Rotokauri Strategic Infrastructure Designation - Landscape And Visual Assessment

Prepared for Hamilton City Council
Prepared by Beca Limited

24 April 2024

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Contents

Appendices

Revision History

Revision Nº	Prepared by	Description	Date
A	**Will Gumbley**	Draft For Internal Review	12/06/2020
B	**Will Gumbley**	Draft For HCC / THAWK Review	30/06/2020
C	**Will Gumbley**	Issue for Notice of Requirement (taking into account land use changes since June 2020 and release of Aotearoa New Zealand Landscape Assessment Guidelines)	01/04/2022
D	**Will Gumbley**	Issue for Notice of Requirement (taking into account land use changes since April 2022)	19/06/2023
E	**Will Gumbley**	Revised Issue for Notice of Requirement	03/08/2023
F	**Will Gumbley**	Revised Issue for Section 92 Response	24/04/2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	**Will Gumbley**		24/04/2024
Reviewed by	**Sophie Strachan**		24/04/2024
Approved by	**Craig Sharman**		24/04/2024
on behalf of	Beca Limited		

1 Introduction

1.1 Purpose

This Landscape and Visual Assessment has been prepared to support a Notice of Requirement (NoR) for the Rotokauri Strategic Infrastructure Designation (the Project) prepared by Beca Limited (Beca) on behalf of Hamilton City Council (HCC) as a requiring authority pursuant to section 167 of the Resource Management Act 1991 (RMA).

This Landscape and Visual Assessment has been prepared to assess the potential landscape and visual effects of the Project. The report forms part of the Assessment of Environmental Effects (AEE) and contains graphic appendices including site location and context plans (**Appendix 1)**, viewpoint and site context photographs (**Appendix 2)**, and typical road cross sections (**Appendix 3)**. The civil engineering plans for the Project, prepared by Beca and appended to the AEE, should be read in conjunction with this Landscape and Visual Assessment.

1.2 Scope

The scope of the report includes:

- A description of the Project with a focus on the aspects that have the potential to generate adverse visual effects and effects on landscape character.
- A description of the existing physical environment including characteristics of the 'site' and wider landscape context as it relates to this assessment, as well as the development context including and in particular the Rotokauri Structure Plan.
- A description of the statutory planning context.
- Identification of the viewing catchment and audiences.
- An assessment of potential landscape and visual effects.

1.3 Methodology

The Landscape Assessment was completed prior to the release date of the Te Tangi a te Manu – Aotearoa New Zealand Landscape Assessment Guidelines (the guidelines)[1], which updates and replaces the New Zealand Institute of Landscape Architects (NZILA) 'Best Practice Note 10.1:Landscape Assessment and Sustainable Management' (2010)[2]. This assessment is consistent with the principles of the guidelines.

The original methodology for this assessment is based on the draft New Zealand Transport Agency (NZTA) Landscape and Visual Assessment Guidelines (October 2013)[3], which is consistent with the principles and approach to assessment set out in the 'Best Practice Note 10.1: Landscape Assessment and Sustainable Management'[4] (2 November 2010), published by NZILA.

Key changes that have been made to the original assessment methodology to align with the guidelines are as follows:

- A seven-point scale has been used in the assessment of landscape and visual effects.

[1] Te Tangi a te Manu, Aotearoa New Zealand Landscape Assessment Guidelines (NZILA, 2022)

[2] Best Practice Note: Landscape Assessment and Sustainable Management 10.1. (2010). New Zealand Institute of Landscape Architects.

[3] App1: NZTA Landscape and Visual Assessment Guidelines (draft), October 2013.

[4] Best Practice Note: Landscape Assessment and Sustainable Management 10.1. (2010). New Zealand Institute of Landscape Architects.

- An assessment of Associative Effects included (refer to Section 6.2.4).

The process set out below forms the basis for this assessment.

1.3.1 Site Visits

Site visits were previously undertaken on the 17th March 2020, 8th June 2020, and 28th February 2022 to investigate the Project, assess the visual catchment of Rotokauri, and to take viewpoint photos. A more recent site visit was undertaken on 9th June 2023 to assess any impact recent development has had to the existing site conditions and to capture updated viewpoint photos where necessary.

1.3.2 Analysis of existing landscape

Landscape is an expression of those natural and cultural features, patterns and processes that exist in an area. It is about the physical components of a place and those human perceptions and associations with it – the way these physical, perceptual and associative components 'hang together' manifests as landscape character.

The analysis of the landscape includes a description of the existing environment, setting out the physical, perceptual and associative components that exist across the site and relevant wider landscape context (e.g. local and/or broader scale landscape). These components are summarised in a statement of the overarching character and landscape values in Section 4.5. For the purpose of this assessment, several sectors have been used to identify and describe existing landform, land cover and land uses, and to provide context for observations about perceptual aspects (primarily visual), key user groups and cultural associations.

1.3.3 Categories of effect

Effects fall into two categories: landscape and visual.

Landscape effects are essentially those that the Project has on the physical, perceptual and associative aspects that comprise landscape character. These effects are considered separately, with a summary statement regarding effects on landscape character. Effects on amenity values are inherent within this context.

Visual Effects are a subset of perceptual effects that require the consideration of project visibility and assessing the effects for specific viewing audiences. A viewpoint map and site photographs that form the basis for the visual assessment are provided in the Appendices.

Factors that (generally) contribute to visual effects include:

- The nature and sensitivity of the viewing location (e.g. static or moving; orientation of view; public or private location);
- The nature and sensitivity of the viewing audience (e.g. homeowners, local road users, tourists etc);
- Overall bulk and scale of the proposal;
- Distance of the proposal from key viewpoints;
- The complexity of the view and extent of intervening elements (e.g. topography, structure and vegetation);
- The nature of the existing view (e.g. heavily modified vs 'natural'; fixed or moving structures); and
- Transient values such as seasonal variation and weather patterns.

1.3.4 Degree of Effect

The effects ratings below are based on a seven-point assessment scale which is outlined in Te Tangi a te Manu[5]. The scale ranges from very low to very high for assessing the degree of landscape character and

[5] Te Tangi a te Manu, Aotearoa New Zealand Landscape Assessment Guidelines (NZILA, 2022)

visual effects that have been identified. The scale is used to determine negative effects of the proposal, whereas positive effects of the proposal are not scaled, they are simply described as positive effects.

To assist project planners and decision makers in understanding the degree of landscape and visual effects of the proposal and also undertaking the broader 'balance' required under the RMA, those effects that are assessed as 'low moderate' are minor in planning evaluation terms. Effects that are at the 'very low' end of the scale are less than minor, and potentially negligible while those effects that are 'high to very high' are significant.

Very Low	Low	Low Moderate	Moderate	High Moderate	High	Very High

2 Statutory Planning Context

The Rotokauri growth cell is one of four structure plan areas that has been identified to facilitate Hamilton's future growth. A site overlay on the Rotokauri Structure Plan is included for reference in **Appendix 1, Figure 2**.

The Hamilton Operative District Plan (District Plan) outlines that the Rotokauri Structure Plan is to guide "*The sustainable expansion of the City into Rotokauri, through a coherent, integrated and people-focused mixed-use development based on best practice urban design principles*"[6].

The Structure Plan outlines the eventual pattern of development for Rotokauri and forms part of Chapter 3 of the District Plan. The District Plan zoning of Rotokauri is very similar to the development areas outlined in the Structure Plan and consists of a combination of General Residential, Major Facilities, Industrial (Rotokauri Employment Area), Residential Intensification and General Residential (Rotokauri Ridgeline Area). The Structure Plan, unlike the District Plan zoning, provides for the proposed Rotokauri Arterial Network (the Network) through the central part of Rotokauri connecting the future land use, as shown on the Rotokauri Structure Plan Overlay in **Appendix 1, Figure 3**.

The Structure Plan incorporates the Rotokauri Ridgeline Character Area which identifies a locally significant landscape feature in the western hills of Rotokauri. The area warrants special landscape management and planning provisions to retain the legibility of the ridgelines and achieve a form and density of development that enables a sense of the underlying landform to be retained.

The Ridgeline Character Area is made up of a number of key visual and physical characteristics, including the pattern of which creates a backdrop to the western edge of the City, as a result of a primary ridgeline that runs from north to south and follows the alignment of Exelby Road; and ridgelines (or spurs) aligned in a generally east-west direction.

It is therefore important to assess the landscape and visual effects as a result of the interface between the Project and the Character Area, as well as an assessment of landscape effects in the context of the eventual pattern of development for Rotokauri, as outlined in the Rotokauri Structure Plan and in the District Plan zoning.

[6] *Hamilton City Council District Plan. Chapter 3: Structure Plans. 3.6 Rotokauri. Page 3-33.*

3 Proposal

The Rotokauri Strategic Infrastructure Designation (the Project) will provide for the construction and operation of the Rotokauri Arterial Network (the Network), including stormwater collection, detention and conveyance and associated stormwater wetland treatment areas. The proposed location and alignment of the Network is shown in **Appendix 1, Figure 1.**

The Project is required to be developed to serve the urbanisation of the Rotokauri growth cell in accordance with the Rotokauri Structure Plan. The arterial transport network is effectively a north-south corridor that commences in the south at Te Wetini Drive and proceeds in a generally north-western direction to the Koura Drive / Te Kowhai Road (SH39) roundabout. The Network also includes a series of west-east corridors that link the Rotokauri growth cell to Te Rapa and Hamilton city. The Network interacts with two other linear corridors within Rotokauri being the Te Rapa Section of the Waikato Expressway (the Expressway) and the Rotokauri Greenway corridor.

The Network covers approximately 5.8km, including the design of a new 5.2km corridor relating to greenfield area which will support future growth and development in Rotokauri. The land subject to the proposed designation varies in width between approximately 20 metres and 30 metres, as the corridors represent a variety of collector, minor arterial and major arterial roads. Cross sections for these roads are illustrated in **Appendix 3**.

Key components of infrastructure associated with the Network with relevance to the assessment of landscape and visual effects are as follows:

- Proposed major arterial: Approx. 0.6km of four lane roading, separated off-road cycle lanes and footpaths, and some sections of median islands, as part of the existing Te Kowhai East Road upgrade through the Te Rapa commercial / industrial area.
- Proposed minor arterials: Approx. 4.6km of two lane roading, separated off-road cycle lanes and footpaths, with large portions containing median islands, located largely to the west of the Expressway.
- Proposed collector roads: Approx. 0.6km of two lane roading with separated off-road cycle lanes and footpaths, located predominantly within existing and future commercial / industrial areas.
- Cut and fill earthworks to raise the roading network above flood prone low-lying areas and to intersect elevated landform, and for the construction of stormwater wetlands, with any excess fill to be utilised locally where possible. The approximate quantum of earthworks required for the project is as follows:
  - For Roading – estimated total cut 50,700m^3 / total fill 132,600m^3
  - For Stormwater wetlands – estimated total cut 167,000m^3.
- Construction of stormwater wetlands, culverts and other drainage infrastructure.
- Street lighting, signage and bus stops.
- Landscape treatments including street trees within the verges and median islands, and rehabilitation / amenity planting through areas of cut or fill, stormwater wetlands and swales.
- Upgrades to existing roads through the Te Rapa business park to the east of the Expressway.

4 Existing Environment

4.1 Regional Landscape Context

The Waikato Regional Landscape Assessment (2010) is a Technical Report commissioned by Environment Waikato, which provides an overview of the landscapes of the Waikato Region and describes the pressures to which they are subject. The report identifies the broad area where the Project is located as the *Waikato Lowlands*, with a key description as follows:

> *The Waikato Lowlands are flat and low lying in contrast with the surrounding hill country. They comprise pasture, hedges, groups of both exotic and indigenous trees, and has a well maintained and developed landscape character.*

Distant landscape features that can be seen from within the Rotokauri area have been identified in The Waikato Regional Landscape Assessment (2010) and include the Western Hill Country, incorporating Mount Pirongia which is approximately 28km to the south west, and the Hakarimata Range which is approximately 12km to the north.

4.2 Rotokauri Structure Plan (refer to Appendix 1, Figures 2-3)

The Project is situated in the northwest of Hamilton and is identified on the Rotokauri Structure Plan. The Rotokauri Structure Plan covers an area of approximately 1000ha immediately adjacent to the existing Te Rapa industrial / business area and will be developed to provide 270ha of industrial land and employment areas, a suburban centre, education and transportation designations, reserves and a residential zone covering approximately 485ha.

The Rotokauri growth cell is an existing greenfield area and has been signalled for urbanisation since 1989. Iterations of the Rotokauri Structure Plan have been in place since 2005 providing a land use development blueprint that enables, and will in time, result in a predominantly residential urban environment.

The growth cell currently sustains a mixture of remnant rural land uses (pastoral farming, cropping and rural lifestyle living) and transitional urbanisation landuses envisaged under the structure plan. The Rotokauri Structure Plan provides for other urban activities including industrial, employment, educational, recreational, commercial (Suburban Centre) and associated network infrastructure as shown in Figure 2-8: Rotokauri Structure Plan[7] of the District Plan.

4.3 Rotokauri Local Landscape Context

For the purpose of this assessment the local landscape is considered as the land contained within the Rotokauri Structure Plan, excluding Lake Rotokauri and the Waiwhakareke Natural Heritage Park which are separated from the immediate surrounds of the proposed designation by intervening landform.

The main north-south portion of the Rotokauri Arterial Network (the Network) is located within Rotokauri which is flanked by the Expressway to the east and the Rotokauri Hills to the west. Much of the landscape of Rotokauri can be described as ‘typical rural’, with dry stock grazing, some dairy farming, and clusters of lifestyle blocks. Vegetation comprises a combination of pasture and exotic tree species used for hedging and shelterbelts. The topography is generally flat although several ridges and gullies of the Rotokauri Hills extend eastwards creating variable relief along the western margins of Rotokauri. Rural drainage networks across the flats have been established to enable agricultural grazing and cropping activities.

[7] https://hamilton.isoplan.co.nz/eplan/rules/0/17/0/0/0/79

Chapter 3.6 of the District Plan describes the topography, land use and waterways within Rotokauri, identifying that:

- *"The ridgelines of Rotokauri contribute significantly to local character and identity. The relationship of the elevated areas to the flat land containing Lake Waiwhakareke is particularly strong.*
- *The flat land is currently crossed with numerous agricultural drains and the extent of these indicates a high-water table throughout the lower-lying areas that will need careful and comprehensive management".*

Whilst the current land use west of the Expressway is primarily rural (but with urban zoning within the District Plan), the south eastern portion of the Project is bordered by urban development, including the completed first stage of the Rotokauri Rise subdivision, a Mainfreight warehouse facility and the Wintec Te Pūkenga Rotokauri Campus.

The eastern edge of Rotokauri is demarcated by the Expressway which forms a visual and physical barrier between the rural landscape to the west and the industrial / urban landscape to the east. This section of the Expressway is elevated above the surrounding low-lying landscape on fill embankments, however, extensive planting along the embankments has integrated them into the landscape. The Expressway provides a comparable example of large-scale roading infrastructure within the Rotokauri landscape, albeit of a much larger scale to the Network.

To the east, between the Expressway and Te Rapa Road, industrial land use is developing rapidly as part of the expansion of the Te Rapa industrial / business area (refer to Appendix 2, Context Photos). The inner Hamilton suburbs and the Waikato River exist beyond Te Rapa to the east, and the Hamilton City Centre is located 6km to the south east.

4.4 Existing Local Landscape Features

Detailed descriptions of characteristic landscape features of the existing Rotokauri local landscape are as follows:

4.4.1 Landform

The topography of the Rotokauri catchment area is largely characterised by flat, low-lying alluvial plains. The Rotokauri Hills form a relatively unique landform feature at the periphery in this context.

The hills are broadly formed by a primary ridgeline which flanks the western edge of the Rotokauri growth cell, and three secondary ridgelines and spurs which extend in a north east direction into the growth cell.

The hills create an elevated backdrop when viewed from the low lying Rotokauri plains and other parts of the City further east. The hills also form a legible natural boundary between the Rotokauri growth cell and rural land of the Waikato District to the west.

The Rotokauri Western Hills Landscape Study[8] provides the following summary of landscape values and significance:

> *"As a landscape feature, the Western Hills are locally significant in the context of the Rotokauri growth node, in that their slope and elevation, relative to the surrounding land, help to physically and visually define the landscape character of the lower lying basins and terrace flats".*
>
> And;

[8] *Rotokauri Western Hills Landscape Study (Boffa Miskell, 2007).*

> *"In a City-wide context the Western Hills are considered to be relatively unique as a discrete and clearly definable ridge and spur system that is notable and distinctive within the generally flat and low lying landscape of much of Hamilton City."*

The Project does not directly impact on the Rotokauri Hills landform, rather the main north-south portion of the Network skirts around the base of the hills at the edge of the low-lying plains. Furthermore, while the topography of the Rotokauri Hills is considered to be locally significant, the hills are part of a highly modified landscape with a mix of farming, housing, and prevalence of pasture and other exotic vegetation. Therefore, the Rotokauri Hills, and adjoining plains to the east where the Project is located, are assessed as having a **very low** degree of naturalness.

4.4.2 Lakes

The main ecological features of the broader Rotokauri area are Lake Rotokauri, Lake Waiwhakareke, and the Rotokauri Drain which links the two lakes.

Lake Rotokauri is a large, shallow peat lake to the west of the Rotokauri Hills. The lake has poor water quality, but native vegetation restoration has enhanced ecological and biodiversity values. Lake Waiwhakareke is a smaller peat lake, with a distinctive horseshoe shape, to the south of Rotokauri. Extensive native restoration planting has occurred around the lake margins in recent years to create habitat representative of the original ecosystem diversity of the Hamilton Basin.

While these two lakes are significant landscape features of the broad Rotokauri area, separation by intervening landform means the Project has no direct effect on landscape values of the lakes. As previously mentioned, for the purpose of this assessment the lakes fall outside of the local Rotokauri landscape.

The lakes are assessed as having a **moderate-high** degree of naturalness in the context of Rotokauri.

4.4.3 Rotokauri Drain

The Rotokauri Drain is an incised, highly modified watercourse that runs between Lake Waiwhakareke and Lake Rotokauri and is connected to the network of drains through the surrounding area. Bank vegetation along the margins of the drain consists typically of exotic herbs, shrubs and pasture, with native swamp plants present towards the southern end of the watercourse.

The Rotokauri drain is assessed as having a **low** degree of naturalness.

4.4.4 Farm Drains

A matrix of straightened and channelised farm drains is prevalent through low-lying parts of the Rotokauri landscape. The farm drains are largely unvegetated with pasture extending up to the edges of the drains and are rarely fenced to exclude stock.

Due to the overall highly modified condition the farm drain network is assessed as having a **very low** degree of naturalness.

4.4.5 Mangaheka Tributary

A straightened, modified tributary of the Mangaheka stream runs through the southern Mangaheka catchment area, on the north east side of the proposed designation, which intersects with the Arterial corridor at one point.

Due to the channelised nature of the tributary at this location, the lack of riparian habitat and industrial land use surroundings the Mangaheka tributary network is assessed as having a **very low** degree of naturalness.

4.4.6 Wetlands

The Ecological Impact Assessment[9] has identified eight wetlands within 100m of the Project. The wetlands, which are remnants of a larger wetland complex, are in a degraded condition and are grazed by livestock. Vegetation consists of primarily grazed pasture, with a limited proportion of native wetland shrubs and grasses present.

Due to their highly modified condition the wetlands network is assessed as having a **very low** degree of naturalness.

4.4.7 Vegetation

Vegetation within the proposed designation is mainly grazed pasture with low-lying areas of rushes, blackberry, and exotic tree species used for hedging or shelterbelts along geometric lot boundaries which are a characteristic part of the general landscape pattern across the proposed designation. Trees are sparse and are typically located in the riparian zones and consist of predominantly exotic species including pine, eucalyptus, barberry, poplar, Lawson's cypress, macrocarpa and tree ferns.

Kahikatea forest remnants are present on the outskirts of Rotokauri.

Overall, the vegetation values and degree of naturalness is assessed as **very low**.

4.5 Landscape Values Summary

Key landscape values of Rotokauri can be summarised as follows:

- The overarching 'typical rural' character, which largely comprises agricultural grazing and cropping activities, and a matrix of scattered exotic trees, hedging and shelterbelts.
- The Rotokauri Hills which provide variable relief along the western margins of Rotokauri.
- Kahikatea forest remnants and peat lakes
- Views to distant landscape features including Mount Pirongia and the Hakarimata Ranges.

4.6 Future Environment

4.6.1 The environment against which effects must be assessed

The Rotokauri Structure Plan requires the advanced or concurrent development of critical infrastructure to unlock the urbanisation planned in the catchment, including the designated Rotokauri Greenway corridor and the Network. The Rotokauri Greenway is a necessary precursor to the construction of a significant component of the Network. On 12 December 2023, the Environmental Protection Authority accepted an application for resource consents to construct the Rotokauri Greenway and supporting infrastructure. The application is currently before an expert consenting panel appointed to determine the application under the COVID-19 Recovery (Fast-track Consenting) Act 2020.

Urbanisation is under way in the growth cell with various consents lodged and several obtained by adjacent landowners and developers. Particularly relevant to the Network are the subdivision consents granted to RDL (197 lots) and Te Wetini Developments (5 lots). It is acknowledged that a degree of integration between HCC as the requiring authority and the development community is necessary during this transitional development phase. As such, it is anticipated that the Network may be refined in co-ordination with adjacent landowners in the future.

[9] *Rotokauri Strategic Infrastructure Designation - Ecological Impact Assessment (Beca, 2024).*

4.6.2 Timing and sequencing

While exact timing and sequencing of development within the Rotokauri Structure Plan will be influenced by development demands, the following assumptions have been made in relation to the state of the environment:

- **The Greenway corridor**

Construction of the Network will not commence ahead of the construction of the Greenway corridor, as it is the first critical piece of infrastructure required to support urbanisation of the area, given the significant stormwater issues associated with Rotokauri. The construction of the Greenway will span several construction seasons involving significant bulk earthworks and associated effects which will be managed by a suite of designation conditions, resource consents, and associated management plans. This will result in temporary disruption of visual amenity and landscape character within Rotokauri until it is completed, and rehabilitation planting is established. The existence of the Rotokauri Greenway and associated wetlands should be assumed in all effects assessments.

- **Urban development**

Development planning is well advanced with three master plans prepared for large greenfield areas of Rotokauri[10]. This includes the Rotokauri North Structure Plan area at the northern extent of the Network for which the zoning is now operative and could commence at any time (subject to regional consents and the provision of other infrastructure). Other developers are progressing the design and construction of the Greenway corridor and roading networks (some of which includes delivering part of the NOR works), which will provide the necessary infrastructure for stormwater management, treatment and discharge, along with critical roading connectivity, to enable the urbanisation of a large portion of Rotokauri. It is therefore feasible to assume that urban development across the Rotokauri Structure Plan will have advanced at the time the construction of the balance of the Network commences.

This future environment at commencement of implementation of the Network forms the baseline for this assessment. This future environment is different to the existing environment that is described in Section 4.2 - 4.4 above.

The landscape and visual effects of the Network are assessed against this future environment, and in this context the area is considered to have a **low** sensitivity to change.

Of the landscape features described in Section 4.4 above, the Rotokauri drain, other farm drains, and wetlands, are expected to experience substantial change as a result of implementation of the Greenway. This is summarised as follows:

4.6.3 Rotokauri Drain

A large portion of the Rotokauri Drain is planned to be modified and incorporated into the Greenway, prior to the implementation of the Project. Therefore, existing landscape values of the Rotokauri Drain will not exist upon commencement of implementation of the Network and will be replaced by the highly modified Greenway.

4.6.4 Farm Drains

The portions of the farm drain network that are intercepted by the Greenway are planned to be modified and incorporated with the Greenway, prior to the implementation of the Project. Other parts of the farm drain

[10] Refer Beca Urban and Landscape Design Framework (June 2023), Page 22, Figure 13 for Rotokauri Development Context map.

network may also be modified in conjunction with other urban development during implementation of the Project.

4.6.5 Wetlands

Of the eight wetlands identified by the Ecological Impact Assessment[11], the six southern-most wetlands (1 – 6) are likely to be affected by changes to ground water conditions as a result of the Greenway.

[11] *Rotokauri Strategic Infrastructure Designation - Ecological Impact Assessment (Beca, 2024).*

5 Natural Character Effects

Lake Rotokauri and Lake Waiwhakareke are important natural landscape features of the wider Rotokauri landscape; however, these exist outside of the immediate Project area and their natural character values are not considered to be affected by the Project.

The focus of assessing effects on natural character is on the wetlands and modified watercourses that contribute to natural character values of the local Rotokauri landscape, as described in Section 4.4 above. The natural character effects on these landscape features are summarised as follows:

5.1.1 Rotokauri Drain

As described in Section 4.6 above, the Rotokauri Drain is planned to be modified and incorporated into the Greenway, prior to the implementation of the Project. Therefore, natural character effects of the Project will be **nil**.

5.1.2 Mangaheka Tributary

The Rotokauri Arterial Network (the Network) intersects with the Mangaheka Tributary at the point where the proposed major arterial corridor extends eastward. At this location, the tributary will be redirected from the adjoining wetland along a new channel to a double box culvert beneath the major arterial corridor, then reconnect with the existing channel. The diverted sections of the Mangaheka Tributary will be enhanced with shallow graded side slopes, planted embankments and ecological habitat features.

The degree of modification and the nature of the works are substantial, in particular the redirection through the double boxed culvert. However proposed enhancements will provide substantial improvement of the natural character values for the diverted sections of the tributary. Overall, the natural character effects on the Mangaheka Tributary will be **positive**.

5.1.3 Farm Drains

The Network intersects numerous rural open water drains along the corridor. At these locations the existing drains will be modified and redirected into the new drainage network or culverted beneath the new roading and redirected into the Greenway. Due to the already straightened and channelised nature of the farm drains, and the general very low natural character values of the farm drain network, the natural character effects of the Project will be **very low.**

5.1.4 Wetlands

Wetlands 1 – 6, as identified by the Ecological Impact Assessment[12], are likely to be affected by changes to ground water conditions as a result of the Greenway. Any residual wetland features will be intersected by, and are likely to be consumed by the Network. Wetlands 7 and 8 located in the northern portion of Rotokauri are not directly intersected by the Network, therefore the wetlands will remain intact.

Overall, the wetlands have very low natural character value, therefore natural character effects are assessed as **low**.

5.1.5 Summary

Overall, the Project will have a **very low** level of effect on the natural character values of the local Rotokauri landscape.

[12] *Rotokauri Strategic Infrastructure Designation - Ecological Impact Assessment (Beca, 2024).*

6 Landscape and Visual Effects

As described previously the following assessment categorises the nature and degree of effects into landscape and visual, whereby:

1. Landscape effects are those that the project has on the **physical**, **perceptual/sensory** and **associative** aspects that comprise landscape character. Effects on amenity values are part of this evaluation; and
2. Visual effects are a subset of landscape (perceptual) effects that require the consideration of project visibility and assessing potential effects on specific 'viewing audiences'.

6.1 Visual Catchment and Audiences

Site visits were undertaken on the 17th March 2020, 8th June 2020, 28th February 2022, and 9th June 2023 to determine likely views of the site, as well as current and anticipated future viewing audiences. The site visits included walking the Project site and the adjacent Waikato Expressway cycleway and driving the surrounding roads of the wider visual catchment.

Several viewpoint locations have been identified that are representative of the anticipated viewing audiences of the future urban areas. Table 1 summarises the identified viewpoint locations with photographs provided in **Appendix 2**:

Table 1: Summary of viewpoint locations

No.	Location	View direction	Distance to site	Description
1	Waikato Expressway Cycleway (south end)	South West	Varies	Views for pedestrians and cyclists travelling along the cycleway
2	Waikato Expressway Cycleway (north end)	West	300m	Views for pedestrians and cyclists travelling along the cycleway
3	Waikato Expressway (described)	East and West	Varies	Described views for people travelling in vehicles in both directions (north and south bound).
4	Te Kowhai Road	South	Varies	Views from travelling vehicles on Te Kowhai Road, between the northern extent of the Project and the Waikato Expressway, and representative of views from residential properties and the Brylyn rest home.
5	Burbush Road	East	400m	Views from travelling vehicles and private residential properties along Burbush Road, and representative of views from future residential areas through the Rotokauri hills.

6	Lee Road	East	400m	Views from the existing residential properties at the end of Lee Road, and representative of views from future residential areas through the Rotokauri hills.
7	Corner of Taiatea Drive and Pukenga Road	North	180m	Views from the street and existing residential properties, and representative of views from future residential areas through the low lying south west portion of the Rotokauri Structure Plan area.

6.2 Landscape Effects

6.2.1 Temporary Landscape Effects on the Existing Landscape

Temporary effects are assessed against the future environment described in Section 4.6 above, where the Project is expected to be implemented in the context of the Greenway and other urban development.

Construction of the Rotokauri Arterial Network (the Network) will generally include the following key components:

- Major earthworks for establishment of the arterial alignment and grading, and excavation of drainage detention, wetlands, and conveyance;
- Presence of earthworks machinery, temporary drainage or dewatering infrastructure, site compound, security fencing and traffic management;
- Road surfacing, paths, barriers and other roading furniture;
- Implementation of above and below ground services, such as drainage infrastructure and street lights;
- Landscaping including implementation of street trees, gardens, and street furniture.

These works will occur in the context of construction of the Greenway which is anticipated to occur over several construction seasons, involving large-scale earthworks and installation of drainage infrastructure across a large expanse of the Rotokauri area with heavy machinery, creation of haul roads, temporary stockpiling of materials, and extensive site rehabilitation works.

Urban development across the Rotokauri Structure Plan area anticipated to occur in conjunction with the Project will also require substantial earthworks, infrastructure, roads, temporary works and eventually housing construction.

Where the Network intersects residual farm drains and wetlands that remain after completion of the Greenway, these will be incorporated into the drainage conveyance and storage network via new swales, culverts and wetlands. Existing drains outside of the Project area will be left intact until such time that they are required to be modified in conjunction with new urban development.

It is likely that there will still be large tracts of land being used for agricultural purposes, and therefore pockets of rural character will remain intact until such time that development across the entire Rotokauri Structure Plan area has been realised. Considering the future modified environment, and extensive, ongoing construction works, the temporary effects resulting from earthworks and construction of the Network are assessed as **low**.

6.2.2 Landscape Effects on the Future Urban Character

Landscape and visual effects associated with the operation of the Network will not eventuate in the environment as it exists today but in a future environment where the Rotokauri Structure Plan area has or will be urbanised. The Network will ultimately appear as an integrated component of the urban environment in accordance with the Rotokauri Structure Plan.

Whilst the site and the visual catchment are not part of a 'significant landscape' identified in the District Plan or Waikato Regional Plan (WRP) i.e. Outstanding Natural Landscape or amenity landscape, the ridgelines of the Rotokauri Hills contribute to the local character and its identity.

The Network is located through the low-lying area at the base of the Rotokauri Hills, avoiding substantial cut and fill earthworks of the hills themselves. Furthermore, the proposed earthworks will be viewed in the context of the Greenway, and surrounding land development, therefore, the Network will not appear as an isolated piece of infrastructure. Typical roading infrastructure such as drainage outlets, barriers and streetlights of the Expressway and the adjacent industrial area form part of the landscape context.

New wetlands distributed across the entire length of the Network will contribute towards a substantial increase of native revegetation, having a positive effect by providing visual relief and breaks in the built form and roading across the low-lying areas of the future urban landscape of Rotokauri.

Ultimately, the effects on landscape character of the future urban environment will be **nil**. A road of this scale is considered to be a typical component of the urban environment, and it is consistent with the intent of the Rotokauri Structure Plan.

6.2.3 Effects on the Existing Commercial / Industrial Character

The portion of the Network within the Te Rapa business park area east of the Expressway will include widening to accommodate dual carriageways, and the reconfiguration of industrial lots, road connections and driveways. The road upgrades will include street trees, cycle lanes and street furniture. Overall, this will enhance the character of this portion of the Te Rapa business park.

Te Rapa business park site context photos are provided in **Appendix 2**. These photos illustrate the overarching 'big box' industrial land use character, and the current lack of landscape amenity. The Tasman Road photo provides an example of an improved streetscape environment, with landscape amenity attributes that will be similar to the proposed road upgrades of the Network through this area.

6.2.4 Associative Effects

The guidelines[13] include increased recognition of mātauranga Māori and the importance of tāngata whenua values.

Through 2020 a series of workshops were held with Te Haa O Te Whenua O Kirikiriroa (THaWK) and a draft version of this Landscape Assessment was issued for review as part of the engagement process. THaWK have provided a Cultural Impact Assessment (February 2021) for the Project which notes that no sites of cultural significance have been identified near the arterial corridors, which is consistent with the findings of the archaeological report by Sian Keith Archaeology Ltd.

Key areas of interest for mana whenua have focused on ecological outcomes particularly in relation to water quality and the alteration of drains and pest fish management, protection of native fauna, revegetation of native plant species and re-establishing wetlands, as well as ongoing input into design, monitoring and implementation of the Network.

6.2.5 Landscape Effects Summary

Landscape character effects in the context of the future urban environment are considered to be **nil** overall, and short term (temporary) landscape character effects resulting from construction activity are assessed as **low**.

[13] Te Tangi a te Manu, Aotearoa New Zealand Landscape Assessment Guidelines (NZILA, 2022)

6.3 Visual Effects Analysis

The following viewpoint evaluations analyse and summarise the landscape character, visual considerations, and the potential impact of the Project. Each viewpoint evaluation concludes with an overall impact rating. For the purposes of this assessment, visual effects include:

a. Changes to views from publicly accessible areas (as represented by the assessment viewpoints);

b. Changes to views from neighbouring private properties (as represented by the representative assessment viewpoints from publicly accessible locations); and

c. Views from future anticipated residential activities (as represented by the representative assessment viewpoints from publicly accessible locations).

The photo viewpoint locations are identified on the Photo Viewpoint Location Plan in **Appendix 1, Figure 1**, and are cross-referenced to the photographs provided in **Appendix 2**.

6.3.1 Viewpoint 1: Views from the Waikato Expressway Cycleway (southern end)

This viewpoint is located towards the southern end of the Network. At this location a cycleway runs along the western side of the Expressway at the base of the road embankment but remains slightly elevated above the adjacent landscape.

There is low mixed native vegetation in the immediate foreground of the view which allows views across the adjacent landscape, however the mix of plants towards each side of the view includes trees and large shrubs which may grow above head height as they mature, which would enclose the path and restrict views.

Views beyond this native vegetation comprise a mix of low-lying, flat land with an open sequence of pasture, shelterbelts, other pockets of exotic trees, and occasional farm sheds and residential properties. Towards the south the large industrial sheds of the Mainfreight depot are visible, and to the south west the residential houses of the Rotokauri Rise subdivision are visible in the distance.

The low rolling Rotokauri Hills are a recognisable residual natural feature which are considered to contribute to the local character and identity of Rotokauri together with Mount Pirongia faintly visible in the distance.

Construction of the Network will occur in context of the Greenway. However, construction is still likely to take place prior to other associated land development and building construction, and the existing rural landscape character is likely to be partly intact. Therefore, during earthworks and construction the Network will have a **low** effect on the visual amenity from this viewpoint location.

The land between the cycleway and the Network is identified as an Employment Area in the Rotokauri Structure Plan. The Employment Area is intended to fulfil a transitional role in ‘stepping down’ the effects of the general industrial zone to ensure that adverse effects on adjoining residential areas can be properly managed. Therefore commercial / business development is anticipated through this area which will dramatically change the character of the existing rural landscape, and the built form will restrict views of the collector road and other parts of the Network. Therefore, in the context of the future urban environment the effects on visual amenity from this location will be **nil**.

6.3.2 Viewpoint 2: Views from the Waikato Expressway Cycleway (northern end)

Towards the northern end of the Network the cycleway is approximately at grade with the adjacent landscape. On the far right hand side of the view is a vegetated bund which screens views to the west from the Expressway. A fenced drain intersects the immediate foreground of the view in front of a cluster of farm sheds with associated agricultural machinery and fencing. The composition of the view beyond includes a mix of low-lying, flat land with an open sequence of pasture, shelterbelts, other pockets of exotic trees, and occasional residential properties.

The low rolling Rotokauri Hills form a backdrop to this viewpoint, and the outline of the Western Ranges are faintly visible in the distance. A large stand of remnant Kahikatea trees can be seen on the right hand side of the view in the background. This view composition has a prevailing rural character.

Construction of the Network is likely to take place prior to the associated land development and building construction, and therefore the existing rural landscape character is likely to be partly intact. Therefore, earthworks and construction will have a **low** effect on the visual amenity from this location.

The area of land between the cycleway and the Network is approximately 300m and is identified as an Employment Area in the Rotokauri Structure Plan as described in Section 4.2. Therefore commercial / business development is anticipated through this area which will dramatically change the character of the existing rural landscape. Future built form will restrict views toward the Network while some glimpses could be obtained between buildings and along local streets. Therefore, in the context of the future urban environment the effects on visual amenity from this location will be **nil**.

6.3.3 Viewpoint 3: Views from the SH1 Waikato Expressway (the Expressway)

Due to safety and practicality reasons a photo viewpoint could not be obtained from the Expressway, however several trips were conducted along the Expressway to gain an appreciation of the visible landscape. Given the elevation of the Expressway and the high numbers of people travelling along the corridor a described ‘representative’ view is provided below.

Views towards the western portion of the Network are a similar distance as those from the cycleway and therefore have essentially the same landscape composition described in Section 6.3.1 and 6.3.2, however there are a number of factors that will influence the viewing experience from the Expressway. These include:

- A large portion of the Expressway is elevated above the surrounding landscape, up to a height of approximately 7.5m at the Wairere Drive overpass towards the southern end of the Network. This provides a higher vantage point, and creates opportunities for viewers to see over the future Employment Area and the Rotokauri Greenway;
- Planted bunds and extensive screen planting along the Expressway embankments can partially or completely screen views out towards the landscape; and
- The viewing audience is limited to people travelling in vehicles at speed (100km/hr speed limit with no stopping), and viewers would be required to turn their head at an acute angle for a side on view.

In addition to the side-on views there are also opportunities for views from a front-on direction over the embankment planting, on approach from the south where there is a sweeping curve in the road alignment above the Chalmers Road extension underpass.

The view composition to the east includes large format industrial buildings, vacant development sites and grazed paddocks, and the backdrop of the wider Te Rapa industrial / business area. Whilst there are agricultural and vegetation components within this view, the composition is dominated by an industrial aesthetic.

Construction of the Network is likely to take place prior to the associated land development and building construction, and therefore the existing rural landscape character is likely to be partly intact. Therefore, during earthworks and construction where there are views through the roadside vegetation the Network will have a **low** effect on the visual amenity from this location.

Vehicles travelling at 100km/hr in both directions will gain fleeting views due to the presence of roadside vegetation, and it is expected that the attention of the drivers in particular, will be focused on the road ahead and the traffic in adjacent lanes. Furthermore, the Industrial zoning to the east and Employment area to the west is anticipated to dramatically change the character of the existing rural landscape, and the future built form will further restrict views of the Network to glimpses between buildings and along local streets.

Therefore, in the context of the future urban environment the effects on visual amenity from this location will be **nil**.

6.3.4 Viewpoint 4: Views from Te Kowhai Road

Taken from Te Kowhai Road looking south, this location is representative of views from the existing residential properties, the Brylyn Rest Home and vehicles travelling along this section of Te Kowhai Road.

This viewpoint is approximately 200m from the Network which runs in a north west direction towards the roundabout at the intersection of Te Kowhai Road and Burbush Road.

The composition of views from this quarter includes broad flat pastoral land in the foreground, with shelterbelts, other pockets of exotic trees, occasional farm sheds and residential properties scattered beyond. The low rolling Rotokauri hills form a backdrop across the south western portion of the view, and to the south east the Te Rapa business park is visible in the distance, with its characteristic large format industrial sheds. The Rotokauri hills are a recognisable residual natural feature which are considered to contribute to the local character and identity of Rotokauri, and when combined with the prevailing rural character this view is considered to have a moderate sensitivity to change.

The flat pastoral land in the foreground is identified as an Employment area in the Rotokauri Structure Plan, and a series of large stormwater wetlands are planned to be positioned directly adjacent to the Network to provide stormwater storage treatment associated with the future minor arterial.

Construction will be highly visible from Te Kowhai Road, and it is likely to take place prior to the associated land development and building construction, and therefore the existing rural landscape character is likely to be partly intact. Therefore, earthworks and construction will have a **moderate** effect on the visual amenity from this location.

The industrial / commercial development anticipated through this area will dramatically change the character of the existing rural landscape, and the built form will restrict views from Te Kowhai Road which will be at a similar elevation. Furthermore, the proposed large stormwater wetlands will be planted with native wetland vegetation which will provide some screening of adjacent sections of the Network and provide enhanced visual amenity. Therefore, in the context of the future urban environment the effects on visual amenity from this location will be **nil**.

6.3.5 Viewpoint 5: Views from Burbush Road

Taken from Burbush Road opposite No. 82 looking east, approximately 450m from the Network. This viewpoint is located adjacent to a low point on the ridge on the east side of the road, which allows views from travelling vehicles. This location is also representative of views from the existing residential properties along Burbush Road as well as from future residential areas through the Rotokauri Hills.

This view is framed by low rolling hills on each side, sloping down to low-lying flat land which extends eastward into the distance. The land cover is comprised of an open sequence of pasture, shelterbelts, other pockets of exotic trees, farm drains, and the Expressway and Te Rapa industrial / business area in the background, with its characteristic large format industrial sheds. The landscape within this view is largely devoid of any residual natural elements or features, apart from clusters of vegetation, and the backdrop clearly has an industrial aesthetic.

Construction is likely to take place prior to the associated land development and building construction, and therefore the existing rural landscape character is likely to be partly intact. Therefore, earthworks and construction will have a **low** effect on the visual amenity from this location.

The land between the viewpoint location and the Network is identified as Future Reserve in the Rotokauri Structure Plan, and it is anticipated that it will remain open and be largely free of built structures which could

obstruct views of the Network through the low lying areas. Whilst the viewpoint is elevated above the low lying area, the Network will not be an obvious or dominant element amongst the broader area of urbanisation. The Network will visually blend with the widespread Te Rapa business park beyond, consistent with the highly urbanised backdrop, and therefore, in the context of the future urban environment the effects on visual amenity from this location will be **nil**.

6.3.6 Viewpoint 6: Views from Lee Road

Taken from the end of Lee Road, the elevated position of this viewpoint is representative of views from existing residential properties at the end of Lee Road and from future residential areas through the Rotokauri Hills.

The Network curves around the base of the hill approximately 450m to the north and 300m to the east of the viewpoint, providing clear views in two directions.

Views from Lee Road reveal an open sequence of pasture, shelterbelts, other pockets of exotic trees, stormwater drains and wetlands, and the wide expanse of the Te Rapa industrial / business area in the background. In the distance rural areas north of Hamilton are visible, and the faint outline of the Hakarimata Range can be seen. While there are areas of agriculture and vegetation within this view, the backdrop has a clear industrial aesthetic.

The location of the Expressway can be clearly identified from this elevated vantage point by the corridor of rehabilitation planting which flank the highway embankments. The Expressway provides an indication of the relative visibility and magnitude of effect of the Network, which generally runs in parallel with the Expressway, albeit of a much lesser scale.

The land between the viewpoint and the Network is zoned Residential and Medium Density Residential in the Rotokauri Structure Plan, which is intended to provide for a range of housing types and densities that will form part of an urban pattern incorporating its own local roading network. Therefore, the Network will ultimately appear to be incorporated within a future urban setting, and built elements associated with the residential zones are anticipated to visually obstruct parts of the Network from this viewpoint, resulting in only glimpsed views. Proposed street trees and amenity planting will assist with integrating the road network within the landscape and will have a softening effect.

Construction of the roading network is likely to take place prior to the associated land development and building construction, and at that time the existing rural landscape character is likely to be partly intact. Therefore, earthworks and construction will have a **low** effect on the visual amenity from this location.

The land beyond the Network to the east includes zoning for an Employment Area and a Suburban Centre in the Rotokauri Structure Plan, further contextualising the Network within an urbanised setting. It is anticipated that future urban development will appear to visually blend with the Te Rapa industrial area to the north and Avalon to the east, so whilst the viewpoint is elevated and gains a relatively expansive view of the area, the effects on visual amenity from this location on the future urban character will be **nil**.

6.3.7 Viewpoint 7: Views from Rotokauri Rise Estate

Taken from the corner of Taiatea Drive and Pukenga Road adjoining the Rotokauri Rise subdivision, views from this location are representative of views from the local roads and existing residential properties of the Rotokauri Rise subdivision.

The view from this location captures the Taiatea Drive Road extension which is nearing completion and is still blocked off by site fencing, and empty subdivision lots. In the background there are areas of grazed pasture, tall shelterbelts, scattered pockets of exotic trees, and the Expressway is visible through breaks in

the vegetation. Beyond the Expressway a number of industrial buildings and The Base shopping centre are visible, with the Hakarimata Range is visible in the distance.

The land between the viewpoint and the Network is zoned Medium Density Residential and a Suburban Centre in the Rotokauri Structure Plan, which will result in the development of a highly urbanised setting.

Construction of the Network will occur in context of the Taiatea Drive Road extension which is nearing completion, and the Greenway which is anticipated to occur prior to the Project. Therefore, earthworks and construction will have a **very low** effect on the visual amenity from this viewpoint location.

The effects on visual amenity from this location on the future urban character will be **nil**.

7 Conclusion

The Rotokauri Strategic Infrastructure Designation (the Project) will provide for the construction and operation of the Rotokauri Arterial Network (the Network), including stormwater collection, detention and conveyance and associated stormwater wetland treatment areas. The Network covers a combined 5.8km length of corridors, including the design of a new 5.2km corridor relating to greenfield area which will support future growth and development in Rotokauri.

The construction of the Network will be spread out, in conjunction with private land development through the Rotokauri area and is expected to occur after the construction of the Greenway. The Network is located through the low-lying area at the base of the Rotokauri Hills, avoiding substantial cut and fill earthworks of the hills themselves and therefore the Network will not have a negative impact on the landscape values of the ridgeline character area.

Temporary effects on the landscape values of Rotokauri resulting from earthworks and construction of the road network are assessed as **low**.

Long term, in the context of the future urban environment the landscape effects of the Network on the landscape values of Rotokauri are assessed as **nil.** A road of this scale is considered a typical component of the urban environment, and it is consistent with the intent of the Rotokauri Structure Plan.

Visual effects are summarised below:

Table 2: Viewpoint Ratings Summary

Viewpoint:	*Temporary Visual Effects on Rural Character:*	***Visual Effects on Future Urban Character:***
1. Waikato Expressway Cycleway (southern end):	*Low*	***Nil***
2. Waikato Expressway Cycleway (northern end)	*Low*	***Nil***
3. SH1 Waikato Expressway	*Low*	***Nil***
4. Te Kowhai Road	*Moderate*	***Nil***
5. Burbush Road	*Low*	***Nil***
6. Lee Road	*Low*	***Nil***
7. Rotokauri Rise Estate	*Very Low*	***Nil***

The overall temporary visual effects on rural character will be **low**. The overall visual effects on the surrounding roads and future urban areas will be **nil**.

Proposed amenity planting and street trees along the verges and median islands of the Network are anticipated to have a **positive effect** on the visual amenity of the future urban environment and through the existing Te Rapa business park. Vegetation will help to screen views of the Network and will visually soften the appearance of the roading and vehicle traffic.

The Project will provide an integral component in the wider transport network which will serve the urbanisation of the Rotokauri growth cell in accordance with the Rotokauri Structure Plan. It is considered appropriate for its location from a landscape effects perspective for the reasons outlined above.

ROTOKAURI STRATEGIC INFRASTRUCTURE DESIGNATION - LANDSCAPE AND VISUAL ASSESSMENT APPENDICES

24.04.2024 Project Number: 4288564 Revision F

Beca

Note: This document should be viewed as a two-page view page display in PDF, or printed double sided at A3 size.

Revision History

Project Number: 4288564

Revision	Prepared By	Description	Date
A	Will Gumbley	Draft For Internal Review	12/06/2020
B	Will Gumbley	Draft For HCC / THAWK Review	30/06/2020
C	Will Gumbley	Issue for Notice of Requirement	01/04/2022
D	Will Gumbley	Revised Issue for Notice of Requirement	19/06/2023
E	Will Gumbley	Revised Issue for Notice of Requirement	03/08/2023
F	Will Gumbley	Revised Issue for Section 92 Response	24/04/2024

Document Acceptance

Action	Name	Signed	Date
Prepared by	Will Gumbley		24/04/2024
Reviewed by	Sophie Strachan		24/04/2024
Approved by	Craig Sharman		

on behalf of Beca Ltd.

This document should be printed double sided at A3.

Images in this document: Unless otherwise noted, drawings, illustrations, photos and other images have been provided directly by Beca. In all other instances, best efforts have been made to reference the image to its original source.

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APPENDIX 1

SITE AND CONTEXT PLANS

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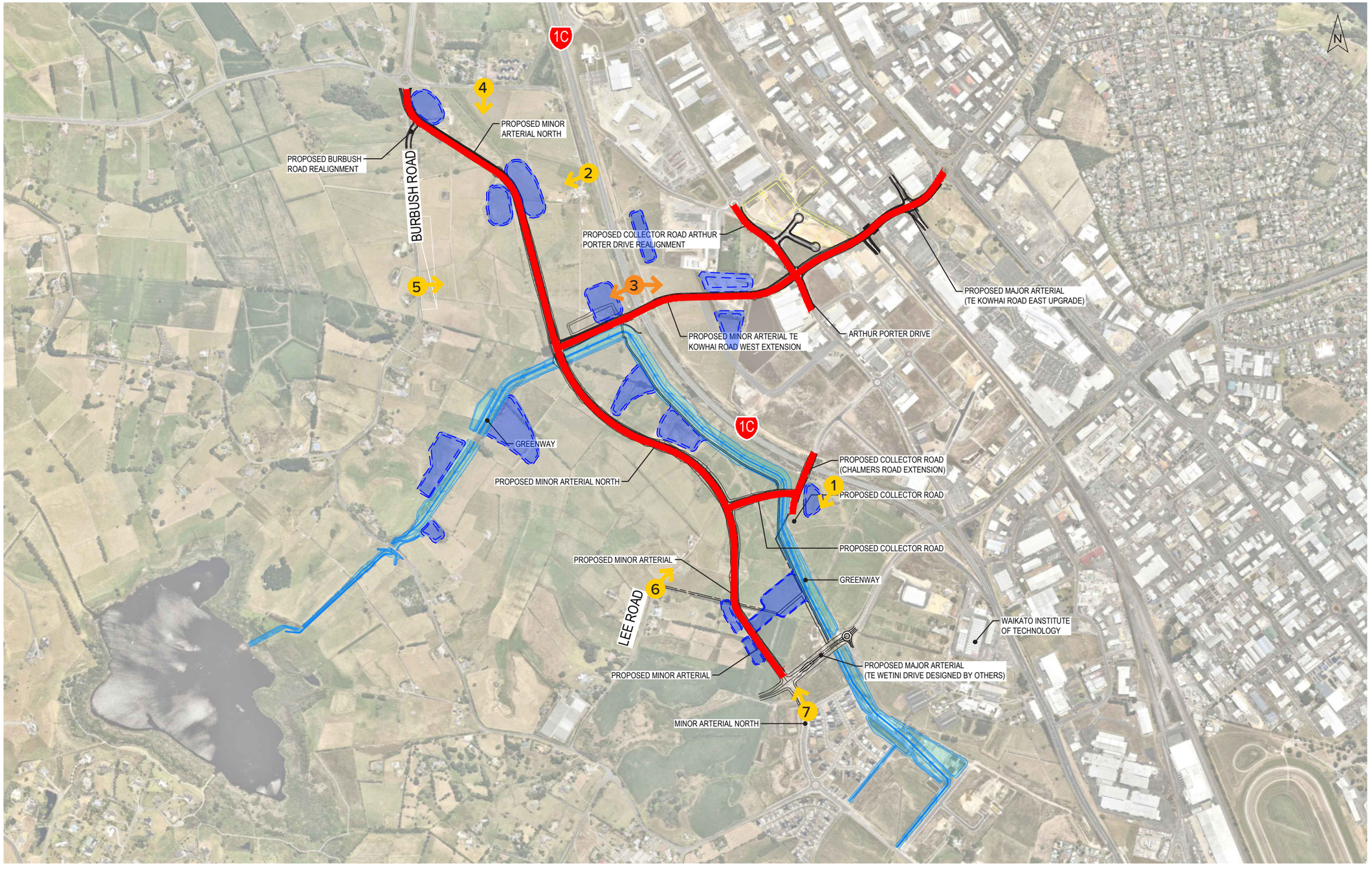
Figure 1: Site Context and Viewpoint Locations



1:15,000 @ A3

Legend

Proposed Greenway | Proposed Stormwater Wetland | Proposed Rotokauri Arterials Network | Photo Viewpoints | Described Viewpoints

Figure 2: Hamilton District Structure Plan Localities

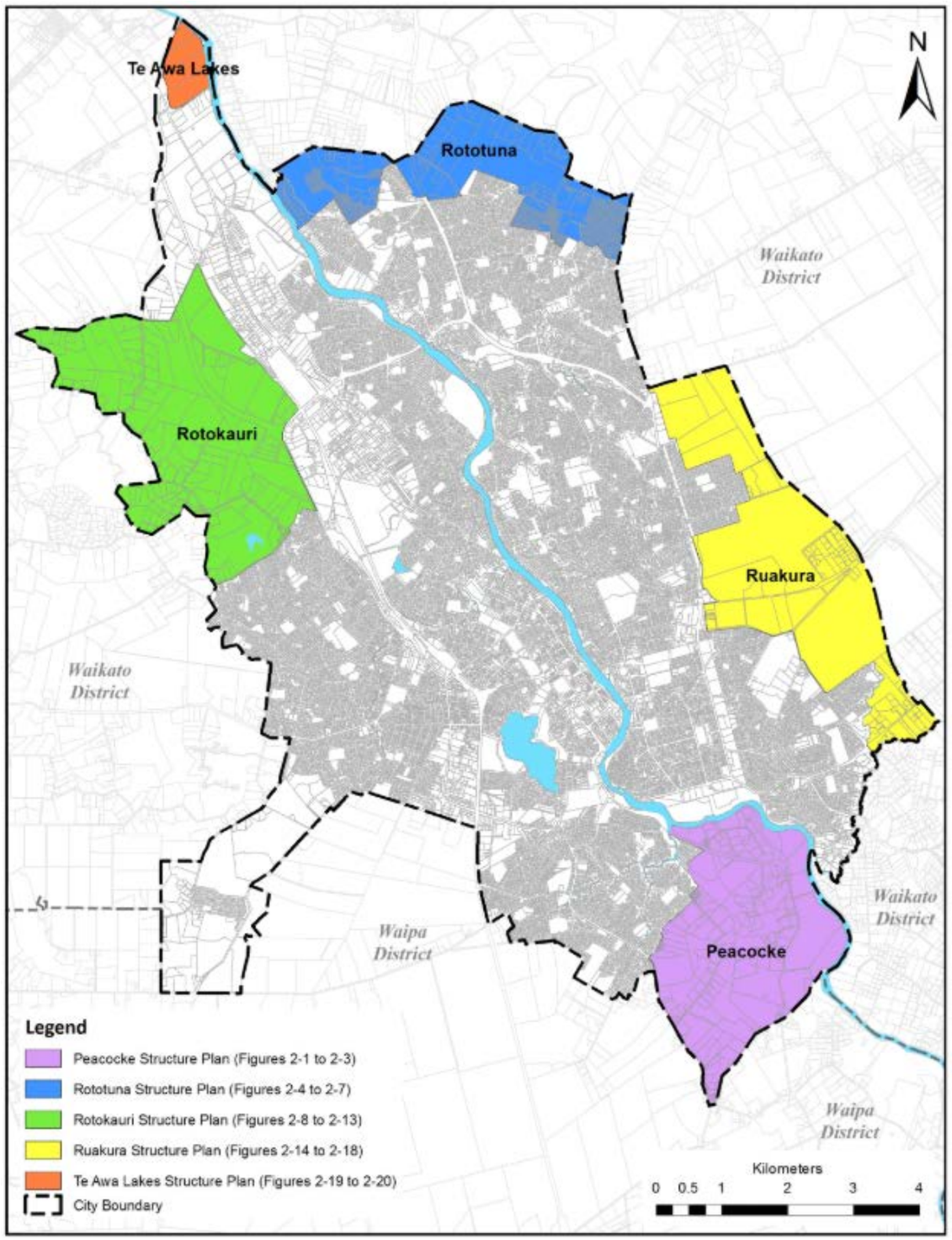
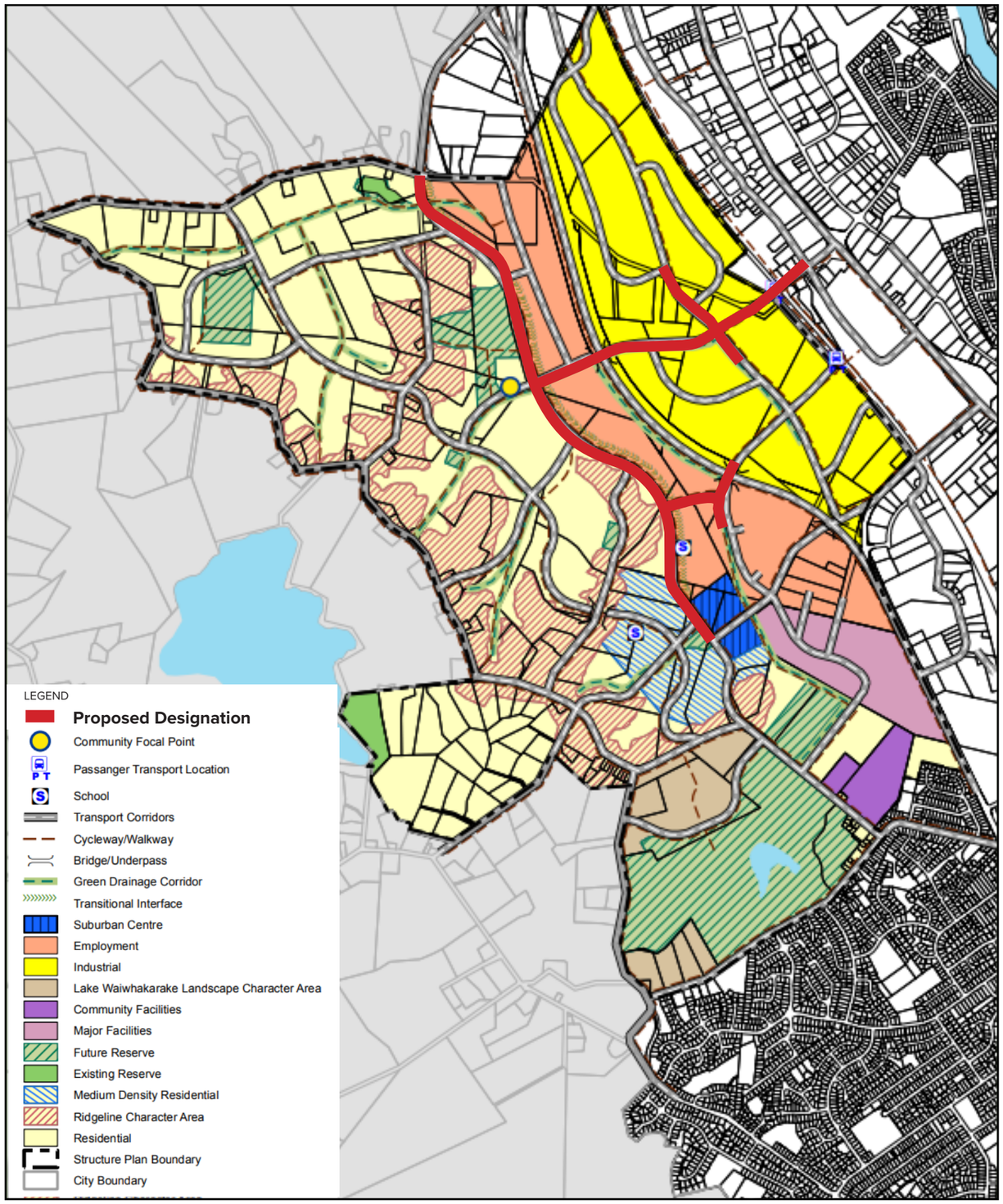


Figure 3: Rotokauri Structure Plan Overlay



APPENDIX 2

CONTEXT PHOTOS AND VIEWPOINT PHOTOS

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Methodology

- Photos were taken using a Canon EOS 5D Mark III DSLR camera with a 50mm lens.
- Viewpoint locations were identified using GPS referencing.
- Multiple portrait photos were taken for each viewpoint location. The individual photos were stitched using a cylindrical photomerge in Kolor Autopano Giga or Adobe Photoshop software to form a panoramic image representative of a 130° horizontal field of view where appropriate (see Figure A).
- The panoramic images are then reproduced across two A3 pages at the correct scale for viewing at a 300mm viewing distance (see Figure B).
- Reproduction in this way (i.e. 110° horizontal and 40° vertical viewed at 300mm) provides a field of view approximate to the field of human binocular vision.

The following references can provide a comprehensive explanation of the methodology outlined above as well as outlining those caveats that are associated with the preparation of visual simulations:

New Zealand Institute of Landscape Architects (2/11/10). Best Practice Guide – Landscape Assessment and Sustainable Management/ Best Practice Guide – Visual Simulations. NZILA Education Foundation.

Scottish Natural Heritage et al (29/03/06). Visual Representation of Windfarms. Good Practice Guidance. Horner + Maclennan and Envision.

Note:

- Photos are two-dimensional and flatten an image compared to a real life
- The human eye can see much more contrast than can be reproduced through photos
- Physical resolution of photography is less than that of the human eye
- A photo is static and passive; the human vision can scan for detail and remember information

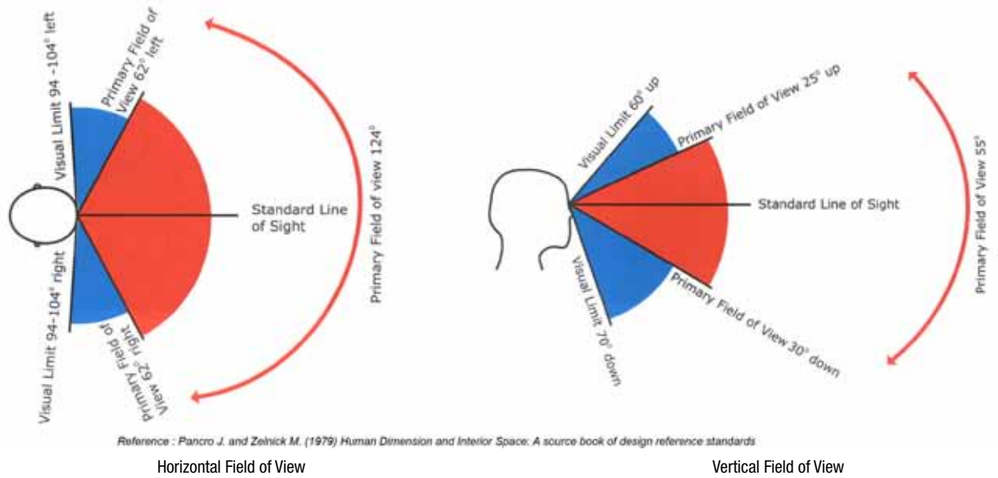
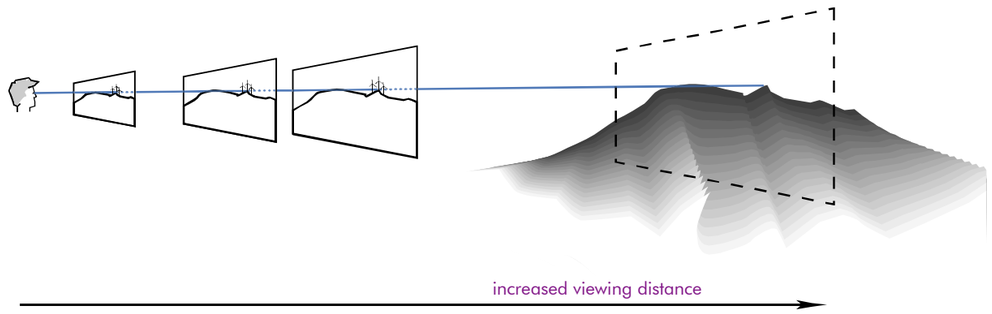


Figure A: Diagram showing horizontal and vertical field of view



Using a standard paper size, a projected boardwalk image will be smaller at a shorter viewing distance, and larger at a further viewing distance. However if held at the correct viewing distance they will be seen as being the same size. This represents a direct mathematical realtionship between the eye and the image of the subject (the landscape).

Figure B: Diagram showing relationship between viewing distance and reproduction size.

Te Rapa Business Park Context Photos

View from Arthur Porter Drive looking north east

View from Te Kowhai East Road looking south west

View from Tasman Road looking south east

Viewpoint 1

Viewpoint 1: View from Waikato Expressway Cycleway looking south west

Original photo: Canon EOS 5D Mark III with 50mm lens | 10:30am 09.06.2023 | Will Gumbley
Viewpoint GPS details: 37°45'13"S | 175°13'26"E
Photomontage: Kolor Autopano Giga
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm

Viewpoint 2

Viewpoint 2: View from Waikato Expressway Cycleway looking west
Original photo: Canon EOS 5D Mark III with 50mm lens | 10:15am 09.06.2023 | Will Gumbley
Viewpoint GPS details: 37°44'36"S | 175°12'48"E
Photomontage: Kolor Autopano Giga
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm

Viewpoint 4

Viewpoint 4: View from Te Kowhai Road looking south
Original photo: Canon EOS 5D Mark III with 50mm lens | 10:50am 28.02.2022 | Will Gumbley
Viewpoint GPS details: 37°44'26"S | 175°12'31"E
Photomontage: Adobe Photoshop CC21
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm

Viewpoint 5

Viewpoint 5: View from Burbush Road looking east

Original photo: Canon EOS 5D Mark III with 50mm lens | 10:00am 09.06.2023 | Will Gumbley
Viewpoint GPS details: 37°44'50"S | 175°12'22"E
Photomontage: Kolor Autopano Giga
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm

Viewpoint 6

Viewpoint 6: View from Lee Road looking east
Original photo: Canon EOS 5D Mark III with 50mm lens | 10:35am 28.02.2022 | Will Gumbley
Viewpoint GPS details: 37°45'27"S | 175°13'00"E
Photomontage: Adobe Photoshop CC21
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm

Viewpoint 7

Viewpoint 7: View from the corner of Taiatea Drive and Pukenga Avenue looking north
Original photo: Canon EOS 5D Mark III with 50mm lens | 9:40am 09.06.2023 | Will Gumbley
Viewpoint GPS details: 37°45'42"S | 175°13'25"E
Photomontage: Kolor Autopano Giga
Approximate field of view: 130° horizontal | 40° vertical
Suggested viewing distance: 300mm


40

APPENDIX 3

TYPICAL ROAD CROSS SECTIONS

Typical Road Cross Sections

TYPICAL SECTION 1.1 - ROTOKAURI MINOR ARTERIAL NORTH (3100.3, 3100.4, 3100.5)
OPTION A, WIDTH 29.4m

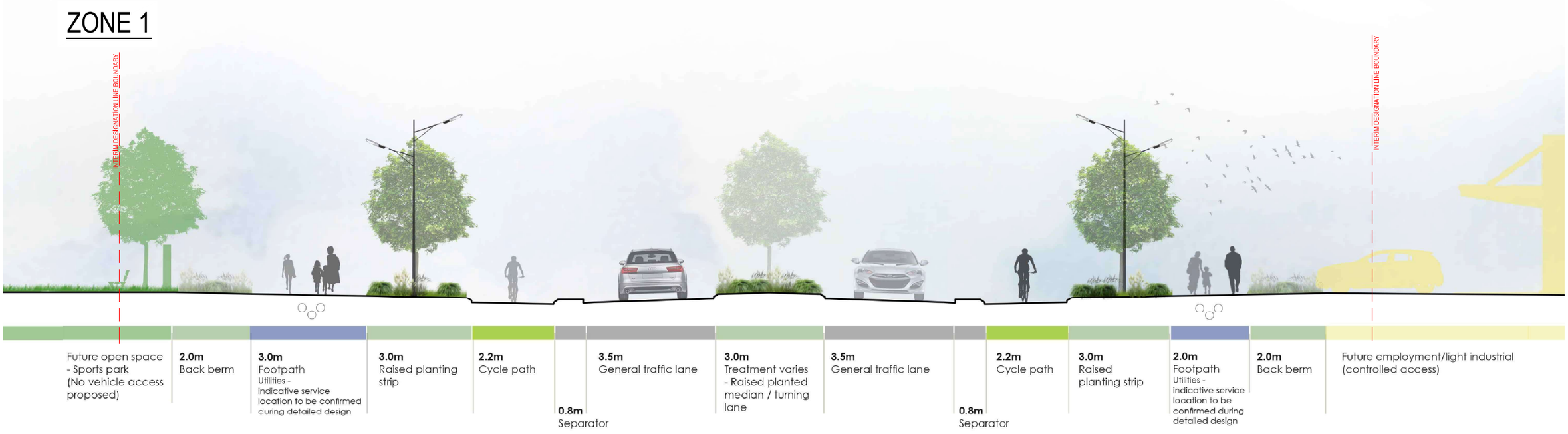
SCALE N.T.S

TYPICAL SECTION 1.1 - ROTOKAURI MINOR ARTERIAL NORTH (3100.3, 3100.4, 3100.5)
OPTION B, WIDTH 31.0m

SCALE N.T.S

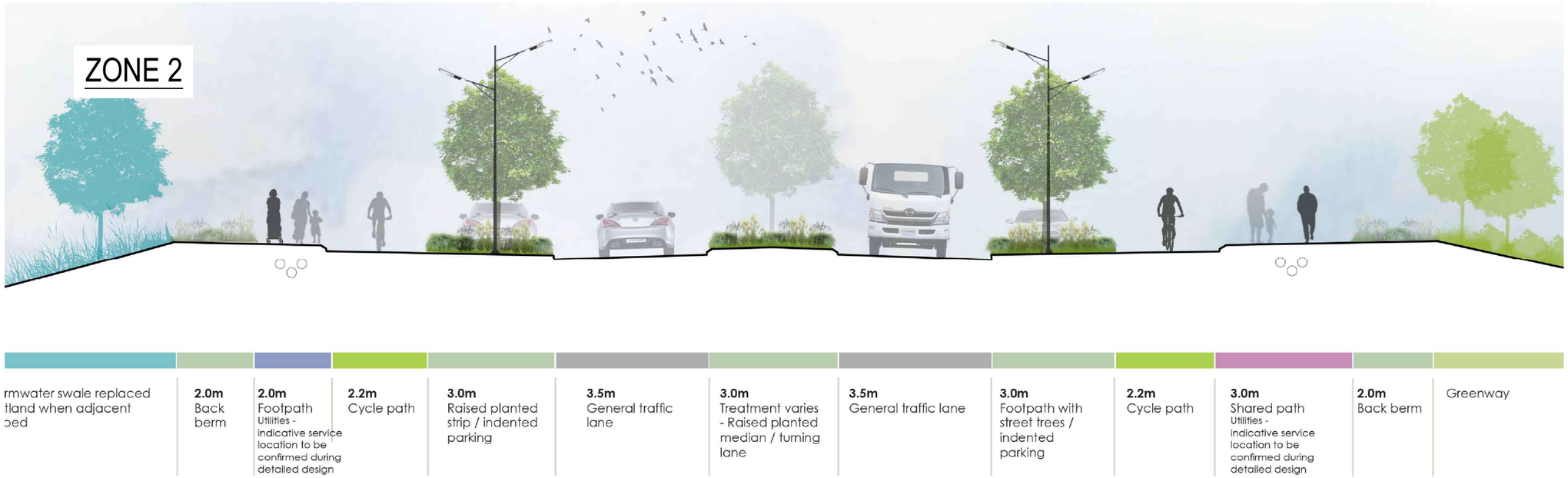
Typical Road Cross Sections

TYPICAL SECTION 1.2 - ROTOKAURI MINOR ARTERIAL NORTH (3100.3, 3100.4, 3100.5)
OPTION A, WIDTH 29.4m
SCALE N.T.S



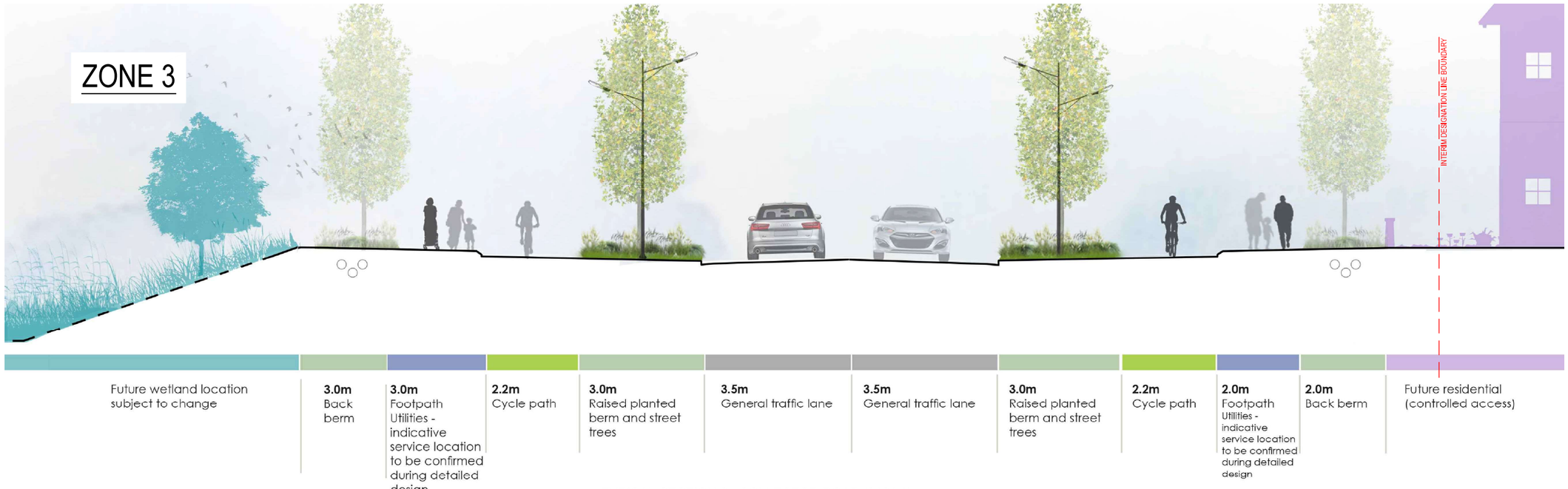
TYPICAL SECTION 1.2 - ROTOKAURI MINOR ARTERIAL NORTH (3100.3, 3100.4, 3100.5)
OPTION B, WIDTH 31.0m
SCALE N.T.S

Typical Road Cross Sections



TYPICAL SECTION 2 - MINOR ARTERIAL, TE KOWHAI ROAD WEST EXTENSION (3101.3)
OPTION A, WIDTH 29.4m

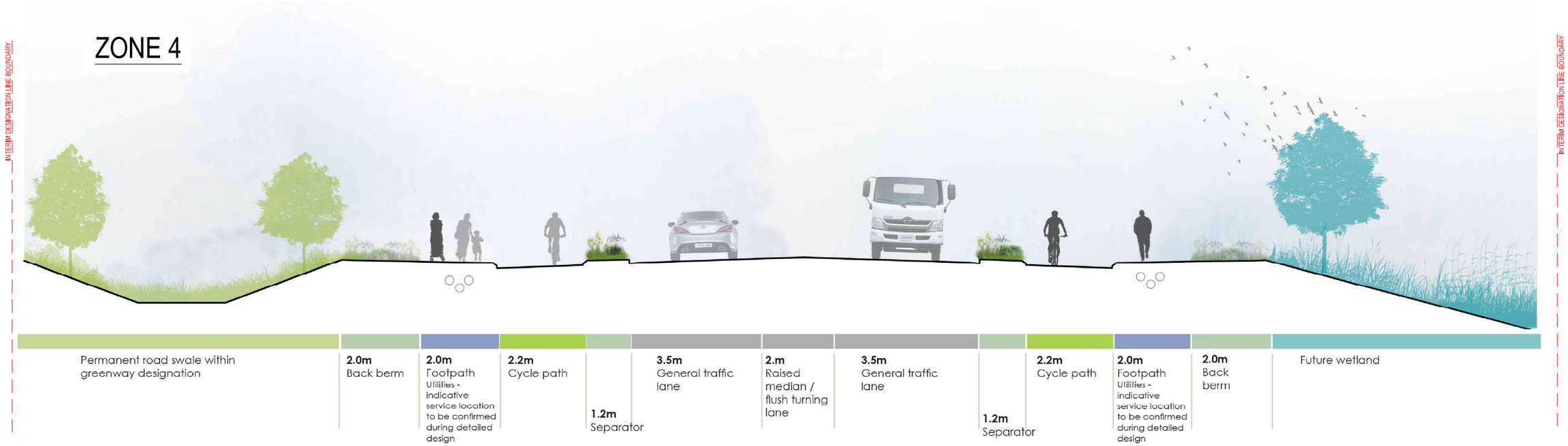
SCALE N.T.S



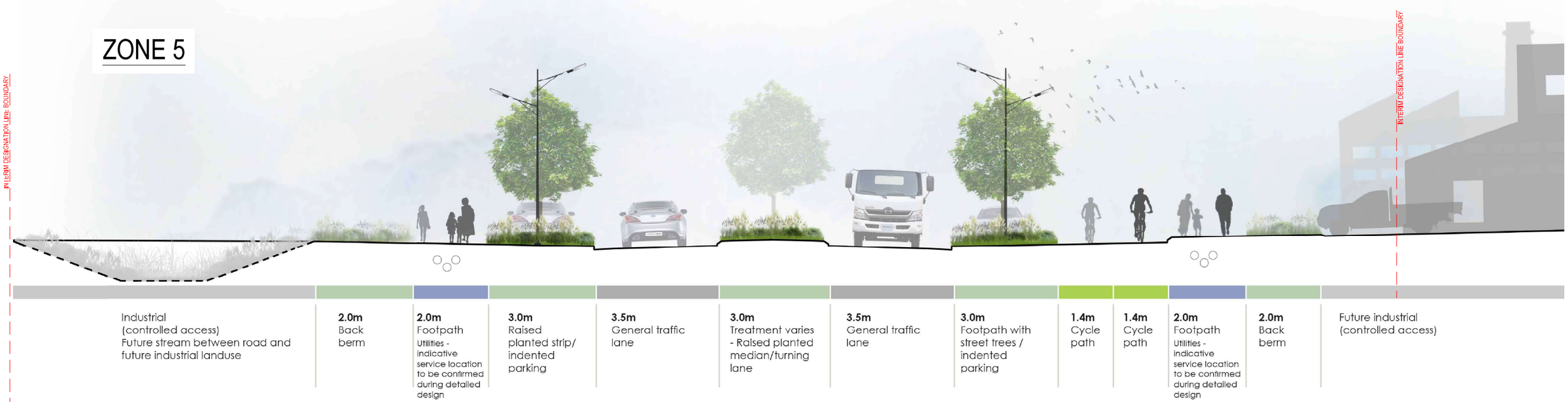
TYPICAL SECTION 3 - COLLECTOR ROAD (3121.1)
WIDTH 25.4m

SCALE N.T.S

Typical Road Cross Sections



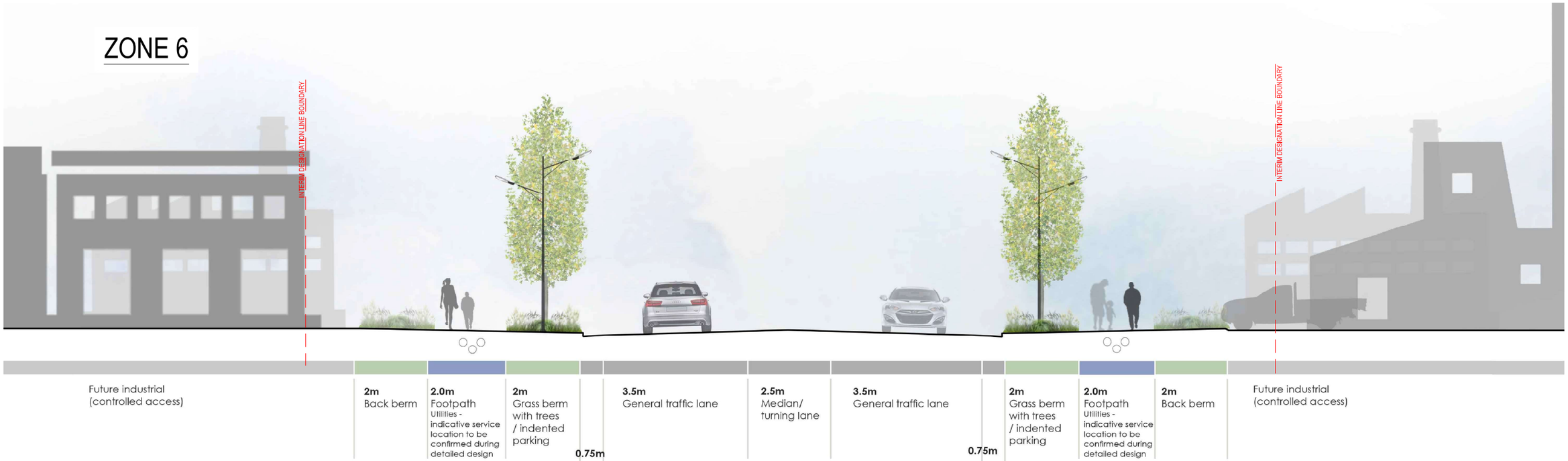
TYPICAL SECTION 4 - COLLECTOR ROAD, CHALMERS ROAD EXTENSION (3122.2)
WIDTH 23.8m
SCALE N.T.S



TYPICAL SECTION 5 - MINOR ARTERIAL, TE KOWHAI ROAD WEST EXTENSION (3101.3)
WIDTH 26.8m
SCALE N.T.S

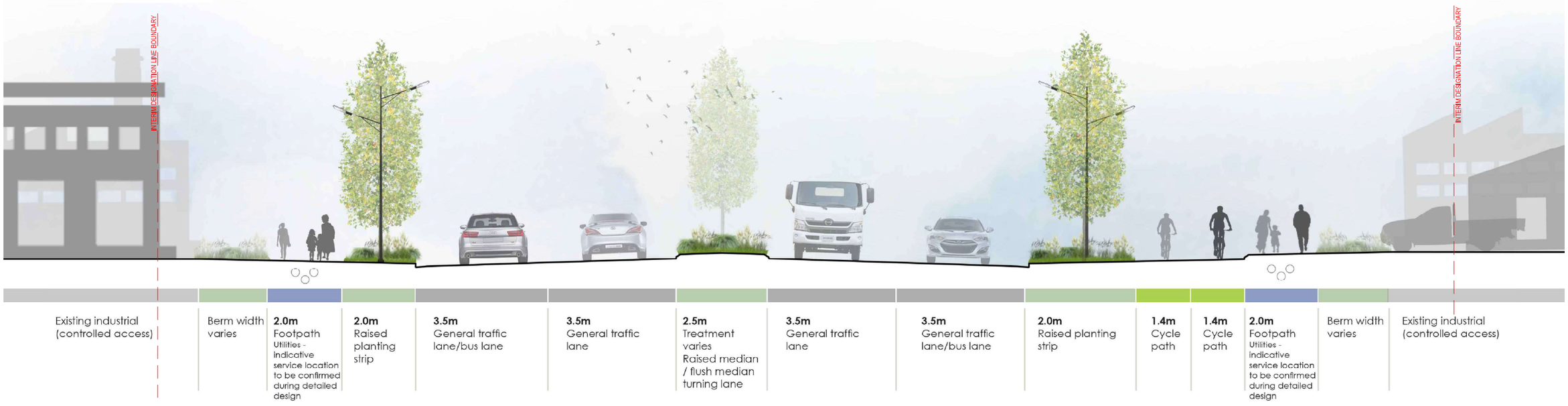
Typical Road Cross Sections

ZONE 6



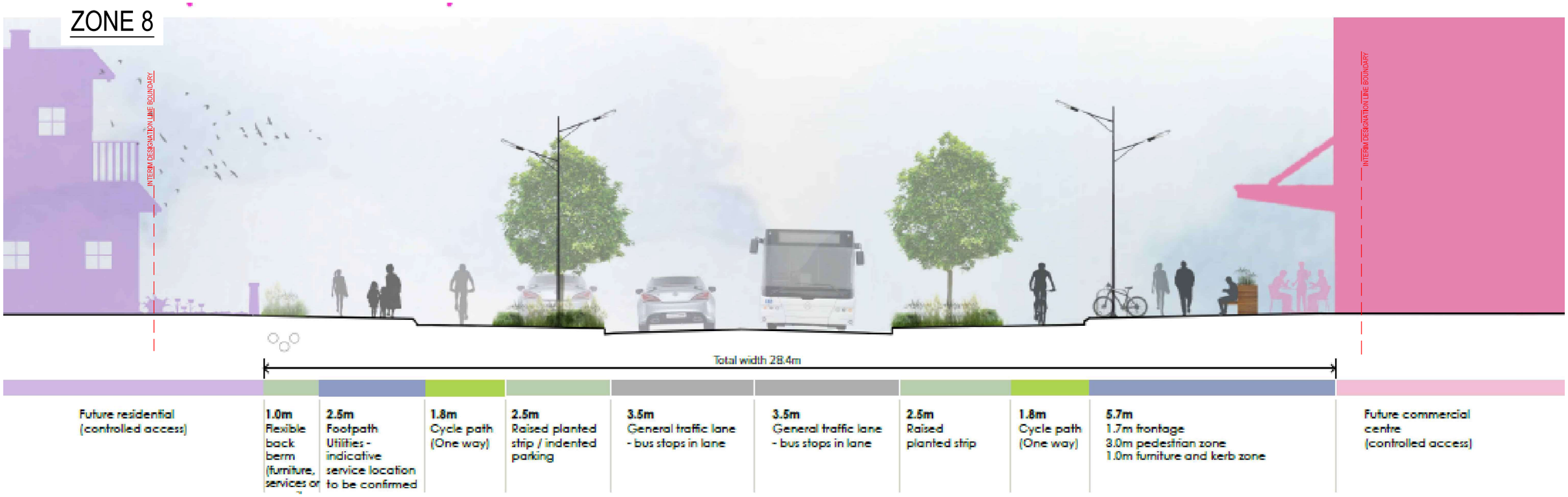
TYPICAL SECTION 6 - COLLECTOR ROAD, ARTHUR PORTER DRIVE (3102.2)
WIDTH 23.0m
SCALE N.T.S

ZONE 7



TYPICAL SECTION 7 - MAJOR ARTERIAL, TE KOWHAI ROAD EAST UPGRADE (3101.1, 3101.2)
WIDTH 31.1m
SCALE N.T.S

Typical Road Cross Sections



TYPICAL SECTION 8 - ROTOKAURI MINOR ARTERIAL NORTH, COMMERCIAL CENTRE (3100.2)
WIDTH 29.4m

SCALE N.T.S

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