Supporting Growth

Redhills Arterial Transport Network

Assessment of Landscape and Visual Effects

Version 1.0

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TE TUPU NGĀTAHI Supporting Growth

WAKA KOTAHI NZ TRANSPORT AGENCY

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Table 1: Glossary of Technical Terms / Acronyms

Acronym/Term	Description
AEE	Assessment of Effects on the Environment
AT	Auckland Transport
AUP:OP	Auckland Unitary Plan Operative in Part 2016
HNC	High Natural Character
NoR	Notice of Requirement
ONC	Outstanding Natural Character
ONF	Outstanding Natural Feature
ONL	Outstanding Natural Landscape
RATN	Redhills Arterial Transport Network
RMA	Resource Management Act 1991
SEA	Significant Ecological Area
TDM	Transport Design Manual
UDLMP	Urban Design and Landscape Management Plan
Waka Kotahi	Waka Kotahi NZ Transport Agency

Table 2: Glossary of Defined Terms

Term	Meaning
Auckland Council	Means the unitary authority for the Auckland Region.
Baseline Landscape (BL)	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.
Change Management	Identification of ways to enhance the landscape and actions to avoid, remedy or mitigate adverse landscape effects.
Designation Boundary	The extent of the proposed NoR(s).
Future Receiving Landscape (FRL)	The landscape and visual character as a result of the future development proposed in the AUP:OP, including specific precinct plans relating to the Project Area. The FRL 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 the likes of future zones, AUP:OP overlays and land development projects (planned and/or under construction).
Landscape	Is the cumulative expression of natural and cultural features, patterns and processes in a geographical area, including human perceptions and associations[1].

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

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, hydrology, vegetation, land use and features of human settlement. These elements create a unique sense of place defining different areas of the landscape.
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.
Natural Character Effects	Natural character effects assessment is triggered by development proposed within the coastal environment, wetlands, lakes and rivers and their margins[2].
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.
Redhills Arterial Transport Network (RATN (Project) or (Project Area)	Refers to the land being developed within the designation boundary. Includes the carriageway, batter slopes, intersections, bridging or culverting, landscape mitigation planting and street trees and construction laydown areas.
Study Area	Refers to the larger parcel of land identified as Redhills Precinct. The precinct is bordered by Red Hills Road along the western and southern boundaries, and by Don Buck Road and Henwood Road along the eastern and northern boundaries respectively.
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"[3].

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

[3] Resource Management Act 1991.

1 Introduction

1.1 Background

Auckland's population is growing rapidly; driven by both natural growth (more births than deaths) and migration from overseas and other parts of New Zealand. The Auckland Plan 2050 anticipates that this growth will generate demand for an additional 313,000 dwellings and require land for approximately 263,000 additional employment opportunities.

In response to this demand, the Auckland Unitary Plan Operative in Part (**AUP:OP**) identifies 15,000 hectares of predominantly rural land for future urbanisation. To enable the urban development of greenfield land, appropriate bulk infrastructure needs to be planned and delivered.

The Supporting Growth Programme is a collaboration between Auckland Transport (**AT**) and Waka Kotahi NZ Transport Agency (**Waka Kotahi**), to investigate, plan and deliver the transport networks needed to support Auckland's future urban growth areas over the next 30 years.

1.2 Purpose of this Report

The Supporting Growth Programme has identified the need for a new arterial transport network in Redhills to support the urban development of the area. This report has been prepared to support AT's notices of requirement (**NoRs**) for the Redhills Arterial Transport Network (the **Project** or the **RATN**). The NoRs under the Resource Management Act (**RMA**) are to designate land to enable the future construction, maintenance and operation of the Project.

This report provides an assessment of the landscape character, natural character and visual amenity effects associated with the construction, operation and maintenance of the Project. This assessment has been prepared to inform the Assessment of Environmental Effects (**AEE**) for the NoRs.

The key matters addressed in this report are as follows:

(a) Identify and describe the existing landscape character and visual amenity of the Project Area;

(b) Describe the actual and potential adverse physical landscape and visual amenity effects of construction of the Project;

(c) Describe the actual and potential adverse landscape character, natural character and visual amenity effects of operation of the Project;

(d) Recommend measures as appropriate to avoid, remedy or mitigate potential adverse landscape character, natural character and visual amenity effects (including any conditions/management plan required); and

(e) Present an overall conclusion of the level of potential adverse landscape character and visual amenity effects of the Project after recommended measures are implemented.

2 Project Description

The Project consists of two new arterial corridors through the Project Area, providing sufficient space for two-lanes for vehicles, new footpaths and dedicated cycleways on both sides of the road. The Project has been broken down into the following NoRs:

Table 3: Redhills Notices of Requirement

Notice	Project	Description
NoR1	Redhills North-South Arterial Corridor	New urban arterial transport corridor and upgrade of Don Buck and Royal Road intersection.
NoR2a	Redhills East-West Arterial Corridor – Dunlop Road	New urban arterial transport corridor that intersects with Fred Taylor Drive and connects to the remaining East-West corridor (NoR2c) at the intersection with the Redhills North-South arterial corridor.
NoR2b	Redhills East-West Arterial Corridor – Baker Lane	New urban arterial transport corridor that intersects with Fred Taylor Drive and connects to the intersection of the remaining East-West connection and Dunlop Road (NoR2a).
NoR2c	Redhills East-West Arterial Corridor – Nixon Road connection	New urban arterial transport corridor that intersects with the Redhills East West Arterial Corridor – Dunlop Road. This includes the upgrade of the existing Red Hills Road/Nelson Road/Nixon Road intersection, and the existing Nixon Road/Henwood Road intersection

To safely tie into the existing road network, the Project includes the upgrade of existing intersections where the new corridors will connect, as follows:

- Signalisation of the intersection at Don Buck Road and Royal Road (NoR 1);
- Signalisation of the intersection at Fred Taylor Drive and Dunlop Road (NoR 2a);
- Signalisation of the intersection at Fred Taylor Drive and Baker Lane (NoR 2b); and
- A new roundabout at the intersection of Red Hills Road, Nixon Road and Nelson Roads (NoR 2c).

The Project also provides for new stormwater wetlands for the treatment and attenuation of stormwater from the new corridors.

This report has primarily considered the Project Area as a whole. Where relevant, NoR 1 is referred to as the N-S Project, and NoR2a, NoR2b and NoR2c are collectively referred to as the E-W Project.

The Project has been split between four NoRs to reflect the likely implementation of the Project. It may also be possible for each designation to be delivered in stages as the Project Area develops.

An overview of the Project is provided in Figure 1. This design, along with the proposed designation boundary, is referred to as the Project Area throughout this report.

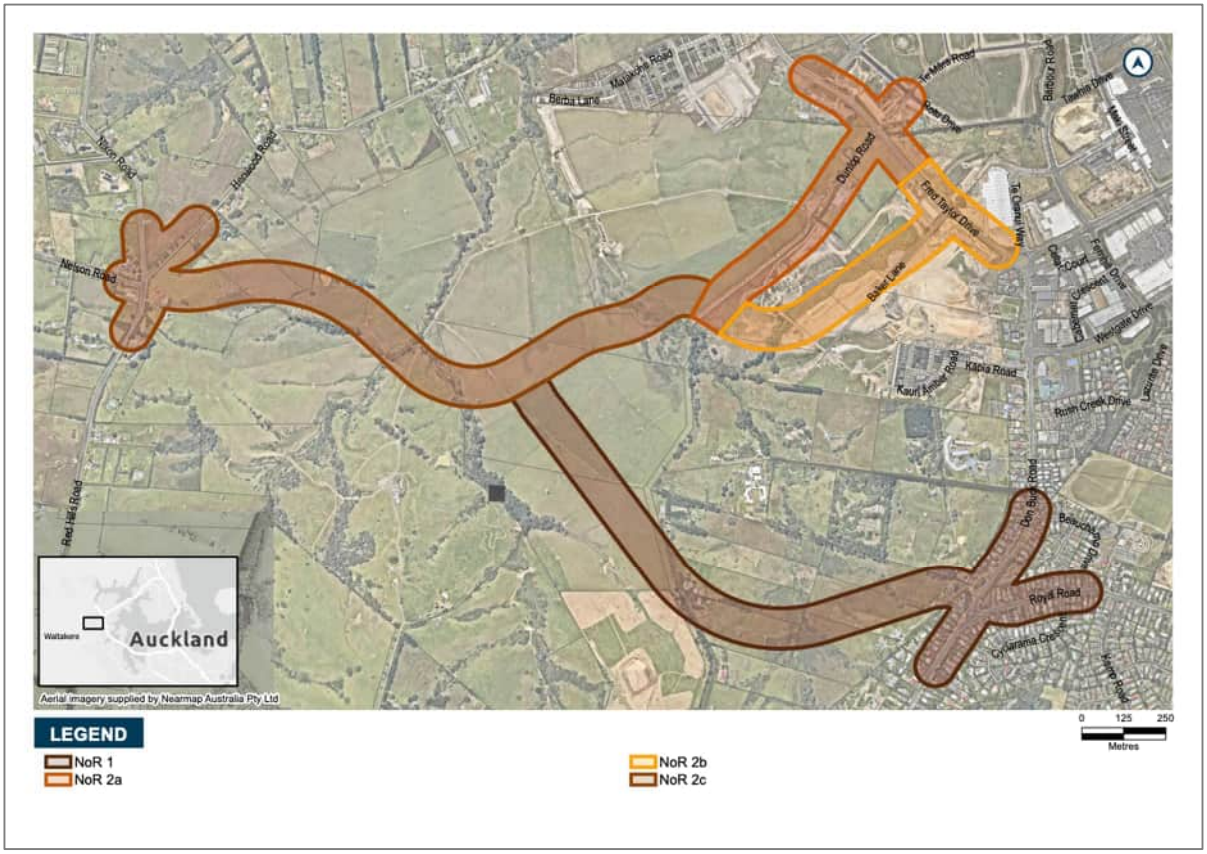

Figure 1: Redhills Arterial Transport Network

2.1 Project Features

The proposed NoRs are accompanied by an indicative alignment (package of works) to inform the proposed designation footprint and to assess an envelope of effects that includes operational and maintenance requirements, potential construction areas and areas required to mitigate effects. Through conditions on the proposed designations and future Outline Plan process, further design detail and assessment will be completed prior to construction.

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, likely vegetation clearance, cut and fill slopes and potential bridge and/or culvert construction.
- The nature and extent of temporary physical impacts on private properties adjacent to the existing Don Buck Road and Royal Road corridors.
- Potential natural character effects on existing hydrological features and associated vegetation, in the location of the proposed bridge and culvert construction areas.
- 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 principle elements of the Project are likely to integrate into the future landscape.

- Consideration of future opportunities to integrate the Project with 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 the Project.

2.2 Indicative Construction Methodology

An indicative construction methodology has been prepared to inform the assessment of the Project, and while subject to change, assists in determining the envelope of effects. An overview of the indicative construction methodology is set out in the AEE. A final construction methodology will be confirmed during detailed design phase and finalised once a contractor has been engaged for the work.

A summary of the key components of the indicative construction methodology are outlined below.

2.2.1 General Construction Overview

It is anticipated that the works will be broken down into separate construction stages based on the type of works required and the nature of the work environment. For the purposes of the assessment these anticipated stages are:

- **Stage 1**: Baker Lane from Fred Taylor Drive to the Dunlop Road intersection
- **Stage 2**: Dunlop Road from Fred Taylor Drive to the E-W Project intersection
- **Stage 3**: E-W Project from Dunlop Road intersection to Red Hills Road
- **Stage 4**: N-S Project from Don Buck Road to the E-W Project

It is expected the duration for each stage ranges from 1.5 years to 3 years.

2.2.1.1 Construction Methodology

Each zone has different construction activities depending on the type of work to be done and the surrounding environment. In all cases the general sequence of construction is likely to be:

1. Bulk earthworks over summer months
2. Divert or remove services
3. Construct permanent and temporary stormwater drainage and controls
4. Move traffic away from works longitudinally (on existing ‘live’ roads)
5. Construct earthworks and retaining structures and, if applicable, bridges
6. Construct new longitudinal drainage
7. Construct new pavement to half of the road
8. Move traffic onto newly constructed pavement (on existing ‘live’ roads)
9. Complete longitudinal drainage

10. Complete pavement and median
11. Move traffic to new alignment (on existing ‘live’ roads)
12. Complete footpath and cycleway

3 Assessment Criteria

3.1 Statutory Context

3.1.1 Notice of Requirement

This assessment has been prepared to support the NoR process for the Project. Section 171 of the RMA sets out the matters that must be considered by a territorial authority in making a recommendation on an NoR. This includes consideration of the actual or potential effects (including positive effects) on the environment of allowing the requirement.

No regional resource consents are currently being applied for. The necessary regional resource consents will be sought prior to construction of the corridors, at which time any regional consenting matters will be assessed.

3.1.2 Resource Management Act (RMA)

Section 6 of the RMA sets out matters of national importance which should be recognised and provided for. Section 6(a) requires the preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers[4] and their margins, and the protection of them from inappropriate subdivision, use, and development. Section 6(b) requires the protection of outstanding natural features and landscapes from inappropriate subdivision, use and development. Section 6(f) requires 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 principles 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.

3.1.3 Auckland Unitary Plan Operative in Part (AUP:OP)

The Project is primarily on greenfield land which is zoned under the AUP:OP for:

- Residential - Terrace Housing and Apartment Buildings Zone
- Residential - Mixed Housing Urban Zone
- Residential - Mixed Housing Suburban Zone
- Residential - Single House Zone
- Business - Mixed Use Zone
- Business - Local Centre Zone
- Road Zone

The following overlays (Chapter D of the AUP:OP) apply to this assessment of landscape and visual effects for the Project:

- Natural Resources: D9 – Significant Ecological Areas

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

- Ridgeline Protection Overlay (Natural).

Auckland-wide zone objectives and policies will apply to the future resource consents required to implement the Project. They will also apply to future urban development of land adjacent to the Project, including the general Objectives and Policies included in Chapter E3 (Natural Resources), particularly E.3 Lakes, rivers, streams and wetlands (E3.2 and E3.3), and E15 Vegetation management and biodiversity (E15.2 and E15.3) which are relevant to an assessment of landscape, natural character and visual effects under the RMA.

3.1.4 Redhills Precinct Plan

Development of the land within the study area will be guided by the objectives and policies of the I610 Redhills Precinct. The objectives of the Redhills Precinct Plan having particular regard to landscape matters are[5]:

- Subdivision and development achieve a well-connected, adaptable, safe, attractive, healthy and pleasant environment for living and working with an emphasis on the importance of access to the public realm including parks, roads and the natural environment.
- A safe, efficient and integrated transport system is established within the Redhills Precinct that provides strategic roading connections, a choice of travel modes, encourages walking, cycling and use of public transport, and provides strong, legible connections to and through the precinct, whilst minimising crossings through natural features.
- The intrinsic character of the precinct and its location in proximity to the Northwest Wildlink is recognised and stream ecology and remnant vegetation is restored with opportunities created for natural wildlife corridors.
- Parks and open space corridors achieve an integrated, attractive and safe open space network across the precinct that integrates stormwater management, and ecological and recreational functions, while enhancing the amenity of cyclists and pedestrians who will have access through these open space areas.

3.2 Non-Statutory Guidance

3.2.1 Te Tupu Ngātahi Design Framework – Version 1.0

The Te Tupu Ngātahi Design Framework provides measurable guidance for outcomes-based decisions throughout each phase of the wider programme. The guidelines in the Te Tupu Ngātahi Design Framework set out the environmental, cultural and growth context for the Project and principles for implementation. Principles 1.1 through to 2.5 are of particular relevance to this landscape and visual assessment.

3.2.2 Transport Design Manual – 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 forms part of section 1 of the TDM and is of particular relevance to this landscape and visual assessment.

[5] 610 Redhills Precinct, 610.1 Description. Auckland Unitary Plan Operative in Part.

3.2.3 Bridging the Gap: Waka Kotahi NZ Transport Agency Urban Design Guidelines (2013)

While the Project is an AT project, Bridging the Gap provides relevant guidance for all transport projects. The guidelines set out 10 over-arching urban design principles, 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[6].

The 10 urban design principles 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

3.2.4 New Zealand Transport Agency Landscape Guidelines (Final Draft, 2014)

Again, while the Project is an AT project, the guidelines provide relevant guidance for all road transport projects. The guidelines set out 10 over-arching landscape principles, and offer guidance related to policy, assessment methodology and landscape design requirements[7].

The 10 landscape principles 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
- Deliver a quality user experience
- Low maintenance and whole of life value

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

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

- Safety in design
- Facilitate community engagement and a collaborative approach

4 Assessment Methodology

Chapter Summary

This assessment was undertaken by a suitably qualified and experienced NZILA Registered Landscape Architect 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 3 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.

4.1 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 the landscape values therein, including regionally significant values such as: Significant Ecological Areas (**SEA**s), Outstanding Natural Landscapes (**ONL**s), Outstanding Natural Features (**ONF**s) 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 and significance 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.

4.1.1 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. The rating scale is symmetrical around 'moderate' and

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 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, moderate 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.

4.2 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'.
- Analysis and description of the landscape elements, features and character of the 'Future Receiving Landscape'.
- Analysis and description of perceptual, sensory and associative qualities of the Project Area and the identification of the viewing audience and visual catchment.

- Summary of landscape values, including inputs from other specialists such as ecology, arboriculture and heritage.
- Evaluation of the sensitivity of the landscape to landscape change arising from transport infrastructure upgrades.
- Analysis and description of the Project including construction methodology and timeline.
- Identification of the principle elements of the Project (effects generators) likely to result in landscape, natural character and visual effects.
- Identification of temporary (construction) vs permanent (operational) effects of the Project.
- Identification of general and targeted mitigation measures to respond to and 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 the Project and a determination of the significance of landscape effects.

4.3 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:OP/GIS overlays (including, but not limited to: SEA's, ONL's, ONF's, ONC, HNC and Land Cover Data Base, zones and catchments and hydrology);
- Desktop analysis of roading corridors, urban areas / future urban areas utilising Google Street View;
- Escorted specialist team visits to the Project Area; and
- Independent site visits to the Project Area to undertake on-site landscape and visual assessment and to undertake indicative public viewpoint photography.

4.4 Landscape Values

In the absence of any scheduled high value landscape areas (ONL, ONF, HNC and ONC) at a national, regional or district level within or adjacent to the Project Area, a summary is provided of local values. Local values generally consider three broad categories including: geographic, perceptual and associative values.[8]

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

4.5 Landscape Sensitivity

The interface between the land and water (riparian margins) is particularly sensitive to landscape change and under Part 2 of the RMA (section 6(a)), the natural character of such features is to be preserved.

Other landscape character forming 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.

4.6 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.

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

- Biophysical - Abiotic: Geophysical processes (Landform) and drainage patterns and processes.
- Biophysical – Biotic: Vegetation type (native / endemic and exotic vegetation) and vegetation cover and patterns (quality of vegetation and evident relationship to landform, climate, mature historic land use and ecological factors).
- Human attributes: Land uses / activities / buildings and structures and recreational areas.

Landscape and visual effects are assessed in two parts as outlined below; firstly, through the construction period where the bio-physical and human attributes 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 (operational phase), 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.

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 how these aspects translate into visual amenity effects for both public and private viewing audiences.

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

4.6.1 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[9] and their margins, and the protection of them from inappropriate subdivision, use, and development. The natural character assessment for this Project applies to the waterbodies associated with Waiteputa Stream, Red Hill Stream and Ngongetepara Stream, outside of the coastal environment.

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.

4.7 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 effects (operational effects).

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 and from 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 Area is 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.

4.7.1 Viewpoint Locations

For the purposes of this assessment, the visual effects of the Project have been assessed from 26 representative vantage points from within the Project Area and surrounding landscape. Refer to Appendix 3: Landscape Plans and Images: Map 16.

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

All viewpoint locations were visited, photographed and assessed in variable-fine weather conditions between November 2019 and January 2020. The viewpoints have been photographed at standing eye level, in portrait view with a digital SLR camera with a 50mm (and 30mm) lens.

4.8 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[10]. The Project has been through the SGA MCA route selection process during which landscape and visual effects were tested and any significant effects avoided or 'designed-out' of the Project in line with specialist landscape input at the time. On that basis, the landscape mitigation measures proposed below in Section 7 deal with the localised effects likely to result from a series of 'effects generators' (construction activities) required to implement the Project, as well as any potential landscape and visual effects arising from the operational phase of the Project.

Design refinements through the detailed design phase can further minimise potential landscape and visual effects. These opportunities are also outlined below in Section 7 of this report.

4.9 Limitations

There are several crossovers with related specialities including arboriculture, ecology, historic heritage, flooding and urban design. 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.

4.10 Project Assumptions

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

- The proposed designation boundary is sufficient to allow for flexibility in the detailed design stages of the Project.
- Any proposed stormwater wetlands, as identified on the engineering plans, will be suitably planted in native species as part of the Project works.
- Parts of the Project may be constructed by private developers as part of the continued urbanisation of the Project Area. This is likely to be achieved via a series of adjoining masterplans for the balance land.

[10] 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.

5 Receiving Environment

Chapter Summary

Redhills is located in West Auckland, approximately 18km northwest of Auckland's CBD. The Redhills Precinct area is situated directly west of Massey and Westgate residential and commercial hubs and is bounded by Don Buck Road and Fred Taylor Drive to the east and Red Hills Road to the west. Refer to Appendix 2: Landscape Plans and Images: Maps 01 – 06.

The receiving environment is outlined in the following sections in two parts. Firstly, the existing baseline landscape is described which includes all existing biophysical landscape features and human attributes that contribute to the existing landscape character and visual amenity of the Project Area. The baseline landscape also comprises sections of the Project Area where urbanisation is imminent or already underway. A handful of developments (consented, in process or in early construction), form the basis of a dynamic and rapidly changing landscape context. These include but are not limited to:

- Malbec housing development (80 Fred Taylor Drive), within the northern extent of the Project Area. The eastern tributaries of Ngongetepara Stream have been incorporated into an urban stormwater design with riparian planting.
- 1 Dunlop Road – proposed Raphoe masterplan with bulk earthworks underway.
- A potential residential subdivision in the vicinity of the N-S Project and Don Buck Road.
- A potential residential subdivision off Redhills Road within the south-east extent of the Project Area, proximate to the proposed N-S Project.
- A potential larger comprehensive development plan situated around the intersection of the proposed N-S Project and E-W Project, comprising community services and a range of housing typologies alongside open space reserves associated with tributaries of the Ngongetepara Stream.

The future receiving landscape is described in the context of the AUP:OP zone provisions and the Redhills Precinct Plan 1 which indicates a basic urban framework (arterial network and green infrastructure) for the Project Area. The future receiving landscape also considers various plan change applications known to influence the Project Area, that are at various stages of the planning process. The latter are not referenced explicitly within this landscape assessment but acknowledged as contributing to the dynamic and evolving landscape context.

The Project Area is largely rural in character with a strong underlying natural landscape pattern dominated by an amphitheatre landform, rolling topography and a network of riparian corridors and associated overland flow paths. While there are tracts of native and exotic vegetation distributed through central and southern areas of the Project Area, open pasture is the most prevalent land cover within the notably undulating hill country.

There is a notable level of modification in the landscape which includes: an existing 110kV transmission line running in a north-west to south-east direction through the centre of the Project Area; re-shaping and re-alignment of natural watercourses and native vegetation removal to accommodate rural land use.

The contextual landscape exhibits the typical land use qualities of a peri-urban landscape, defined at the edges by an ever-increasing presence of urban development. Given the notable modification of the Project Area and localised landscape, the Project Area is considered to have low sensitivity to landscape change.

5.1 Approach to Receiving Environment

A key objective of the Project is to protect land now to ensure that the transport networks required to support growth areas in the future can be provided in an efficient and co-ordinated manner.

It is anticipated that unless urbanisation occurs (or is at least confirmed to occur), the transport corridor will not be constructed. As such, any effects associated with the construction or operation of the transport corridor will not eventuate in the environment as it exists today but in a future receiving environment that has or will imminently be urbanised.

In the context of the RMA assessment process, considering the environment as it exists today will not be a true reflection of the 'real-world' environment in which the transport corridor will be constructed and will operate. Accordingly, when considering the context within which the effects of the construction and operation of the transport corridor are likely to occur, this assessment addresses the anticipated environment at the time the Project is likely to be constructed.

The following outlines the key elements of the planning context for the Project:

- The Project is on greenfield land which is zoned under the AUP:OP for:
  - Residential-Single House Zone
  - Residential-Mixed Housing Suburban Zone
  - Residential-Mixed Housing Urban Zone
  - Residential-Terrace Housing and Apartment Buildings Zone
  - Business-Local Centre Zone.
- The Redhills Precinct includes an indicative arterial network (specified in 'I610.10.1. Redhills Precinct: Precinct Plan 1').
- AT is the requiring authority for designations along Fred Taylor Drive which provide for road widening to enable an approximately 30m wide corridor between Don Buck and Brigham Creek intersections.

The AUP:OP zoning (illustrated below) provides the future urban context in which the corridors will operate.

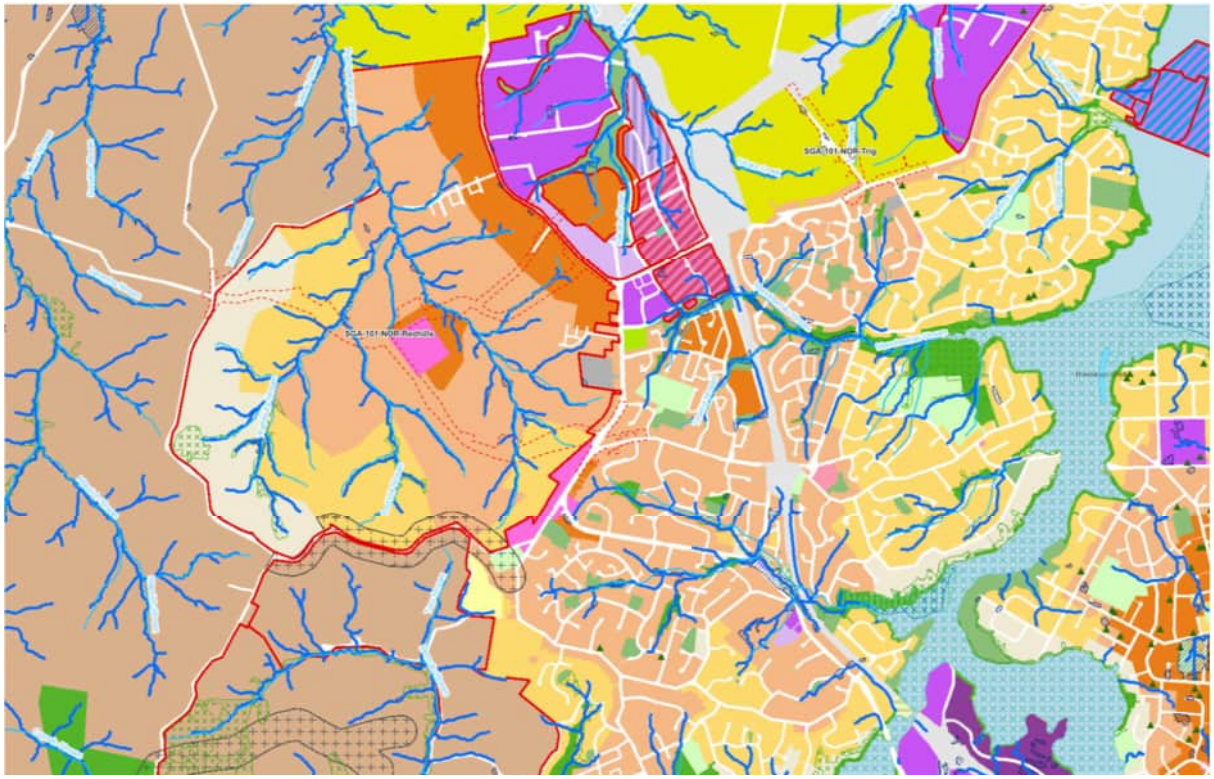

Figure 2: AUP:OP Zones and Overlays – Redhills Precinct and Contextual Landscape[11]

[11] Auckland Council GIS Database.

Table 4 sets out the likely receiving environment of the Project Area based on operative zoning provisions. This signals a high probability of land use change over time from the currently rural character of the area these scenarios have been used to inform the assessment.

Table 4: Redhills Arterial Transport Network receiving land use environment

Redhills Arterial Transport Network receiving environment	
Residential – Single House Zone	• Maintain and enhance amenity values of established neighbourhoods • 'Generally characterised by one to two storey buildings with multi-unit development not anticipated'
Residential – Mixed Housing Suburban Zone	• 'Largely characterised by one and two storey, mainly standalone buildings with boundary setbacks and landscaped gardens', however 'enables intensification through attached two storey housing in a variety of types and sizes'
Residential – Mixed Housing Urban Zone	• 'Reasonably high-intensity zone enabling greater intensity of development than previously provided for' • Development 'typically up to three storeys in a variety of sizes and forms including detached dwellings, terraced housing and low-rise apartments'
Residential – Terraced Housing and Apartment Building Zone	• 'A high-intensity zone…providing for urban residential living in the form of terraced housing and apartments…with the greatest density, height and scale of development of all the residential zones' • Buildings enabled up to five, six or seven storeys • 'Predominantly located around metropolitan, town and local centre zones and the public transport network', also providing for a range of non-residential activities within an 'urban residential character'
Business – Local Centre Zone	• 'Generally located in areas of good public transport' • 'Primarily provides for local convenience needs of surrounding residential areas, including local retail, commercial services, offices, food and beverage, and appropriately scaled supermarkets'

5.2 Baseline Landscape

This assessment refers to the Project Area (covering the proposed designation) and the localised landscape of the Project Area, which includes approximately 600ha of zoned land.

The defining characteristics of the Project Area are summarised below:

- The land within the Project Area is 'greenfield' and predominantly rural in character with the exception of the lower northern portion bordering Fred Taylor Drive where urban development is underway.
- The underlying landform and associated hydrological patterns of the study area are strong landscape character forming elements that, if appropriately managed, have the potential to generate long-term landscape and natural character value into the future.
- Further afield, the contextual landscape is best described as a transitional landscape exhibiting an eclectic range of rural, residential and commercial activities located in close proximity. This is clearly driven by the development and urban growth that is occurring around the edges of the study area.

The existing landscape features of the Project Area are illustrated in Appendix 2**:** Landscape Plans and Images: Maps 01 – 06.

5.2.1 Landform and Hydrology

- The study area is an amphitheatre shape, rising 100m above sea level to the south and lowering to just under 25m above sea level to the north. It enjoys a northerly aspect.
- Red Hills Road traverses the prominent ridgeline along the western and southern perimeter of the study area and connects with Don Buck Road along the eastern fringe to create a bowl-shape that is accessible along the entire perimeter.
- The rolling landform is intersected by 3 streams: Waiteputa Stream, Red Hill Stream and Ngongetepara Stream and further defined by the main tributaries and overland flow paths associated with each stream.
- Within the extensive hydrological patterns are several areas classified by ecological assessment as wetlands, although according to the ecological assessment, they are all highly modified and dominated by exotic wetland species.
- The three separate watercourses culminate at the northern edge of the Project Area at Ngongetepara Stream which ultimately drains north into Brigham Creek.
- The landform and hydrological corridors within the lower north and north-eastern sections of the Project Area have been modified to accommodate urban and residential development adjacent to Fred Taylor Drive.

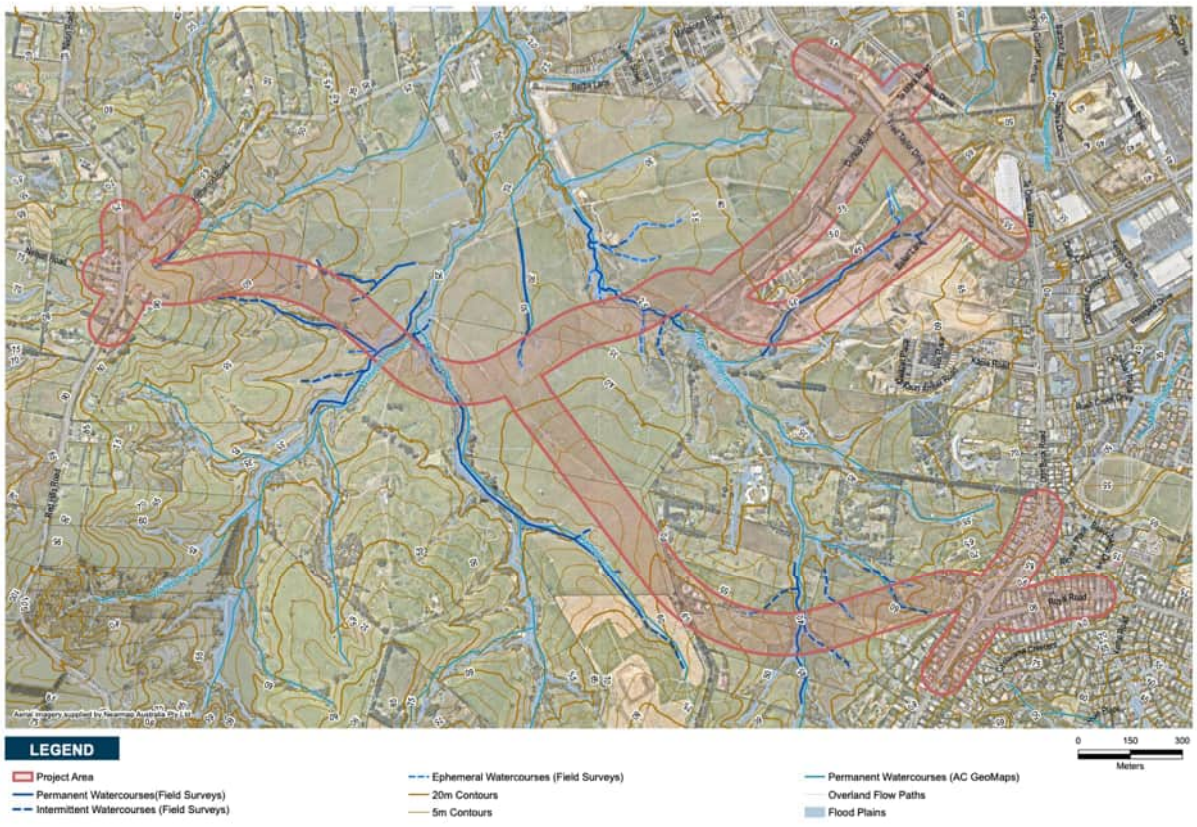

Figure 3: Existing Hydrological Features in relation to Project Areas (SGA graphic)

5.2.2 Land Cover

- The pastoral landscape within the study area largely consists of open pasture, exotic grass, shelter belt plantings, exotic trees and limited areas of native vegetation, interspersed with exotic trees.
- Existing vegetation within the NoR1 Project Area includes residential gardens through Royal Road and Don Buck Road, exotic tree land (including *pinus radiata*), exotic shrub and planted amenity gardens associated with rural residential properties through Red Hills Road.
- Existing vegetation within the NoR2b Project Area includes exotic wetland, interspersed with native and exotic shrubs and trees.
- Existing vegetation within the NoR2c Project Area includes exotic wetland, shrubs and trees, interspersed with native shrubs and trees.
- Residential gardens and shelter belt plantings are concentrated in the south-eastern quarter of the study area to the east of the Red Hills Road laneway.
- According to ecological survey, low value riparian vegetation and indigenous and exotic forest habitat within and directly adjacent to the Project Area are likely to serve as commuting corridors for long-tailed bats.

5.2.3 Land Use

- The study area consists of a range of rural residential properties, larger lifestyle blocks and a larger farming operation owned by a developer[12].
- Rural residential and lifestyle blocks are focussed within the eastern extent of the study area, off Red Hills Road.
- Other rural residential properties line the southern and western boundaries of the study area taking advantage of the elevated ridgeline and access afforded by Red Hills Road.
- St Paul's Primary School and Westbridge Residential School are located halfway along Don Buck Road.
- A commercial and retail strip is located at the Red Hills Road and Don Buck Road intersection, which includes a take away shop, bakery, petrol station, General Practitioners clinic and a pet grooming centre.
- The lower northern section of the study area, bordering Fred Taylor Drive, is currently undergoing urban development.

[12] Redhills Urban Design Statement, section 2. July 2020

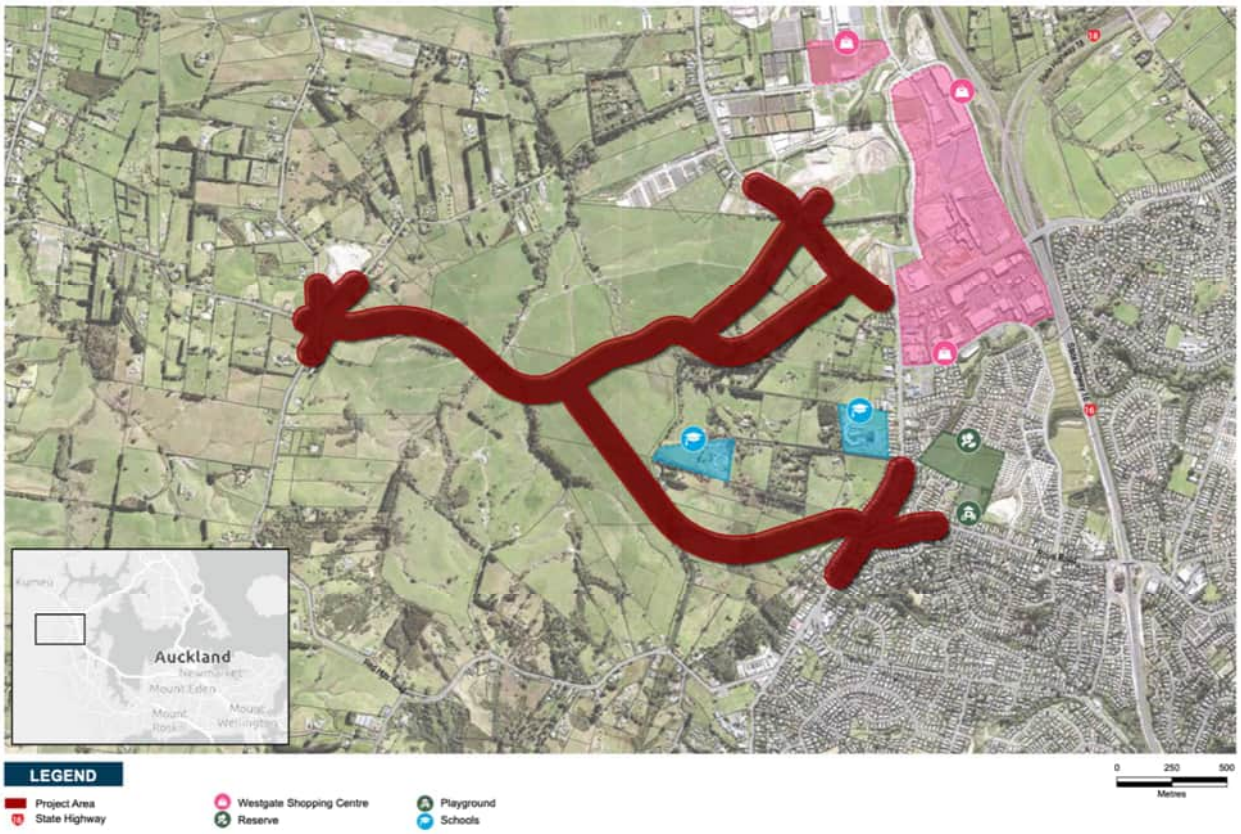

Figure 4: Existing Land Use Features in relation to Project Areas (SGA graphic)

5.2.4 Scheduled Landscape and Ecological Features

The study area features three SEA areas within the southern elevated boundary, outside of the Project Area. The southern boundary of the study area, between Sunnyvale Road and Don Buck Road is subject to the AUP:OP Ridgeline Protection Overlay. Refer to Appendix 2: Landscape Plans and Images: Map 05.

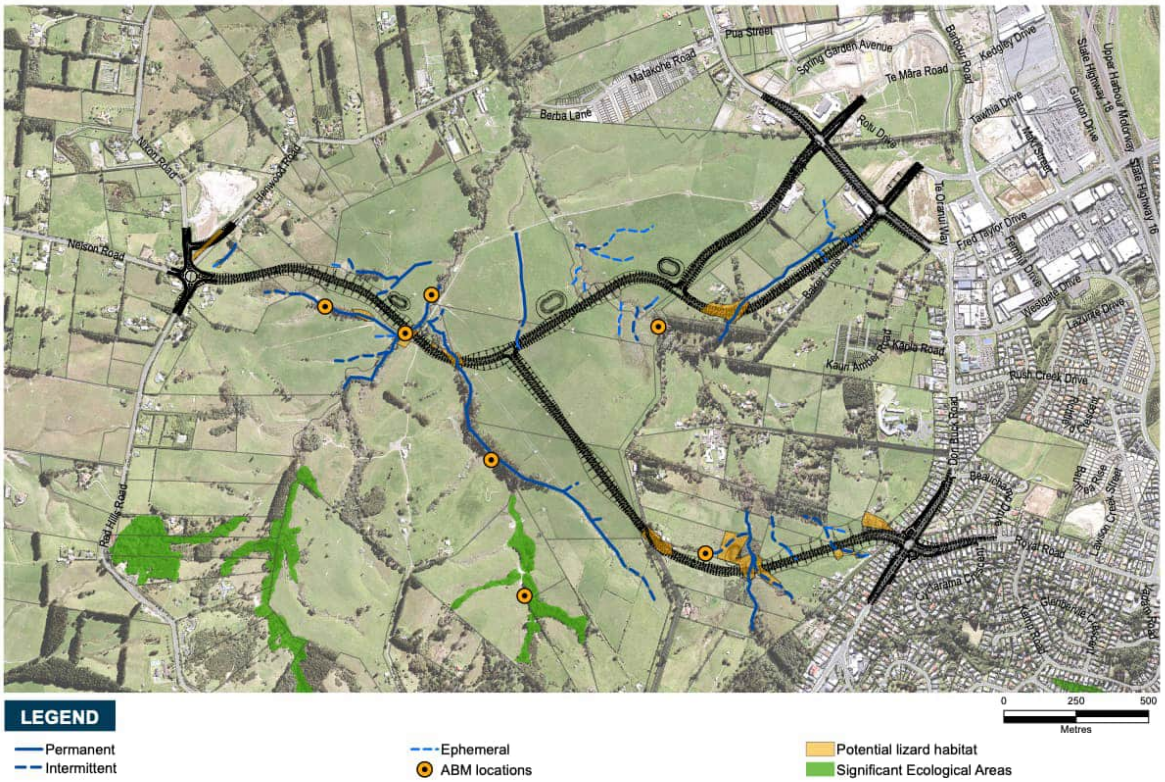

Figure 5: Ecological Features in Relation to Project Areas (SGA graphic)

5.3 Future Receiving Landscape

5.3.1 Overview

The land adjacent to the Project Area is expected to undergo a significant change from rural to urban land use and character within the foreseeable future. It's anticipated that some of the defining abiotic features and patterns of the landscape will endure if not define the pattern of urban development within the remaining greenfield areas of the Project Area. Defining landscape features include the riparian and modified wetland environments associated with Waiteputa Stream, Red Hill Stream and Ngongetepara Stream. Scheduled features such as the SEAs identified in Figure 5 above and the landscape character forming amphitheatre landform also have a high probability of featuring within the future urban landscape.

Conversely, it's expected that some of the less defining 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 Chapter E3 of the AUP:OP which generally seeks to protect and enhance these landscape features.

5.3.2 Redhills Precinct Plan

The Redhills Precinct Plan anticipates high quality residential development and includes provision for a Green Road circuit that will provide a high amenity cycle and pedestrian route, connecting recreational spaces such as parks and stream corridors, and connections to commuter cycling routes. There is a strong emphasis on achieving an integrated and attractive open space network across the precinct that integrates stormwater management, ecological and recreational functions (refer to Appendix 2: Landscape Plans and Images: Map 05).

The key assumptions for the Future Receiving Landscape include:

- Considerable shift from rural character to urban.
- Focus on high quality open space connections and ecological outcomes.
- Overarching landform preserved through the alignment of arterial routes. Indicative collector road and Redhills Green Road proposed to generally follow existing contour which will maintain landform structure.
- Emphasis on open space networks across the precinct integrated with stormwater management, and ecological and recreational functions.

5.4 Viewing Context

The viewing audience consists of private landowners within the Redhills Precinct, adjacent to the Project Area and the transient viewing audience (i.e. vehicles travelling at 50km/h) along Red Hills Road, Don Buck Road and Fred Taylor Drive. Intermittent views may also be afforded from intersecting roads such as Royal Road, Matakohe Road, Nelson Road, Nixon Road, Henwood Road,

Over time, the viewing audience is expected to include residents and visitors of future urban developments within the Redhills Precinct as sections of the RATN are delivered simultaneously with urban development.

The key characteristics of the viewing context are outlined below:

- The underlying landform of the study area creates a north facing amphitheatre that is visually accessible from a range of vantage points along the elevated roads that border it to the west, south and east.
- Public vantage points offering the most expansive views over the Project are afforded along the southern boundary along Red Hills Road.
- Views from inside the study are afforded through the interior and are readily available from pastoral areas and rural residential properties. It's generally accepted that these vantage points will remain yet the extent and clarity of views towards the Project Area will change over time with ongoing development.
- Sensitive receivers for the Project exist within the eastern portion of the precinct from Red Hills Road, Westridge Residential, St Paul's Primary School and existing residents within the Royal Road and Don Buck Road catchment.
- Rural residential and lifestyle properties located along the Redhills Road ridge have superior views over the wider study area.

5.5 Landscape Values

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

The highest landscape values are attributed to the three stream corridors and the limited fragments of indigenous vegetation associated with the blue-green areas of the Project Area. The SEA areas identified within the elevated southwestern extent of the Project Area also contribute to heightened landscape character values within local landscape.

Notable value is given to the overarching landform that shapes the Project Area and underlies the drainage patterns of the Project Area. The amphitheatre landform also provides north-facing aspect for the future urban neighbourhoods.

When considering the Baseline Landscape, there are a range of existing landscape qualities that come together that can be described as being picturesque and providing aesthetic value within the viewing catchment. These qualities include the landform and hydrological patterns mentioned above as well as the open 'rural' character of the balance of the study area, both of which contribute to the perceived undeveloped, rural character of the Project Area.

5.6 Landscape Sensitivity

Areas of the Baseline Landscape are sensitive to landscape change on the basis of the existing rural character and perceived visual amenity that is afforded to existing properties within the Redhills Precinct. This is particularly the case for properties within the elevated southern and eastern extents where superior views can be obtained over the currently undeveloped interior of the Redhills Precinct.

However, as a whole, the landscape sensitivity of the Redhills Precinct is moderated by the heavy landscape modification that has occurred as a result of rural land use and the obvious signs of urban development within the northern extents between Baker Lane and Dunlop Road. Landscape sensitivity to land use change is further moderated by the policy direction of the AUP:OP zones and decisions passed through the Unitary Plan Independent Hearings Panel where it was decided that the Redhills land is suitable for urban development.

Furthermore, it is noted that many of the sensitive hydrological features within the Project Area exist within a state of degradation, with unrestricted stock access to waterbodies and the limited native vegetation that exists. On that basis, it is considered that land use change (urbanisation) is likely to deliver some form of enhancement to the blue-green aspects of the landscape whereby works within riparian areas will trigger the regional consenting mechanisms that require protection and enhancement of riparian areas. Native planting delivered through street tree planting, open space design and private yard amenity planting is also likely to improve the general quality of the landscape within the existing peri-urban setting.

6 Assessment of Landscape and Visual Effects

Chapter Summary

This section identifies the principle elements of the Project that have the potential to impact on landscape as a physical resource and ultimately change the landscape character, natural character and visual amenity of the Project Area and local landscape.

Landscape and visual effects are assessed in two parts; firstly, through the construction period where the bio-physical and human attributes of 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 (operational phase), the 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.

Overall, the temporary **physical landscape effects** resulting from the **construction** phase are assessed as **low** to **moderate-low** and **moderate-low** in relation to private properties, taking into account the proposed mitigation outlined in section 6.1.6.

Adverse **visual effects** for public viewing audiences is likely to be **low** to **moderate-low** for public viewing audiences during the **construction** phase, taking into account the proposed mitigation outlined in section 6.1.6.

Visual effects are likely to be heightened for private viewing audiences directly adjacent to the road corridor during the construction phase, on the basis of more direct and prolonged engagement with the construction activities of the Project. On that basis, visual effects for private viewing audiences is assessed as **low** to **moderate,** taking into account the mitigation outlined in section 6.1.6.

Adverse **landscape character** effects during the **operational** phase of the Project are assessed as **low,** taking into account the proposed mitigation outlined in section 6.2.4.

Adverse **natural character** effects during the operational phase of the Project are assessed as **very low** taking into account the heavily modified condition of the waterbodies and the proposed mitigation outlined in section 6.2.4.

Adverse **visual effects** for the public viewing audience is assessed as **low** during the operational phase of the Project, moving to beneficial over time. For the private viewing audience, the visual effects are likely to be **low** to **moderate-low reducing** over an extended period of time.

6.1 Assessment of Construction Effects

This section identifies the principal elements of the Project that are likely to give rise to temporary adverse landscape effects on landscape as a physical resource. The construction activities required to implement the Project are categorised under three broad headings as follows:

- **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 (to be determined at detailed design) and landscaping (including street trees, mitigation planting and riparian/wetland planting (to be determined by detailed design and resource consents)).

The principal elements of the Project expected to impact on the physical landscape resource are outlined below and assessed in the following sections:

- Re-alignment and profiling of adjacent land within the existing road corridors of the Project Area to accommodate corridor widening, active modes of transport and to integrate the new alignment sections (N-S Project and E-W Project) into existing infrastructure surrounding Redhills Precinct.
- Clearance and/or disturbance of broad areas of existing road-side vegetation within the existing road corridors of the Project as well as the greenfield sections.
- Potential construction of indicative new stormwater wetlands.
- Construction of proposed bridge (or culvert) crossings.

6.1.1 Site Enabling Works

6.1.1.1 Construction Areas

Site compound and laydown areas are to be established at 9 locations within the Project Area. The designation footprint includes the areas required to construct the Project, providing space for manoeuvring, setup and temporary storage of construction plant and to establish construction management measures. Larger construction buffer areas are proposed around wetlands and stream crossings to allow for construction works to be undertaken around sensitive natural features within the Project Area.

The proposed site compound and laydown areas are located within pastoral land that is already somewhat modified by existing rural land use or within existing service areas where buildings are already present in the landscape. 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,** taking into account the existing modification of the landscape and the recommended mitigation measures.

6.1.1.2 Vegetation Clearance – Existing Road Sections

Broad areas of street-side vegetation are proposed to be removed to accommodate the Project works. This includes trees and shrubs located within the road reserve and private boundaries along Fred Taylor Drive, Don Buck Road, Royal Road, Red Hills Road, Nelson Road, Nixon Road and Henwood Road.

Private garden plantings comprising native and exotic shrubs and trees make up the majority of vegetation to be removed. Some noteworthy tree species located within private properties and the road reserve are also required to be removed; these include a semi mature Rimu (*dacrydium cupressinum*), Puriri (*vitex lucens*) and several Pohutukawa trees (*metrosiderous excelsa*). While such vegetation is not considered significant on an individual basis, the vegetation collectively contributes to the roads amenity and provides a degree of screening and privacy for properties adjacent to the existing road corridors.

Several of the noteworthy trees appear to be located within the general vicinity of the proposed berm and footpath/cycleway alignment and it is reasonable to assume that some of these trees may be able to be accommodated within the future road reserve. On that basis, it is recommended (if practicable and subject to detailed design) that the footpaths and cycleways within these localised areas be

refined to either avoid noteworthy trees or leave them in place within a bespoke footpath and cycle way design.

An area of planted native and exotic species located above the existing timber and concrete block retaining wall, adjacent to the footpath, at the intersection of Royal Road and Don Buck Road will also be impacted by the Project works. This planted area comprises native species such as Nikau, Oioi, *comprosma sp* (ground covers and shrubs), Ti Kouka *Cordyline australis* and harakeke and may have been designed to integrate the structure into the street environment and provide a planted buffer between Don Buck Road and Jack Smyth Court (homes for the elderly). It is recommended that where practicable, affected vegetation be replaced during the finishing works period to re-establish the planted buffer currently afforded to residents to the east.

Figure 6: Existing timber retaining wall and buffer planting at Don Buck Road / Royal Road intersection

Figure 7: Existing retaining wall feature and buffer planting at Don Buck Road / Royal Road intersection

New street tree plantings along the entire length of the proposed alignment will mitigate for the loss of individual or small groupings of existing native trees and shrubs. This is also expected to reduce the impact of the scale of landscape change associated with the clearance of existing road-side vegetation. Mitigation for vegetation clearance on private property is discussed below.

Overall, the physical landscape effects resulting from vegetation clearance within the existing road corridors of the Project Area is assessed to be **moderate-low,** taking into account the loss of existing mature trees, disturbance to an established native planting area and the opportunities afforded through mitigation to reinstate and replace affected vegetation.

6.1.1.3 Vegetation Clearance – Greenfield Sections

Vegetation clearance is limited through the greenfield sections of the Project Area due to the existing modified condition of the landscape and noteworthy vegetation (including SEAs) located outside of the Project Area.

Several mature exotic trees and native shrubs are required to be removed between 456 and 458A Don Buck Road to make way for the N-S Project to tie-in with Don Buck Road. A group of mature pine trees (*Pinus radiata*) located further west will also be removed to make way for the corridor as it travels north towards the interior of the Redhills Precinct.

Figure 8: View southwest from Don Buck Road reserve towards exotic mature trees (to be removed)

Garden plantings, including mature exotic trees and native and exotic scrubs are required to be removed within the private boundaries of 23 and 25 Red Hills Road. This relates to CH800-1000 of the N-S Project (see figure 9 below).

Figure 9: View northwest outside 23 Red Hills Road. Existing garden planting to be removed

As depicted in the site photos below, the proposed bridge (or culvert) crossings are anticipated to have negligible impacts (subject to future regional consenting) on the limited vegetation types present within each of the stream crossing areas.

Figure 10: View southeast towards the proposed E-W Project crossing over Waiteputa Stream

Figure 11: View southwest towards the proposed E-W Project crossing over Ngongetepara Stream

Figure 12: View northeast towards the proposed N-S Project crossing over Ngongetepara Stream

For all greenfield areas impacted by the Project works, it is recommended that existing indigenous vegetation impacted by the Project works (albeit limited) be replaced during the finishing phase of the construction period. As the detailed design progresses and regional consents are sought, the extent and type of indigenous vegetation affected by the bridge and/or culvert construction works will be determined. It is understood that at that point, landscape enhancement measures (over and above the mitigation recommended by this assessment) will be designed and integrated into the Urban Design and Landscape Management Plan (**UDLMP**).

Overall, the physical landscape effects resulting from vegetation clearance within the greenfield areas of the Project Area is assessed to be **low,** taking into account the limited distribution of native species within riparian areas of the streams, and the mitigation strategies proposed.

6.1.2 Project Formation Works

6.1.2.1 Don Buck Road / Royal Road Intersection

The proposed road realignment and widening through the Don Buck Road and Royal Road intersection will result in moderate scale cut and fill slopes adjacent to the new road corridor which will alter the existing modified landform of the existing road reserve and adjacent private properties.

Notable modification is proposed along Royal Road between CH50 – 150 (Refer to Appendix 2: Landscape Plans and Images: Map 06), to where the existing corridor is proposed to curve north towards a perpendicular intersection with Don Buck Road and the proposed N-S Project. These changes will impact on several dwellings at the western end of Royal Road (as outlined above) and will result in a cut face into the existing elevated housing area between 6 – 16 Royal Road (approximately 1m - 3.5m high). A retaining wall (approximately 1m high) is proposed along the eastern side of the new intersection between 2 Royal Road and 453 Don Buck Road. The proposed retaining wall will replace the existing timber retaining wall and be set back into the slope on account of the proposed corridor widening. The new wall will be of a similar scale to that which currently exists.

A retaining wall and upgraded slip lane are proposed along the other side of the road in front of 462 – 484 Don Buck Road. A ‘like for like’ design is proposed by the RATN that will ensure continued access to affected properties via a new tie-in with Don Buck Road located further west. Impacts on private boundaries are discussed below in section 6.1.4.

Small to moderate-scale fill slopes along Don Buck Road and Royal Road will generally be absorbed into the existing modified road corridor and adjacent property boundaries. Impacts on private properties are discussed below in section 6.1.4.

Overall, the physical landscape effects resulting from land modification within the existing Don Buck Road / Royal Road corridors is assessed to be **moderate-low,** taking into account the noteworthy modification of the Royal Road / Don Buck Road intersection and the opportunity to reinstate other affected sections of the road corridor with a similar design to that existing.

6.1.2.2 N-S Project

The N-S Project is proposed to tie into the Royal Road intersection between the private properties of 456 and 458A Don Buck Road. From there the N-S Project alignment traverses a moderately steep slope trending southwest towards 23 Red Hills Road; at which point, it curves north to align with the existing 110kV transmission line running in a north-west to south-east direction through the centre of the Project Area to intersect with the proposed E-W Project.

The proposed N-S Project generally conforms to the natural topography of the receiving landscape with the exception of the elevated section (CH60-CH600) where site constraints combined with the requirement to tie-in with the elevated Royal Road intersection results in a steep section of road (8%) and large-scale fill slopes into the surrounding rolling topography. Given the open pastoral landscape in which the landform modification is to occur, it is possible to shape the large fill batters to a natural profile effectively creating a false ridgeline that will eventually flank future urban development to the north (Mixed Housing Suburban Zone as indicated by the AUP:OP). Landscape character effects are discussed further in section 6.2.1 below.

Smaller fill slopes associated with the remainder of the alignment and the proposed Waiteputa Stream crossing are similarly proposed into existing pastoral landform and will therefore have a negligible impact on the existing modified landform.

An indicative stormwater wetland (W3) is proposed between CH600 and CH700 on elevated land adjacent to Waiteputa Stream and will require earthworks to re-shape the land and achieve optimal depths and edge profiles. W3 is proposed within modified pastoral land and outside of existing waterways; on that basis, the physical landscape effects required to construct W3 are considered to be very low.

6.1.2.3 E-W Project

Small to moderate-scale fill slopes associated with the proposed Red Hills, Nixon and Nelson roundabout will generally be absorbed into the existing modified road corridor and adjacent property boundaries. Impacts on private properties is discussed below in section 6.1.4.

From the proposed roundabout the E-W Project descends along a south-east trending spur roughly parallel to a tributary of the Waiteputa Stream. Moderate scale fill slopes (up to 6m high) are proposed along this stretch of the corridor towards the proposed Waiteputa Stream bridge (or culvert) crossing after which cut slopes are proposed (approximately 6m deep) towards the intersection with the proposed N-S Project.

An indicative stormwater wetland (W1) is proposed between CH700 and CH800 and will require earthworks to re-shape the land and achieve optimal depths and edge profiles.

The fill slopes are proposed to integrate into the surrounding pastoral landform (outside of riparian margins) and will therefore have a negligible impact on the existing pastoral landform.

6.1.2.4 Dunlop Road and Baker Lane

Dunlop Road and Baker Lane are proposed to align with existing urban development with Baker Lane requiring small to moderate fill slopes to moderate existing earth worked landform and to integrate with the Fred Taylor Drive surface level.

Overall, the physical landscape effects resulting from earthworks within the Project Area is assessed as **low,** taking into the account the existing modified pastoral landscape in which earthworks are proposed with the proposed mitigation measures included in the Project works.

6.1.3 Site Finishing Works

Finishing works are expected to include lighting, signage, footpath/cycleway details and line markings. Streetscape elements and landscaping (to be determined by detailed design) will also be implemented. These activities will occur within the already modified areas of the Project and generally bring some relief to the exposed areas of the landscape and visual effects associated with bare earth. Physical landscape effects are expected to be negligible through this final phase of the construction process.

6.1.4 Impacts on Private Property

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 access ways to be regraded;
- Encroachment into private yard areas and the removal of private garden plantings and mature trees (as outlined above), ancillary buildings and boundary fences;
- Construction of noise mitigation measures and retaining walls;
- Demolition of existing dwellings and ancillary buildings (required properties) ;
    - 458A Don Buck Road (northern dwelling to be removed only)
    - 2, 4 and 6 Royal Road
    - 1 Dunlop Road
    - 68 Fred Taylor Drive
    - 23 Red Hills Road

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 (i.e. to avoid double layering of noise walls and boundary fences). It is also recommended that retaining walls and/or noise mitigation measures incorporate any reinstatement planting required to replace vegetation lost through the Project works (if practicable).

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.

On the basis of the above, the physical landscape effects on private properties is assessed as **moderate-low** and can be adequately remedied from a landscape perspective.

6.1.5 Visual Effects

The consideration of visual effects through the construction phase acknowledges the full range of activities (and their resultant visual impact), required to implement the new and upgraded road corridors. As discussed earlier, this includes site enabling works (site establishment, demolition and vegetation clearance), bulk earthworks and surface formation, bridge and/or culvert construction and the 'finishing works' period where it is anticipated that street trees, lighting, footpath/cycleway details and line marking will be implemented, alongside any other urban design and landscape features of the Project.

The Project works are anticipated to be broken down into 4 separate and independent construction stages, each ranging in duration between 1.5 to 3 years, which will be dependent on other construction activities (associated with urban development) that is expected to occur congruently with the development of each NoR. Given that each construction stage is independent, it is possible that resident and transient viewing audiences may concurrently experience adverse visual effects from two or more of the proposed stages through the construction period.

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 the existing road sections of the Project Area. Similarly, as alluded to above, it's anticipated and likely that the new N-S Project and E-W Project sections will be constructed congruently with associated urban development, likely resulting in a heavily modified receiving landscape at the time of construction.

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. These areas are outlined below:

- Royal Road / Don Buck Road intersection where noteworthy earthworks, road realignment and vegetation clearance are proposed.
- Along Don Buck Road (adjacent to sensitive receivers at Jack Smyth Court elderly residential area), where the existing retaining wall and buffer planting is proposed to be temporary impacted and reinstated.
- Private properties within the Royal Road / Don Buck Road upgrade catchment, where physical landscape effects will occur along roadside boundaries.
- A localised receiving audience west of the Don Buck Road / Royal Road roundabout with views towards the elevated section of the N-W Project (CH0 – CH600) where noteworthy fill slopes and vegetation clearance (at the Don Buck Road intersection) are proposed.
- Red Hills / Nelson / Nixon and Henwood Road intersection where noteworthy earthworks, road realignment and vegetation clearance are also proposed.

- Elevated sections along Red Hills Road where superior views into the Redhills Precinct are afforded.

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 main roads (Royal Road / Don Buck Road and Red Hills / Nelson / Nixon Roads);
- The landscape is notably modified by rural land use activities;
- Construction activities are already underway within the northern extent of the Redhills Precinct;
- Construction of the proposed NoRs will occur congruently with future urban development adjacent to the Project Area.

Visual effects through the interior of the site are considered to be moderated by the anticipated development that is likely to coincide with these sections of the Project and the distance between the Project works and superior vantage points along Red Hills Road, mentioned above.

Representative viewpoint images are provided in Appendix 1. Representative Viewpoint Images. The supporting commentary for each location outlines the existing visual composition as well as the landscape change that is anticipated to occur that might translate into adverse visual effects during the construction period.

Overall, adverse visual effects for the transient public viewing audience are likely to range between **low** to **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, particularly those located directly adjacent the existing Don Buck Road / Royal Road corridor who will experience more frequent and prolonged engagement with the construction activities of the Project. On that basis, visual effects for private viewing audiences are likely to range between **low** (for those immediately impacted by construction activities**)** to **moderate** (those residents separated from the Project works)**.**

6.1.6 Recommended Measures to Avoid, Remedy or Mitigate Construction Effects

The matters outlined below address the temporary construction impacts on the physical landscape, during the construction phase of the Project. An UDLMP is recommended as a condition on the designation which should include the matters outlined below:

- Reinstate site compounds and construction yards by removing any left-over fill and shaping ground to integrate with surrounding landform. Reinstate with grass at the completion of works.
- Retain noteworthy trees and vegetation identified within the Project Area where practicable.
- Reinstate the retaining wall and native and exotic buffer planting above the existing timber retaining wall at the Don Buck Road / Royal Road intersection.
- Reinstate private fences and garden plantings for existing, remaining properties temporarily affected by Project works.

- For affected private properties, where existing dwellings are assumed to be removed, it is recommended that, after completion of the works affecting the property, if the remnant land is maintained within the road corridor it be grassed to mitigate adverse visual amenity effects potentially arising from residual land.

Refer to Appendix 2: Landscape Plans and Images: Maps 06 - 19 which illustrate the general location of the proposed mitigation measures.

6.2 Assessment of Operational Effects

6.2.1 Effects on Landscape Character

The principle elements of the Project will permanently alter the character of the baseline landscape within the Project Area, particularly within the greenfield areas of the Project. 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 an increased visual amenity within the existing road sections and intersections within the Project Area.

By the time the Project is operational it can reasonably be assumed that further sections of the Redhills Precinct will have urbanised, alongside (if not as part) of the implementation of the NoR sections. As discussed previously in section 5.1, the AUP:OP zones indicate a local centre at the northern intersection of the N-S Project / E-W Project intersection; high density residential typologies directly adjacent and Residential - Mixed Housing Urban (medium – high density) residential typologies through the interior and northern extents of the Redhills Precinct. Residential – Mixed Housing Suburban and Residential – Single House development will be concentrated within the elevated sections within the western extent of the Redhills Precinct.

As indicated by the Redhills Precinct Plan, future urbanisation might reasonably include the development of an interconnected Redhills Green Road and corresponding Recreation Open Space areas interpreted through future masterplans for the balance areas of the Redhills Precinct.

New street tree plantings along the length of the proposed alignment will assist with mitigating the landscape character and visual effects arising from the removal of mature trees and shrubs within the Project Area.

Localised sections (stream crossings) within the Project Area have been identified by ecological survey as high value (bat habitat), therefore it is suggested (subject to detailed design) that ecological survey and recommendations inform the species selection of street trees. In a general landscape character sense, any potential fauna planting strategies (including potential bat hop overs) are considered to introduce a unique future landscape design opportunity that will (overtime) enhance the urban amenity and neighbourhood character of future urban development adjacent to the Project Area and potentially contribute to the unique sense of place of the Redhills Precinct.

For private properties adjacent to the Project, specifically along Royal Road and Don Buck Road, the proposed earthworks will permanently impact on private property 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 regrading of some driveways and private access ways;
- Greater proximity of the carriageway and footpath/cycleway to property boundaries and increased traffic volumes;
- Introduction of noise mitigation walls or other mitigation features and retaining walls.

In assessing the landscape character effects of a transport corridor within a landscape 'live zoned' for urban development, there is an overlap with urban design considerations. This is expressed through the consideration of urban amenity, neighbourhood character and sense of place. For the Project specifically, the following aspects have been considered and are also addressed by the Urban Design specialists and are recommended for inclusion in the UDLMP.

- **Bridge/culvert structures** – It is noted that the proposed stream crossings are subject to detailed design and could be culvert crossings. Bridge crossings are preferred over culverts from a landscape and natural character perspective as this offers the best opportunity for natural and/or planted regeneration of native species within the riparian corridors, thus improving the natural character values of the landscape within the Project Area. It is recommended that the proposed bridges (if implemented) be designed to contribute to the local sense of place and urban amenity of the future urban landscape.
- **Reinstatement of Retaining wall (Don Buck / Royal Road intersection) –** It is recommended that the new retaining wall be designed to contribute to the local sense of place and urban amenity of the future urban landscape.
- **Pedestrian 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 (as indicated on the Redhills Precinct Plan). It is recommended that through the UDLMP open space and cycleway routes be identified and connection opportunities investigated.
- **Noise mitigation measures / retaining walls –** It is recommended that noise mitigation measures and retaining walls be designed to integrate with private boundary fencing (i.e. to avoid double layering of noise walls and boundary fences). It is also recommended that noise mitigation measures and retaining walls incorporate existing and reinstatement planting in a way that contributes to the streetscape character, minimises visual amenity effects on residents and integrates with the layout and design of outdoor living spaces.
- **Proposed noise mitigation wall (25 Redhills Road) –** A 27m long x 1.8m high noise mitigation wall is proposed to mitigate the noise effects for the existing dwelling at 25 Red Hills Road (should this dwelling remain in place). It is noted that should this mitigation feature be required there are several contextual features within the proposed road corridor that would enable the noise wall to be integrated (through a high level of design input) as a purposeful feature within the road corridor.
- **Indicative stormwater wetlands –** Indicative stormwater wetlands are proposed at three locations within the Project Area. It is recommended that any stormwater wetlands (if provided) 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. Given the future urban location and scale of the proposed wetlands, it is important that they enhance the landscape and visual amenity of the local landscape.
- **Fill slopes –** moderate to large-scale fill slopes, if not otherwise actively integrated back into the adjacent urban development parcel (i.e. remain within the road reserve) are likely to read

as left-over spaces and will do little to enhance the amenity of the road corridor and adjacent urban neighbourhood. In relation to large-scale fill slopes, there is the potential for landscape character and visual amenity effects to arise, therefore it is recommended that residual fill slopes (those retained within the road reserve) be planted in native species or otherwise integrated with adjacent land use through site specific landscape and urban design.

- Based on the scale of indicative earthworks and long sections through the alignment, there are specific locations within the Project Area where it is considered that a planted or specific landscape design response would provide one or more of the following benefits: additional green infrastructure to the road corridor, reduced maintenance requirements, a vegetated backdrop to adjacent urban housing and integrate the road corridor with adjacent land use through specific landscape and urban design interventions to avoid potential adverse landscape character and visual amenity effects associated severance issues. Specific areas for assessment are illustrated in Appendix 2 – landscape Plans and Images: Maps 06 – 19 and include the following locations:
    - N-S Project (CH0 – CH700) (refer also to specialist urban design framework section 3.1, Table 1 Urban Design Evaluation (2.4))
    - E-W Project (CH350 – CH1050)
    - E-W Project (CH1600-1700)
- On the basis of the above, it is recommended as a matter for the UDLMP that fill slopes be assessed against adjacent land use and integrated through specific landscape and urban design treatment. These treatments should be included in a planting plan for the Project Area.
- It is recommended that all fill slopes be shaped to a natural profile to integrate into the surrounding landform and future land use scenario. Fill slopes associated with proposed bridge (or culvert) crossings are recommended to be shaped to natural landform at a suitable gradient to allow riparian planting to be established.

On the basis of the above, the magnitude and nature of landscape character change within the Project Area is considered to accord with that which will occur throughout the localised landscape over time within adjacent development areas. Overtime, the Project is expected to have a positive impact on the developing landscape and urban amenity values of the local landscape.

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

6.2.2 Natural Character Effects

Potential effects on natural character arise from landform modification and subsequent vegetation clearance (although limited), associated with potential bridge or culvert construction, within the margins of Waiteputa Stream, Red Hill Stream and Ngongetepara Stream. Removal of vegetation within wetland and stream environments has the potential to alter the character of these areas by heightening the impression of further human modification.

As noted earlier, limited areas of native vegetation are expected to be impacted by the Project works. It is understood that as regional consents are sought, the full extent and type of indigenous vegetation affected (within the Waiteputa Stream, Red Hill Stream and Ngongetepara Stream environments) will be determined and riparian and wetland mitigation planting will be designed and integrated into the Landscape and Urban Design Management Plan. This will ensure that natural character values are preserved, if not enhanced.

Based on the assessment of the quality of existing riparian and wetland vegetation, the Project is likely to give rise to **very low** natural character effects.

6.2.3 Visual Amenity Effects

Once the Project is completed, the public viewing audience will engage with a similar visual environment to that which currently exists within the existing road sections of the Project Area, within the backdrop of continued urban development through the balance areas of the Redhills Precinct.

Conversely, viewing audiences located within the existing greenfield areas of the Project (if they remain) will engage with an entirely different visual environment. As discussed earlier, visual change of the magnitude proposed will be perceived within the context of adjacent urban development which over time will (itself) substantially change the scale and character of the Redhills landscape, which in turn will absorb the landscape and visual changes proposed within the Project Area.

Adverse visual effects are likely to be heightened for the localised receiving audience located directly west of the existing Don Buck Road / Royal Road roundabout (422 – 456 Don Buck Road). This is because the Receiving Landscapes of existing dwellings in this row of housing equates roughly with the levels proposed through the longitudinal section of the elevated portion of the proposed N-S Project. Where existing dwellings currently enjoy superior views over the Redhills Precinct, these have the potential to be disrupted by the elevated section of road corridor, drawing focus towards the southern fill slopes and potentially distorting the horizon view. This type of visual effect could be perceived as significant for the existing receiving audience; however, such effects are considered to be moderated by the AUP:OP zone overlay for this localised setting that signals Business – Local Centre development surrounded by Mixed Housing Suburban development. It's reasonable to consider that this type of policy direction would enable future urban development to respond to the design constraints and potential resulting visual impacts of the elevated sections of the N-S Project. Notwithstanding the urban development opportunities afforded to the receiving audience, it is recommended that the southern fill slopes (CH0 - 600 - if retained within the road reserve) be subject to a specific planting or landscape and urban design response to mitigate the visual prominence of the elevated section of corridor on the localised receiving audience.

Overall, 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.

Nevertheless, residual adverse effects are anticipated from some private properties because as a direct result of the Project, residents will experience a degree of material change to the visual composition and residential amenity of private space and entryways. For existing properties set back from the Project Area, the visual amenity effects will be an incremental increase in existing effects from the road corridor. However, for properties directly adjacent to the Project Area (immediately impacted by the Project), residual amenity effects may be heightened by the greater proximity of the carriageway and footpaths/cycleways to property boundaries and the permanent loss of yard space.

Overall, adverse visual effects within the Project Area are likely to be **low** (moving to beneficial) for transient viewing audiences 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.

6.2.4 Recommended Measures to Avoid, Remedy or Mitigate Operational Effects

The matters outlined below address the principle 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 a UDLMP is a condition on the designation which should include the following matters.

- Bridges (if applicable) - It is recommended that any proposed bridges be designed to contribute to the local sense of place and urban amenity of the future urban landscape.
- Reinstatement of retaining wall (Don Buck / Royal Road intersection) – It is recommended that the new retaining wall be designed to contribute to the local sense of place and urban amenity of the future urban landscape.
- Walking and cycling connectivity – Investigate opportunities to integrate with existing and future open space (as indicated by the Precinct Plan).
- Noise mitigation measures / retaining walls – It is recommended that noise mitigation measures and retaining walls be designed to integrate with private boundary fencing (i.e. to avoid double layering of noise walls and boundary fences). It is also recommended that noise mitigation measures and retaining walls incorporate existing and reinstatement planting in a way that contributes to the streetscape character, minimises visual amenity effects on residents and integrates with the layout and design of outdoor living spaces. Refer to Bridging the Gap: Waka Kotahi Urban Design Guidelines (2013), Section 4.13 Retaining Walls and Section 4.15 Noise Barriers.
- The 27m long x 1.8m high noise mitigation wall proposed to mitigate the noise effects for 25 Red Hills Road should be designed to integrate with the contextual features of the road corridor and be designed (with a high level of design input) as a purposeful streetscape feature within the road corridor.
- Cut and fill slopes – Cut and fill slopes should be shaped to a natural profile to integrate into the surrounding natural landform. Fill slopes associated with proposed bridge (or culvert crossings) are recommended to be shaped to natural landform at a suitable gradient to allow riparian planting to be established.
- Planting Plan – A planting plan should be prepared for the Project including for:
    1. Reinstatement planting of the Don Buck Road / Royal Road buffer planting.
    2. Reinstatement planting in relation to private properties.
    3. Treatment of fill slopes to integrate them with adjacent land use. Specific areas for assessment are noted on Appendix 2 – landscape mitigation plans 06 – 19 and include the following locations:
        - N-S Project (CH0 – CH700) northern and southern fill slopes (refer also to specialist urban design framework section 3.1, Table 1 Urban Design Evaluation (2.4))
        - E-W Project (CH350 – CH1050)
        - E-W Project (CH1600-1700)
- Street trees – Ecological analysis to determine species selection relative to local landscape context and ecological opportunities.

- The UDLMP planting plan should integrate with riparian planting recommended with regional consents.

Refer to Appendix 2. Landscape Plans and Images: Maps 06 - 19 which illustrate the general location of the mitigation measures.

6.3 Future Resource Consent and Detailed Design Considerations

There is significant opportunity to enhance the landscape character, natural character and visual amenity of the Project Area. The following design opportunities are suggested to be considered at the detailed design phase and implemented through the UDLMP (if practicable) alongside the mitigation measured outlined above in section 6.2.4.

The opportunities are summarised as follows:

- **Riparian planting** – native riparian and wetland planting associated with stream crossings (including fill slopes within riparian areas), subject to regional consent stage.
- **Indicative stormwater wetlands -** Stormwater wetlands are proposed at three locations within the Project Area. It is recommended that any 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. Given the future urban location and scale of the proposed wetlands, it is important that they enhance the landscape and visual amenity of the local landscape. Bridging the Gap: Waka Kotahi Urban Design Guidelines (2013), Section 4.17 Stormwater Management Devices.
- **Expand reinstatement planting areas** to include a greater extent of wetland and riparian margin beneath and surrounding the upgraded proposed stream crossings, to enhance the natural character values of water bodies and to integrate proposed stream crossings into the landscape.
- **Ecological design of potential bat hop overs** - Should ‘bat hop-overs’ be implemented within the permanent works, the following principles should inform an integrated ecological and landscape design approach to locations within the Project Area indicated by ecological assessment.
    - Trees are tall enough so that bats commuting along the top of the tree canopy are higher than vehicles driving along the road (>5 m).
    - The canopy extends over the road reducing the distance that the bats fly without a continuous vegetated linkage (ideally canopy would touch) (refer to the Assessment of Ecological Effects).
    - Compensation planting for the loss of mature trees could occur within the ‘hop-over’ locations and should include native forest species that will provide long-term habitat such as kahikatea, kauri, totara and rimu. Fast growing exotic tree species should also be included that are known to provide short-medium term. This should form the criteria for the development of detailed landscape planting plans at the Outline Plan of Works stage.

7 Recommendations and Conclusions

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

Positive landscape character and visual amenity effects are likely to arise, over time, as a result of the Project, while broader landscape enhancement measures are likely to be designed into the Project at the detailed design and resource consent stage, as envisaged by the AUP:OP Chapter E.3 and the Redhills Precinct Plan.

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 5: Redhills Arterial Transport Network Summary of Landscape and Visual Effects

	Temporary Effects - Construction (with mitigation implemented)	Permanent Effects – Operation (with mitigation implemented)
Physical Landscape Effects **(earthworks, construction areas and vegetation clearance)**	**Low to moderate-low** **Moderate-low** for affected private properties	N/A
Visual Effects	**Low to moderate-low** for public viewing audiences **Low to moderate** for private viewing audiences	N/A
Effects on Landscape Character	N/A	**Low**
Effects on Natural Character Values	N/A	**Very low**
Effects on Visual Amenity	N/A	**Low** for public viewing audiences (moving to beneficial overtime) **Low to moderate-low** for private viewing audiences (reducing over an extended period of time)

Appendix 1. Representative Viewpoint Analysis

Viewpoints 01 – 04 – Fred Taylor Drive / Baker Lane (NoR 2b)

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 21 - 22**

Viewpoints 1, 2 and 4 illustrate the view looking southwest through the proposed Baker Lane corridor, while viewpoint 3 illustrates the view north looking back towards Taylor Drive from the end of proposed Baker Lane. As depicted in the photographs, this section of land is currently under development and forms the northern extent of the Project Area where urban development is underway as discussed in section 5 of this report.

Viewpoints 2 and 4 demonstrate the existing vegetation types existing within the minor tributaries of the Ngongetepara Stream along the perimeter of proposed Baker Lane and within the proposed bridge (or culvert) crossing at CH2100. Mature exotic trees are visible from this vantage point are likely to be removed and replaced with street trees through the Baker Lane corridor.

Notable visual changes to this section of the existing landscape will include the proposed Baker Lane road corridor and associated fill slopes (to both sides) and urban housing typologies including Residential – mixed Housing Urban and Terrace housing and Apartment buildings as indicated by the AUP:OP zones.

The viewing audience is currently restricted though this section of the Project Area due to ongoing development works, however viewpoint 1 depicts the general view afforded to the transient viewing audience (i.e. vehicles travelling between 50-80km/h) along Fred Taylor Drive. In time the proposed corridor will be experienced by residents and visitors of the adjacent urban environment; therefore, the magnitude and nature of visual change associated with this section of the Project is considered to accord with that of the future localised urban landscape.

Viewpoint 05

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 23**

Viewpoint 5 illustrates the view looking southwest towards Westbridge Residential School and the rural residential properties (21,23, 25 Redhills Road) located further south. Existing land use through this section is defined by the rolling, elevated landform defined by the tributaries of Ngongetepara Stream and shelter belt and amenity plantings associated with existing land use. As discussed in section 5.6, this area of the Redhills Precinct currently exhibits a heightened degree of rural character and perceived visual amenity.

The immediate landscape depicted in this view is not impacted by the Project, parts of the lower N-S Project section are likely to be visible (adjacent to future urban development) in the background of the view. Properties (including the school) are also afforded views north towards NoR 2b (Baker Lane).

Viewpoint 06 and 07

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 23 - 24**

Viewpoint 6 illustrates the contextual view looking southwest from elevated land north of proposed Dunlop Lane (NoR 2a). The land from which this vantage point is captured will be immediately absorbed into high density residential development in accordance with the AUP:OP zoning for the northern extent of the Redhills Precinct.

From this general location, is might be possible to view sections of the E-W Project (NoR 2c), proposed stormwater wetlands (W1 and W2) and sections of the N-S Project, all within the distant view of this vantage point. The existing Transmission lines offer a visual reference point for the N-S Project alignment which is proposed to generally align towards the intersection with the E-W Project. The proposed road corridors will be visually absorbed by the Business - Town Centre and medium to high density residential typologies associated with the new road corridor as indicated by the AUP:OP zones.

Viewpoint 7 illustrates the existing localised condition of the Ngongetepara Stream, at the proposed crossing point (CH1600). A bridge crossing (subject to regional consents) over this section of the project would afford better riparian revegetation outcomes for the stream and underpin greater natural character enhancement within the Project Area. A culverted option will require fill slopes to cover sections of the riparian margins; however, those fill slopes would be able to be planted to integrate into the riparian corridor.

Viewpoint 08

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 24**

Viewpoint 8 illustrates the contextual view looking north from elevated land overlooking the proposed N-S Project and E-W Project intersection. Intermittent sections of the N-S Project might be visible from this general location, with the indicated Business - Town Centre and medium to high density residential typologies visible in the background of the proposed road corridor.

Viewpoint 09 and 10

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 25**

Viewpoint 09 illustrates the view looking northeast into the riparian margins of the tributaries of Waiteputa Stream and Red Hill Stream intersecting in the background of the view. As depicted in the photograph, the stream environment is heavily modified and very little native terrestrial vegetation exists within the proposed crossing point (CH850). Proposed W1 is located in the general vicinity of the existing barn and will require small-moderate fill batters to integrate into the adjoining landform, which will be visible from this localised vantage point. It's suggested (subject to detailed design) that the treatment of fill slopes be integrated into adjacent land use. It is suggested that fill slopes proposed between CH 700 – 780 be integrated with planting for visual cohesion.

Viewpoint 10 illustrates the view looking northwest towards the western boundary of the Redhills Precinct. The views follow the proposed E-W Project alignment directly adjacent (on the right-hand side) of a tributary of Waiteputa Stream and the mature shelterbelt planting. Fill slopes (approximately 6m high) will modify the existing ridge formation of the landform through this section. Given the open

nature of the pastoral landscape in this area, the proposed fill slopes are anticipated to visually integrate into the receiving landform.

Viewpoint 11 and 12

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 26**

Viewpoints 11 and 12 illustrate the view looking northeast from the localised receiving environment of the elevated section of the N-S Project. The views demonstrate the superior elevation over the Project Area.

Adverse visual effects are likely to be heightened for the localised receiving audience located directly west of the existing Don Buck Road / Royal Road roundabout (422 – 456 Don Buck Road). This is because the RL's of existing dwellings in this row of housing equates roughly with the levels proposed through the longitudinal section of the elevated portion of the proposed N-S Project. Where existing dwellings currently enjoy superior views over the Redhills Precinct, these have the potential to be disrupted by the elevated section of road corridor, drawing focus towards the southern fill slopes and potentially distorting the horizon view. This type of visual effect could be perceived as significant for the existing receiving audience; however, such effects are considered to be moderated by the AUPIOP zone overlay for this localised setting that signals Business – Local Centre development surrounded by Mixed Housing Suburban development. It's reasonable to consider that this type of policy direction would enable future urban development to respond to the design constraints and potential resulting visual impacts of the elevated sections of the N-S Project. Notwithstanding the urban development opportunities afforded to the receiving audience, it is recommended that the southern fill slopes (CH0 - 600 - if retained within the road reserve) be subject to a specific planting or landscape and urban design response to mitigate the visual prominence of the elevated section of corridor on the localised receiving audience.

Viewpoint 13 and 14

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 27**

Viewpoints 13 and 14 illustrates the view looking east and southeast from the elevated western extent of the proposed E-W Project corridor. The viewing audience from this general vicinity have superior views over the Redhills area and will view the E-W Project corridor from above, within the context of adjacent urban development. The proposed alignment generally conforms to the natural topography of the land and as such is likely to appear integrated with the natural landform. Recommendations to shape the southern fill slopes into natural landform, adjacent to the tributary of the Waiteputa Stream will play an important role in integrating the proposed land modification.

Viewpoint 15 and 16, and 18

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 28-29**

Viewpoints 15, 16 and 18 illustrate the distant views afforded from the elevated pastoral areas (future medium density housing) towards the N-S Project corridor, specifically the elevated eastern section of the corridor. It's likely, given the proposed elevation of this section of the proposed corridor that the southern road corridor and southern fill slopes will be visible. It's likely that these elements will

read in unison with the spurs visible in the foreground of viewpoint 16. Visibility towards the N-S Project corridor is likely to diminish, over time, as future urban development is implemented.

Viewpoint 17

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 29**

Viewpoints 17 illustrates the close-range view looking northwest from outside 29 Red Hills Road. The N-S Project corridor will sweep past this vantage point, in front of the 110kV transmission lines running in a north-west to south-east direction through the centre of the Redhills Area. The E-W Project corridor will be visible in the background view running down the south-east trending spur behind the white house visible in the view. From viewpoint 17, the N-S Project corridor will be visible as an integrated road and expected feature within the future urban neighbourhood of this location.

Similarly, the E-W Project corridor, visible in the background view will read as an integrated roading corridor within the future low to medium density housing development that will occur upon the elevated east facing slopes.

Viewpoint 19-21

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 30 - 31**

Viewpoints 19 – 21 illustrates the views looking west and south-west along Don Buck Road towards the eastern boundary of the Redhills precinct. Viewpoint 19 illustrates the existing timber retaining wall and buffer planting at the Don Buck Road / Royal Road intersection. This feature will be impacted by the project works and is recommended to be reinstated in a general like-for-like design. The existing vegetation to the right of the view will also be impacted by the project works and while this vegetation is not proposed to be reinstated, new street tree plantings will generally replace the vegetative structure of the current view.

Viewpoint 20 illustrates the existing view from 488 Don Buck Road, along the accessway to St Paul's Primary School and Westbridge Residential School. Given that medium density housing is proposed within the general area, intermittent views towards the project area are unlikely to be maintained.

Viewpoint 22 - 23

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 31**

Viewpoints 22 and 23 illustrate the distant views looking east from Nixon Road and Henwood Road / Nixon Road intersection from rural zoned land. Views towards the Project areas are limited due to intervening elements in the landscape and perceived visual change from these locations will result predominately from the future urban development areas.

Viewpoint 23 - 26

Refer to **Appendix 2**: Landscape Plans and Images: **Map 20 and 32 - 33**

Viewpoints 24 - 26 illustrates the contextual vantage points along the ring Road route of Red Hills Road to Nixon Road. Views afforded from these superior vantage points will undergo substantial

change as urban development is implemented in accordance with the AUPOIP. The proposed NoRs from these elevated vantage points will be visible as an integrated and potentially organising feature within the future urban framework. Proposed street trees throughout the proposed alignments will also provide some degree of visual legibility to future urban form, as perceived from these vantage points. The AUPOIP Ridgeline Protection Overlay is anticipated to generally preserve the superior views towards greater Auckland in the background.

Appendix 2. Landscape Plans and Images