETAINING WALL (RW)
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- EXISTING SW PIPE (SW)
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- FIRST GAS TRANSMISSION LINES (G)
- WATERCARE (MAIN) (W)
- TRANSPOWER OVERHEAD LINES (OH)
- COUNTIES POWER LOW VOLTAGE CABLE (LV)
- COUNTIES POWER MEDIUM VOLTAGE CABLE (MV)
- COUNTIES POWER HIGH VOLTAGE CABLE (HV)
- WASTEWATER (MAIN) (WW)
- SPARK FIBRE OPTIC (FO)

KEY PLAN

1 2 3 4 5

FILL SLOPES - plant and/or integrate with adjacent land use.

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

SITE COMPOUND AND CONSTRUCTION AREA

01

STATE HIGHWAY 22 WETLAND 3

RURAL URBAN BOUNDARY

MATCHLINE - REFER DRG-SHT-004-CI-6104

WOODLYN DRIVE

KARAKA ROAD

370 KARAKA RD

TE NINI WAITITI KARAKA RD

4300 4400 4500 4576

A1 1:1000 A3 1:2000 0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01 OIRA CREEK

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Landscape Mitigation Plan

NoR D1 - SH22 Upgrade - Sheet 5 of 5

13

TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	NGAKAROA STREAM (unnamed tributaries)
02	RED SHED PALAZZO
03	MAKOMAO PLANT CENTRE
04	JESMOND HYBRIDS LTD
06	AROHA HISTORIC COTTAGE
07	PROTECTED TREES (AUP OIP)

DATE	DECEMBER 2020
SCALE	1:5500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Jesmond Road Section

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM
02	NGAKAROA STREAM (unnamed tributaries)
03	EXISTING NGAKAROA BRIDGE
04	SH1 CROSSING
05	HINGIAI STREAM
06	NORTH ISLAND MAIN TRUNK (NIMT)
07	WAKA TAURANGA
08	RUNCIMANS HOMESTEAD
09	REDOUBT WHARF
10	ST JOHN ANGLICAN CHURCH

DATE	DECEMBER 2020
SCALE	1:5000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Bremner Road Section

15

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM
02	NGAKAROA STREAM (unnamed tributaries)
03	EXISTING NGAKAROA BRIDGE
04	SH1 CROSSING
05	HINGIAI STREAM
06	NORTH ISLAND MAIN TRUNK (NIMT)
07	WAKA TAURANGA
08	RUNCIMANS HOMESTEAD
09	REDOUBT WHARF
10	ST JOHN ANGLICAN CHURCH

DATE	DECEMBER 2020
SCALE	1:5000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Auranga Development Overlay

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

LEGEND

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)
- SEA (Marine)

01	HINGIAI STREAM
02	HINGIAI STREAM (unnamed tributary)
03	WAIHOIHOI STREAM (unnamed tributary)
04	NORTH ISLAND MAIN TRUNK (NIMT)
05	EXISTING BRIDGE OVER NIMT

DATE	DECEMBER 2020
SCALE	1:4000 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Waihoehoe Road West Section

17

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN: 1 | 2 | 3

STATE HIGHWAY 22

MATCHLINE - REFER DRG-SHT-004-CI-1102

2000 2100 2200 2300

NoR D2

TIE-IN WITH STATE HIGHWAY 22

JESMOND ROAD

01 02 03

KIWI RAIL DESIGNATION 6302

NIMT

WAKA KOTAHI DESIGNATION 6707

A1 1:1000 A3 1:2000 0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM (unnamed tributaries)
02	RED SHED PALAZZO
03	MAKOMAO PLANT CENTRE
04	JESMOND HYBRIDS LTD

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Jesmond Road Section - Sheet 1 of 3

18

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
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- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

2300 2400 2500 NoR D2 2600 2700 2800 2900 3000

01

MATCHLINE - REFER DRG-SHT-004-CI-1103

MATCHLINE - REFER DRG-SHT-004-CI-1101

JESMOND WETLAND 1

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM (unnamed tributaries)
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03	MAKOMAO PLANT CENTRE
04	JESMOND HYBRIDS LTD

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Jesmond Road Section - Sheet 2 of 3

19

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
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- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

CONSTRUCTION AREA

JESMOND WETLAND 2

SITE COMPOUND

3100 3200 3300 3400

NoR D2

NoR D2

TIE-IN WITH BREMNER ROAD FTN UPGRADE

TIE-IN WITH JESMOND ROAD

MATCHLINE - REFER DRG-SHT-004-CI-1102

01

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM (unnamed tributaries)
02	RED SHED PALAZZO
03	MAKOMAO PLANT CENTRE
04	JESMOND HYBRIDS LTD

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Jesmond Road Section - Sheet 3 of 3

20

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
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- HISTORIC HERITAGE
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- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

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- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
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- SW — EXISTING SW PIPE
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- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

TIE-IN TO EXISTING ROAD

TIE-IN WITH JESMOND ROAD

JESMOND ROAD

0 100 200 400 500 600 700

NGAKOROA STREAM TRIBUTARY CROSSING - Design bridge to integrate into Auranga Development central park

AURANGA STAGE 8 ROAD DEVELOPMENT

CONSTRUCTION AREA

POTENTIAL STREAM REALIGNMENT SUBJECT TO RESOURCE CONSENT

NoR D2

CUT SLOPES - plant and/or integrate with adjacent land use.

MATCHLINE - REFER DRG-SHT-004-CI-2102

01

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM
02	SH1

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Bremner Road Section - Sheet 1 of 3

21

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- NOTABLE TREES
- RAIL TRACK
- PROPOSED RETAINING WALL (RW)
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- EXISTING SW PIPE (SW)
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- FIRST GAS TRANSMISSION LINES (G)
- WATERCARE (MAIN) (W)
- TRANSPOWER OVERHEAD LINES (OH)
- COUNTIES POWER LOW VOLTAGE CABLE (LV)
- COUNTIES POWER MEDIUM VOLTAGE CABLE (MV)
- COUNTIES POWER HIGH VOLTAGE CABLE (HV)
- WASTEWATER (MAIN) (WW)
- SPARK FIBRE OPTIC (FO)

KEY PLAN

1 2 3

AURANGA STAGE 8 ROAD DEVELOPMENT

BREMNER ROAD

TIE-IN WITH BREMNER ROAD

PROPERTY ACCESS TO BE DEVELOPED WITH FUTURE NZUP PROJECT

NoR D2

TIE-IN TO EXISTING ROAD

BRIDGE CONSTRUCTION AREA

BRIDGE CONSTRUCTION AREA

NGAKOROA STREAM BRIDGE - demonstrate visual integration, sense of place and associative values through design.

TIE-IN WITH VICTORIA STREET

FILL SLOPES - integrate with adjacent land use. Gradient to allow planting.

NGAKAROA STREAM

DRURY SPORTS COMPLEX

VICTORIA STREET

SOUTHERN MOTORWAY

GREAT SOUTH ROAD OFF RAMP

MATCHLINE - REFER DRG-SHT-004-CI-2101

MATCHLINE - REFER DRG-SHT-004-CI-2103

800 900 1000 1100 1200 1300 1400

01 02

A1 1:1000 A3 1:2000 0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTIO

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM
02	SH1

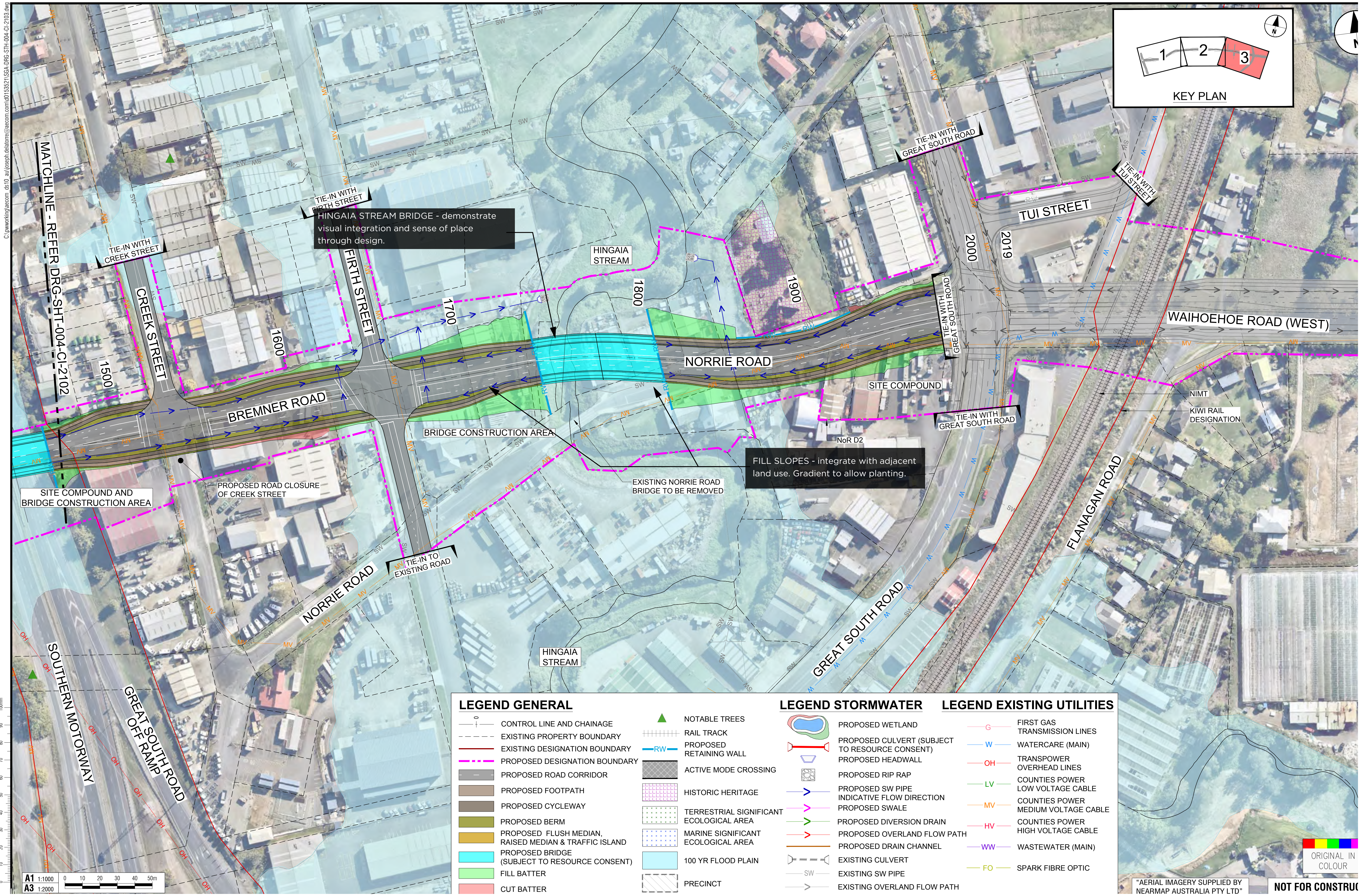
DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Bremner Road Section - Sheet 2 of 3

22


KEY PLAN
1
2
3
MATCHLINE - REFER DRG-SHT-004-CI-2102
HINGAIA STREAM BRIDGE - demonstrate visual integration and sense of place through design.
TIE-IN WITH FIRTH STREET
TIE-IN WITH CREEK STREET
HINGAIA STREAM
TIE-IN WITH GREAT SOUTH ROAD
TIE-IN WITH TUI STREET
TUI STREET
2000
2019
1500
1600
1700
1800
1900
CREEK STREET
FIRTH STREET
BREMNER ROAD
NORRIE ROAD
WAIHOEHOE ROAD (WEST)
SITE COMPOUND
NIMT
KIWI RAIL DESIGNATION
BRIDGE CONSTRUCTION AREA
NoR D2
FILL SLOPES - integrate with adjacent land use. Gradient to allow planting.
EXISTING NORRIE ROAD BRIDGE TO BE REMOVED
PROPOSED ROAD CLOSURE OF CREEK STREET
SITE COMPOUND AND BRIDGE CONSTRUCTION AREA
TIE-IN TO EXISTING ROAD
FLANAGAN ROAD
GREAT SOUTH ROAD
SOUTHERN MOTORWAY
GREAT SOUTH ROAD OFF RAMP
LEGEND GENERAL
CONTROL LINE AND CHAINAGE
EXISTING PROPERTY BOUNDARY
EXISTING DESIGNATION BOUNDARY
PROPOSED DESIGNATION BOUNDARY
PROPOSED ROAD CORRIDOR
PROPOSED FOOTPATH
PROPOSED CYCLEWAY
PROPOSED BERM
PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
FILL BATTER
CUT BATTER
NOTABLE TREES
RAIL TRACK
PROPOSED RETAINING WALL
ACTIVE MODE CROSSING
HISTORIC HERITAGE
TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
MARINE SIGNIFICANT ECOLOGICAL AREA
100 YR FLOOD PLAIN
PRECINCT
LEGEND STORMWATER
PROPOSED WETLAND
PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
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PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
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PROPOSED DIVERSION DRAIN
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EXISTING CULVERT
EXISTING SW PIPE
EXISTING OVERLAND FLOW PATH
LEGEND EXISTING UTILITIES
FIRST GAS TRANSMISSION LINES
WATERCARE (MAIN)
TRANSPOWER OVERHEAD LINES
COUNTIES POWER LOW VOLTAGE CABLE
COUNTIES POWER MEDIUM VOLTAGE CABLE
COUNTIES POWER HIGH VOLTAGE CABLE
WASTEWATER (MAIN)
SPARK FIBRE OPTIC
ORIGINAL IN COLOUR
"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"
A1 1:1000
A3 1:2000
NOT FOR CONSTRUC

TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Bremner Road Section - Sheet 3 of 3

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
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- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

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- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

FILL SLOPES - plant and/or integrate with adjacent land use.

TIE-IN WITH GREAT SOUTH ROAD

TIE-IN WITH TUI STREET

TUI STREET

RELOCATION OF WAIKATO 1 WATERMAIN TBC

BRIDGE CONSTRUCTION AREA

SITE COMPOUND

KATH HENRY LANE

TIE-IN WITH KATH HENRY LANE

NoR D2

01

03

WAIHOEHOE ROAD (WEST)

NORRIE ROAD

TIE-IN WITH NORRIE ROAD

02

CONNECTION WITH FLANAGAN ROAD AND PROPERTY ACCESS TO BE DEVELOPED WITH FUTURE NZUP PROJECT

NIMT

KIWI RAIL DESIGNATION 6302

FLANAGAN ROAD

GREAT SOUTH ROAD

MATCHLINE - REFER DRG-SHT-004-CI-3102

A1 1:500 A3 1:1000 0 20m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	HINGIAI STREAM
02	NORTH ISLAND MAIN TRUNK (NIMT)
03	EXISTING BRIDGE OVER NIMT

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Waihoehoe Road West Section - Sheet 1 of 2

24

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
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- PRECINCT

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- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2

FILL SLOPES - plant and/or integrate with adjacent land use.

OPAHEKE NORTH-SOUTH FTN ARTERIAL

TIE-IN WITH PROPOSED OPAHEKE NORTH-SOUTH FTN ARTERIAL

TIE-IN WITH KATH HENRY LANE

NoR D2

WAIHOEHOE ROAD (WEST) FTN UPGRADE

TIE-IN WITH WAIHOEHOE ROAD (EAST)

WAIHOEHOE ROAD (EAST)

TIE-IN WITH FITZGERALD ROAD

FITZGERALD RD

MATCHLINE - REFER DRG-SHT-004-CI-3101

200 300 400 500 600 700 800 900

A1 1:500
A3 1:1000
0 20m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	NGAKAROA STREAM (unnamed tributaries)
02	RED SHED PALAZZO
03	MAKOMAO PLANT CENTRE
04	JESMOND HYBRIDS LTD

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D2 - Jesmond to Waihoehoe West FTN Upgrade

Waihoehoe Road West Section - Sheet 2 of 2

TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	WAIHOEHOE STREAM
02	HINGAIA STREAM

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D3 - Waihoehoe Road East Upgrade

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
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- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
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- PROPOSED OVERLAND FLOW PATH
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- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

APPLEBY ROAD

TIE-IN WITH APPLEBY ROAD

01

MATCHLINE - REFER DRG-SHT-004-CI-4102

FILL SLOPES - plant and/or integrate with adjacent land use.

800 900 1000 1100 1200 1300 1400

NoR D3

SITE COMPOUND

TIE-IN WITH WAIHOEHOE ROAD (WEST)

WAIHOEHOE ROAD (EAST)

GAS FACILITY

FIRST GAS DESIGNATION 9104

TIE-IN WITH FIELDING ROAD

FIELDING ROAD

02

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	HINGAIA STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D3 - Waihoehoe Road East Upgrade

Sheet 1 of 3

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

MATCHLINE - REFER DRG-SHT-004-CI-4103

MATCHLINE - REFER DRG-SHT-004-CI-4101

COSSEY ROAD

TIE-IN WITH COSSEY ROAD

WAIHOEHOE ROAD (EAST)

NoR D3

1500 1600 1700 1800 1900 2000 2100 2200

01

02

CONSTRUCTION AREA

FILL SLOPES - plant and/or integrate with adjacent land use.

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	HINGAIA STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D3 - Waihoehoe Road East Upgrade

Sheet 2 of 3

28

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RURAL URBAN BOUNDARY
- RAIL TRACK
- PROPOSED RETAINING WALL (RW)
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
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- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

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- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3

N

DRURY HILLS ROAD

2300 2400 2500 2600 2605

WAIHOEHOE ROAD (EAST) UPGRADE

TIE-IN WITH DRURY HILLS ROAD

MATCHLINE - REFER DRG-SHT-004-CI-4102

RURAL URBAN BOUNDARY

A1 1:500
A3 1:1000
0 20m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	HINGAIA STREAM

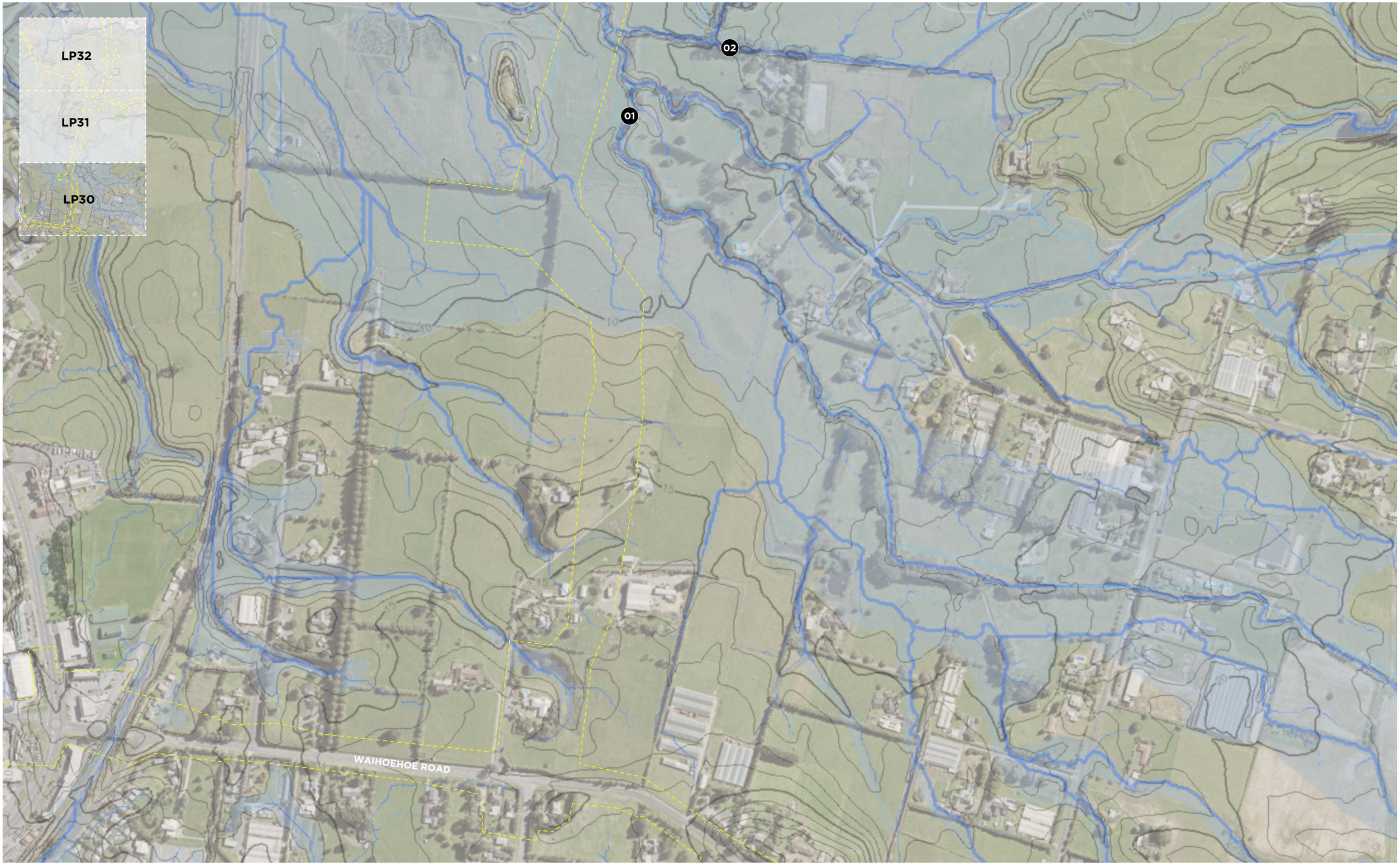
DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D3 - Waihoehoe Road East Upgrade

Sheet 3 of 3

29



TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	WAIHOEHOE STREAM
02	MANGAPU STREAM

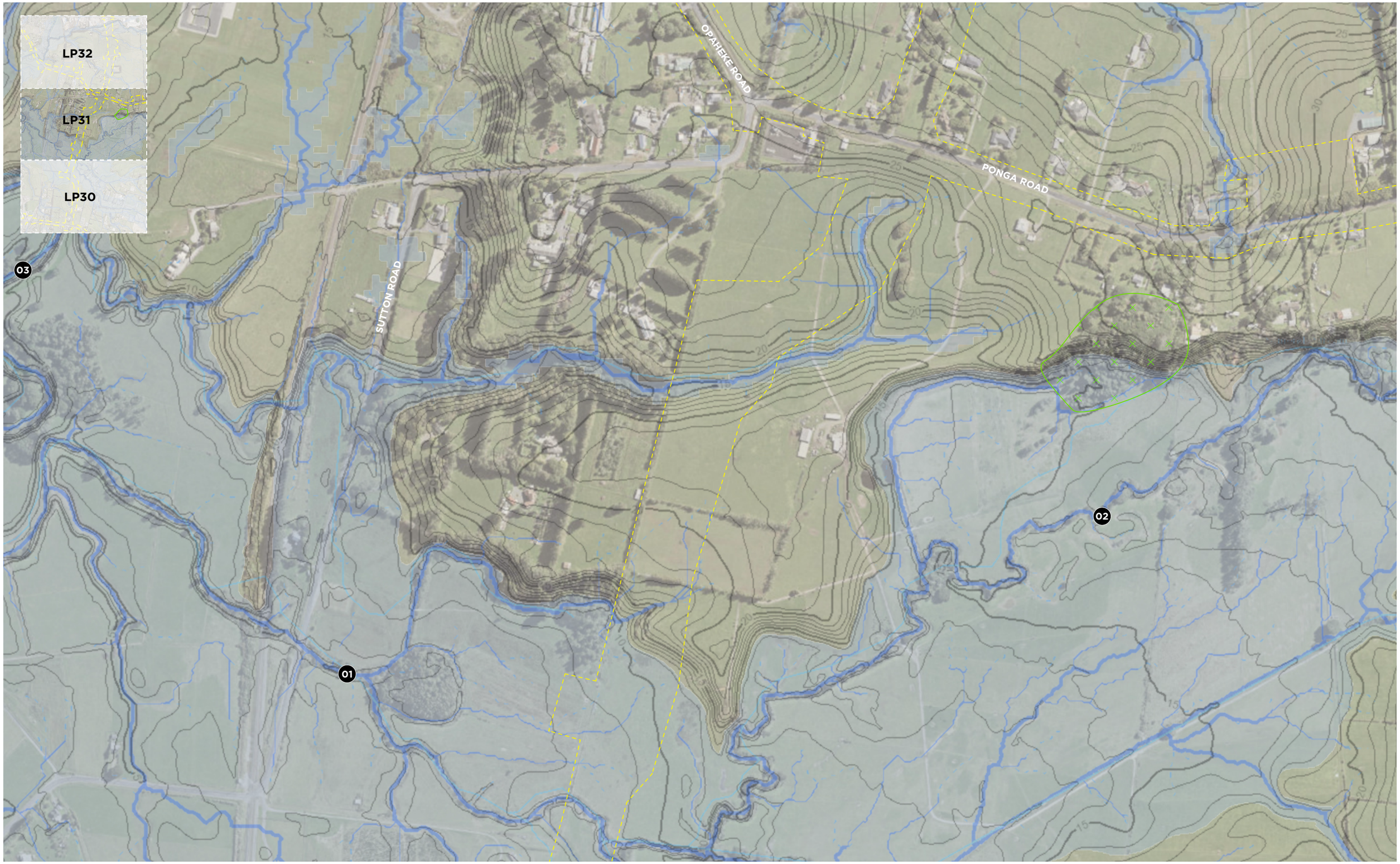
DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D4 - Ōpāheke North-South FTN Arterial

Southern Section

30



TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D4 - Ōpāheke North-South FTN Arterial

Middle Section

31

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D4 - Ōpāheke North-South FTN Arterial

Northern Section

32

C:\pwwork\kmjoake\acom_ds10_au\joseph.delatorre@aecom.com\d0135221\SGA-DRG-STH-004-CI-5101.dwg

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
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- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2 3 4 5

HUNUA ROAD

TIE-IN WITH HUNUA ROAD

WAIPOKAPU (HAYS) STREAM

BRIDGE CONSTRUCTION AREA

NoR D4

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

04

MATCHLINE - REFER DRG-SHT-004-CI-5102

600 700 800 900 500 400 300 200

HUNUA ROAD

SITE COMPOUND

NoR D4

TIE-IN WITH HUNUA ROAD

FIRST GAS DESIGNATION 9104

TIE-IN WITH BOUNDARY ROAD

BOUNDARY ROAD

FIRST GAS DESIGNATION 9104

WAIPOKAPU STREAM BRIDGE - demonstrate visual integration, sense of place and associative values through design.

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D4 - Ōpāheke North-South FTN Arterial

Sheet 1 of 5

33

WALKER ROAD (EAST)

TIE-IN WITH WALKER ROAD (EAST)

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

04

OPAHEKE N-S FTN WETLAND 1

SITE COMPOUND

NoR D4

1000 1100 1200 1300 1400 1500 1600 1700

GAS FACILITY

FIRST GAS DESIGNATION 9104

MATCHLINE - REFER DRG-SHT-004-CI-5101

MATCHLINE - REFER DRG-SHT-004-CI-5103

TIE-IN WITH WALKER ROAD (WEST)

WALKER ROAD (WEST)

MV W

KEY PLAN

1 2 3 4 5

N

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
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ORIGINAL IN COLOUR

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NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D4 - Ōpāheke North-South FTN Arterial

Sheet 2 of 5

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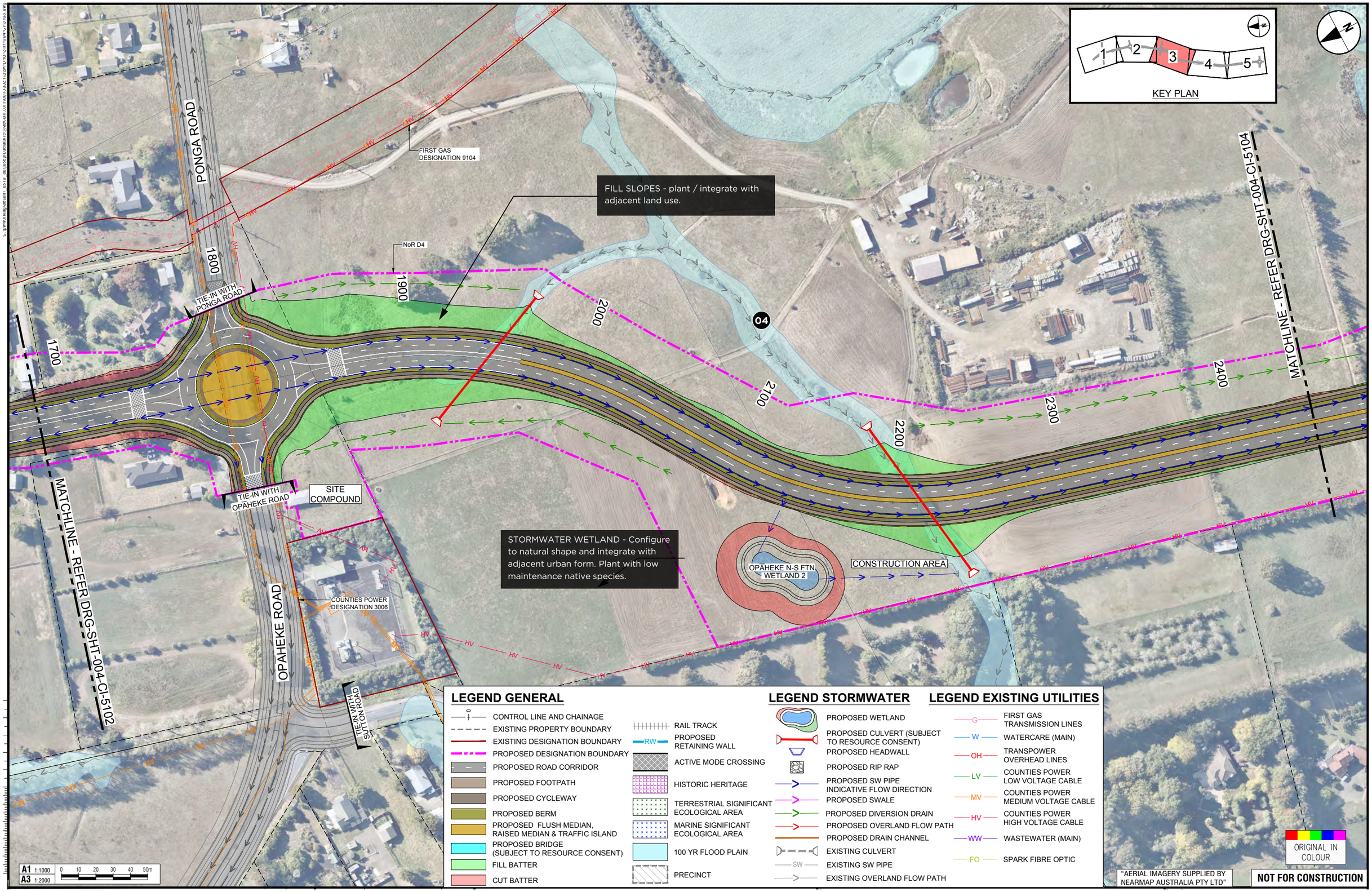

LEGEND GENERAL

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LEGEND STORMWATER

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ORIGINAL IN COLOUR

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TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D4 - Ōpāheke North-South FTN Arterial

Sheet 3 of 5

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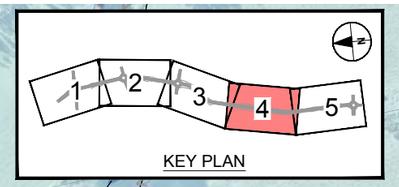

MATCHLINE - REFER DRG-SHT-004-CI-5105

MATCHLINE - REFER DRG-SHT-004-CI-5103

2500
2600
2700
2800
2900
3000
3100
3200

WAIHOEHOE STREAM BRIDGE - demonstrate visual integration and sense of place through design. Consider viewing platforms for users .

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

NoR D4

BRIDGE CONSTRUCTION AREA

BRIDGE CONSTRUCTION AREA

OPAHEKE N-S FTN WETLAND 3

NoR D4

01

WAIHOEHOE STREAM

OPAHEKE N-S FTN WETLAND 4

CONSTRUCTION AREA

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

HV

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
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- FILL BATTER
- CUT BATTER
- NOTABLE TREE
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
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LEGEND STORMWATER

- PROPOSED WETLAND
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A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

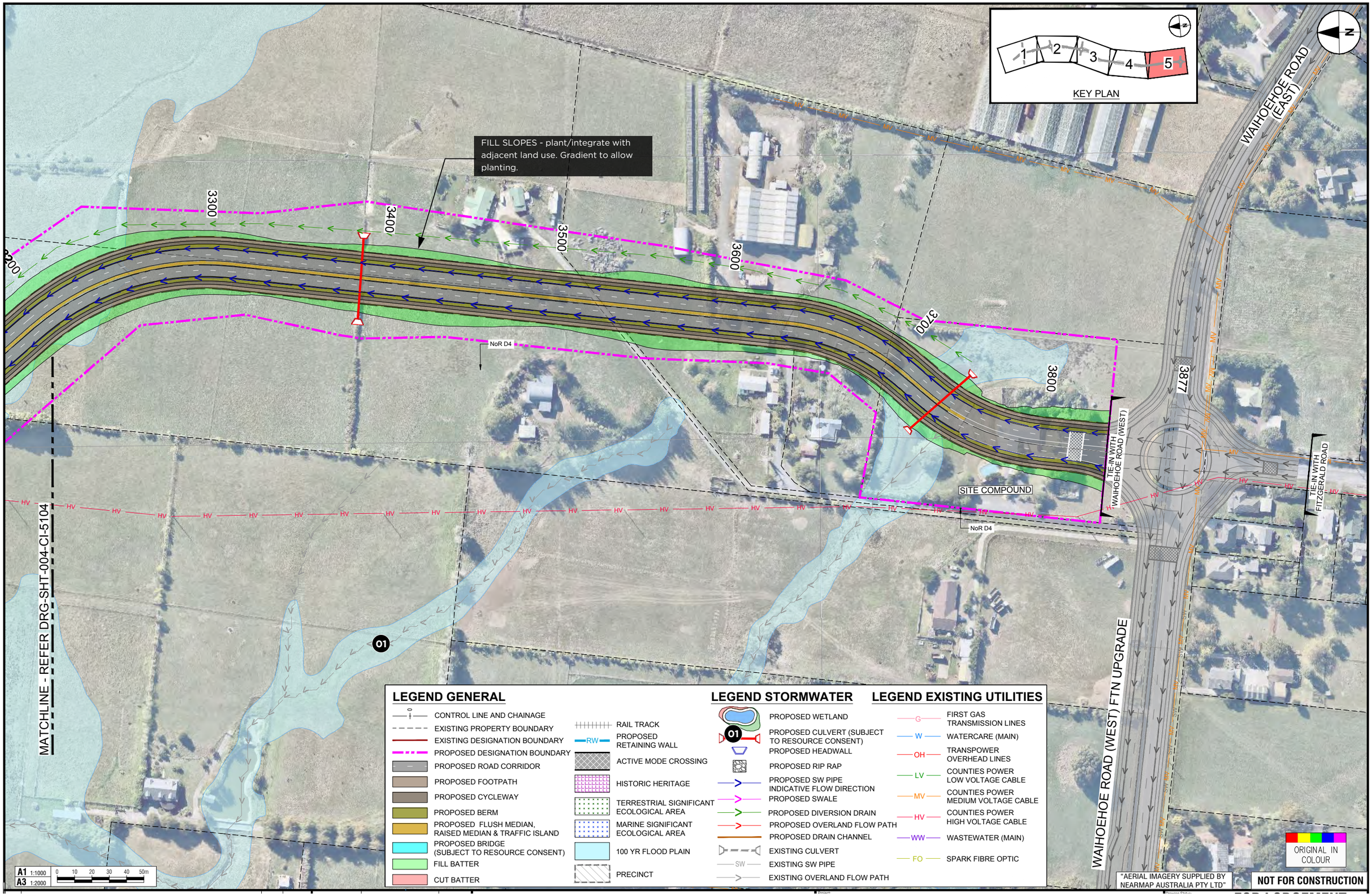
DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D4 - Ōpāheke North-South FTN Arterial

Sheet 4 of 5

36



LEGEND GENERAL

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- MARINE SIGNIFICANT ECOLOGICAL AREA
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LEGEND STORMWATER

- PROPOSED WETLAND
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- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

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- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

01	WAIHOEHOE STREAM
02	MANGAPU STREAM
03	OTUWAIROA STREAM
04	WAIPOKAPU STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

Landscape Mitigation Plan

NoR D4 - Ōpāheke North-South FTN Arterial

Sheet 5 of 5

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OPAHEKE N-S FTN ARTERIAL

PONGA ROAD

TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	MANGAPU STREAM
02	WAIPOKAPU STREAM
03	MATURE ENGLISH OAK TREES
04	MATURE POHUTUKAWA TREE
05	PURIRI FOREST (198 PONGA ROAD)
06	COHESIVE VEGETATION PATTERN

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D5 - Ponga and Ōpāheke Road Upgrade

Ponga Road Section

38

TE TUPU NGĀTAHI
Supporting Growth

WAKA KOTAHI
NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	OTUWAIROA STREAM
02	WAIPOKAPU STREAM
03	NORTH ISLAND MAIN TRUNK (NIMT)
04	OTUWAIROA STREAM ESPLANADE RESERVE (conservation zone)
05	WAIPOKAPU STREAM ESPLANADE RESERVE (informal recreation zone)
06	OPAHEKE RESERVE EXISTING WETLANDS

DATE	DECEMBER 2020
SCALE	1:4500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D5 - Ponga and Ōpāheke Road Upgrade

Ōpāheke Road Rural Section

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

LANDSCAPE FEATURES

- PROPOSED DESIGNATION BOUNDARY
- STREAMS + OVERLAND FLOW PATHS - AUP OIP GIS (Including Floodplains)
- 0.5m CONTOURS - AUP OIP GIS
- SEA (Terrestrial)

01	OTUWAIROA STREAM
02	WAIPOKAPU STREAM
03	NORTH ISLAND MAIN TRUNK (NIMT)

DATE	DECEMBER 2020
SCALE	1:5500 @ A3
PROJECT ID	SGA - DRURY ARTERIAL NETWORK
DRAWN BY	K. HOLYOAKE
REVISION	V07

Existing Landscape Features

NoR D5 - Ponga and Ōpāheke Road Upgrade

Ōpāheke Road Urban Section

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

FILL SLOPES - plant / integrate with adjacent land use.

MATCHLINE - REFER DRG-SHT-004-CI-8102

OPAHEKE ROAD

PONGA ROAD

NoR D5

OVERLAP OF NoR D5 & NoR D4

TIE-IN WITH SUTTON ROAD

TIE-IN WITH OPAHEKE NORTH-SOUTH FTN ARTERIAL

OPAHEKE NORTH- SOUTH FTN ARTERIAL

1000

1100

1200

1300

1400

COUNTIES POWER LTD. DESIGNATION 3006

FIRST GAS DESIGNATION 9104

01 MANGAPU STREAM

02 WAIPOKAPU STREAM

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 - Ponga Road Upgrade

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2

N

FILL SLOPES - plant / integrate with adjacent land use.

MANGAPU STREAM BRIDGE - visually integrate / planting to fill slopes to integrate with wetland and riparian planting (regional consents).

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

NoR D5

PONGA WETLAND 1

PONGA WETLAND 2

SITE COMPOUND

CONSTRUCTION AREA

BRIDGE CONSTRUCTION AREA

BRIDGE CONSTRUCTION AREA

MANGAPŪ (SYMONDS) STREAM

TIE-IN WITH PONGA ROAD

PONGA ROAD

JACK PATERSON ROAD

1500 1600 1700 1800 1900 2000

01

MATCHLINE - REFER DRG-SHT-004-CI-8101

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

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TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01	MANGAPU STREAM

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 - Ponga Road Upgrade

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

KEY PLAN

1 2

02

MATCHLINE - REFER DRG-SHT-004-CI-9102

1500 1600 1700 1800 1900 2000 2100 2200 2300

NoR D5

CONSTRUCTION AREA

FILL SLOPES - plant/integrate with adjacent land use. Gradient to allow planting.

OTUWAIROA (SLIPPERY) CREEK

LORELEI PLACE

TIE-IN WITH BELLFIELD DEVELOPMENT

OPAHEKE ROAD

TIE-IN WITH PARK ENTRANCE

OPĀHEKE 1 PRECINCT

BRIDGE CONSTRUCTION AREA

OPAHEKE WETLAND 1

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

01 OTUWAIROA CREEK

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 Ōpāheke Road Rural Upgrade

Sheet 1 of 2

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KEY PLAN

1 2

STORMWATER WETLAND - Configure to natural shape and integrate with adjacent urban form. Plant with low maintenance native species.

FILL SLOPES - plant for visual integration

FILL SLOPES - plant / integrate with adjacent land use.

WALKER ROAD

TIE-IN WITH WALKER ROAD

OPAHEKE WETLAND 2

SITE COMPOUND

OPAHEKE ROAD

ROAD CLOSURE

BRIDGE CONSTRUCTION AREA

NoR D5

NoR D4

OVERLAP OF NoR D5 & NoR D4

TIE-IN WITH FUTURE ARTERIAL

OPAHEKE N-S FTN ARTERIAL

TIE-IN WITH SUTTON ROAD

2300 2400 2500 2600 2700 2800 2900 3000

MATCHLINE - REFER DRG-SHT-004-CI-9101

NIMT

KIWI RAIL DESIGNATION 6302

OPĀHEKE RESERVE

COUNTIES POWER LTD. DESIGNATION 3006

A1 1:1000
A3 1:2000
0 10 20 30 40 50m

ORIGINAL IN COLOUR

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- RAIL TRACK
- PROPOSED RETAINING WALL (RW)
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- EXISTING SW PIPE (SW)
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- FIRST GAS TRANSMISSION LINES (G)
- WATERCARE (MAIN) (W)
- TRANSPOWER OVERHEAD LINES (OH)
- COUNTIES POWER LOW VOLTAGE CABLE (LV)
- COUNTIES POWER MEDIUM VOLTAGE CABLE (MV)
- COUNTIES POWER HIGH VOLTAGE CABLE (HV)
- WASTEWATER (MAIN) (WW)
- SPARK FIBRE OPTIC (FO)

TE TUPU NGĀTAHI Supporting Growth

AT

WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 Ōpāheke Road Rural Upgrade

Sheet 2 of 2

LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- NOTABLE TREES
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

NOTE:
WORKS SHOWN OUTSIDE OF THE DESIGNATION BOUNDARY ARE INDICATIVE AND WILL BE SUBJECT TO A SEPARATE STATUTORY APPROVALS PROCESS (IF REQUIRED) IN THE FUTURE.

Consider utilising residual land (within the road corridor) to integrate with cemetery grounds in a way that enhances the landscape amenity of the memorial landscape.

KEY PLAN: 1 | 2

TIE-IN WITH SETTLEMENT ROAD

TIE-IN WITH GREAT SOUTH ROAD

PAPAKURA CEMETERY

OPAHEKE ROAD

WARD AVENUE

SETTLEMENT ROAD

ALEXANDER STREET

ALBERT STREET

MATCHLINE - REFER DRG-SHT-004-CI-9102

WELLINGTON STREET

GREAT SOUTH ROAD

CHAPEL STREET

ONSLOW ROAD

NELSON STREET

EAST STREET

SOUTH STREET

LIVERPOOL STREET

A1 1:500
A3 1:1000
0 20m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

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TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

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PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 Ōpāheke Road Urban Upgrade

Sheet 1 of 2

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LEGEND GENERAL

- CONTROL LINE AND CHAINAGE
- EXISTING PROPERTY BOUNDARY
- EXISTING DESIGNATION BOUNDARY
- PROPOSED DESIGNATION BOUNDARY
- PROPOSED ROAD CORRIDOR
- PROPOSED FOOTPATH
- PROPOSED CYCLEWAY
- PROPOSED BERM
- PROPOSED FLUSH MEDIAN, RAISED MEDIAN & TRAFFIC ISLAND
- PROPOSED BRIDGE (SUBJECT TO RESOURCE CONSENT)
- FILL BATTER
- CUT BATTER
- NOTABLE TREES
- RAIL TRACK
- RW — PROPOSED RETAINING WALL
- ACTIVE MODE CROSSING
- HISTORIC HERITAGE
- TERRESTRIAL SIGNIFICANT ECOLOGICAL AREA
- MARINE SIGNIFICANT ECOLOGICAL AREA
- 100 YR FLOOD PLAIN
- PRECINCT

LEGEND STORMWATER

- PROPOSED WETLAND
- PROPOSED CULVERT (SUBJECT TO RESOURCE CONSENT)
- PROPOSED HEADWALL
- PROPOSED RIP RAP
- PROPOSED SW PIPE INDICATIVE FLOW DIRECTION
- PROPOSED SWALE
- PROPOSED DIVERSION DRAIN
- PROPOSED OVERLAND FLOW PATH
- PROPOSED DRAIN CHANNEL
- EXISTING CULVERT
- SW — EXISTING SW PIPE
- EXISTING OVERLAND FLOW PATH

LEGEND EXISTING UTILITIES

- G — FIRST GAS TRANSMISSION LINES
- W — WATERCARE (MAIN)
- OH — TRANSPOWER OVERHEAD LINES
- LV — COUNTIES POWER LOW VOLTAGE CABLE
- MV — COUNTIES POWER MEDIUM VOLTAGE CABLE
- HV — COUNTIES POWER HIGH VOLTAGE CABLE
- WW — WASTEWATER (MAIN)
- FO — SPARK FIBRE OPTIC

NOTE:

1. THE PROPERTY ADDRESSES SHOWN INDICATE WHERE DRIVEWAYS ARE LIKELY TO REQUIRE REGRADING TO TIE INTO THE PROPOSED OPĀHEKE ROAD UPGRADE.
2. WORKS SHOWN OUTSIDE OF THE DESIGNATION BOUNDARY ARE INDICATIVE AND WILL BE SUBJECT TO A SEPARATE STATUTORY APPROVALS PROCESS (IF REQUIRED) IN THE FUTURE.

KEY PLAN

1 2

COTTON PLACE
TASMAN DRIVE
REMBRANDT PLACE
BOUNDARY ROAD
SHORT STREET
800
900
1000
1100
1200
1300
1400
1500
56 OPAHEKE RD
56A OPAHEKE RD
54 OPAHEKE RD
64 OPAHEKE RD
66 OPAHEKE RD
72 OPAHEKE RD
80 OPAHEKE RD
TIE-IN WITH SHORT STREET
OPĀHEKE ROAD
57 OPĀHEKE RD
77 OPAHEKE RD
MATCHLINE - REFER DRG-SHT-004-CI-9101
TIE-IN WITH BUTTERWORTH AVENUE
BUTTERWORTH AVENUE
CALLIS AVENUE
FAIRVIEW AVENUE
ROSS PLACE
GAYLANDS PLACE
RHONDA PLACE
SNOWDEN PLACE

A1 1:500
A3 1:1000
0 20m

ORIGINAL IN COLOUR

"AERIAL IMAGERY SUPPLIED BY NEARMAP AUSTRALIA PTY LTD"

NOT FOR CONSTRUCTION

TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

DATE	DECEMBER 2020
SCALE	1:2000 @ A3
PROJECT ID	DRURY ARTERIALS
DRAWN BY	K. HOLYOAKE
REVISION NOTES	V07

Landscape Mitigation Plan

NoR D5 Ōpāheke Road Urban Upgrade

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Appendix 2. NoR D1 – Representative Viewpoint Images

Viewpoint 01 – Looking southwest from 415 Karaka Road (SH22).

Viewpoint 01 illustrates the visual composition of the existing SH22 corridor, looking southwest towards Oira Creek. The southern stormwater wetland is proposed behind the existing vegetation to the right.

Notable visual changes to this section of the Project include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport (walking and cycling). Minor (less than 10m wide) cut slopes are proposed to the left-hand side and fill batters to the right, as well as the subsequent loss of vegetation to achieve the proposed earthworks. The proposed vegetation clearance to the right will potentially open up views to the wider landscape.

Viewpoint 02 – Looking east from 362 Karaka Road (SH22).

Viewpoint 02 illustrates the relatively open stretch of road and distance views towards the Hunua Ranges foothills between 362 and 286 Karaka Road.

Notable visual changes to this section of the Project includes an increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport (walking and cycling); subsequent vegetation clearance to the left-hand side; small to moderate (up to 20m wide) fill slopes on the right-hand side. The existing rolling pastoral landscape to the right will overtime develop into a range of urban residential living environments which will enclose the road corridor.

Viewpoint 03 – Looking east from 350 Karaka Road (SH22), towards the proposed Oira Road roundabout.

Viewpoint 03 illustrates the view at the approach of the proposed Oira Road roundabout.

Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of the transport. Minor fill slopes to the left and moderate (wider than 10m) fill slopes to the right, associated with the approach towards the Oira Road roundabout. Vegetation loss to the left hand side of the corridor, as a result of proposed earthworks is also noted. The existing rolling pastoral landscape to the right will overtime develop into a range of urban residential living environments which will enclose the road corridor.

Viewpoint 04 – Looking northeast from 250 Karaka Road (SH22).

Viewpoint 04 illustrates the view through the elevated ridge system between 329 and 160 Karaka Road. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport. Moderate scale fill slopes are proposed on both sides of the alignment to deal with the proposed elevated surface levels and steeper natural landform adjacent to the road, through this section of the corridor. Subsequent loss of roadside buffer plantings on both sides of the road is also noted.

Viewpoint 05 – Looking north from 160 Karaka Road (SH22), towards the Jesmond Road intersection.

Viewpoint 05 illustrates the view through the lower terrain on the approach towards the Jesmond Road intersection. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of the transport. Minor cut and fill slopes and subsequent loss of roadside exotic hedge rows, shrubs and trees, on both sides of the road.

A stormwater wetland is proposed on the corner block of land at the Jesmond /Karaka Road intersection (as part of NoR D2) and includes cut slopes to form the depth and profile of the wetland.

Viewpoint 06 – Looking northeast from 110 Karaka Road (SH22). Exotic forest to the west.

Viewpoint 06 illustrates the view further to the north of VP05, towards the Ngakoroa Bridge. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of the transport and minor cut and fill slopes.

There is limited vegetation removal associated with this section of the designation. The view to the left depicts the exotic forest that has been identified by ecology as exhibiting the ideal conditions for potential bat roosting and grazing.

Viewpoint 07 – Looking north from 6 Burberry Road (SH22). Ngakoroa Reserve to the right.

Viewpoint 07 illustrates the view looking north in the direction of the Ngakoroa Stream Bridge. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport. Moderate cut and fill slopes and subsequent loss of roadside vegetation, including within the Ngakoroa Reserve.

Viewpoint 08 – Looking north from the southern side of Ngakoroa Bridge.

Viewpoint 08 illustrates the existing visual composition of the Ngakoroa Stream Bridge (looking north). Notable visual changes to this section of the NoR include widening of the new bridge to the righthand side (outside of the SEA) to accommodate two additional vehicle lanes and active modes of transport. Moderate fill slopes either side of the alignment to provide for an elevated corridor and bridge freeboard (just shy of 2m) and subsequent clearance of low value exotic shrubs along the righthand side of the corridor and some marginal disturbance to the SEA vegetation associated with the north-western batter slopes and proposed construction area.

Appendix 3. NoR D2 - Representative Viewpoint Images

Jesmond Road

Viewpoint 01 – looking northwest from SH22

Viewpoint 01 illustrates the visual composition of the existing SH22 / Jesmond Road intersection. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport (walking and cycling). Moderate fill slopes are proposed to both sides of the existing corridor and the first stormwater wetland is proposed within the southwest corner of the intersection.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; minor changes to existing landform and improved visual amenity and appeal for users as a result of the urban streetscape design and accessibility to active modes of transport.

Viewpoint 02 – looking northwest from 16 Jesmond Road

Viewpoint 02 illustrates the visual composition of the existing Jesmond Road corridor at the southern end. Notable visual changes to this section of the NoR include the increased width of the corridor (on both sides), to provide for two additional vehicle lanes and active modes of transport. A minor fill slope is proposed on the righthand side in the location of the overland flow path.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; minor changes to existing landform and improved visual amenity and appeal for users as a result of the urban streetscape design and accessibility to active modes of transport.

Viewpoint 03 – looking northwest from 54 Jesmond Road

Viewpoint 03 illustrates the visual composition of the existing corridor at 54 Jesmond Road. Notable visual changes to this section include the increased width of the corridor (on both sides), cut slopes on both sides and subsequent loss of vegetation. The private dwelling at 43 will need to be removed.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; minor changes to existing landform, reduction of vegetation on the left-hand side and improved visual amenity and appeal for users as a result of an urban streetscape design and accessibility to active modes of transport.

Viewpoint 04 – looking southeast at 131 Jesmond Road

Viewpoint 04 illustrates the visual composition of the existing corridor at 131 Jesmond Road. Notable visual changes to this section include the increased width of the corridor (on both sides) and the minor batter slope into the riparian margin at chainage 2600.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; minor changes to existing landform and improved visual amenity and appeal for users as a result of an urban streetscape design and accessibility to active modes of transport.

Viewpoint 05 – looking north at 169 Jesmond Road

Viewpoint 05 illustrates the visual composition of the existing corridor at 169 Jesmond Road. Notable visual changes to this section include the increased width of the corridor (on both sides); moderate cut slopes (chainage 2800) to the left and fill slopes to the right and subsequent loss of vegetation along the righthand side.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; modification to natural landform, loss of vegetation and improved visual amenity and appeal for users as a result of an urban streetscape design and accessibility to active modes of transport.

Viewpoint 06 – looking north at 221 Jesmond Road

Viewpoint 06 illustrates the visual composition of the existing corridor at 221 Jesmond Road. Notable visual changes to this section include the increased width of the corridor (predominately to the left); moderate cut slope to the left (chainage 3150) and subsequent loss of vegetation; minor fill slopes to the right into the exotic wetland and the proposed stormwater wetland to the left of the background view.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; modification to natural landform, loss of specimen trees within the private property of 221 Jesmond Road and improved visual amenity and appeal for users as a result of an urban streetscape design and accessibility to active modes of transport.

Viewpoint 07 – looking south at 288 Jesmond Road

Viewpoint 07 illustrates the visual composition of the existing corridor at 288 Jesmond Road. Notable visual changes to this section include the increased width of the corridor (predominately to the right), to accommodate the signalised intersection with Bremner link (Auranga Road 1) and associated vehicle stacking and tie-ins. Changes also include minor fill and cut slopes and subsequent loss of vegetation, including the Oak trees that have been identified as important in section 6.2.1 of the arboriculture report.

The overall visual impact of the changes described above includes: a wider, dominant road corridor; modification to natural landform and loss of important specimen trees currently providing visual amenity to the road reserve. Given the elevated position of this section of road, the physical changes are also likely to open up views out over the surrounding FUZ land providing a sense of orientation.

Jesmond Road

Viewpoint 01 illustrates the view looking east at the Jesmond Road / Bremner Link intersection.

Notable visual changes to this section of the NoR include the proposed signalised intersection and the proposed cut slopes between chainage 10-300 to accommodate the new alignment through greenfield land.

The overall visual impact of the changes described above includes a notable shift from pastureland to a dominant road corridor, and changes to existing landform that may result in opening up distant and

framed views towards the Hunua Ranges. This is considered to be a positive outcome of the development.

Viewpoint 02 illustrates the view looking southwest at the existing Bremner Road intersection, within the Auranga development zone.

Notable visual changes to this section include the proposed tie-in of the Bremner Link section into the partially formed intersection to the left of this view.

Viewpoint 03 illustrates the view looking east from the existing Bremner Road intersection towards the existing Ngakoroa Stream Bridge. This view illustrates the existing profile (RL) of the bridge crossing and the visual threshold and focal point that is likely to develop in this composition when apartment buildings are built along each side the corridor.

Notable visual changes to this section include the increased width of the corridor on the right hand side of the view and the elevated grade of the new bridge crossing.

Viewpoint 04 illustrates the view looking east from the approach to the to the Ngakoroa Stream Bridge. This view illustrates the existing profile (RL) of the bridge and the perceived natural character of the marine SEA to the left of the view.

Notable visual changes to this section include the increased width of the corridor on the right hand side of the view and the elevated grade of the new bridge crossing which is likely to alter the experiential qualities for pedestrians and cyclists accessing the bridge.

Viewpoint 05 illustrates the view looking west from the Bremner / Victoria Street intersection.

Viewpoint 06 provides an indicative view from the elevated section of Drury Sports Complex. The existing bridge is set low within the crest of the foreground. The upgraded bridge will be elevated and more visible from vantage points inside the park. This presents the opportunity to design the bridge as a focal point in the landscape with high visual amenity and sense of place value.

Viewpoint 07 represents the view looking west over SH1, towards the Ngakoroa Stream Bridge, from 17 Bremner Road.

Viewpoint 08 represents the view looking north from Creek Street towards the Bremner Road corridor. The new profile of the alignment is approximately 500mm above EGL and presents a negligible change in the view.

Viewpoint 09 represents the view looking north from Firth Street towards the Bremner Road corridor. The new profile of the alignment is approximately 300mm above EGL and presents a negligible change in the view. Building demolition.

Viewpoint 10 represents the view looking northeast along the existing Norrie Road corridor with the existing bridge crossing in the righthand side of the view. Decommissioning the end of the road and bridge provides opportunities for restoring the natural character of the Hingaia Stream (within the designation boundary).

Viewpoint 11 and 12 represent the view looking west from 12 and 7 Norrie Road (respectively), through the proposed alignment upgrade. The proposed bridge crossing is located behind St Johns church.

Waihoehoe Road West

Viewpoint Photograph 01 – 11 Waihoehoe Road (chainage 00)

Viewpoint 01 illustrates the view looking east from 11 Waihoehoe Road towards the NIMT crossing. The road is currently a single lane in both directions and lined on both sides by commercial/light industrial buildings and associated carparks / grass verges.

Notable visual changes to this section of the NoR include the increased profile of the new bridge crossing (approximately 2m above existing ground level) and increased width of the corridor (on the left hand side), to provide for additional vehicle lanes and active transport modes. Fill slopes are proposed on both sides of the alignment to deal with the proposed elevated surface levels and the building to the left of the view is to be demolished to make way for the new corridor and site compound / bridge construction area.

The overall visual impact of the changes described above includes: a wider, more elevated and more dominant road corridor; notable change to existing landform and potentially the temporary obstruction of backdrop views of the Hunua Range. Construction activities to the left-hand side of the view will detract from the pleasantness of the view during the construction phase.

Mitigation planting to the notable fill slope would assist in integrating the elevated profile of the new crossing against the background setting for the operational phase of the Project.

Viewpoint Photograph 02 – 45 Waihoehoe Road (chainage 250)

Viewpoint 02 illustrates the view looking west back towards the NIMT crossing. Notable visual changes to this section of the NoR include the increased profile of the new bridge crossing, increased width of the corridor (on the right hand side) and notable fill to the righthand side of the view and subsequent clearance of existing vegetation.

The overall visual impact of the changes described above includes: a wider, more elevated and more dominant road corridor; notable change to existing landform and loss of visual amenity associated with vegetation clearance.

Viewpoint Photograph 03 – 45 Waihoehoe Road (chainage 250)

Viewpoint 03 illustrates the view looking east from 45 Waihoehoe Road towards the intersection with Kath Henry Lane. Notable visual changes to this section of the NoR include: the increased width of the corridor (on the left hand side) and subsequent vegetation clearance; minor fill slopes on both sides of the road and a new intersection tie-in on the right hand side of the road at the site of the existing power pole and transformer box.

The overall visual impact of the changes described above includes: a wider, more dominant road corridor; minor change to existing landform and reduced visual amenity delivered by existing vegetation.

Viewpoint Photograph 04 – 101 Waihoehoe Road (chainage 550)

Viewpoint 04 illustrates the view looking east from 101 Waihoehoe Road towards the existing intersection with Fitzgerald Road and the future intersection with proposed ŌpāhekeNorth-South FTN (NoR D4). Notable visual changes to this section of the NoR include: the increased width of the corridor (on the left hand side), subsequent vegetation clearance and small fill slopes on both sides of the road.

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the loss of the existing grass verge, private property boundaries and established trees.

Viewpoint Photograph 05 – 6 Fitzgerald Road (chainage 620)

Viewpoint 05 illustrates the view looking west from the Fitzgerald / Waihoehoe Road intersection towards the future intersection with proposed Ōpāheke North-South FTN (NoR D4). Notable visual changes to this section of the NoR include: the increased width of the corridor (on the right hand side), and subsequent vegetation clearance of the mature tree and shelterbelt planting in the location of the speed sign.

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the loss of the existing established trees meaning that the widened carriageway will dominate the view.

Appendix 4. NoR D3 - Waihoehoe East Representative Viewpoints

Viewpoint Photograph 01 – 160 Waihoehoe Road (CH800)

Viewpoint 01 illustrates the view looking southeast along the existing Waihoehoe Road corridor. Notable visual changes to this section of the NoR include: the increased width of the corridor (predominately to the left hand side), minor cut and fill slopes to the left hand side of the view and subsequent vegetation clearance of the mature trees and shelterbelt planting.

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the loss of the existing established trees meaning that the widened carriageway will appear more prominent. Street trees planted within the finishing phase of the construction period will return the green infrastructure to the road corridor.

Viewpoint Photograph 02 – 171 Waihoehoe Road (CH900)

Viewpoint 02 illustrates the view looking southeast along the existing Waihoehoe Road corridor. Notable visual changes to this section of the NoR include: the increased width of the corridor (predominately to the left hand side), minor cut and fill slopes to the left hand side of the view and subsequent vegetation clearance of the mature trees and shelterbelt planting.

Viewpoint Photograph 03 – 270 Waihoehoe Road (CH1250)

Viewpoint 03 illustrates the view looking northwest along the existing Waihoehoe Road corridor. Notable visual changes to this section of the NoR include: the increased width of the corridor (predominately to the right hand side), minor cut and fill slopes to the right hand side of the view and subsequent vegetation clearance of the mature shelterbelt planting.

Viewpoint 04 illustrates the view looking southeast along the existing Waihoehoe Road corridor. Notable visual changes to this section of the NoR include: the increased width of the corridor (predominately to the left hand side), minor fill slopes to the left hand side of the view, removal of the existing dwellings to accommodate the site compound and subsequent vegetation clearance of mature shelterbelt planting and domestic gardens.

Viewpoint Photograph 04 – 270 Waihoehoe Road (CH1250)

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the loss of the existing established vegetation meaning that the widened carriageway will appear more prominent for a p[period of time. Construction activities (including machinery and vehicles movement) from the site compound is anticipated to temporarily detract from the visual amenity of the road corridor. Street trees planted within the finishing phase of the construction period will return the green infrastructure to the road corridor.

Viewpoint Photograph 05 – Waihoehoe / Appleby Road intersection (CH1350)

Viewpoint 05 illustrates the view looking north along the existing Appleby Road corridor. Notable visual changes to this section of the NoR include: the increased footprint of the corridor to accommodate the proposed roundabout and tie in with Appleby Road, moderate fill slopes on both sides of the corridor and subsequent vegetation clearance of domestic gardens and mature trees within the road reserve.

Viewpoint Photograph 06 – 311 Waihoehoe Road (CH1680)

Viewpoint 06 illustrates the view looking southwest along the existing Waihoehoe Road corridor. Notable visual changes to this section of the NoR include: the increased width of the corridor (on both sides), minor cut and fill slopes on both sides and subsequent vegetation clearance of exotic hedgerows.

Viewpoint Photograph 07 – 120 Cossey Road (CH2000)

Viewpoint 07 illustrates the view looking north along the existing Cossey Road corridor. Notable visual changes to this section of the NoR include the increased footprint of the corridor to accommodate the proposed roundabout, moderate cut slopes and subsequent vegetation clearance of exotic shrubs.

Appendix 5. NoR D4 - Ōpāheke N-S Arterial FTN Representative Viewpoints

Viewpoint Photograph 01 – 33 Hunua Road (CH400)

Viewpoint 01 illustrates the view looking southeast through Hunua Road towards Hays Stream. Hunua Road is currently single lane in both directions and lined on both sides by business and industrial land use.

Notable visual changes to this section of the existing corridor include the increased width of the corridor (on both sides), minor slopes and the new curvature of the alignment entering the Hunua/Boundary Road intersection. The existing mature trees visible in the distance are situated on the boundary of the fill slopes and may require removal.

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the likely loss of some existing established trees meaning that the widened carriageway will dominate the view.

Viewpoint 02 illustrates the view looking southeast from the Hunua / Boundary Road intersection towards Hays Stream.

Viewpoint Photograph 02 – Hunua / Boundary Road intersection (chainage 600)

Viewpoint Photograph 03 – 149 Boundary Road (chainage 600)

Viewpoint 03 illustrates the view looking east from 149 Boundary Road towards the Hunua / Boundary Road intersection. The new corridor is proposed to pass through the container yard behind the blue building to the right at an elevated surface level roughly 0.5-1m above EGL. Surface levels continue to rise above NGL towards the south and are expected to reach approximately 3.5m above EGL along the upper northern banks of Hays Stream. The new corridor descends to NGL at chainage 1020.

Viewpoint Photograph 04 – 149 Boundary Road (chainage 650). View south - Hays Stream Crossing

Viewpoint Photograph 05 – 164 Walker Road (chainage 1200)

Viewpoint 05 illustrates the view looking north from 164 Walker Road through the proposed alignment. The new corridor is proposed to pass through this section of grassland just right of the exotic hedgerow.

Notable visual changes to this section of the designation include the introduction of the new road corridor and very minor (negligible) cut and fill slopes. Some sections of the existing hedgerow may need to be removed.

Viewpoint Photograph 06 – 28 Ponga Road (chainage 1800)

Viewpoint 06 illustrates the view looking northeast from 28 Ponga Road through the proposed alignment. The new corridor is proposed to pass through this section of grassland and mature trees towards the 30m Hays Stream Bridge crossing.

Notable visual changes to this section of the designation include the introduction of the new road corridor and very minor (negligible) cut and fill slopes. The mature trees located in the foreground of the view (Ponga Road intersection) are likely to remain, however the mature trees in the background will be removed.

Viewpoint Photograph 07 – 6 Ponga Road (chainage 1800)

Viewpoint 07 illustrates the view looking southeast from 6 Ponga Road towards the proposed alignment (chainage 1820-2000). The new corridor is proposed to pass through this section of grassland in front of the mature trees in the midground, intersecting the Slippery Creek tributary in two locations.

Notable visual changes to this section of the designation include the introduction of the new road corridor with moderate fill slopes. The mature trees located in the midground are likely to remain.

Viewpoint Photograph 08 – 205 Sutton Road (CH 2700 - 3000)

Viewpoint 08 illustrates the view looking east from 205 Sutton Road towards the middle section of the proposed Waihoehoe Stream bridge. The proposed bridge will be visible from this vantage point as a continuous horizontal element above the 'grass line' to the right of the view. It then passes behind the scheduled group of trees (in the midground) to the left of the view.

The proposed bridge will be elevated above the drainage landform and will reach approximately 6m above NGL through the middle section. The middle section will be visible from this vantage point and is anticipated to sit just below the existing utility lines that are visible in the mid-background view.

Viewpoint Photograph 09 – 128 Waihoehoe Road (CH3800)

Viewpoint 09 illustrates the view looking northwest 128 Waihoehoe Road towards the southern section of new corridor.

Appendix 6. NoR D5 - Representative Viewpoint Images

Ponga Road

Viewpoint Photograph 01 – 48 Ponga Road (chainage 000)

Viewpoint 01 illustrates the view looking east down the existing Ponga Road corridor. Ponga Road is currently single lane in both directions and lined on both sides by residential dwellings, grass berms, mature trees and hedgerows. This section of the corridor is proposed to be widened to tie into the Ponga / Ōpāheke Road intersection. The new corridor will narrow to single lanes in each direction with the addition of walking and cycling lanes at chainage 120 (roughly at the location of the Transpower Lines in the mid-view).

Notable visual changes to this section of Ponga Road include the increased width of the corridor (on both sides), minor fill slopes and subsequent vegetation clearance of exotic trees and private boundary plantings.

The overall visual impact of the changes described above includes a shift in the balance between hardstand and 'green space' with the loss of the existing established vegetation meaning the widened carriageway will dominate the view.

Viewpoint Photograph 02 – 74 Ponga Road (chainage 250)

Viewpoint 02 illustrates the view looking east through the existing Ponga Road corridor. This section of the corridor is slightly elevated with open views extending beyond the corridor. The proposed alignment will widen either side and require a cut slope to the right hand side, requiring the mature Oak trees to be removed.

Viewpoint Photograph 03 – 126 Ponga Road (chainage 400)

Viewpoint 03 illustrates the view looking east towards the first stream intersection. The stream is currently culverted and this is proposed to be upgraded. The proposed alignment will be widened predominately to the right hand side.

Notable visual changes to this section of Ponga Road include the increased width of the corridor (predominately to the right hand side), moderate fill slopes and subsequent vegetation clearance of mature trees and hedgerows. The overall visual impact includes a shift in the balance between hardstand and 'green space' with the loss of the existing established vegetation meaning the widened carriageway will dominate the view. The visual character will shift from being enclosed by vegetation to more exposed with views opening up to adjacent land either side and the proposed stormwater wetland potentially visible on the left hand side.

Viewpoint Photograph 04 – 117 Ponga Road (chainage 500)

Viewpoint 04 illustrates the view looking northeast into the location of proposed stormwater wetland 1. The wetland will be positioned directly behind the row of mature Oak trees and visible through intermittent gaps between the trees. The proposed alignment is to be widened to the right hand side and minor fill slopes will be required on both sides of the road. The mature Oak trees are proposed to

stay along the northern perimeter of the corridor and vegetation clearance is proposed to the southern perimeter.

Viewpoint Photograph 05 – 125 Ponga Road (chainage 600)

Viewpoint 05 illustrates the view looking southwest back through the corridor of viewpoint 04. Notable vegetation clearance is proposed along the left-hand side as well as the likely demolition of the existing dwelling at 123 Ponga Road and there will also be an overall shift in visual character as a result of this clearance.

Viewpoint Photograph 06 – 154 Ponga Road (chainage 650)

Viewpoint 06 illustrates the view looking east through the existing corridor. Heritage sites 17017 / 17016, are signalled by the large stone plaque to the left of the view with mature Oak trees and regenerating native Taraire Tawa podocarp forest forming a dominant vegetated edge along the northern road reserve. The road will widen to the right-hand side and require notable vegetation clearance along the southern perimeter of the corridor.

Viewpoint Photograph 07 – 190 Ponga Road (chainage 700) looking east

Viewpoint 07 illustrates the view looking east out towards the Symonds Stream riparian corridor and the high value landscape features. Stormwater wetland pond 2 is proposed on the elevated slope in front of the mature (venerable) Oak tree.

Viewpoint Photograph 08 – 190 Ponga Road (chainage 800) looking east

Viewpoint 08 illustrates the view looking east through the existing corridor towards the Symonds Stream crossing (roughly at the location of the oncoming car).

Viewpoint Photograph 09 – 190 Ponga Road (chainage 900) looking west

Viewpoint 09 illustrates the view looking west back through the existing corridor.

Viewpoint Photograph 10 – Symonds Stream crossing (chainage 950) looking east

Viewpoint 10 illustrates the view looking east over the Symonds Stream crossing.

Ōpāheke Road Rural

Viewpoint Photograph 01 – View east from the boundary of 28 Ponga Road (CH2900 - 3100)

Viewpoint 01 illustrates the view looking east down the existing Ponga Road corridor. Ponga Road is currently single lane in both directions and lined on both sides by residential dwellings, grass berms, mature trees and hedgerows. This section of the corridor is proposed to be widened on both sides.

Notable visual changes to this section of Ponga Road include the increased width of the corridor and minor fill slopes (on both sides), removal of private boundary fences and subsequent vegetation clearance including the removal of at least one of the mature Oak trees on the left hand side. The proposed Ōpāheke N-S Arterial roundabout will be visible in the background.

Proposed street trees within the new road-side berms alongside the proposed separated footpath and cycleways (on both sides of the new corridor) will generate a more formal (urban) visual composition.

Viewpoint Photograph 02 – View northwest from the western boundary of 28 Ponga Road (CH2900)

Viewpoint 02 illustrates the view looking northwest towards the intersection of Ponga, Ōpāheke and Sutton Roads. Ōpāheke is currently single lane in both directions and views to neighbouring properties are expansive through this section with limited vegetation along the edge of the road corridor.

The proposed alignment through this section shifts to the right hand side of the existing corridor through the private properties of 28 Ponga Road and 216 Ōpāheke Road. The Sutton Road tie-in is also proposed to be upgraded and will follow the existing road alignment visible in this view. This section of the corridor is proposed to be widened on both sides.

Notable visual changes to this section of the corridor include the increased width of the corridor, holding to the existing edge on the left but expanding into the private rural land on the right hand side. This will result in small-scale fill slopes into private land, removal of private boundary fences and subsequent vegetation clearance including the removal of at least two of the existing shelterbelt plantings along the property boundary of 36 Ponga Road.

The noteworthy Rimu tree is visible in the background and will be avoided by the proposed alignment.

Proposed street trees within the new road-side berms alongside the proposed separated footpath and cycleways (on both sides of the new corridor) will generate a more formal (urban) visual composition.

Viewpoint Photograph 03 – View northwest from the southern boundary of 216 Ōpāheke Road (CH2700)

Viewpoint 03 illustrates the view looking northwest through the existing Ōpāheke Road corridor towards the private property of 216 Ōpāheke Road.

The proposed alignment through this section widens predominately on the right hand side and swings wide behind 216 Ōpāheke Road through the low-lying pastoral land visible in the background view. The proposed alignment encroaches into the southern boundary of 216 Ōpāheke Road requiring existing boundary fences and garden plantings to be removed. The proposed Walker Road (extension) intersection and NIMT bridge will be visible within in background following the removal of the existing garden plantings on 216 Ōpāheke Road.

Notable visual changes to this section of the corridor include the increased width of the corridor and the new alignment through private land to the right hand side of the existing road corridor. This will

result in moderate-scale fill slopes into private land on the right-hand side and into the edge of the existing road corridor to the left. It will also include the removal of private boundary fences and subsequent vegetation clearance including the removal of most of the mature shrubs and trees within the southern boundary of 216 Ōpāheke Road. The elevated section over the NIMT will also form part of the backdrop view, which if planted with integrate into the borrowed landscape behind the proposed alignment.

Proposed street trees within the new road-side berms alongside the proposed separated footpath and cycleways (on both sides of the new corridor) will generate a more formal (urban) visual composition.

Viewpoint Photograph 04 – 235 Ōpāheke Road looking east towards the proposed NIMT bridge crossing (CH 2200)

Viewpoint 04 illustrates the view looking east through the existing Ōpāheke Road corridor towards the proposed NIMT bridge crossing.

The proposed alignment travels along the left hand side of the existing road corridor and is proposed to be elevated approximately 8m above the NIMT. The large fill slopes will be visible descending into the edge of the existing road corridor, on the left hand side.

The new alignment will generate a notable shift in visual composition for the viewing audience traveling past this short section of the alignment. This will result in intermittent loss or obstruction of views towards the Hunua Ranges Foothills for localised viewing audiences , including from inside Ōpāheke Reserve. However this is largely moderated by the likelihood of future urban form having the same effect on backdrop views and the opportunities afforded through the remaining sections of the alignment to obtain backdrop views to the Hunua Ranges Foothills.

The proposed native planting will assist with integrating the batter slopes into the backdrop view and improving the visual amenity and landscape character experienced from localised vantage points surrounding the NIMT bridge crossing.

Viewpoint Photograph 05 – View southeast towards the proposed NIMT bridge crossing. Ōpāheke Reserve on the right. (CH 2000)

Viewpoint 05 illustrates the view looking southeast through the existing Ōpāheke Road corridor towards the proposed NIMT bridge crossing. Ōpāheke Reserve is visible on the right hand side, including the existing constructed wetland where proposed stormwater wetland 1 is proposed.

The noteworthy swamp cypress (*Taxodium distichum*) are visible in this view, growing within the road reserve outside the Ōpāheke Reserve. These trees are required to be removed and will be replaced by new street trees within the new road berm (within a similar footprint).

The proposed alignment is proposed to widen on both sides of the road corridor within the foreground view then it will trend to the left hand side of the exiting road corridor towards the NIMT bridge crossing. The large fill slopes will be visible descending into the edge of the existing road corridor, on the left hand side, towards the background view.

The proposed native planting will assist with integrating the batter slopes into the backdrop view and improving the visual amenity and landscape character experienced from localised vantage points surrounding the NIMT bridge crossing.

Viewpoint Photograph 06 – View southeast towards the proposed Ōtūwairoa Stream bridge upgrade (CH1850).

Viewpoint 06 illustrates the view looking southeast towards the Ōtūwairoa Stream bridge crossing and the general mix of exotic vegetation within the terrestrial margins of the stream. Ōpāheke Reserve is visible on the right hand side in the background.

The proposed alignment is proposed to widen on both sides of the road corridor and existing bridge section which will translate to a wider road surface either end of the ridge crossing, small batter slopes on the eastern end of the bridge and moderate fill slopes into the existing plant nursery visible on the left hand side of the existing road corridor.

Native revegetation planting has recently been implemented within the Open Space – Conservation corridor associated with Bellfield Estate within the right hand side of the view.

Viewpoint Photograph 07 – View southeast towards Bellfield Estate (CH1600).

Viewpoint 07 illustrates the view looking southeast through the existing Ōpāheke Road corridor. Th construction area of Bellfield Estate is visible on the right hand aside of the view with Ōtūwairoa Stream corridor visible in the background view.

The proposed alignment is proposed to widen on both sides of the road corridor with a greater portion covering the left hand side of the road corridor. This will impact on the private properties visible in the view (114 and 122 Ōpāheke Road) whereby existing boundary fences, garden plantings and driveways will need to be reinstated. The proposed Bellfield Estate entry roundabout proposed at CH1800 will result in greater impacts on the private property of 122 Ōpāheke Road which will require several mature exotic shrubs and trees (English Oak) to be removed.

Ōpāheke Road Urban

Viewpoint Photograph 01 – View north towards Papakura Cemetery

Viewpoint 01 illustrates the view looking north through the existing Settlement Road / Ōpāheke Road intersection. Proposed new roundabout location.

Viewpoint Photograph 02 – View southwest from Settlement Road.

Viewpoint 02 Papakura Cemetery in the background (right). Trees to be cleared along the left hand side of the existing intersection.

Viewpoint Photograph 03 – View northwest along Ōpāheke Road – approximately 50m north of Gaylands Place.

Viewpoint 03 Viewpoint 3 depicts the general street character through Ōpāheke Road.