

Addendum

Project:	Stage 2 P2B	Reference No.	506207-0590-FRM-NN-0003	Revision	A
To:	NZ Transport Agency Waka Kotahi	From	Natarsha Lamb-Egar		
Date	21/05/2024	Pages	23 + Appendices		
Subject	Urban Design Assessment				

Glossary of Abbreviations

Abbreviation	Term
AEE	Assessment of Effects on the Environment
AUP:OP	Auckland Unitary Plan (Operative in Part 2016)
GSR	Great South Road
LVA	Landscape and Visual Assessment
NoR	Notice of Requirement
NoR 1	Alteration to the SH1 Designation 6706
NoR 2	Alteration to the SH1 Designation 6700
NoR 3	Alteration to the SH1 Designation 6701
NoR 4	Shared User Path between Quarry Road and Bombay Interchange
NoR 5	Drury South Interchange Connections
NZTA	New Zealand Transport Authority
P2B Project	Papakura to Bombay Project
(the) Project	Stage 2 of the P2B
RMA	Resource Management Act 1991
SEA-T	Significant Ecological Area – Terrestrial
P2B	SH1 Upgrades Project between Papakura to Bombay
SH1	State Highway 1, the southern motorway
SUP	Shared Use Path
UDA	Urban Design Assessment
UDLMP	Urban Design and Landscape Management Plan
ULDF	Papakura ki Pukekohe Urban and Landscape Design Framework

1. Addendum

This urban design assessment (UDA) is an addendum to the Landscape and Visual Assessment (LVA). It forms part of a series of technical reports created to support the Assessment of Effects on the



Environment (AEE) for five Notices of Requirement (NoRs) filed by NZ Transport Agency (NZTA) for Stage 2 Papakura to Bombay (P2B, the Project), under the Resource Management Act 1991 (RMA).

This UDA is undertaken as part of the S92 request from Auckland Council. The purpose of this addendum is to consider the factors and inputs related to the construction, operation, and maintenance of P2B, and how it will affect the current and future environment in terms of urban design. Additionally, it aims to evaluate and identify opportunities for integrating future transport and land use.

The main areas covered in this UDA are as follows:

- Identify and describe the future urban context of the Project;
- Identify the effects of the Project in relation to:
 - Future urban form and land use;
 - Connectivity; and
 - the urban design outcomes in relation to Papakura ki Pukekura Urban and Landscape Design Framework (ULDF);
- Recommend measures as appropriate to support future transport and land use integration opportunities for each Project corridor; and
- Present an overall conclusion of the urban design outcomes for each Notice of Requirement.

This addendum should be read in conjunction with the AEE, which provides additional information about the background and context of the Project. The AEE also offers a comprehensive description of the proposed works for the Project as a whole, as well as for each individual NoR.

Therefore, unless it is necessary to describe an activity to understand its potential effects, the details provided in the AEE are not reiterated here. Any such descriptions included in this report are for the purpose of clarity.

The assessment is based on the current design, with detailed design of the project to be undertaken at a later date. The management of this design will follow the requirements set out in an Urban Design and Landscape Management Plan (UDLMP) for each of the Project NoRs, which must be prepared in accordance with the recommendations of the corridor wider ULDF.

1.1 Structure

The structure of the addendum is as follows.

Table 1-1 Document structure

Sections	Section number
Purpose of the addendum and description of the Project	Section 1
Identification and description of the future receiving environment	Section 2
Methodology used to assess the urban design effects including guidelines	Section 3
Description of alternative design options	Section 4
Assessment of the five NoRs	Section 5
Summary of UD effects and recommendations	Section 6



1.2 Project description

P2B, also known as Papakura to Bombay, is a NZTA project aiming to improve transport capacity and accommodate growth in South Auckland. Stage 2 which is made up of five NoRs, seeks to protect land for future upgrades, including new and upgraded interchanges, lane additions, and stormwater management. The Project starts south of Quarry Road to around 600 meters south of the existing Bombay Interchange.

NZTA is seeking to designate land to accommodate the following planned works:

- New interchange constructed at Drury South (one additional lane in both direction of the proposed interchange) including connections to Maketū Road and Great South Road;
- Upgrades to existing Bombay Interchange (one additional lane in both directions);
- Upgrades to Ramarama Interchange;
- Continuation of a SUP from Quarry Road to Bombay Interchange; and
- Stormwater management devices.

This Project relates to future upgrades to the state highway network. There is currently no funding allocated towards the construction of the projects, though it is expected to be constructed within 15-20 years. Further details of the project are provided in the Landscape and Visual Assessment, with further discussion of the different stages of the P2B Project is contained in the, Assessment of Effects on the Environment Design Report - Appendix C, and legal submissions supporting this application.

2. Methodology

'Urban design' is defined by the NZTA Urban Design Policy (NZ Urban Design Protocol), as:

"Urban design involves the design and placement of buildings, roads and open spaces in towns and cities to create desirable places in which to live, work and play. On a large scale it is concerned with urban and rural structure, the pattern of buildings, open space, and movement networks. On a small scale, it is concerned with urban and rural character and function and how roads, open space, and buildings interact, appear and function."

There are number of guidelines which inform the urban design of transport Projects by NZTA, which have been considered in this assessment including:

- NZTA Urban Design Guidelines (Bridging the Gap, 2013)
- NZTA Urban Design Protocol (Ministry for the Environment, 2005)
- NZTA Landscape Guidelines (Final Draft, September 2014)
- NZTA P39 Specification for Planting (2013)
- NZTA State Highway Noise Barrier Design Guide (2014)
- NZTA Cycling Network Guidance (online)
- NZTA Pedestrian Planning & Design Guide (2009)
- NZTA Sustainability Plan (2020)
- NZTA Bridge Manual (2022)

Additionally, the AUP(OP) sets out the Regional Policy Statement (ACRPS) objectives relevant to the area which have been considered (refer to Appendix A for these Urban Design objectives).



The methodology for this assessment is modelled on the NZTA Urban Design Guidelines (Bridging the Gap), considered best practice within the industry and which requires the key areas for assessment of urban design effects to include:

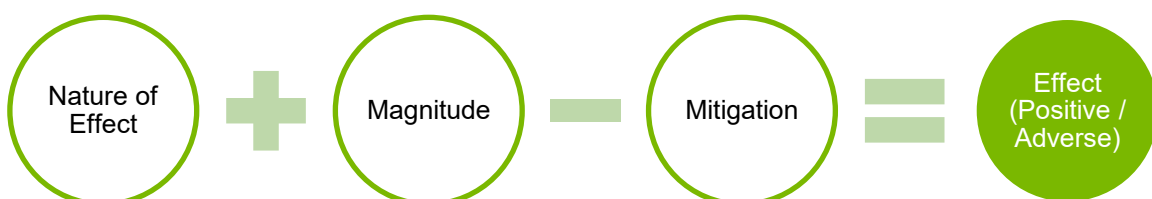
- Urban form and land use effects:
 - The effects of the Project on the efficient use and development of land.
 - Effects to land parcels adjacent the NoRs.
 - The road corridor fit into adjacent future land uses, including wayfinding, character and views to surrounding environment.
 - Over bridges and underpasses: the design of bridges and their fit into the urban context.
 - Potential CPTED issues.
- Amenity effects:
 - The effects of the Project on the qualities and characteristics of an area that contribute to people’s appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes.
- Connectivity effects:
 - The effects of the Project on pedestrian, cycle and local vehicular movement as well as the perceived severance effects associated with loss of visual connection to community facilities, neighbouring areas or the wider landscape.
 - Integration with the existing/future motorist, pedestrian and cycle network.
 - Whether it provides improved connectivity for the local community.
- Establishing recognised urban design principles, policies and objectives;
 - From these principles, providing a baseline evaluation of the future urban design environment.
 - Meeting the ULDF objectives (refer Section 3.4.1).
- Where applicable/practical recommend further mitigation measures avoid, remedy or mitigate adverse effects.

For clarity, the Amenity effects are addressed in the Landscape and Visual Assessment (LVA) and not repeated in this Urban Design Assessment.

The urban design assessment has been prepared for each NoR, in regard to the urban modifications to the future planned environment.

2.1 Significance of Effects

Analysis of effects is based on the design information available and its effect on activities, circulation, urban form and amenity. The effects are then identified as either positive or negative.



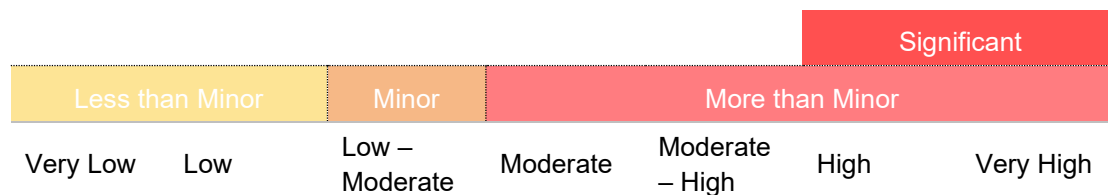


The magnitude of urban design effects considers the design quality of the element, its visibility, the significance of the location and its fit into the environment. The magnitude is rated to below scale, and whether the effect is adverse or positive.



The assessment is used to guide the significance of effects in accordance with the Resource Management Act (1991) as outlined in Table 2-1.

Table 2-1 Level of effect



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

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

3. Existing and likely future environment

The following assessment is taken from the Application AEE, from Section 8 which discusses the approach for assessing route protection. Note that the LVA is not a planning assessment.

3.1 Assessment of existing environment

The approach for assessing the existing urban environment is outlined in Section 8.7 of the Application AEE. However, it is not accurate to assess the impact of the construction and operation of the Project on the environment solely based on its present state. This approach does not reflect the actual environment in which the effects of such activities will be experienced.

3.2 Assessment of likely future environment

Assessing the likely future environment over a long period of 20 years requires a nuanced approach, but it is not untested. The assessment is based on some fundamental assumptions.

Firstly, the Project is intended to be constructed in accordance with adjacent transport triggers such as the adjacent P2B projects and Pukekohe Arterial Network (SGA), which are all dependent on urban



growth in the Southern Growth Area. Therefore, it is reasonable to anticipate that urbanisation will occur within the area before the construction and operation of the Project NoRs take place.

In the Stage 2 Project Area, there are various existing and future urban zoning patterns that will affect the environment for assessment purposes. Areas with existing urban or rural zoning that is not intended for future urban growth are unlikely to undergo significant changes in the future. However, Project NoR areas that are currently rural or urban zoned but have been recently up-zoned for urban development or have a Future Urban Zone (FUZ) are expected to experience significant changes due to the urbanisation proposed by the planning provisions.

The FUZ area is expected to undergo urbanisation in accordance with the Drury-Opāheke Structure Plan and Auckland Council's Future Development Strategy (FDS). Based on strategic documents, a small area of FUZ, which is located to the east of SH1 and north-east (NoR 5) and falls under the Stage 2 Project Area, is expected to be urbanised around 2040+ (i.e. in 15-20 years). The Drury-Opāheke Structure Plan provides developers and the Requiring Authority with tangible suggestions regarding the potential for zoning of this land. This land is predominantly expected to be zoned for commercial light industry alongside the SH1 corridor.

The remaining areas of live-zone green-field development are located east of SH1 NoR 5 and at Bombay Interchange. The land situated east of SH1 is predominantly owned by one developer, Drury South Ltd. They are considered to be a key stakeholder in the Stage 2 Project. Consultation with Drury South Ltd has taken place since the Detailed Business Case (2020) stage of the Project to determine the location of the Proposed Drury South Interchange. This was done to ensure its integration with the existing and planned infrastructure at Drury South (see Appendix B for Drury South Precinct plans). The likely future environment in this area has been designed to integrate with the proposed design. The project team, notably the LVA, has been assessed based on Drury South Ltd's Stage Three subdivision scheme plans for the area.

The land at Bombay Interchange is limited and inaccessible to the wider urban area. It is considered to be an insignificant urban environment now or in the future. It is worth noting that the project area is not subject to Plan Change 78, which is a planning intensification instrument that will upzone all urban land in proximity to existing and planned urban centres and rapid transit stations. Therefore, it is not relevant to the assessment of the likely future urban environment.

3.3 Viability of rural site and land use may change

The Project team recognises that the Project has the potential to bring about changes in land use in the vicinity of the Project Area. The concept design has been evaluated under the assumption that if the current land use is not intended to be changed through plan changes of relevant structure plans, then the existing land use will be relevant in the future. This is particularly important for the number of rural sites that adjoin the SH1 corridor.

The Project is not expected to have any impact on property access, and where any effects exist, adequate mitigation will be provided. The Project relates to an existing motorway corridor that, by its nature, has limited access points to avoid conflicts and congestion. If the proposed works to provide improvements to SH1 encroach within private property access, all Project NoRs have a condition to maintain private property access during construction and operation by providing alternative access routes. Therefore, the project will be unable to influence the productivity of rural sites by affecting existing access.

In terms of the size and shape of property parcels, the applicant reasonably anticipates that conflicts between land acquisition and viability of that land will be resolved through the Public Works Act via hardship. This does not necessarily mean that rural viability will require a rezoning of a large scale of rural land for urban purposes.



3.4 Other relevant matters/ Urban Design Objectives

The urban design assessment of Stage 2 of the Papakura to Bombay Project (the Project) in terms of its consistency with urban design principles, as set out by the following policies and guidelines.

- Papakura ki Pukekura Urban Design and Landscape Framework (ULDF)
- This is informed by:
 - Auckland Unitary Plan (AUP),
 - Drury - Oopaheke Structure Plan
 - Drury South Industrial Precinct and
 - The Strategic South Network prepared as part of the Supporting Growth Program.

3.4.1 Papakura ki Pukekura ULDF (June 2022)

The following urban design and landscape objectives have been determined for the Papakura ki Pukekura Project. This assessment considers the risk of the Project affecting these objectives.

- **ULD-1** Provide for cultural and historical expression throughout the project.
- **ULD-2** Enhance the existing landscape within the project corridor addressing both environmental and social aspects.
- **ULD-3** Create and enhance connectivity along and across the corridor to expand and strengthen alternative transport opportunities.
- **ULD-4** Incorporate Crime Prevention Through Environmental Design (CPTED) principles and objectives along the corridor and address related safety and crime prevention.
- **ULD-5** Meet or exceed water quality standards.
- **ULD-6** Celebrate and enhance important landscape features such as stream corridors, marine areas, open spaces and recreation sites.
- **ULD-7** Consider whole of life costs and minimise potential future maintenance costs (including traffic management and safety requirements).

This UDA encompasses various aspects, such as creating a connected community, integrating with transportation, respecting the natural environment, ensuring public space provision, and enhancing the overall quality of the environment and amenities.

3.5 Baseline urban context

The urban design aspects covered in Table 3-1 are considered relevant to the Project, with 'Visual Amenity' covered in the LVA. These aspects are considered in regards to the future highway corridor and the surrounding area.

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Table 3-1: Baseline urban context for each NoR

Key UD elements	NoR 1	NoR 2	NoR 3	NoR 4	NoR 5
Natural environment	<ul style="list-style-type: none"> Hingaia Stream traverses to the east and wetlands further to the northwest. Hingaia Stream riparian planting. 	<ul style="list-style-type: none"> High producing pastureland with flat to slightly rolling landforms. Wind rows to paddocks Small areas of remnant vegetation and presence of SEA-T. Views of Drury Hills to the east and adjacent rural land use. Increased native vegetation to embankments north of Ramarama from GSR. 	<ul style="list-style-type: none"> Rolling land on the foothills of the Bombay Hills covered with short-rotation cropland and rich red soils. Volcanic Tuff Ring at foothill of Bombay Hills. 	<ul style="list-style-type: none"> Route parallel to SH1 comprising four-lanes, road barriers and over passes at east-west highway crossings No existing water body crossings. 	<ul style="list-style-type: none"> Stormwater management and open space along Hingaia, Harrison/Roslyn Streams Ephemeral native vegetation along streams (undergoing rehabilitation) Views of Drury Hills to the east.
Connectivity	<ul style="list-style-type: none"> Dominated by the motorway and Great South Road. Upgrades to pedestrian and cycle circulation along Great North Rd, undertaken with Stage 1. Drury Interchange (in construction) is a main interchange and wayfinding marker for motorists. 	<ul style="list-style-type: none"> Active circulation concentrated around Ramarama school, and Hunua View suburb. East-west connector at Ararimu Road. North-south connecting roads: Great South and Hillview Roads. Te Araroa Trail on-road path along Hillview Road. 	<ul style="list-style-type: none"> Roadside service centre at Mill Rd including fast food and fuel. Key access roads from Bombay along GSR and Bombay Road. No pedestrian paths. 	<ul style="list-style-type: none"> No existing SUP. Key urban markers at road crossings (Quarry Rd, Maketu, Great South and Mill Roads). 	<ul style="list-style-type: none"> Quarry, Maketu and Fitzgerald Roads are key connecting roads for Drury South precinct. Planned key pedestrian and cycle routes to Maketu Road.



Land use activities

- A highly modified urban environment dominated by road and rail infrastructure.
- FUZ/light industrial land use with an increase in built form.
- Open spaced planned along Hingaia Stream to the east.

- East of SH1: Light industrial, Mixed housing suburban and rural production (south of Ararimu Rd).
- West of SH1: FUZ/light industrial, Mixed Rural and Countryside Living (east of GSR).
- Motorists using GSR or connecting into SH1.
- Landscape has an open rural character with patchwork of built form, grazing or crops.

- Rural production and Mixed rural.
- St Stephen School and reserve at Bishop Selwyn Memorial Cairn, of regional historic significance.
- Access via GSR.
- Landscape has an open rural character in rolling hills, with patchwork of ownership.

- Mixed rural and Special Purpose at St Stephens School.

- South Drury Industrial Precinct which has planned an extensive stormwater collection and wetland treatment recreation reserve.
- Light industrial and mixed business use within Drury South precinct.
- Mixed housing suburban to the southeast of interchange including Hunua Views subdivision.



Built form

- | | | | | |
|--|---|--|---|---|
| <ul style="list-style-type: none"> ■ 4-lane highway with central road barrier, grassed medians and light poles to either side. ■ Sheds and equipment depots adjacent corridor. | <ul style="list-style-type: none"> ■ 4-lane highway with central road barrier in grassed central median, grassed medians and light poles to either side. ■ Wire-rope central barriers south of Ramarama. ■ Transmission towers parallel to corridor. ■ Current overpasses (Quarry Rd, Ramarama) lack any design or them relating to the site's context or heritage. ■ Rural land use including some stock and farm fencing and hedge rows. | <ul style="list-style-type: none"> ■ 4-lane highway with central embankment separating north and south-bound, with road barriers to inside and outside lanes and light poles to either side ■ Current overpasses (Great South Rd) lack any design or them relating to the site's context or heritage. ■ Limited retaining walls (mainly to bridge abutments) vary from stone to precast concrete. ■ Rural land use and post and wire fencing and occasional sheds. | <ul style="list-style-type: none"> ■ Timber post and wire farm fencing | <ul style="list-style-type: none"> ■ Industrial estate streets 2 to 4 lanes with central median. ■ Lots sizes vary from approximately 0.5ha to 6.0ha (refer precinct plans Figure B-1 to Figure B-3). ■ Some lots backing onto waterway/stormwater reserve. ■ Large format shed/warehousing and offices. ■ Hunua Views subdivision comprises medium density one and two storey houses on lots <0.6ha. |
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Addendum

4. Alternatives

Project design options are presented in 'Assessment of Alternative Report' (16/02/2024). A Multi Criteria Assessment (MCA) framework was used to evaluate and compare the design options, including consideration of the following which are relevant to urban design matters.

- Integration with planned land use
 - To what extent will the option impact on the future development of land (adjacent to it and impacted by it), in relation to:
 - integration with the future land use scenario (including any Structure Plans or Plan Changes)
 - access to and use of land impacted.
- Urban design
 - To what extent does the option support a quality urban environment (both current and future planned state) particularly relating to:
 - scale of long-term impact on the amenity and character of the surrounding environment.

The Project objectives and factors are summarised below for each area where options were explored. These are a summary only of those matters relevant to the urban design for the selected option.

4.1 Drury South Interchange

Drury South Interchange is required to achieve the complete benefits of the adjacent NZTA and Auckland Transport projects identified in the Strategic Transport Network and was positioned to align with the proposed Pukekohe Arterial Network intersection with Great South Road (to the west). A key risk associated with any of the interchange options considered is their impact on the flood plain and flood storage, with particular regard to the Transpower site at Drury South. Two design options were assessed to address positioning and land acquisition in proximity to Transpower land and substation. Option 2020-1 was preferred consisting of a conventional interchange form, slightly less land acquisition, reduced flood impacts and positioning which allows substation expansion and reducing undevelopable land between the interchange and substation.

4.2 Drury South Interchange Connections (NoR 5)

The western connection aligns with the Pukekohe Arterial Network at Great South Road. Three design options were assessed for the eastern connection at Drury South Interchange. The assessment factors included:

- Three streams passing under the proposed connections (Hingaia, Rosslyn and Harrison Streams);
- Potential natural inland wetland areas;
- Transpower infrastructure (i.e. sub-station and over-head lines), and;
- The alignment traversing a flood plain and therefore impacting flood levels upstream.

The preferred design (option B) consisted of a long bridge over stream and flood areas, short embankments, and a revised intersection location with Maketu Road. Option B provided reduced risk around flood impacts, assumed avoidance of piers within stream beds and retention of opportunities for ecological enhancement of streams.



4.3 Ramarama/Ararimu Road over-bridge replacement

An upgrade to the existing interchange is to provide links into the future adjacent residential areas. The upgrades include modifications to the on and off-ramps to SH1 in both the north and south directions and upgrade to the over bridge for consistency with P2B project objectives, allowing for improved SUP connections.

The preferred design (option 3), moves the interchange alignment further to the north, avoiding acquisition of a residential property and Ramarama Hall, and upgraded design to achieve a modern over-bridge with separated active mode connections.

4.4 St Stephens School (Notable trees)

The St Stephen's School site (driveway) contains a group of Notable Long Plane trees, impacted by the construction of the elevated SUP over Great South Road.

The two design options explored use of a batter slope to support the proposed SUP, resulting in removal of vegetation, including a group of notable trees; or construction of a nine-metre-high retaining wall to support the SUP, resulting in reduced tree removal.

The batter slope was the preferred option, providing better integration with the surrounding natural environment, amenity planting to be incorporated into the batter slope and providing the opportunity to provide mitigation planting in place of the removed London Plane trees, with Manu whenua indicating a preference for native trees.

5. Urban design assessment

This urban design assessment considers how the current design and alignment responds to the future environment. The detailed design of the project will be determined at a later date. The management of this design will follow the requirement of a UDLMP on each of the Project NoRs, which must be prepared in accordance with the recommendations of the corridor wider ULDF. The main potential urban design issues of the Project are captured in the below three points (refer to 2 Methodology), in which the impacts on these are discussed in the following section.

- Urban Form and land use effects;
- Connectivity; and
- Meeting the ULDF objectives.

5.1 Urban design matters: Stage NoR 1-3

This section assesses the specific urban design matters relating to NoR 1-3 – Alterations to the existing SH1 Designations 6706, 6700, and 6701.

Table 5-1: Overview of alteration to NoR 1-3

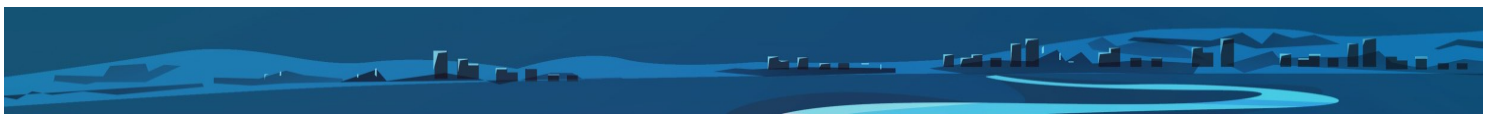
Key features	
Overview	<ul style="list-style-type: none"> ■ Increase to six general traffic lanes (4.3m shoulders) on SH1. ■ Safety improvements include upgrading interchanges, wider shoulders, new barriers, and improved lighting along the full extent of the Project. ■ Swales and wetland treatment (100% treatment of impervious surfaces and full-scale wetland)
Structures	<ul style="list-style-type: none"> ■ Drury South Interchange (NoR 2) – new over-pass with roundabouts ■ Ramarama Interchange (NoR 2) – modified Stevenson’s roundabout with ramp signals and off-line bridge ■ SH1 Great South Road Bridge (NoR 3) - bridge widening ■ Upgrades to the existing Mill Road/Bombay Interchange (NoR 3) ■ Mill Road over-bridge and abutments (NoR 3)

5.1.1 Urban design magnitude of change

The magnitude of urban design changes proposed by the design is discussed below under the key urban design effects.

Urban form and land use effects

- Corridor widening to accommodate additional lanes and wide median are accommodated within the existing designation, with stormwater, landscaping and some retaining structures are within the new NoR boundary.
 - Changes including upgrades to barriers and lighting are elements within the corridor, including those further to the north, provide a regular pattern of road corridor elements which are already present.
 - Extent of works/modification to medians and batter slopes
 - NoR 1: intervening wide medians remain between the corridor and adjacent light industrial land uses, with negligible magnitude of change.
 - NoR 2 and 3: steepening of embankments to allow for widening or stormwater elements will involve temporary removal of existing vegetation, to be replanted in line with whole of corridor planting strategy. Earthworks for embankments are likely to have a very low magnitude of change to adjacent rural and mixed-residential land, being commensurate with existing undulating topography and existing embankments within the corridor.
- Structures
 - New retaining walls including:
 - NoR 1: Beneath Quarry Rd bridge, a retaining wall will replace a concrete sloped embankment, noticeable mostly to SUP users and briefly bypassing motorists.



- NoR 2: North-bound on and off ramps, and south-bound on ramp at Ramarama interchange are new retaining walls to the base of sloped and vegetated embankments. These present a very low magnitude of change within a highly-built interchange.
 - New Drury South Interchange overpass (NoR 2): interchange including new on-off ramps and overpass is commensurate with other interchanges along motorway, however, introduces built infrastructure to adjacent land parcels, including mixed rural land to the west and light industry to the east.
 - Ramarama Interchange (NoR 2): the modification introduces a roundabout the west side of the corridor, mirroring the existing to the east, and shifts the overpass slightly south to avoid impacts to private property and incorporate the SUP overpass. The alignment takes some mixed rural land to the northwest of the interchange, however, provides landscaping space surrounding the SUP which is an intervening element to the existing residential property and community hall.
 - GSR bridge widening (NoR 3): widening of the overpass will occur to the centre and will be a negligible change in urban form from existing overpass.
 - Mill Road/Pukekohe Interchange (NoR 3): the road widening along Mill Road and introduction of the SUP (assessed under NoR 4 along with SUP overpass), has minimum impact for the commercial area and mixed rural area to the northwest within the designation boundary.
- Stormwater management elements
 - Wetlands located southwest and northwest of Ramarama interchange, adjacent St Stephens School driveway and southwest of Mill Road/Pukekohe interchange; are located in rural land close to road infrastructure. The wetlands and surrounding planting, enhance natural characteristics of the areas (NoR 2 & 3).
 - Vegetated swales parallel to the corridor provide a landscaped buffer between the motorway and adjacent land including mixed rural, rural production, FUZ and mixed residential. Stormwater management does not conflict with this adjacent land use.

Connectivity effects

- Introduction of east-west active mode and vehicular connectivity at Drury South Interchange, connection to Drury South Connector (NoR 5) provides a high (positive) magnitude of change to connectivity, enabling users to access between industrial, residential and open spaces.

ULDF objectives

- Stormwater management elements including drainage swales to both sides of corridor and wetlands, aids in meeting ULDF objective (ULD-5) to meet or exceed water quality standards.
- Alternative transport options are expanded (ULD-3) through introduction of Drury South Interchange and upgrades to Ramarama interchange.

5.1.2 Mitigation recommendations

The following mitigation measures are recommended to reduce adverse effects and/or enhance positive effects.

- Opportunity for bridge facades to incorporate cultural expression and connection to context to provide positive effects to the corridor's urban environment and meet objective ULD-1.

- Detailed design of finished slopes/embankments at grade (more than 1V:2.5H), to support planting and maintenance viability to motorway verges and embankments.
 - The implementation of vegetated embankment will reduce the risk of adverse effects through implementation of built form or hard edges within the corridor, by allowing for a vegetation buffer to act as a visual screen between the motorway and adjacent land uses.

5.1.3 Urban design effects

Table 5-2 below is the assessment of urban design effects based on the magnitude of change to key design elements and incorporating recommended mitigation measures.

Table 5-2: NoR 1-3 Assessment of urban design effects

Type of urban design effect	Magnitude	Mitigation	Effect
Urban form and land use effects	<ul style="list-style-type: none"> ■ Corridor widening and upgrade of lighting and barriers has a negligible magnitude of change for NoR 1-3. ■ New and upgrades to structures (retaining walls and overpasses) <ul style="list-style-type: none"> – NoR 1 & 3 is Negligible – NoR 2 is Low (adverse) due to increase in built structures ■ Stormwater management elements enhance natural characteristics and provide a buffer to adjacent land uses for NoR 1-3. 	<ul style="list-style-type: none"> ■ No mitigation ■ The design of the overpass could introduce a positive urban element that celebrates its cultural and environmental context. ■ No mitigation 	<ul style="list-style-type: none"> ■ Negligible ■ Low (positive) ■ Low (positive)
Connectivity effects	<ul style="list-style-type: none"> ■ Medium magnitude for NoR 2 - new east-west overpass at Drury South Interchange and improved connection at Ramarama Interchange 	<ul style="list-style-type: none"> ■ No mitigation 	<ul style="list-style-type: none"> ■ Medium (positive)
ULDF objectives	<ul style="list-style-type: none"> ■ The corridor upgrades and new interchange meets ULDF 3 & 5 objectives with a low-moderate magnitude of change. 	<ul style="list-style-type: none"> ■ No mitigation 	<ul style="list-style-type: none"> ■ Low-moderate (positive)

5.2 Urban design matters: NoR 4

This section assesses the specific urban design matters relation to NoR 4 – construction of a new Shared User Path (SUP) from Quarry Road to Bombay Interchange.

Table 5-3: Overview of alteration to NoR 4

Key Features	
Overview	<ul style="list-style-type: none"> ■ Requires a new designation between 200m north of Quarry Road to 600m south of the existing Mill Road/Bombay Interchange s, with some locations overlapping the existing SH1 Designations 6706, 6700 and 6701; ■ 3.0m wide SUP continuing from 200m north Quarry Road to 600m south of the existing Bombay/Mill Road Interchange; and ■ Located on the western side of the motorway.
Structures	<ul style="list-style-type: none"> ■ Tie-ins to all new and upgraded motorway interchange (i.e. Drury South, Ramarama and Bombay); and ■ New bridge at Great South Road. ■ Retaining walls: ■ Retaining walls to underpasses at Drury South and Ramarama interchange roundabouts
Access	<ul style="list-style-type: none"> ■ Connection from north to the Stage 1B1 SUP at Quarry Road. Access provided at Drury South Interchange, Ramarama Interchange and Bombay Interchange.

5.2.1 Urban design magnitude of change

The magnitude of urban design changes proposed by the design is discussed below under the key urban design effects.

Urban form and land use effects

- The SUP introduces a 3.0m wide path to the west side of SH1. It runs parallel, traversing beneath Quarry Rd overpass and offset from the motorway by stormwater swales and interchange ramps. This alignment associates the SUP with SH1 and offers an alternative transport route. Land uses that the SUP impacts include FUZ (NoR 1 & 2), and mixed rural (NoR 2 & 3) where land use is already influenced by SH1 and connecting arterial roads, having a low adverse magnitude of change through land-take (up to approximately 40m width) in mixed rural land (NoR 2&3), which will minimally reduce rural grazing capacity from adjacent fields.
- Surveillance and lighting within underpasses or overpasses at Quarry Road, Drury South interchange, Ramarama interchange, GSR elevated SUP. Lighting and surveillance will be designed with CPTED principles to reduce security risks and increase safety.
- Potential CPTED issue on the perceptions of safety within the SUP where there are long distances to entry exit points and no alternative exits. The distances are likely to inhibit use by some pedestrians and less so for cyclists. Surveillance is limited from motorist on SH1 due to travel speeds, though is improved at east-west connectors.
 - distances between connection points approximately 1,400m between Quarry Rd and Drury South interchange, 1,800m onto Ramarama interchange, 3,900m onto GSR and then 1,900m onto Mill Road consecutively.

- Balustrades and fencing will be provided along both sides of the SUP and designed with CPTED principles to reduce security risks and increase safety. The scale of the fencing is commensurate with existing rural fencing.
- Underpasses and retaining walls are located at Drury South and Ramarama Interchange roundabouts for provide safe and continuous travel on the SUP at the roundabouts. As the interchange roundabouts are areas with large road infrastructure, the SUP structures do not contrast the existing surrounding built environment.
- A SUP bridge is introduced over GSR, parallel to SH1 and adjacent a private dwelling and St Stephens School driveway. The scale of the bridge is commensurate with the existing SH1 bridge at this location, however due to vegetation removal for the structure, the bridge will be more visible (to residents, motorists on GSR and St Stephen School).

Connectivity effects

- The SUP ties into GSR and Quarry Road within NoR 1, provided an improved east-west connection over Quarry Road and proposed development within Drury town centre and Drury South to the east.
- The introduction of the SUP and connections at Drury South interchange, provide improved active connectivity from GSR (tie into Pukekohe Arterial Network) to the west and Drury South open space to the east.
- SUP underpasses at Ramarama interchange including underpasses at bridge and intersections provides a new active mode connect to the west and improves the safe use at the existing roundabout at the east through limited at-level road crossings. The new connection and upgrade provides a moderate-high (positive) magnitude of change to connectivity.
- The addition of the SUP to both sides of Mill Road provides active mode east-west connectivity and improved safety for users over SH1 and between the roadside service commercial centre.

ULDF objectives

- The introduction of the SUP meets ULD-3 'Create and enhance connectivity along and across the corridor to expand and strengthen alternative transport opportunities.
- CPTED principles (ULD-4) are to be incorporated at the detailed design phase.

5.2.2 Mitigation recommendations

The following mitigation measures are recommended to reduce adverse effects and/or enhance positive effects. These measures are incorporated in the ULDF, highlighting below the specific urban design issues identified.

- Detailed design to undertake a wayfinding and signage strategy, with distance markers provided at SUP connection points.
- There is opportunity for the interchange SUP retaining walls and underpasses to incorporate architecture and aesthetic design elements to provide cultural and historical expressions (ULD-1), to create unique points of reference within the SUP and be designed for pedestrian scale.
- Detailed design of the GSR SUP bridge underpasses to incorporate architecture and aesthetic design elements to provide cultural and historical expressions (ULD-1) to safety screens and efficient 'tidy' use and placement of supporting structures.



5.2.3 NoR 4 Urban design effects

Table 5-4 below is the assessment of urban design effects based on the magnitude of change to key design elements and incorporating recommended mitigation measures.

Table 5-4: NoR 4 Assessment of urban design effects

Type of urban design effect	Magnitude	Mitigation	Effect
Urban form and land use effects	<ul style="list-style-type: none"> ■ Low (adverse) magnitude for potential CPTED issues including alternative exits due to distances, design for surveillance and lighting ■ Low (adverse) magnitude of change through land-take in mixed rural land which will reduce rural grazing capacity. ■ Low (adverse) magnitude applied to SUP retaining walls and underpasses contributing to urban form. ■ Moderate (adverse) magnitude for SUP bridge structure at GSR adjacent private dwelling and private school 	<ul style="list-style-type: none"> ■ Incorporate CPTED principles and wayfinding signage strategy in detailed design. ■ No mitigation ■ Provide unique design of facades to celebrate place. ■ Architectural aesthetic design of SUP bridge to provide positive element and mitigate contrast of built form; and provide vegetation screening to soften appearance of infrastructure from adjacent house. 	<ul style="list-style-type: none"> ■ Negligible ■ Low (adverse) ■ Low (positive) ■ Low (adverse)
Connectivity effects	<ul style="list-style-type: none"> ■ Moderate-high (positive) magnitude through introduction of SUP providing active mode transport opportunity 	<ul style="list-style-type: none"> ■ No mitigation 	<ul style="list-style-type: none"> ■ Moderate-high (positive)
ULDF objectives	<ul style="list-style-type: none"> ■ The introduction of the SUP meet ULD-3 'Create and enhance connectivity along and across the corridor to expand and strengthen alternative transport opportunities'. 	<ul style="list-style-type: none"> ■ CPTED principles are to be incorporated at detailed design to work out wayfinding and safety issues, with opportunity for the SUP to incorporate architecture and aesthetic design elements to provide cultural and historical expressions at different built structures along its journey. 	<ul style="list-style-type: none"> ■ High (positive)

5.3 Urban design matters: NoR 5

This section assesses the specific urban design matters relation to NoR 5 – the construction of new link roads either side of Drury South Interchange and high-quality walking and cycling facilities

Table 5-5: Overview of alteration to NoR 5

Key Features	
Overview	<ul style="list-style-type: none"> ■ New link roads to the adjacent network (Maketu Road and Great South Road) to tie-into the proposed Drury South Interchange; and ■ Four traffic lanes, cycle lanes and footpaths on either side. ■ Swales and wetland treatment train (100% treatment of impervious surfaces and full-scale wetland).
Structures	<ul style="list-style-type: none"> ■ Raised viaduct across the Hingaia reserve area.
Access	<ul style="list-style-type: none"> ■ New signalised intersection at Maketu Road; and ■ New round-about intersection tie-in to Great South Road.

5.3.1 Urban design magnitude of change

The magnitude of urban design changes proposed by the design is discussed below under the key urban design effects.

Urban form and land use effects

- The viaduct over the Hingaia Stream connects the Drury South Interchange to Quarry Road in the east. The introduction of the viaduct is located over a future open space reserve and existing floodplain; which presents a moderate-high magnitude of change to the natural character, however is of low magnitude to the adjacent light industry residential land zones. Adverse effects are mitigated through the following measures:
 - Ties into new intersection at realigned Quarry Road (see Figure B-3) adjacent land zoned light industry within Drury South Crossing. The alignment both fits into the development plans and minimises the crossing points over the Hingaia Stream.
 - Retains proposed restoration of riparian corridor and avoids impacts to SEA-T
 - Retains access to proposed open space along Hingaia stream/floodplain and access beneath bridge, from within open space and from residential suburb (Hunua Views).
 - Small embankments to either end of the viaduct minimises upstream or downstream flood effects.
- A gateway is created to Drury South precinct through the viaduct retaining open space beneath which celebrates the waterway. Additionally, the views to the Drury Hills are experienced for users travelling east, which is a significant place and important wayfinding marker.
- New Drury South Interchange including new roundabouts and connecting roads is commensurate will other interchanges along motorway, however, introduces urban form to adjacent land parcels.
 - To the west this is a new arterial corridor connecting to GSR and the Pukekohe Arterial Network (South Drury Connection), adjacent mixed rural land and a private resident. However, the alignment is set by the location of the South Drury Connection and although within a mixed rural zone, is close to FUZ.

- To the east the interchange is located adjacent a substation and land zoned light industrial to the northeast and mixed residential to the southeast. The intersection alignment is located closest to the substation, minimising unusable space between road infrastructure and maximising intervening space to mixed residential area.

- A stormwater wetland located northeast of Drury South interchange is in land zoned light industrial, close to road infrastructure, a transmission tower and adjacent the Drury South substation. The wetlands and surrounding planting, enhance natural characteristics of the area, providing a low-moderate modification.

Connectivity effects

- A SUP is proposed on north and south sides of the connecting road and viaduct, which introduces east-west connectivity across SH1. The SUP also ties into the proposed SUP network within Drury South (Maketu Road and Flanagan Road) which has local paths and connects to the residential neighbourhood and Ramarama. This enables broader access of the active network and ensures a connected network where there is new urban development within Drury South. This is considered a moderate positive effect, enabling a more connected neighbourhood.
- The alignment connects to Great South Road/ Pukekohe Arterial Network to the west, where there is one private property, a large dwelling surrounded by rural land, that will be impacted with the connecting road located to the north. Though considered an adverse effect for the private property, the effects are considered low to the existing land use, with impacts to private dwelling minimal and broader connectivity being achieved between Pukekohe Arterial Network, Drury South, SH1 and Great South Roads.

ULDF objectives

- The placement of a viaduct over the floodplain/open space reserve with small embankments to either end, allows continuance of environmental flows and recreational connectivity where open space reserve visitors can traverse along the stream, beneath the bridge. This helps address:
 - environmental and social aspects meet (ULD-2),
 - water quality standards (ULD-5); and
 - celebrate important landscape features such as stream corridors and open spaces (ULD-6).
- Alternative transport options are expanded (ULD-3) through introduction of Drury South Interchange to the Drury South Connector.

5.3.2 Mitigation recommendations

The following mitigation measures are recommended to reduce adverse effects and/or enhance positive effects.

- Opportunity for the detailed design of the bridge to incorporate architecture and aesthetic design elements to provide cultural and historical expressions (ULD-1).

5.3.3 NoR 5 Urban design effects

Table 5-6 below is the assessment of urban design effects based on the magnitude of change to key design elements and incorporating recommended mitigation measures.

Table 5-6: NoR 5 Assessment of urban design effects



Type of urban design effect	Magnitude	Mitigation	Effect
Urban form and land use effects	<ul style="list-style-type: none"> The presence of a bridge over the floodplain and adjacent light industrial and mixed residential is considered a low-moderate (adverse) magnitude. The connecting roads to the east and west of the interchange introduce urban form to adjacent land parcels, near to the boundary of FUZ and Rural land. 	<ul style="list-style-type: none"> Architectural aesthetic design of bridge and facades to celebrate cultural identity and place would provide a positive gateway. No mitigation 	<ul style="list-style-type: none"> Low (positive) Low (adverse)
Connectivity effects	<ul style="list-style-type: none"> The road alignment and SUP ties in proposed roads and SUP networks with a moderate (positive) magnitude of change 	<ul style="list-style-type: none"> No mitigation 	<ul style="list-style-type: none"> Moderate (positive)
ULDF objectives	<ul style="list-style-type: none"> Low (adverse) Whilst the bridge minimises impacts to the stream and open space environment, it is not considered to enhance the environment. The introduction of the connecting roads and SUP meet ULD-3 'Create and enhance connectivity along and across the corridor to expand and strengthen alternative transport opportunities.' 	<ul style="list-style-type: none"> The design of the bridge could introduce a positive urban element that celebrates its cultural and environmental context. 	<ul style="list-style-type: none"> Low (positive) Moderate (positive)

6. Summary of urban design assessment and recommendations

6.1 Urban form and land use effects

6.1.1 NoR 1-3

The Project has less than minor potential effects to urban form and land use within NoR 1-3, as the Project is an expansion of the existing motorway. The widening and upgrade of the corridor will not have a significant impact on the urban form and land use in this area. There is a hard boundary between the motorway and surrounding land use, with dwelling or buildings set back, creating a buffer for safety, noise and visual amenity purposes. Any increase in road structures at certain interchanges will be influenced by the existing motorway and have minimal adverse effects on the surrounding areas. The design of road overpasses is expected to have a residual low positive effect on the urban environment, incorporating cultural and environmental elements.

6.1.2 NoR 4

The Project has potential less than minor effects to urban form and land use within NoR 4, with adverse effects able to be mitigated through the detailed design phase. The Shared Use Path (SUP) will have a low adverse effect on the urban form and land use, mainly due to potential issues with Crime Prevention Through Environmental Design (CPTED), such as alternative exits and limited surveillance. However, incorporating CPTED principles and implementing a wayfinding signage strategy can help mitigate these concerns. The new retaining wall and underpasses will contribute to



the built form at interchange roundabouts. Overall, the SUP can have positive elements that celebrate the local culture and become points of interest.

The Shared Use Path (SUP) overpass at GSR has a minor effect on the surrounding land uses, including a private property and the driveway of St Stephen's, through introduction of a public path adjacent and overlooking private property. Alternative design options have been considered, and the implementation of a vegetated embankment adjacent St Stephen's, helps mitigate the impact of the built form. Additionally, mitigation through architectural design of the SUP screening, as recommended in the LVA, provide opportunity for a positive element, resulting in a residual less than minor urban design effect.

6.1.3 NoR 5

The Project has less than minor potential adverse effects to urban form and land use within NoR 5. The presence of a viaduct over the floodplain/open space, with small embankments to either end, as well as being adjacent to light industrial and mixed residential areas, will have a minor adverse effect. However, this can be sufficiently mitigated. Viaduct piers are likely able to avoid impacts to stream embankments and recreational use, with the open space retained with paths able to traverse beneath the bridge. There is opportunity for the architectural design of the bridge and its facades to celebrate cultural identity and create a gateway, resulting in a residual low positive urban design effect.

6.2 Connectivity effects

6.2.1 NoR 1-3

The connectivity in NoR 2 has a more than minor positive effect, with the introduction of new east-west connectivity at the Drury South Interchange and improved connection at the Ramarama Interchange. The road connectivity in other areas is commensurate with the existing conditions.

6.2.2 NoR 4

The introduction of a Shared Use Path (SUP) provides a more than minor positive effect on connectivity, as it offers an opportunity for active mode transport and increases local and east-west connections.

6.2.3 NoR 5

The road alignment and integration of the SUP contribute to a minor positive effect in connectivity, as they tie in with the proposed roads and SUP networks.

6.3 Risk of Project affecting ULDF policy objectives

6.3.1 NoR 1-3

The corridor upgrades and new interchange generally align with ULDF (Pukekura ki Pukekohe Urban and Landscape Design Framework) objectives, with minor positive effects.

6.3.2 NoR 4

The introduction of the Shared Use Path (SUP) aligns with ULDF-3 objective to create and enhance connectivity along and across the corridor to expand alternative transport opportunities. CPTED (Crime Prevention Through Environmental Design) principles will be incorporated at the detailed design stage to address wayfinding and safety concerns. Additionally, there is an opportunity for the



SUP to incorporate architecture and aesthetic design elements that provide cultural and historical expressions at various built structures along its route.

6.3.3 NoR 5

The risk to ULDF policies is low adverse, as the bridge minimises impacts to the stream and open space environment but does not enhance it. However, the design of the bridge could introduce a positive urban element that celebrates its cultural and environmental context, aligning with ULDF principles.

6.4 Conclusion

The assessment of urban design effects results in less than minor adverse effect to urban form and land use for all NoRs. The Project is an expansion of the existing motorway and as such, land uses are already influenced by the motorway. Where there are localised adverse effects, these are able to be sufficiently mitigated.

There are positive effects to connectivity, with the introduction of the SUP (NoR 4), Drury South Interchange (NoR 5).

The Project incorporates ULDF policy objectives. Potential adverse effects will be mitigated through the use of an Urban Landscape and Design Management Plan (ULDMP) adopted for each of the Project NoRs, which must be prepared in accordance with the objectives of the P2B corridor-wide ULDF.



Addendum

Appendix A

Urban Design objectives

a) AUP(OP) sets out the Regional Policy Statement (ACRPS) include the following strategic policies relevant to this NoR.

■ 2.6.8 Urban Design

- ii) Buildings, public spaces and road corridors contribute to a vibrant, liveable and attractive environment with a sense of place;
- iv) Urban environments have a logical permeable and safe structure of connected routes for all modes of transport, including walking and cycling;
- (v) Public transport, roading, cycling and walking networks are integrated with each other and the land uses they serve;
- (vii) There is long term protection of public open space, and improvement in the quality, quantity and distribution of local open space;
- (ix) Natural features and their relationship with built elements are recognised and protected, and, where appropriate, enhanced;
- (x) A positive contribution is made to the environmental health of urban streams, the harbours, beaches and their catchments, including through improved storm water and wastewater management;

■ 2.6.5 Future Urban Areas

- 19. the rezoning of Future Urban Areas shall enable urban development and/or a subdivision pattern that maximises the efficient use of the land and provides higher density development adjacent to public transport Corridors, subject to consideration of environmental, economic and infrastructural capacity issues.

■ 2.4.2 Urban development in the Region threatens environmental qualities and thresholds.

- Urban expansion can generate reverse sensitivity effects when it occurs in or adjacent to productive rural areas. Any proposal for urban expansion needs to consider effects on productive soils and water and air quality
- The expansion of urban activities onto rural land may, individually or cumulatively over time, reduce the visual distinction between rural and urban areas and the distinction between the types of activities that are characteristic within each of these areas. This lack of a clear visual distinction between rural and urban areas may then generate further pressure for urban expansion and/or urban sprawl.
- The intrusion of urban structures and activities into rural areas may also impact on both rural landscape character and amenity.

■ Other:

- Enabling higher levels of intensification and growth along public transport corridors and near open space
- Ensuring that infrastructure is in place or can be provided to support new development; and

- Promotes the efficient use of land and enables a range of built forms to support choice for a diverse and growing population impacts on sustainable urban form and design, including town centres, and on urban and rural amenity values

Appendix B

Drury South Precinct plans

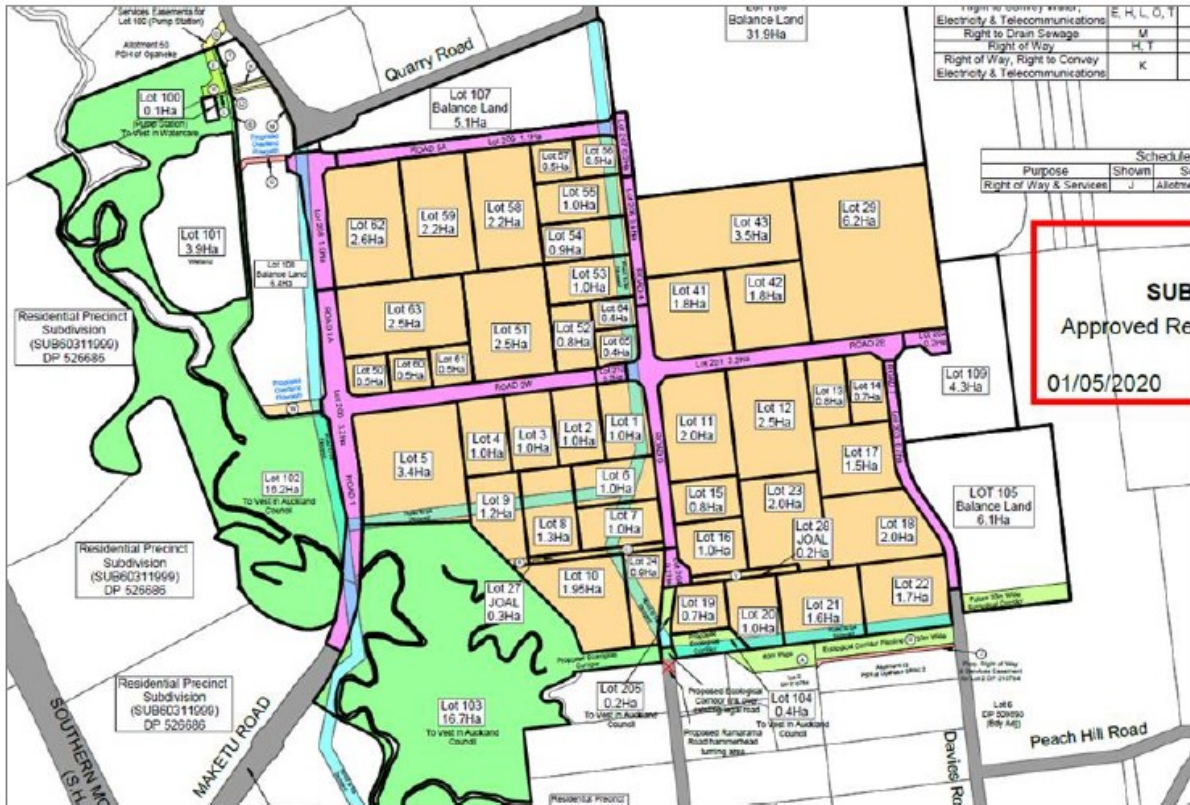


Figure B-1: Drury South Phase 1 subdivision plan (source: Dury South Limited, 2021)

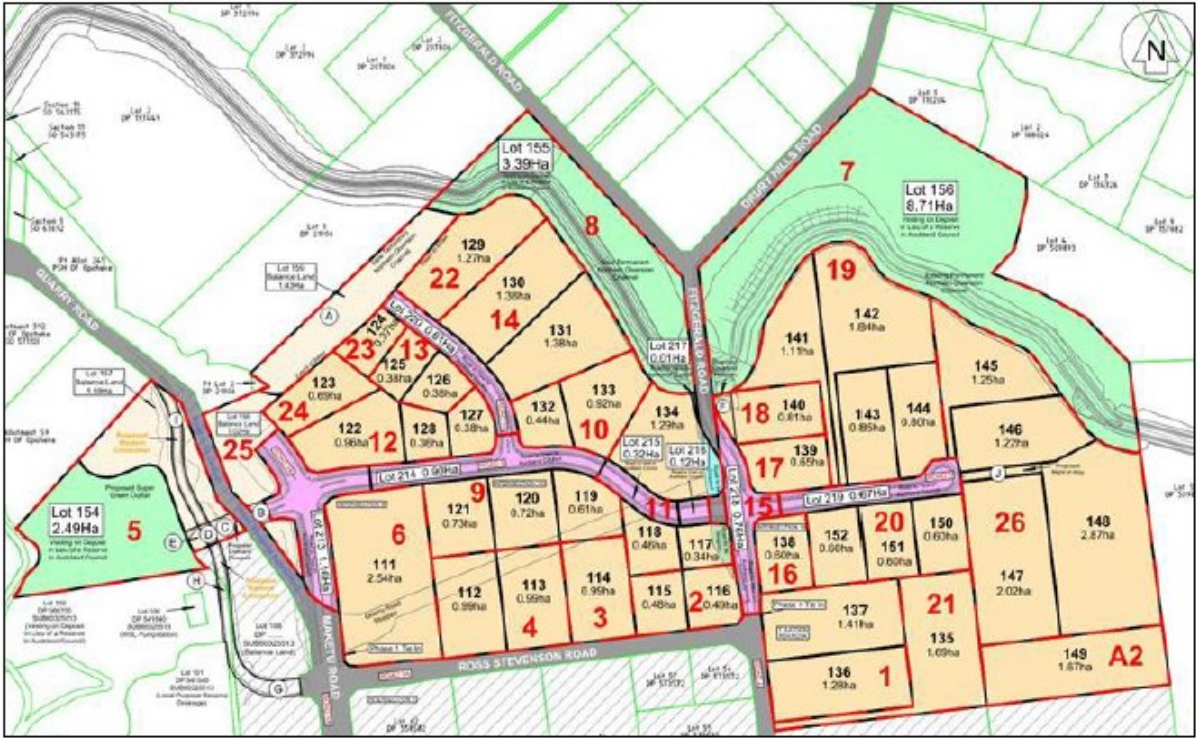


Figure B-2: Drury South Phase 2 subdivision plan (source: Dury South Limited, 2021)

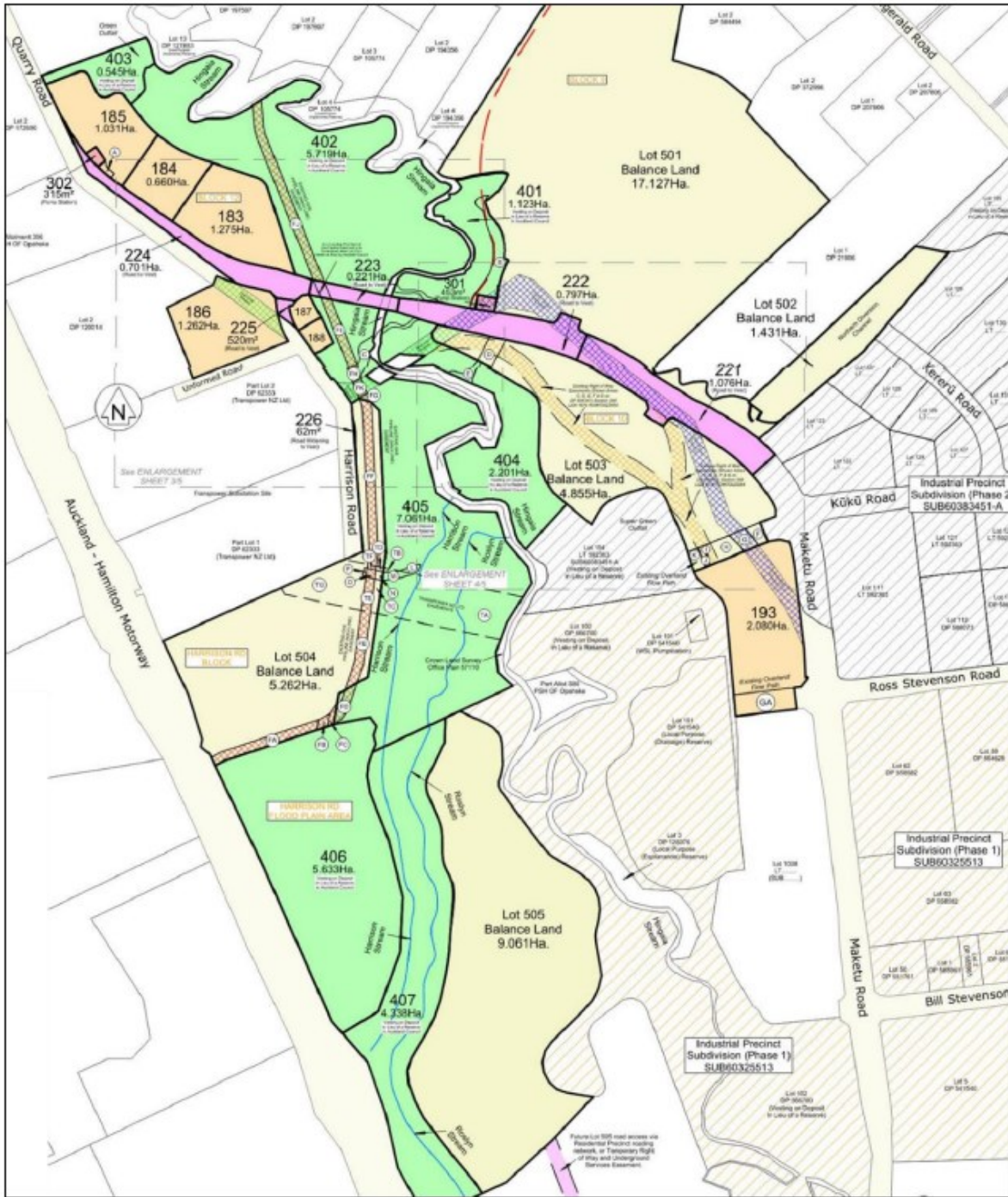


Figure B-3: Drury South Phase 3 subdivision plan (source: draft AEE application Dury South Limited, April 2024)