The Arataki Project Fast Track Consent

Integrated Transport Assessment

July 2025

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STATEMENT OF EXPERIENCE

My full name is Lukas Gerhard van der Westhuizen. I am a Principal Transportation Engineer at Flow Transportation Specialists Limited. I have held this position since May 2023.

I hold a Bachelor of Engineering (Civil) from the University of Pretoria, South Africa (2017). Before joining Flow, I was employed by Stantec New Zealand from August 2019, where I held a Senior Transportation Engineer position and the acting Team Leader role for Transport Advisory (Auckland). I am a member of the Engineering New Zealand Transportation Group.

I have over 10 years of experience as a transportation planner and engineer in public and private sector land development projects, which includes experience with plan changes, integrated transport assessments, development consenting, and Notices of Requirement.

I have been involved with a number of plan changes and resource consent applications. I provided similar assistance for these planning processes, including review, assessment of transport effects and guidance on the relevant transport planning provisions and reporting, and the conceptual design of roading infrastructure associated with these projects. This work has included

- Plan changes including Private Plan Changes 43, 70, 72 in Auckland; Private Plan Change 81 in Dargaville and Private Plan Change 83 in Mangawhai
- Resource consent application reviews for the public sector in Whangarei[1], Auckland[2] and Kaipara[3]
- Resource consent applications for the private sector for various developments[4] in Auckland.

I confirm that, in my capacity as author of parts of this FastTrack Application, I have read and abided by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

[1] 406 Kamo Road (Gull Fuel Station); Sands Road residential subdivision; 54-56a Goerge Street residential subdivision and Kiripaka Road residential subdivision.
[2] Various residential and billboard resource consents.
[3] 28 & 48 Old Waipu Road residential development; Mangawhai Central residential development and 344 SH12 Brynderwyn industrial development.
[4] Multiple residential developments in Waiata Shores (Te Napi Drive), Takanini; Various industrial developments in the Auckland Airport Precinct (Te Kapua Drive and Maurice Wilson Drive); an industrial development in Favona (Savill Drive) and an industrial development in Wiri (Puaki Drive).

SUMMARY OF OUR ASSESSMENT

CDL Land New Zealand Limited (CDL) has engaged Flow Transportation Specialists Ltd (Flow) to assess the transport planning and traffic engineering matters relating to a Fast Track Application located at Arataki Road, Havelock North.

This report is submitted in support of CDL's Substantive Application (Application) to the Environmental Protection Authority (EPA) to authorise the subdivision and development of the Arataki Extension land, located at 86, 108, 122 Arataki Road, Havelock North, Hawkes Bay (Site).

The proposal, which is also referred to as the 'Arataki Project', will provide for the residential subdivision of the site to enable the development of 171 detached dwellings to contribute additional housing capacity to Havelock North and the Hawkes Bay region. As shown in Figure S1, the development will be supported by a local road network, pedestrian accessways, and required infrastructure. A planning design framework is proposed to facilitate residential built form development on the future lots.

Figure S1: Proposed Arataki Project

The Integrated Transport Assessment prepared to support the substantive application under the Fast Track Approvals Act (FTAA) provides a full site description. With respect to matters relating to transport the following comments are made about the site.

Zoning and development

- The Arataki Project development of Plains Production Zone land is to enable the development of a residential landscape comprising about 171 lots.

Transport strategy alignment

- Aligning with relevant transport strategies, the Arataki Project prioritises the upgrade of Arataki Road and Brookvale Road to an urbanised form along its frontage. This will cultivate a safer and connected transportation system. This approach incorporates gateway treatment and traffic calming features that facilitate a safer environment for all users, and safe access to land use development. The Arataki Project also demonstrates a commitment to introducing new active mode facilities, an extended and connected active mode network catering to pedestrians and cyclists, along with improvements to public transport infrastructure to encourage mode shift and reduce emissions.

Public transport and active mode access

- Providing opportunities for Council to upgrade the existing public transport network in Havelock North, the Arataki Project emphasises inclusivity and accessibility for both existing and future residents. Furthermore, the Arataki Project incorporates off-road active mode connections. Thereby facilitating a comprehensive active mode network that caters to pedestrians and cyclists of all ages.

Developer collaboration and Vision Zero safety principles

- The Arataki Project provides an opportunity for collaborative efforts between the Hastings District Council and developers. Aligning with Vision Zero principles, the Arataki Project proposes low speed access roads, gateway treatment and urbanisation of existing arterial roads, creating safer urban environments for all users.

Traffic impact assessment

- The transport assessment has been informed by existing traffic volumes and intersection SIDRA traffic models. The assessment has accounted for different scenarios, including the traffic generated by the implementation of the Brookvale Plan Change and Metlifecare Resource Consent and a 2% growth per annum for 5 years (2030). The assessment of key intersections demonstrates that the surrounding network can acceptably accommodate the traffic generated by the Arataki Project.

We consider that the Site has good transport accessibility and that the Proposal will have negligible effects on the surrounding transport environment.

- The proposed new road intersections will operate well, and the three new crossroads intersections will not have any adverse safety or operational effects
- Internally, there is appropriate traffic calming and the new road cross sections encourage a low speed, local road environment
- The design promotes a low-speed, pedestrian and cycle-friendly environment with strategic use of changes in materiality at intersections, kerb buildouts and staggered on-street parking to calm traffic. Pedestrian and cycle connectivity is well integrated, footpaths, and road crossings throughout the site and strong connections to the shared path network beyond Arataki Road
- The proposed car parking and vehicle access design is compliant with District Plan requirements and is anticipated to operate well

- The proposed application aligns with local and national policies
- The additional peak hour traffic volumes generated by the Proposal are low and can be accommodated on the surrounding road network which is currently operating well below capacity
- The transport design aspects of the proposed Arataki Project will function safely and efficiently and any infringements with the transport design requirements of the Operative Hastings District Plan (District Plan) will be very minor in nature
- There are no existing road safety concerns on the roads surrounding the Proposal, and we anticipate that the Proposal will not create any new road safety issues.
- The Residential Design Framework includes the proposed transportation / design standards for future buildings on the site. ensures appropriate transport design outcomes.

Additionally, we note that the construction traffic likely to be generated can be adequately managed by a Construction Traffic Management Plan. This will include the implementation of mitigation measures to minimise the effects of heavy vehicles on existing residents and road users in the area.

In conclusion, this Integrated Transport Assessment finds no transportation planning or traffic engineering reasons that would impede the implementation of the proposed Arataki Project.

CONTENTS

APPENDICES

1 WHAT THIS REPORT INCLUDES

CDL Land New Zealand Limited (CDL) has engaged Flow Transportation Specialists Ltd (Flow) to assess the transport planning and traffic engineering matters relating to CDL's Substantive Application (Application) to the Environmental Protection Authority (EPA) to authorise the subdivision and development of the Arataki Extension land, located at 86, 108, 122 Arataki Road, Havelock North, Hawkes Bay (Site).

The proposal, known as the Arataki Project, will provide for the residential subdivision of the site to enable the development of 171 detached dwellings to contribute additional housing capacity to Havelock North and the Hawkes Bay region. The development will be supported by a local road network, pedestrian accessways, and required infrastructure. A planning design framework is proposed to facilitate residential built form development on the future lots.

This Integrated Transport Assessment (ITA) supports the fast track application for the Arataki Project and provides the following information.

- A description of the Arataki Project, focusing on the transport matters
- An assessment of the Arataki Project against the relevant transport planning documents, including the Operative Hastings District Plan (District Plan), the Heretaunga Plains Urban Development Strategy (HPUDS), and the Draft Future Development Strategy (FDS)
- The provision of background information to provide context to the transport assessment of the Arataki Project. This information includes
  - the Site location and immediate surrounding transport network, including traffic volumes
  - a description and assessment of the historic crash record of the immediate transport network
  - a description of the private vehicle, public transport, walking and cycling accessibility of the Site
- An assessment of the Arataki Project and potential transport effects with regard to
  - the vehicular and pedestrian access provisions
  - traffic generation and impacts on the surrounding transport network
  - safety impacts and upgrades
  - the location, design and adequacy of the on-site parking and servicing facilities proposed to support the Arataki Project
  - active mode and public transport provisions
  - the transportation rules contained in the District Plan for the adopted zoning
- Outcomes in relation to the implementation of upgrades, including responsibility for delivering the upgrades.
- Proposed Residential Design Framework which will guide the future residential design and site layout for the proposed lots.

2 WHAT DOES THE ARATAKI PROJECT INVOLVE?

As shown in Figure 1, the Arataki Project proposes to provide for the residential subdivision of the Site to enable the development of 171 detached dwellings. This will contribute additional housing capacity to Havelock North and the Hawkes Bay region. The planning report prepared to support the substantive application under the FTAA provides a full description of the proposal.

Figure 1: Proposed Arataki Project Structure Plan (Source: Woods)

- This proposed residential development will be supported by a local road network, pedestrian accessways, and other required infrastructure
- A planning design framework is proposed to facilitate the residential built form development of the future lots
- The Arataki Project will comprise 2 phases of development

2.1 First phase of the Arataki Project

The first phase of the Arataki Project will realise the residential subdivision of the land, which will be delivered by CDL. The residential subdivision and bulk earthworks phase will

- create 171 residential lots (average lot size 450 m^2)
- create a drainage reserve to vest, 4 roads to vest, 3 accessways, and 10 Jointly Owned Access Lots (JOALs)

- provide for a connected, safe and permeable development that connects activities internal and external to the Arataki Project area through a network of on-street and off-street active mode facilities
- require the Brookvale Road/ Arataki Road intersection to be upgraded to an urban standard in line with development staging to the surrounding road network to improve road safety
- urbanise Arataki Road along the frontage of the Site, including the provision of a shared path for pedestrians and cyclists and on-street parking
- upgrade of Brookvale Road in line with development staging to introduce gateway treatment. This will provide a safer transport environment on Brookvale Road when approaching from the existing rural environment to the east
- construct a new roading network of local access roads, including new intersections with Arataki Road, to enable safe public road access to the Arataki Project area for vehicles and active modes. These roads include
    - Access Road AR01 – a cul-de-sac road with a priority control intersection (a new T intersection with Arataki Road)
    - Access Road AR02 – a 'loop' road with two new priority control intersections (a 4-arm intersection with Grooby Place/Arataki Road and a new T-intersection with Arataki Road)
    - Access Road AR03 – a 'loop' road with two new priority control intersections (a 4-arm intersection with Te Heipora Place/Arataki Road and a new T-intersection with Arataki Road)
    - Access Road AR04 – a 'loop' road with two new priority control intersections (a 4-arm intersection with Meissner Road/Arataki Road and a new T-intersection with Arataki Road)
    - Further active mode connections on Arataki Road.
- provide bulk earthworks landform modification, infrastructure provision, buffer planting and external boundary fencing.

2.2 Second phase of the Arataki Project

The second phase of the Arataki Project will deliver the residential built form in accordance with the planning design framework established for the Arataki Project. This phase of development will be delivered by CDL's build partners and will involve house construction on individual lots, including vehicle access, parking, landscaping, and fencing.

The planning report prepared to support the substantive application for the Arataki Project provides a full description of the proposal.

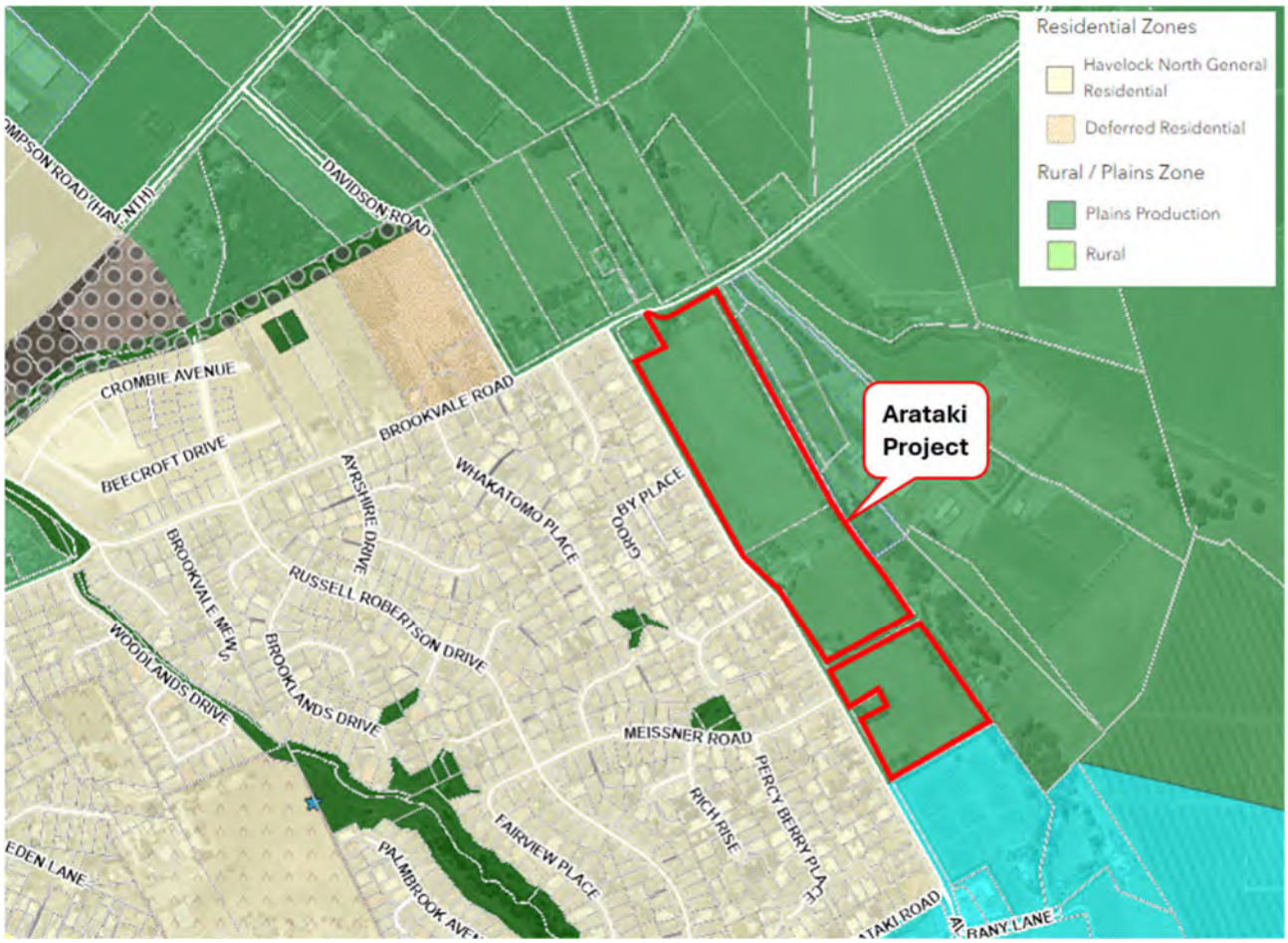
Our report below sets out further details and assessment of the Arataki Project's transport.

3 HASTINGS DISTRICT PLAN TRANSPORT ASSESSMENT

3.1 Site location and Hastings District Plan zoning

As shown in Figure 2, the Site is located on land zoned Plains Production as indicated on the Hastings District Plan (District Plan) zone map.

Figure 2: Arataki Project District Plan zoning



3.2 Our assessment of District Plan transport matters

The Site is currently zoned Plains Production zone in the District Plan which does not provide for urban residential development. The Arataki Project seeks approval to establish urban residential development on Plains Production zoned land in accordance with the Fast Track Approvals Act 2024. A Residential Design Framework (RDF) is proposed to provide a workable planning framework to establish urban residential development on land that is not zoned for urban residential development. The RDF largely adopts the existing provisions of the Chapter 8.2 Havelock North Residential Environment zone and Chapter 26.1 Transport and Parking. From a transport perspective, the proposal aligns well with this adopted residential framework.

We have assessed the transport elements of the Arataki Project against the provisions of Chapter 26.1 (Transport and Parking) of the District Plan (which are adopted into the proposed RDF), with the detailed assessment included in Appendix A of this report.

This assessment concludes that the Arataki Project complies with all the transport standards of the District Plan, except Standard 26.1.6A.2, which requires vehicle crossings to be located at least 15.0 m away from an intersection. In particular, the following lots are proposed to have vehicle crossings, which are located closer to the adjacent intersections. The distance between the vehicle crossing and the intersection is given in brackets.

- Lots 4 (12.5 m)
- Lot 11 (12.9 m)
- Lot 27 (14.0 m)
- Lot 54 (11.0 m)
- Lot 60 (8.4 m)
- Lot 90 (13.8 m)
- Lot 98 (14.4 m).

Our assessment of this non-compliance in Section 8.7.2 of our report concludes that these infringements will have negligible effects on the safe and efficient operation of the Site or the surrounding transport network.

4 OUR CONSIDERATION OF RELEVANT TRANSPORT STRATEGIES

4.1 A summary of the relevant transport strategies

Over the past decade, land use and transport planning in New Zealand has increasingly focused on creating integrated, efficient, and safe transport systems that support compact urban development and reduce reliance on private vehicles. While earlier national strategies placed strong emphasis on mode shift and emissions reduction, the Government Policy Statement on Land Transport 2024 (GPS 2024) marks a shift in focus toward supporting economic growth and productivity, improving network resilience, enhancing safety, and ensuring value for money in land transport investment.

Despite this shift, broader central government strategies such as the Transport Emissions Reduction Plan (TERP) and the National Policy Statement on Urban Development 2020 (NPS-UD) continue to promote integrated land use and transport planning, sustainable travel choices, and urban forms that support accessibility and reduce car dependency.

Local policy documents, including the Operative Hastings District Plan (OHDP), reinforce these strategic directions through planning provisions that enable more intensive development in appropriate locations and reduce reliance on private vehicle travel by supporting walkable neighbourhoods and mixed-use outcomes.

Key themes across these strategies and plans include

- reducing reliance on single-occupant vehicles by supporting land use patterns and transport services that reduce the need to travel long distances to access employment, education, and services (GPS 2024, TERP, OHDP)
- enabling efficient and cost-effective travel choices through improved access to public transport and active modes in urban areas (TERP, OHDP)
- recognising that mobility should support access to social and economic opportunities, rather than being an end in itself (TERP)
- improving road safety and reducing deaths and serious injuries across the transport system (GPS 2024, TERP)
- reducing greenhouse gas emissions and improving public health by encouraging lower-emission travel modes and aligning transport investment with urban development (TERP)
- supporting growth in well-connected locations, including near centres and rapid transit stations (NPS-UD 2020)
- removing regulatory barriers to intensification, such as minimum car parking requirements (NPS-UD 2020, OHDP).

Further information and details on these points are included in Appendix B.

4.2 How the Arataki Project Fast Track Consent aligns with the relevant transport strategies

4.2.1 Government Policy Statement on Land Transport

The Arataki Project aligns with the direction of the Government Policy Statement on Land Transport 2024 (GPS 2024), which places a strong emphasis on supporting economic growth and productivity, improving resilience and maintenance of the transport network, enhancing safety, and delivering value for money.

- The upgrade of Brookvale Road to an urban standard, including gateway treatments and traffic calming, supports a safer transport system that helps reduce deaths and serious injuries, aligning with GPS 2024's safety objectives
- New pedestrian and cyclist facilities, along with the future-proofing of Arataki Road for potential public transport infrastructure, improve access to the site and provide cost-effective travel options that support local productivity and development
- The project contributes to a reliable and efficient local transport network, helping maintain an acceptable level of service while reducing pressure on surrounding routes
- The intersection and frontage upgrades have been designed with efficiency and constructability in mind, ensuring optimal use of land and resources, contributing to value for money and supporting long-term resilience of the network.

4.2.2 Operative Hastings District Plan

Hastings District's transportation network is vital for both the community's daily functioning and its economy, supporting the movement of goods and people. While the system relies heavily on roads, it also faces environmental challenges like noise and pollution. The Council aims to manage these issues through long-term planning, a structured roading hierarchy, and promoting sustainable transportation options such as cycling, walking, and public transport. The Council is focused on integrating transportation with urban development to ensure an efficient and environmentally responsible system. The District Plan seeks to support the objectives set out below.

It is anticipated that the following Outcomes will be achieved:

- **TSAO1** The reduced intrusion of unnecessary vehicular traffic into residential streets
- **TSAO2** The establishment of an effective arterial and collector roading system to manage vehicle flows and provide attractive routes for heavy vehicles and inter-District/region traffic
- **TSAO3** The establishment of long-term design and environmental standards for roads, and for activity adjoining different types of roads in the network
- **TSAO4** The improved use and integration of environmentally sustainable transportation forms throughout the urban area and across the Heretaunga Plains.

The following outcomes are also proposed by the District Plan:

- **TPAO1** A safe and efficient District Transport Network

- **TPAO2** A transportation network that actively encourages alternative transport modes
- **TPAO3** Vehicle parking, access and loading facilities that are effective, safe and efficient in meeting the needs of individual activities
- **TPAO4** A transport network that integrates land use and the subdivision process

The Arataki Project aligns with these outcomes by

- providing a design that will be accessible to all users, with a focus on creating safe, convenient and accessible pedestrian connections within the Site and extending existing facilities for pedestrians and cyclists
- providing an internal road layout and road cross sections with a design that is appropriate for the function that they serve
- providing improvements to the existing Arataki Road and Arataki Road/Brookvale Road intersection
- future-proofing the design of Arataki Road to allow for the introduction of a public transport route
- assessing the safety and operational traffic effects of the proposed development on the existing road environment.

4.2.3 Transport Emissions Reduction Pathway

The Arataki Project aligns with the TERP by

- making walking and cycling safer, easier and more accessible with the active mode upgrades along Arataki Road
- future proofing the proposed designs to allow for the provision of future public transport infrastructure.

4.2.4 Hastings and Napier Future Development Strategy

Hastings District Council, Napier City Council, the Hawke's Bay Regional Council and iwi and hapū partners are jointly developing the Hastings and Napier Future Development Strategy (FDS). The FDS will guide development across existing urban areas and areas close by across the 2 districts over the next 30 years. The FDS study area is shown in Figure 3.

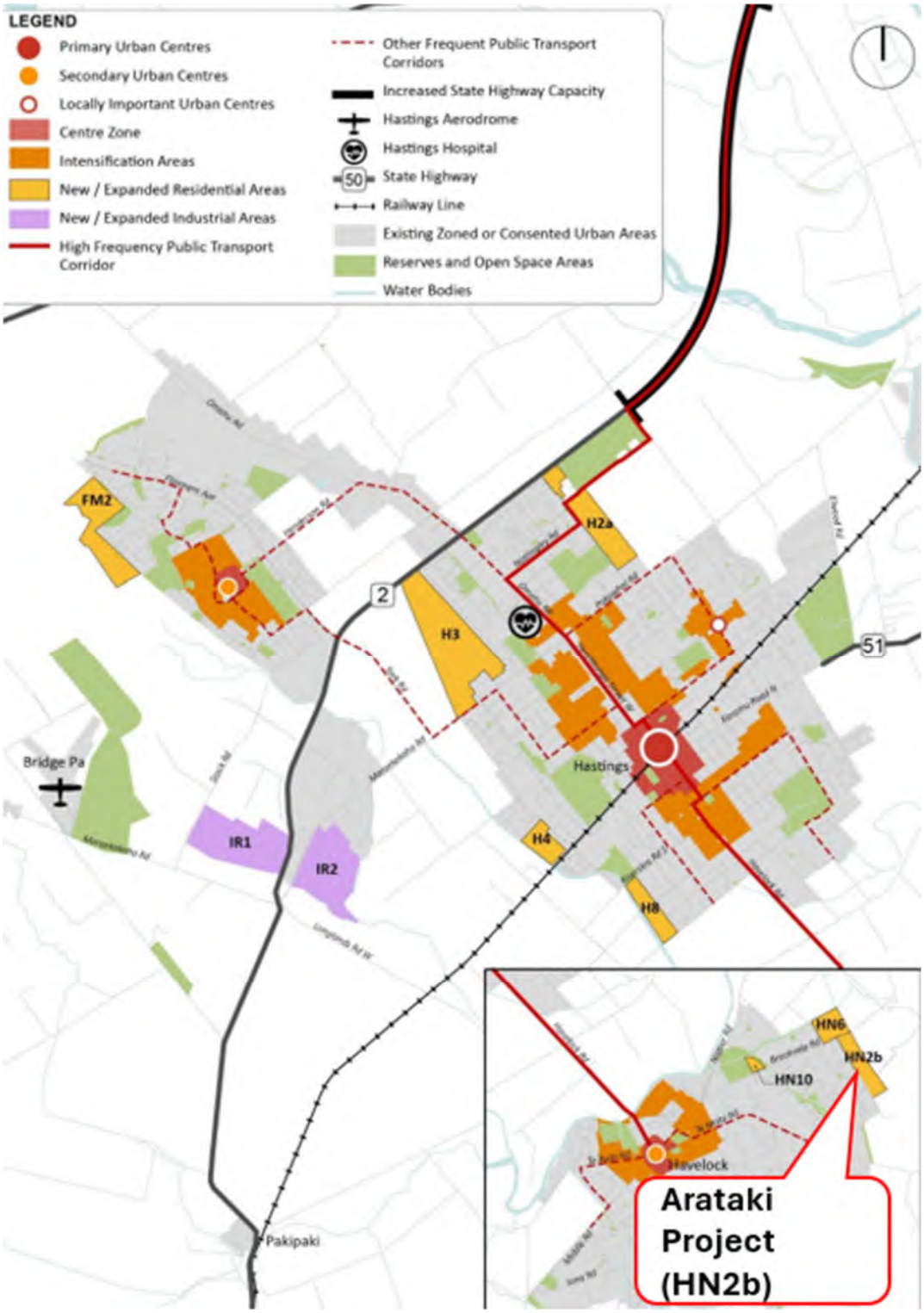
The draft FDS has been developed in accordance with the NPS-UD and aims to

- achieve 'well-functioning urban environments' in Napier and Hastings' current and future urban areas.
- identify the big issues around growth, things like housing, transport, employment, cultural wellbeing, the environment, protection of productive land, climate change and resilience.
- show the infrastructure needed to support and service that growth, and development constraints.

The Site is identified as a New / Expanded Residential Growth Area under the FDS (Figure 3 below). Land to the north of the Site is also identified as Residential Growth Area (Brookvale across the road).

The Arataki Project proposes urban development of the Site, providing the opportunity for residential housing within the Residential Growth Area while also providing the supporting infrastructure needed for future residents. The provision of facilities for both walking and cycling, as well as safe access roads, cater for all users and aim to encourage the accessibility of active modes.

Figure 3: Hastings and Havelock North FDS Growth Areas



5 A DESCRIPTION OF THE EXISTING ENVIRONMENT

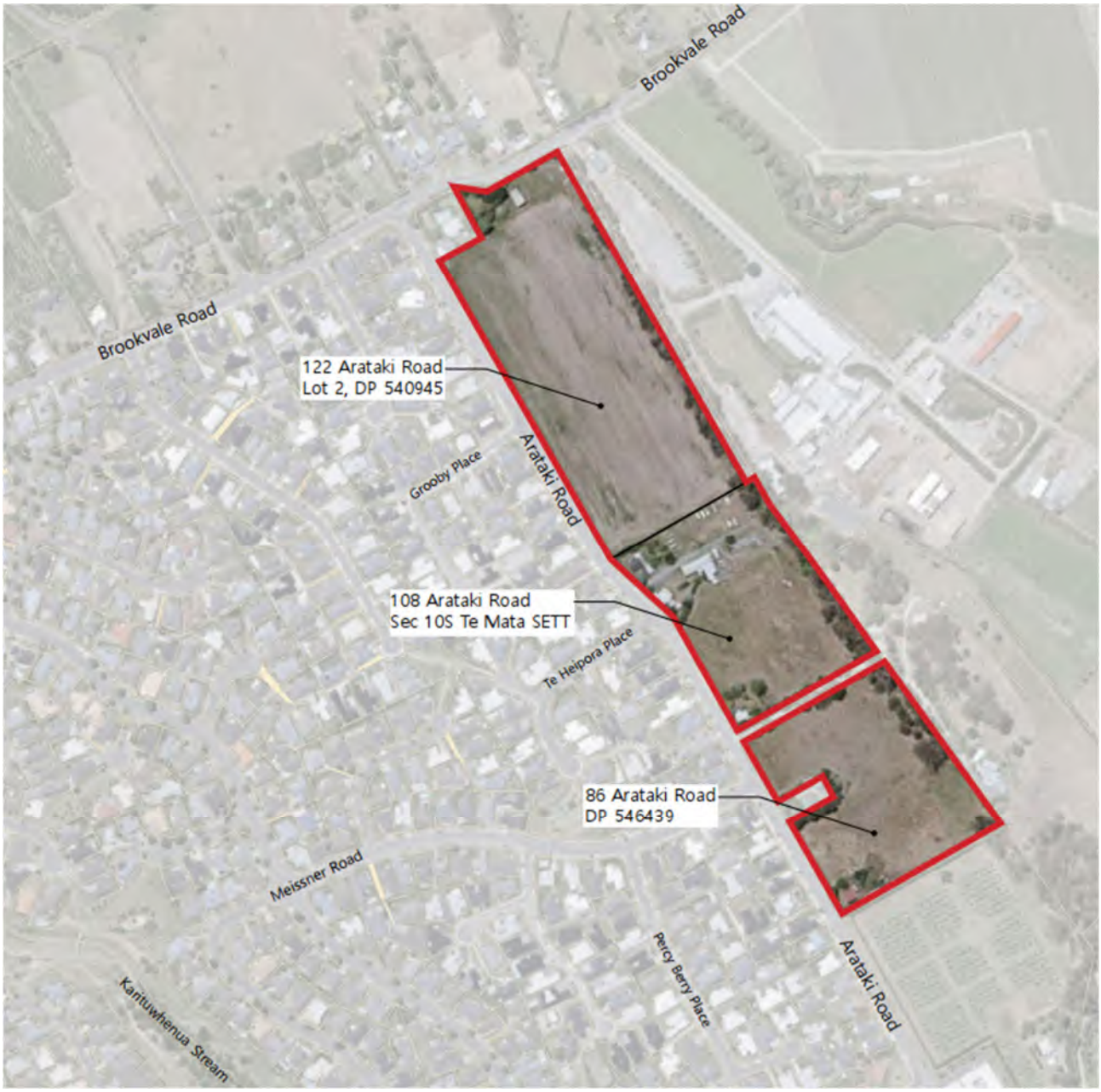
5.1 The Fast Track Consent site and surrounding environment

Comprising a total area of approximately 11 ha, the Site is held in 3 separate titles, all owned by CDL. The Site is located at the eastern edge of the existing urban area of Havelock North, approximately 2.5 kilometres from the Havelock North Village Centre.

- The Site has a gentle cross-fall from south to north and is currently used for grazing purposes
- A scattering of buildings is present within the Site
- Vegetation (predominantly exotic species) is largely limited to garden areas around these buildings and a shelter belt alongside the eastern boundary
- The Site sits upon a natural terrace, and the landform is elevated above the rural property to the east by approximately 6 m.

The Site is generally bounded by Brookvale Road to the north and Arataki Road to the west. The land to the south is used as an olive orchard, and the land to the east is used for rural and light industrial purposes. Access to the Site is provided via five existing crossings along Arataki Road.

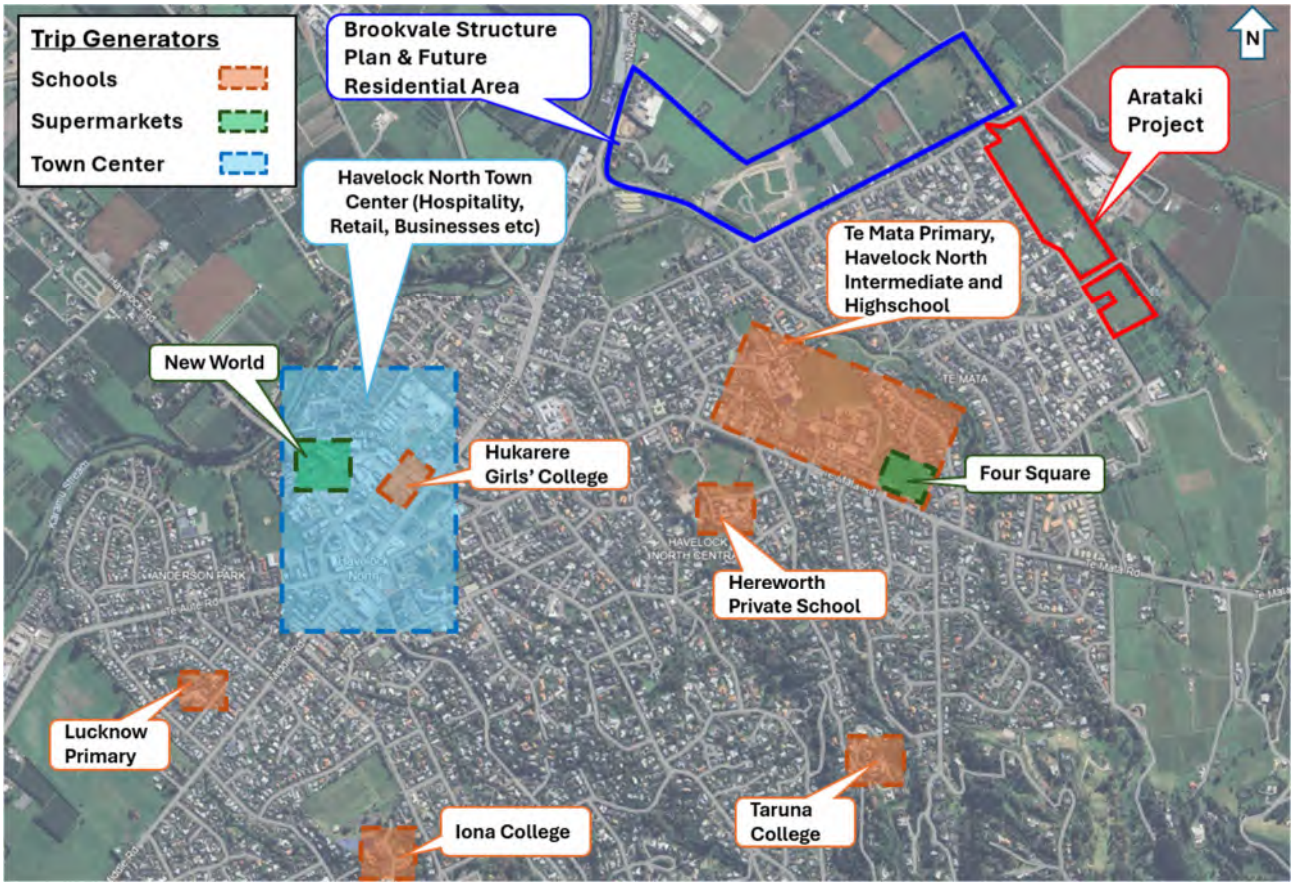
Figure 4: The Arataki Project Site



The immediate surroundings and trip generators associated with the Arataki Project area are shown in Figure 5. We note that

- the land within the Site is currently either used as farm pasture (northern portion) or clustered rural residential living sites
- the existing Havelock North Town Centre is located approximately 2.5 km west of the Site's furthest point
- the Site fronts Arataki Road on its western boundary and a short section of Brookvale Road on its northern boundary
- the Site sits southeast of the Metlifecare Brookvale Road development.

Figure 5: The Arataki Project site and immediate surrounds



5.2 Existing roads

The existing roads in the surrounding area include

- Arataki Road
- Brookvale Road
- Te Mata Road
- Messiner Road
- Romanes Drive
- Napier Road.

These roads are key links between the Arataki Project area and surrounding land uses such as the Havelock North Town Centre, various schools and local supermarkets.

The One Network Road Classification (ONRC) road hierarchy of these key roads is shown in Figure 6, and their cross sections are described in Table 1 below.

Figure 6: Arataki Project ONRC classification

Table 1: Existing transport network

Road	Road type	Connects	Layout
Arataki Road	Access	Brookvale Road and Te Mata Road	▪ Two-lane road ▪ Urbanised frontage along the west with a footpath and a kerb and channel ▪ Rural frontage along the Site's boundary (the eastern side of the road) with no footpath and an open swale drain ▪ Road reserve width of 20.1 m
			
Brookvale Road	Secondary Collector	Thompson Road and Napier Road	▪ Two laned road

Road	Road type	Connects	Layout
			▪ Urbanised frontage along the southern side to the west of Arataki Road with a footpath and a kerb and channel ▪ Rural frontage along the Site's boundary to the east of Arataki Road with no footpath and an open swale drain
			
Te Mata Road	Primary Collector/ Arterial (urban)	Havelock North town centre And Te Mata Mangateretere Road	▪ Urban standard ▪ Two lanes with a flush median ▪ On road cycleway ▪ Footpaths on both sides
			
Meissner Road	Access	Arataki Road	▪ two-lane urban road with footpaths on both sides
			

Road	Road type	Connects	Layout
Romanes Drive	Primary Collector	Brookvale Road and Napier Road	▪ Two laned rural road standard with no kerbs and channels ▪ Footpath provided on the southern side ▪ On road cycleways in both directions
			
Napier Road	Arterial	SH51 and Middle Road (Havelock North town centre)	▪ Two laned urban road standard flush median ▪ Footpaths are provided on both sides ▪ On road cycleways in both directions
			

The key intersections include

- Arataki Road/Brookvale Road
- Arataki Road/Te Mata Road
- Brookvale Road/Romanes Drive/Bourke Place.

The key details are summarised in Table 2.

Table 2: Existing key intersections

Intersection	Intersection type	Layout	Existing issues
Arataki Road/ Brookvale Road	T-intersection (give-way)	Single lane approaches	Limited visibility looking east from Arataki Road, no pedestrian crossing facilities in each direction
			
Arataki Road/Te Mata Road	3 leg roundabout	Single lane approaches Inconsistent crossings for pedestrians and cyclists	No significant issues to note
			

Intersection	Intersection type	Layout	Existing issues
Brookvale Road / Romanes Drive	4 leg Roundabout	Single lane approaches Inconsistent crossings for pedestrians and cyclists	No significant issues to note
			

5.3 Existing traffic conditions

5.3.1 Council traffic data

Average annual daily traffic (AADT) count data has been obtained from Hastings District Council from January and August 2021. The relevant data has been summarised below.

Table 3: Council Road Traffic Count Data

Road	AADT	Year of Count
Arataki Road	737	2021
Brookvale Road (East of the Site)	430	2020
Brookvale Road (West of the Site)	936	2020
Te Mata Road	3728	2020
Romanes Drive	4114	2020
Meissner Road	473	2021
Napier Road	3827	2020

Traffic count data for several of the key intersections has been summarised in Table 4.

Table 4: Council count data

Intersection	AADT	Year of Count
Arataki Road/Te Mata Road roundabout	3648	2020
Brookvale Road/Romanes Drive roundabout	2308	2020
Napier Road Romanes Drive roundabout	5382	2020

Traffic survey data

We completed traffic surveys within the immediate area to confirm traffic movements. These surveys included tube counts, which collect traffic volumes on road sections, as well as intersection counts.

Tube counts

A tube count survey[5] spanning a 7-day duration collected traffic volumes on Brookvale Road (immediately north of the Arataki Road/Brookvale Road intersection).

In summary, Brookvale Road recorded

- a 5-day ADT of 888 vehicles during the weekdays
- an average morning peak hour volume of 93 vehicles per hour (in both directions) or 64 vehicles per hour in the peak direction
- an average evening peak hour volume of 87 vehicles per hour (in both directions) or 52 vehicles per hour in the peak direction
- 15 % heavy vehicles over the 5-day period.

Intersection turning movement counts

Intersection traffic surveys[6] were undertaken during both the morning and evening peak periods for the following intersections.

- Romanes Drive/Brookvale Road, Bourke Place roundabout
- Arataki Road/Brookvale Road intersection
- Arataki Road/Te Mata Road roundabout.

The results of these surveys are shown in Appendix C.

5.4 Existing speed limits

The existing speed limits on the roads about the immediate area are shown in Figure 7

[5] As undertaken October 2024
[6] As undertaken October 2024

- Arataki Road and other surrounding roads in Havelock North currently have a posted speed limit of 50 km/hr
- Brookvale Road transitions from a speed limit of 100 km/hr to 50 km/hr at a point 260 m east of its intersection with Arataki Road.
- Operating speed data from MegaMaps indicates that the mean operating speed along the Site frontage is 62 km/hr on Brookvale Road and 45 km/hr on Arataki Road.

Figure 7: Existing speed limits near the Arataki Project site

5.5 The existing road safety record

5.5.1 Immediate transport network

We have completed a thorough historical search of NZTA's Crash Analysis System (CAS) for the 5-year timeframe from 2020 to 2024, as well as all available data for 2025[7]. Our objective was to gather information regarding any recorded crashes on Arataki Road and the intersections of Arataki Road/Brookvale Road and Arataki Road/Te Mata Road.

The crash search area and results are shown in Figure 8.

[7] As undertaken March 2025

Figure 8: CAS search area and results

A total of 4 crashes were reported, summarised as follows.

- 3 non-injury crashes and 1 minor injury crash
- The minor injury crash involved 3 vehicles and a cyclist. A northbound and a southbound vehicle on Arataki Road gave way to each other, reducing the available space for the following northbound cyclist. As a result, the cyclist, who was reportedly travelling at high speed, collided with a parked vehicle
- One of the non-injury crashes involved a northbound vehicle hitting a parked vehicle on Arataki Road
- The other 2 non-injury crashes occurred on Brookvale Road immediately north of the intersection with Arataki Road.
    - One of the crashes involved a vehicle failing to drive around a bend due to sun strike
    - Another non-injury crash involved a vehicle failing to take the bend on Brookvale Road correctly and subsequently driving off the road at the bank.

Given that there are no serious crashes and considering the infrequent occurrence and relatively low severity of the reported crashes in this area, there are no discernible concerning crash trends.

5.5.2 Wider transport network

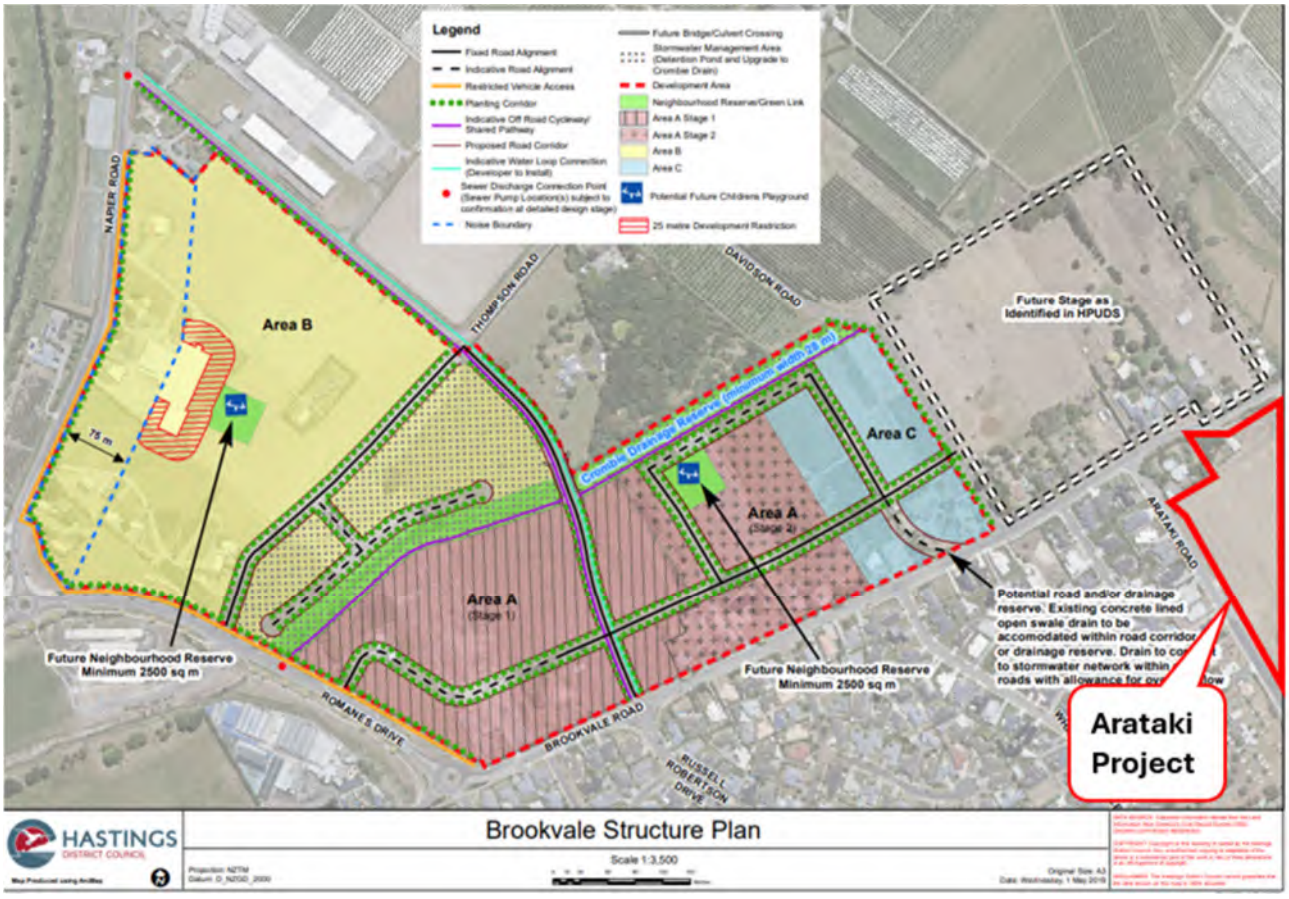
We have also assessed the crash records for the wider transport network around the Arataki Project area.

Details of the wider network crash history are included in Appendix D.

5.6 Future Residential Development in Havelock North

Future residential development is both approved and planned in the wider Havelock North area including the Brookvale Structure Plan area. This includes the future Metlifecare residential retirement development. The location and extent of this structure plan within the Havelock North area is shown below in Figure 9, with the proposed Arataki Project being located to the southeast.

Figure 9: Havelock North recently established Precincts



5.6.1 The Brookvale Structure Plan

Land on the northern side of Brookvale Road has been rezoned for residential development as part of the mediation of an appeal to the proposed Hastings District Plan.

- **Development Stages** – Building in the Brookvale area will happen in phases, based on the funding available in the Council's Long-Term Plan. These phases are shown on the plan, with Stage 1 (Area A), Stage 2 (Area A), and Area B ready for development now, while Area C will be available in 2025.

However, future stages could start earlier if the Council decides. Other stages, as shown in the plan, will be looked at for rezoning based on demand and after any issues have been fixed.

- **Roads** – Russell Robertson Drive will be extended through the new development area, linking the existing Arataki community with the new Brookvale residential area. There are also plans to upgrade the intersections at Napier Road/Thompson Road and Thompson Road/Russell Robertson Drive Extension.
- **Walkways and Cycleways** – There will be walking and cycling paths, including off-road bike paths and shared paths along the Crombie drainage reserve and Russell Robertson Drive extension (and part of Thompson Road to Napier Road).

5.6.2 Changes to the Brookvale Structure Plan

Metlifecare Retirement Villages Limited (Metlifecare) has proposed a Private Plan Change to the Hastings District Plan to rezone approximately 4.7ha of rural land on the northern side of Brookvale Road for residential use. They propose amendments to the Brookvale Structure Plan to provide for the development of their site to be consistent with adjacent development. From a transport perspective, the key changes that are relevant to the Arataki Project include

- a cycle/walking connection through Area D from the Crombie Drainage Reserve to Brookvale Road
- the north-south pedestrian/cycle connection is indicated to meet Brookvale Road in the vicinity of the Arataki Road intersection.

Arataki Road and Davidson Road are identified as cycle-friendly routes in the local cycle network, and the demand to cross Brookvale Road in the vicinity of the intersection has been identified. The Plan Change has been lodged with Council for approval and has not yet been notified.

6 TRANSPORT ACCESSIBILITY OF THE ARATAKI PROJECT

6.1 Public transport accessibility

A map of the wider area public transport network in the vicinity of the Arataki Project area is shown in Figure 10. The Arataki Project area is currently served by 1 bus route, which currently loops on the southern end of Arataki Road and Russell Robertson Drive.

- Route 21 operates between Hastings and Havelock North
- Service operates from around 6:00 am to 6:00 pm Monday to Friday on an hourly basis.

Figure 10: Public transport network in the wider area near the Arataki Project site

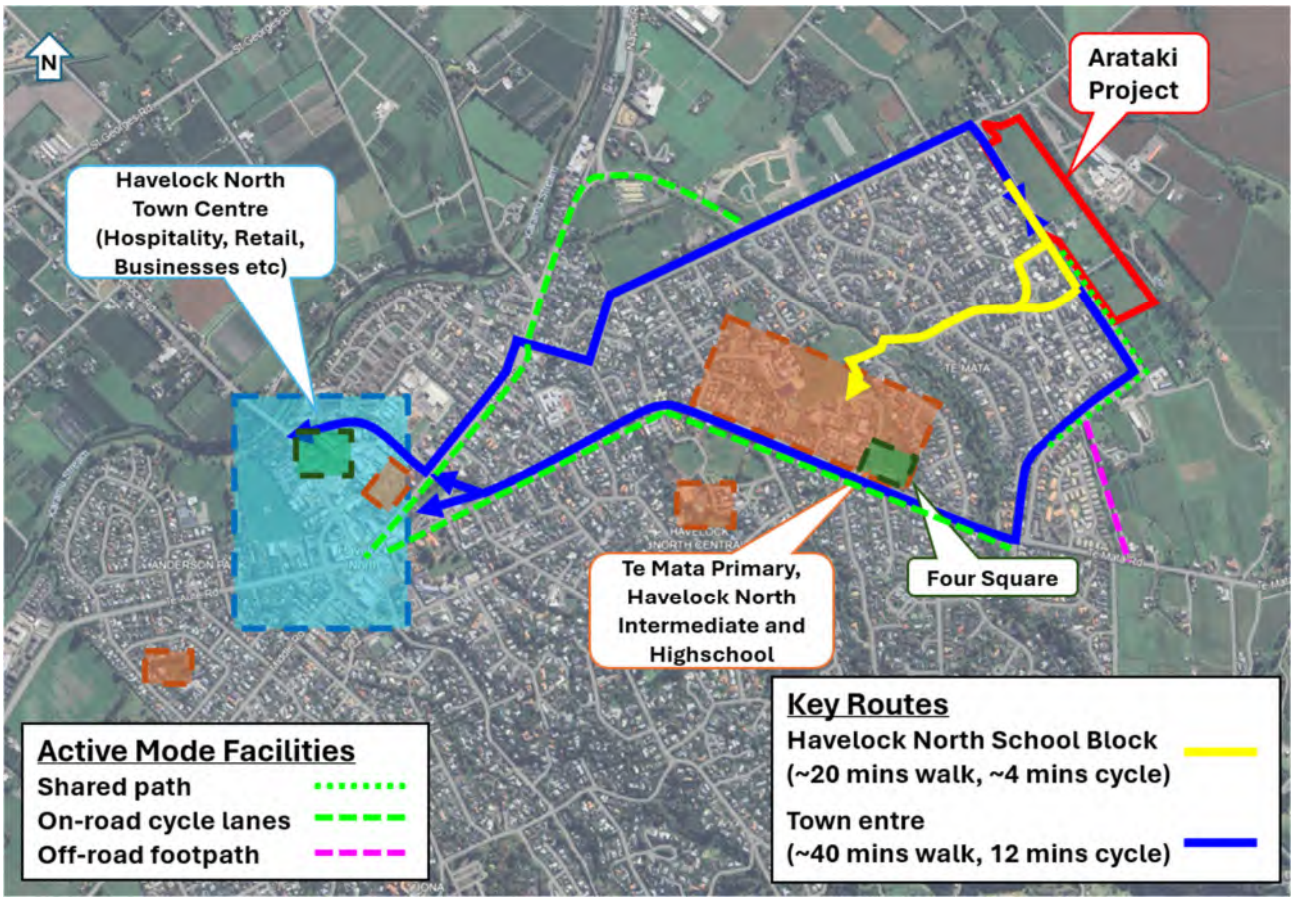
There are currently no public transport bus stops within the immediate vicinity of the Arataki Project area, and no new or improved bus stops have been proposed as part of other developments.

We understand from our discussions with Hawkes Bay Regional Council that there is an opportunity to provide a new bus route or an extension of the existing routes to better serve the development and the residential areas in northeast Havelock North. This could include the extension of Route 21 further north along Arataki Road to the Site. This will enable public transport users in the Arataki Project area to have improved access to public bus services.

6.2 Walking and cycling accessibility

Given the current rural nature of the Arataki Project area, there are limited active mode facilities available. The active mode network surrounding the Arataki Project area is shown in Figure 11 below.

Figure 11: Arataki Project location in the active modes network



For pedestrian accessibility in the vicinity of the Arataki Project area, we note that

- there is a network of path connections through multiple parks that link various cul-de-sacs, connecting the Site to the Havelock North Town Centre
- there is a network of pedestrian footpaths that connect the Arataki Project to the block of schools on Te Mata Road
- there is a footpath connection through the Arataki Link Reserve connecting Arataki Road to Te Mata Road, providing more direct access towards the vineyards located along Te Mata Drive

For cycling accessibility, we note that

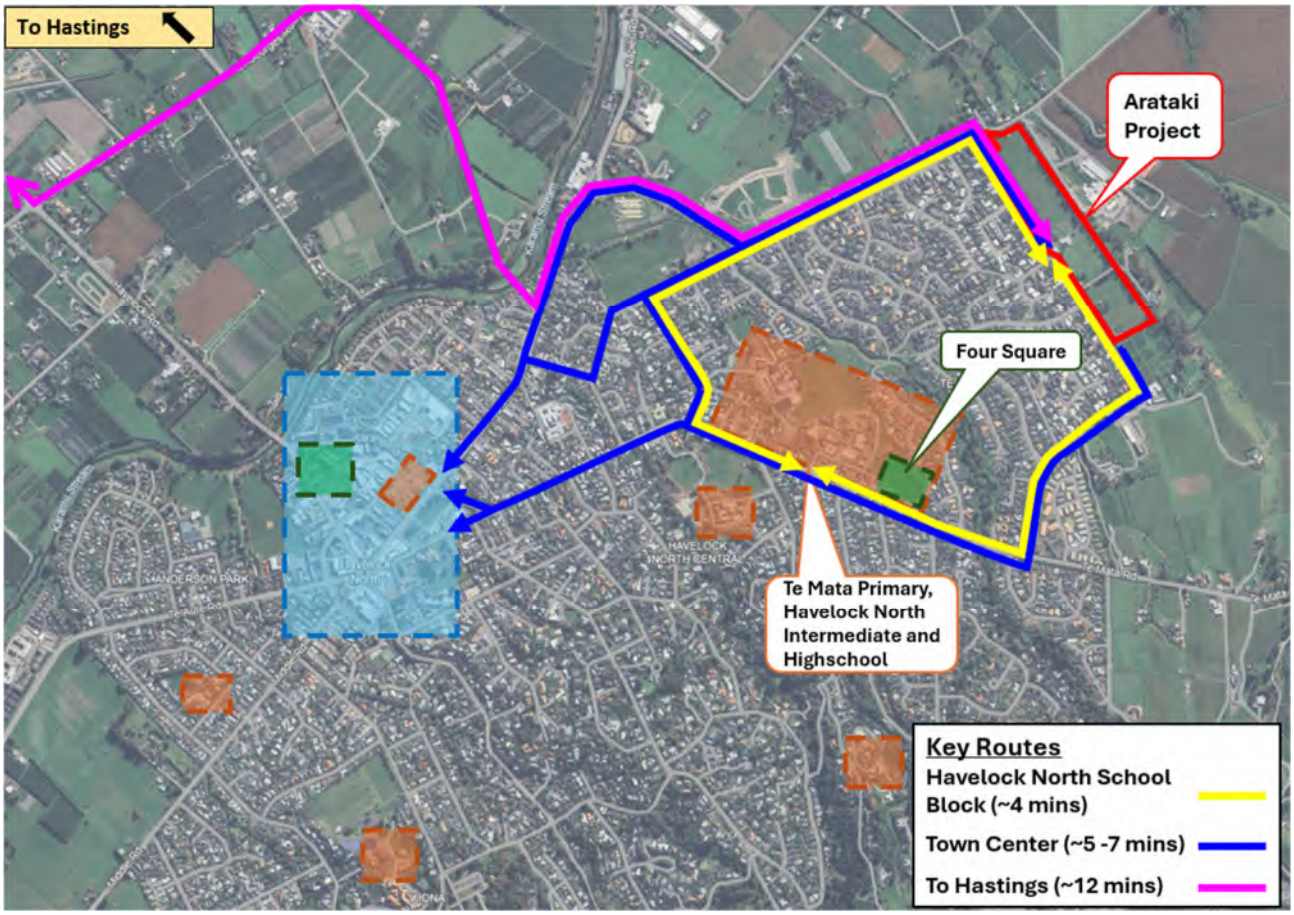
- Arataki Road is marked as a cycle-friendly route on the iWay network map (as described in Section 7 below) and provides a length of shared path from Meissner Road south to Albany Lane
- various on and off-road cycle lanes are provided along key roads in the network, including
  - on-road cycle lane/ Hawke's Bay Trail along Te Mata Road
  - the off-road Cycle Path along Napier Road and on road on Napier Road to the north
  - on-road cycle lane on Romanes Drive.

- Palmbrook Reserve includes off-road cycle paths which are connected to Arataki Road via Meissner Road
- Metlife Care is proposing an off-road cycle facility through their site on Brookvale Road and a cycle-friendly route along Davidson Road. It is noted that they did not consider it necessary for cycle lanes to be provided along additional roads due to the residential local road level traffic.

6.3 Private vehicle accessibility

The Arataki Project area is well-located with respect to providing vehicle accessibility to the local road network, as shown in Figure 12.

Figure 12: Arataki Project location in the local transport network



The vehicle road network is summarised as follows.

- Te Mata Road to the south of the Arataki Project area provides accessibility to the school block and Havelock North town centre. This 10-minute travel time catchment provides access to the main trip-generating activities within Havelock North
- Brookvale Road provides connections to Te Mata Mangateretere Road in the east and Napier Road and St Georges Road in the west. These arterials provide connections to nearby towns.

7 FUTURE TRANSPORT NETWORK

7.1 iWay and the Hawkes Bay Regional Cycle Plan

The iWay programme is an active modes development initiative run by the collaboration of the Hawkes Bay, Napier, and Hastings Councils to create an extensive combined shared walking and cycling network in Hawke's Bay. These walking and cycling routes are intended to be safe active mode routes that provide commuters with an alternative to the existing vehicle routes and link various communities.

The iWay network map showing the various walking and cycling routes available in Havelock North is given in Figure 13 below.

Figure 13: iWay Network Map

The Hawke's Bay Regional Cycle Plan seeks to build on the existing and planned iWay network within the Hastings and Napier districts. A map of the Havelock North area included in this plan is shown in Figure 14. The priorities of this plan include

- investigate improvements to connectivity between towns in the region, in particular Havelock North to Waipawa

- promote cycling in schools, including any necessary infrastructure improvements for safe routes to school
- promote cycling as an option for transport, particularly commuting
- correct safety issues on existing networks
- maintain existing networks to a high standard and maximise use through effective promotion
- cycle tourism.

Figure 14: Hawkes Bay Regional Cycle Plan 2015

Arataki Road is identified on these maps as a cycle-friendly route.

- This route connects the on-road cycle lane/ Hawke's Bay Trail along Te Mata Road to the off-road cycle path along Napier Road
- Both of these networks lead directly into the Havelock North town centre.

7.2 Future public transport upgrades

We understand through our consultation with Hawke's Bay Regional Council that a future public transport plan is currently being developed for Havelock North by the Hawke's Bay Regional Council. This is expected to go to consultation in late 2025.

The intention of the public transport routes supported by this plan is dependent on the demand and future use in the areas they are implemented. The Arataki Project is likely to be a catchment that will be addressed by future public transport routes, with Arataki Road as a key road for buses.

7.3 The Brookvale Road Development project

The 'Brookvale Road Development' Project is a package of Council-led roading projects in the area to support the development of the Brookvale Structure Plan area. The Council Long Term Plan 2021-2031 has over $7M allocated to the Brookvale Road Development project under 'Major Capital Projects Roads and Footpaths' between 2021/22 and 2028/29.

The Brookvale Road Development improvements that Council will develop include

- upgrading Thompson Road from Napier Road to the new crossroad intersection with the new subdivision roads linking to Brookvale Road and Romanes Drive
- constructing a roundabout at the Napier Road/Thompson Road intersection
- construction of a new link road from the Thompson Road intersection across the Crombie Drainage Reserve to Brookvale Road
- construction of a new subdivision road from the Thompson Road intersection to Romanes Drive
- upgrading of the Napier Road/Romanes Drive roundabout to provide two lanes (left and right) on the Romanes Drive approach
- construction of two new priority controlled intersections on Romanes Drive linking to the new subdivision roads.

8 THE PROPOSED TRANSPORT ELEMENTS OF THE ARATAKI PROJECT

8.1 Design philosophy

To assist with the design and development of the Arataki Project, we have used several guiding documents to form the overall design philosophy for the road network. This includes the Vision Zero principles.

8.1.1 Vision Zero

Vision Zero is an ethics-based transport safety approach. The responsibility for safety is placed on people who design and operate the transport system. The goal is to provide a safe system which accommodates human beings. It acknowledges that people in the transport system make mistakes, and people are vulnerable to high-impact forces in a crash. The Vision Zero system looks at the whole system to ensure everything works together to protect road users from forces that can cause traumatic injury.

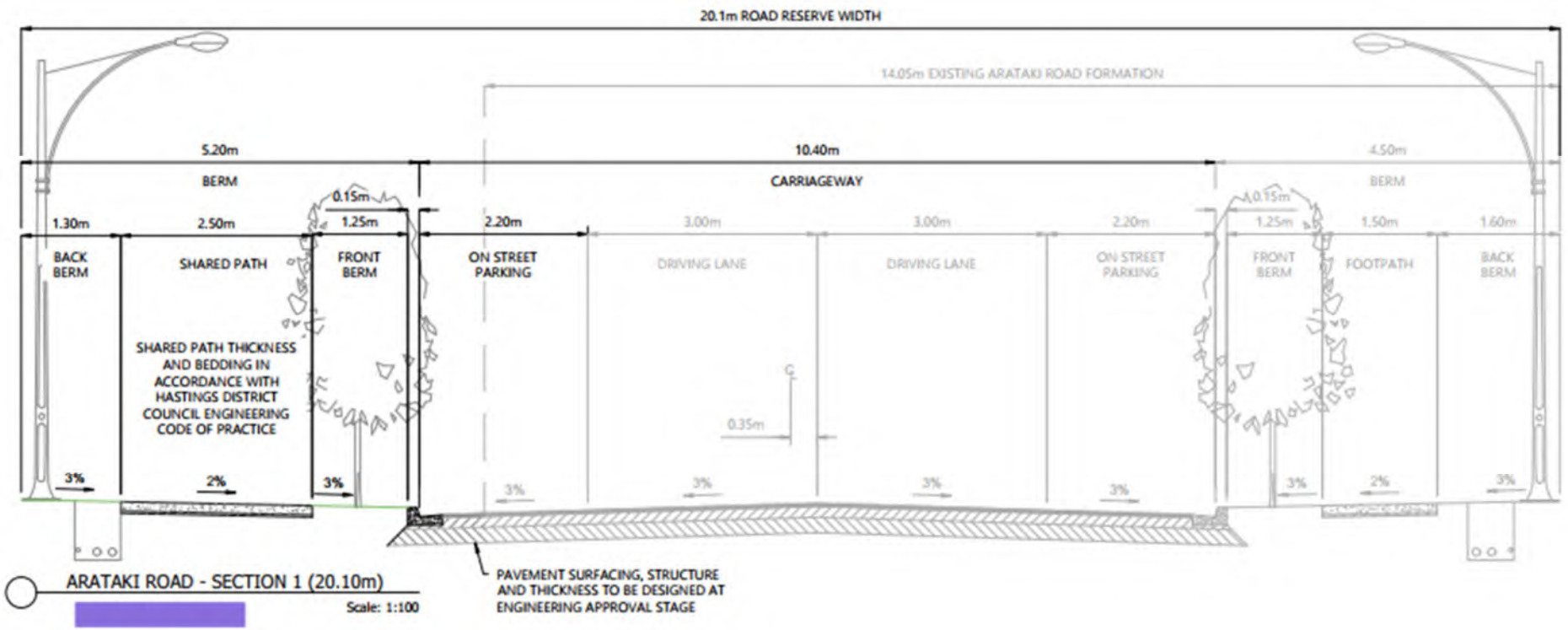
As transport system designers and operators, reducing the likelihood and severity of serious injury crashes from occurring aligns with the goals of Vision Zero. Measures to align with Vision Zero include speed limit reductions, as road users are much less likely to sustain serious injuries at lower speeds. It also encourages designs and intersections that minimise crash likelihood and severity, such as using roundabouts at intersections, which reduce the likelihood of head-on crashes.

The Arataki Project provides the opportunity to make both Arataki Road and Brookvale Road a safer place for all road users by adopting Vision Zero principles. The roading and intersection upgrades proposed to achieve this outcome external to the development, with the layout and functions of roads internal to the development presenting safe outcomes for all road users.

8.2 Arataki Road upgrades

As part of the Arataki Project, it is intended to upgrade the eastern frontage of Arataki Road to provide the following cross-section from its intersection with Brookvale Road to the southern end of the Site, as shown in Figure 15 below.

Figure 15: Arataki Road with 2.5m shared path



The Arataki Road upgrade includes the following elements

- A minimum 1.65 m front berm allowing street tree planting synonymous with the existing landscaping along the western side of Arataki Road
- A new 2.5 m shared path on the eastern side of Arataki Road extending to the Brookvale Road/Arataki Road intersection
- A back berm of minimum 1.3 m
- Upgrades to the intersection of Arataki Road with Brookvale Road, with details on the intersection upgrades outlined in subsequent sections below.

The details of the road design are shown in Appendix E and form part of the civil engineering drawing package undertaken by Woods.

8.3 Arataki Road/Brookvale Road intersection upgrades

The existing intersection of Arataki Road/Brookvale Road has restricted visibility due to the horizontal alignment and existing vegetation on Brookvale Road. Upgrades to this intersection are required to bring it up to an urban standard, consistent with the staging of surrounding network development, to improve road safety.

The proposed upgrades include

- kerb buildouts at pram crossing locations
- kerb and channel
- surface treatment at the entrance to Arataki Road to indicate the residential nature of the road
- trimming of vegetation along Brookvale Road to improve sight lines.

These intersections will be further detailed in future detailed design stages.

8.3.1 Brookvale Road speed survey

We undertook speed surveys along Brookvale Road in October 2024 to inform the design of the proposed upgrade to the Arataki Road/ Brookvale Road intersection.

- These surveys took place between Tuesday, 15 October and Monday, 21 October 2024
- The tubes were placed between Arataki Road and the existing speed de-restriction, as shown in Figure 16.

Figure 16: Brookvale Road speed survey tube locations

A summary of the results is shown in Table 5.

Table 5: Summary of speed survey

Approach	Mean speed (km/hr)	85th percentile speed (km/hr)
Eastbound	46.5	56.5
Westbound	45.2	54.2

8.3.2 Sight distance assessment

Sight distance has been assessed for approach sight distance (ASD) and safe intersection sight distance (SISD) as per Austroads 'Guide to Road Design' Part 4A (2023) (Austroads). The 85th percentile speeds measured in the above speed surveys have been used to calculate the required sight distances, as shown in Table 6 below.

Table 6: Alten Road Visibility calculations

Approach	Longitudinal grade (a)	Design Speed (km/hr)	Reaction Time (s)	Observation Time (s)	Calculated SISD (m)	Calculated ASD (m)
(V1) Eastbound	-5	57	2	3	115	67
(V2) Westbound	5	54	2	3	107	62

The visibility plan of the required sight distances from the intersection is shown in Figure 17.

Figure 17: Arataki Road visibility plan

As shown in Figure 17,

- the required SISD of 115 m complies to/from the western approach (V1)
- the required SISD of 107 m does not comply to/from the eastern approach (V2). There is about 75 m SISD available if the existing vegetation is trimmed
- the calculated ASD of 62 m complies to/from the eastern approach; however, it requires some existing vegetation to be trimmed.

While the SISD towards the east is not met, we consider the impact of this to be insignificant, given

- The existing crash history of the intersection does not show any existing safety issues
- The ASD is met (by far), ensuring that in the event that a vehicle turns out of the Arataki Road intersection onto Brookvale Road, an oncoming vehicle on Brookvale Road could observe such a vehicle and stop safely in time to avoid a collision
- As part of the development, the speed threshold (gateway treatment) into the Havelock North area is upgraded to emphasise to a driver that they are entering an urbanised area. This will help reduce approach speeds.

8.4 Urban gateway treatments

A gateway treatment is proposed at the rural/urban boundary of the Arataki Project area and is intended to be a physical measure that signals to motorists that they are entering an urban environment. A

gateway treatment is required for Brookvale Road, given that the Arataki Project site sits on the edge of the rural / urban boundary.

The existing gateway treatment outside 174 Brookvale Road, as shown in Figure 18, consists of speed change signage and a single road marking. Additional measures are proposed to communicate the change to the urban environment to road users more clearly.

Figure 18: Existing Gateway Treatment on Brookvale Road

While the design of the gateway treatments will be addressed at a subsequent detailed design stage, we anticipate they could include the following measures

- road markings to narrow the carriageway width and lower vehicle speeds
- a different coloured surface treatment of the carriageway, indicating to drivers to slow down
- signage, displaying the reduced speed limit.

NZTA's RTS 15: Guidelines for urban-rural speed thresholds[8] sets out design considerations for rural-to-urban gateway treatments and provides elements of the above, as shown in Figure 19.

[8] Road traffic standards 15 guideline for urban-rural speed thresholds

Figure 19: Pictorial examples of the effects of design elements (Source: RTS 15)

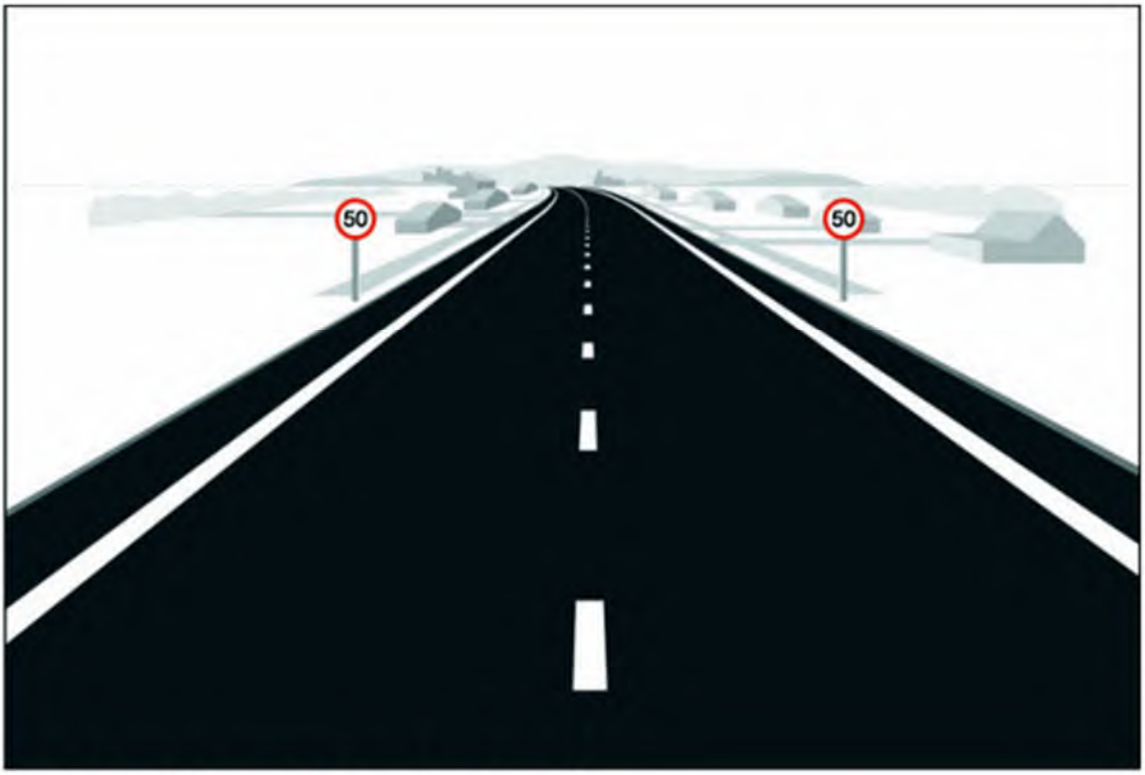


Figure 5: Typical untreated approach to a township

Figure 6: Completed threshold

8.5 Arataki Project road layout

The Arataki Project includes a series of vested internal access roads and JOALS that will serve the proposed lots.

There are 5 types of internal roads and JOALS, namely

- Access Road Type 1
- Access Road Type 2
- JOAL type 1
- JOAL type 4
- JOAL type 3
- JOAL type 4

The network of these road types is shown in Figure 20 overleaf.

While the detailed design of these different roads and JOALs are provided in the Woods Civil Engineering Plans, we provide below a cross-section plan and brief description of each type of road and JOAL.

The detailed layout for each road will be subject to future Engineering Approval stages, where site constraints and earthwork requirements will be considered carefully.

Figure 20: Arataki Project: Internal road layout

Local access roads will be designed to achieve the most appropriate posted speed limit at the time of urban development (likely a speed limit of 30 km/h), providing a safe environment for all road users. Local access roads will accommodate front and back berms, footpaths and two-way vehicle movement.

- The proposed alignments of these access roads encourage these low speeds, with build-outs provided at pedestrian crossing points and horizontal curves.

- These roads will be vested.
- With a design speed of 30 km/hr, there is no requirement for dedicated cycle facilities to be provided on these roads.
- Access road volumes will generally be very low, with most access roads for this development serving residential traffic only.

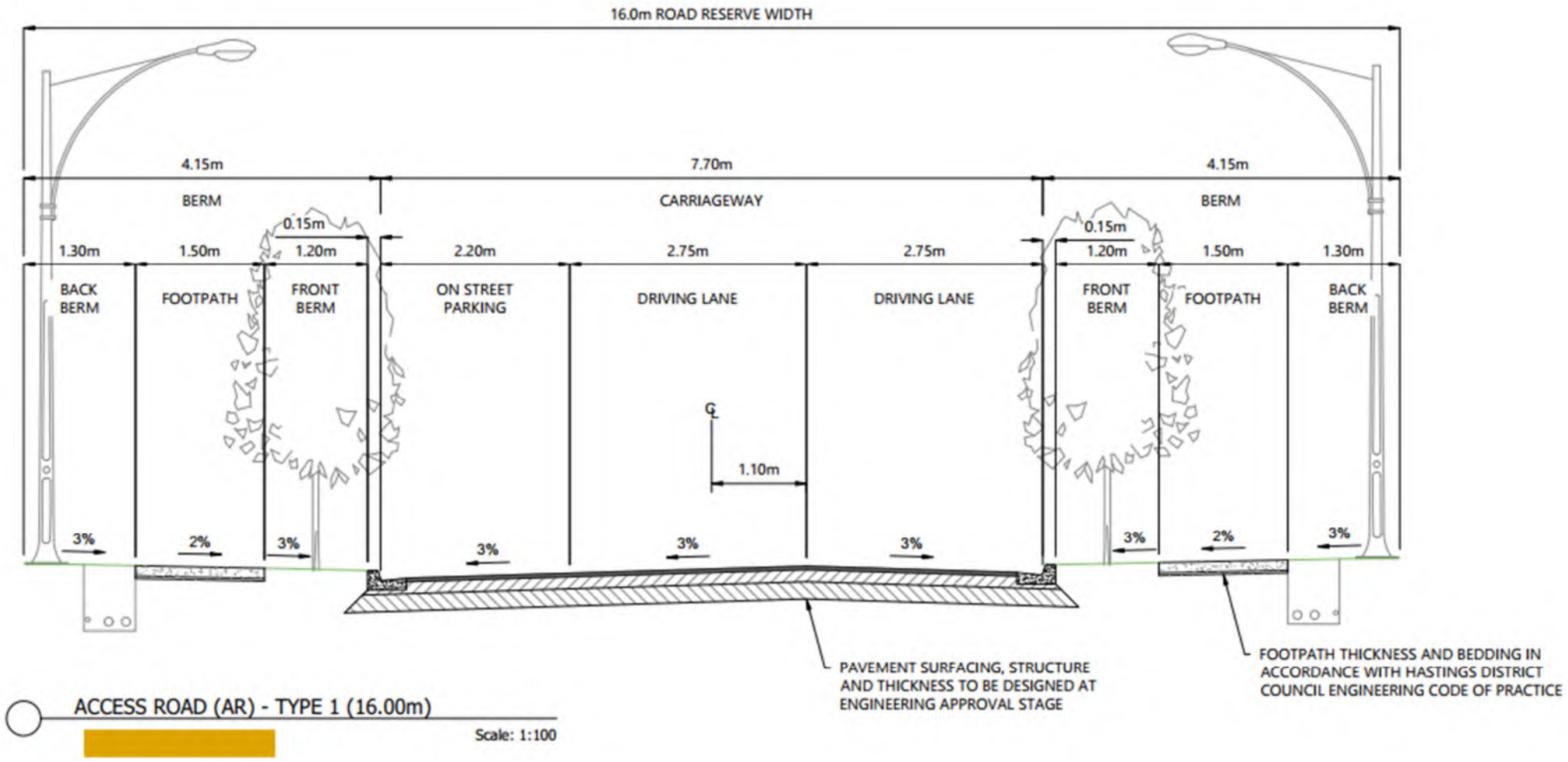
8.5.1 Type 1 Access Road

Type 1 access roads will have road reserve widths of 16.0 m, which is consistent with access roads as set out in the Hastings Engineering Standards. The cross-section of the Type 1 access road is shown in Figure 21 and will have the following features:

- 7.7 m carriageway width providing for two-way moment with 2.45 m and 2.75 m wide driving lanes
- 1.9 m on-street parking lane
- 1.2 m front berm and 1.3 m back berm to allow for services
- 1.5 m footpath on both sides of the road.

Access Road AR01, Access Road AR04 and sections of Access Roads AR02 and AR03 are proposed to be Type 1 access roads.

Figure 21: Type 1 Access Road cross-section



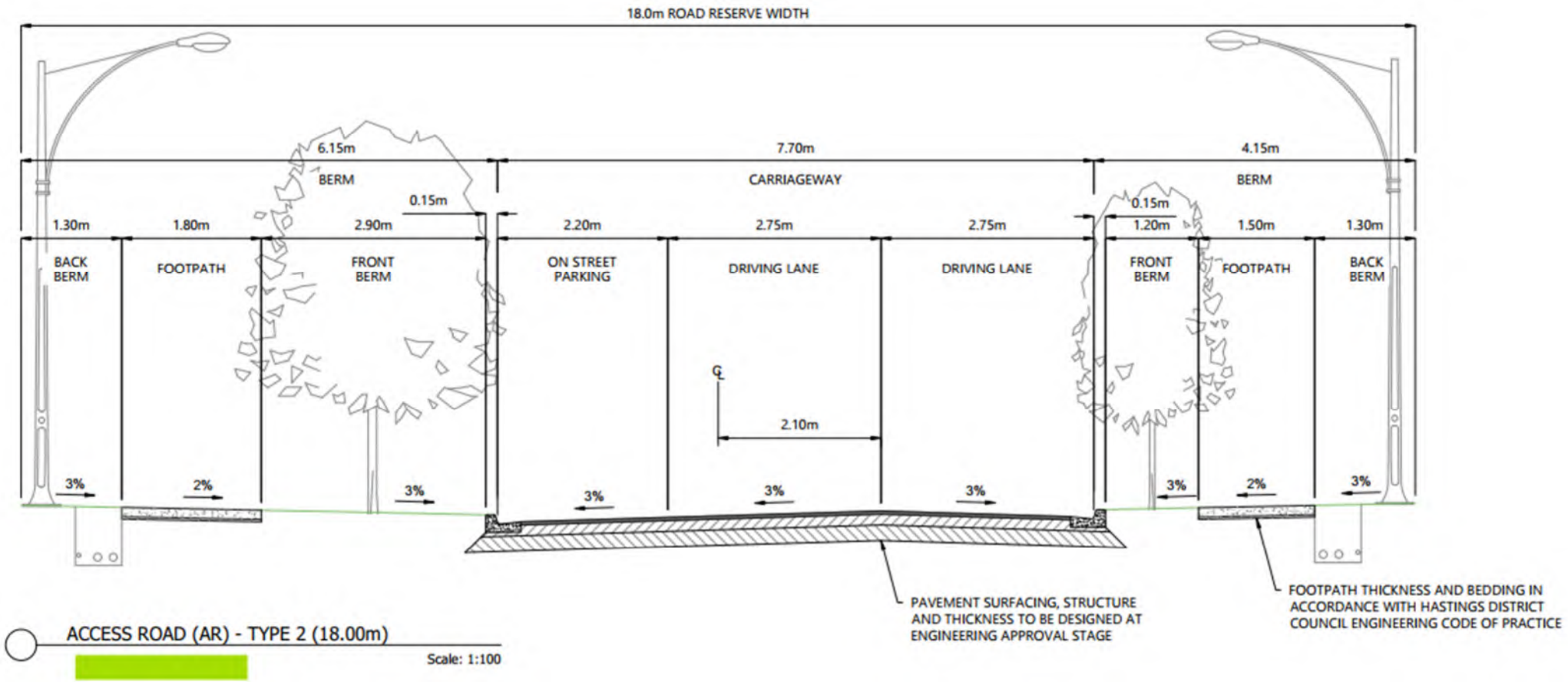
8.5.2 Type 2 Access Road

The cross-section of the Type 2 access road is shown in Figure 22 and will have the following features:

- 7.7 m carriageway width providing for two-way moment with 2.45 m and 2.75 m wide driving lanes
- 1.9 m on street parking lane
- 2.9 m front berm and 1.3 m back berm on its western side to allow for services
- 1.2 m front berm and 1.3 m back berm on its eastern side to allow for services
- 1.8 m footpath on both sides of the road.

Sections of Access Road AR02 and Access Road AR03 will have a road reserve width of 18 m, forming Type 2 of local access road.

Figure 22: Type 2 Access Road cross-section

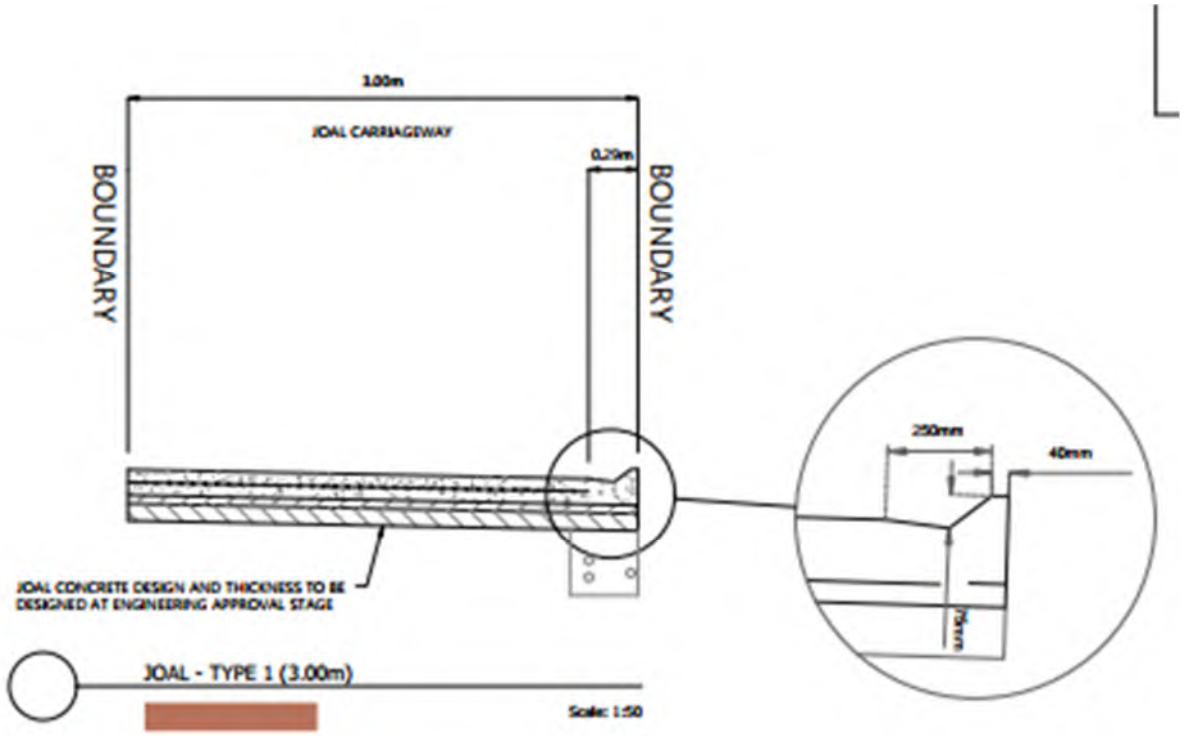


8.5.3 JOAL Type 1

The cross-section of the Type 1 JOAL is shown in Figure 23 and will have a 3.0 m legal access width providing for two-way traffic movement.

One Type 1 JOAL is proposed off Access Road AR04 and will serve lots 152 and 153.

Figure 23: Type 1 JOAL cross-section

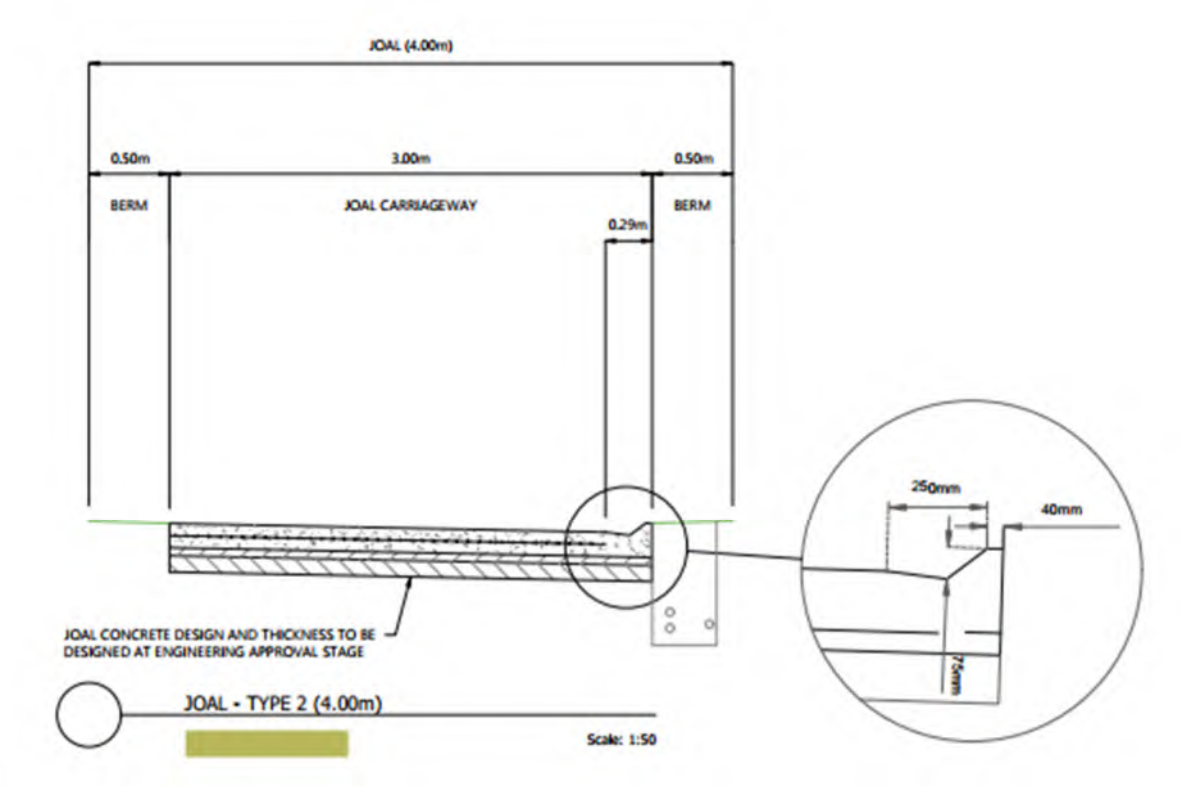


8.5.4 JOAL Type 2

The cross-section of the Type 2 JOAL is shown in Figure 24 and will have a 4.0 m legal access width, providing for two-way movement to be shared with pedestrians.

Two Type 2 JOALs are proposed and will serve Lots 19 and 20, and 71 and 72 respectively. These JOALS are proposed off Access Roads AR02 and AR03.

Figure 24: Type 2 JOAL cross-section



8.5.5 JOAL Type 3

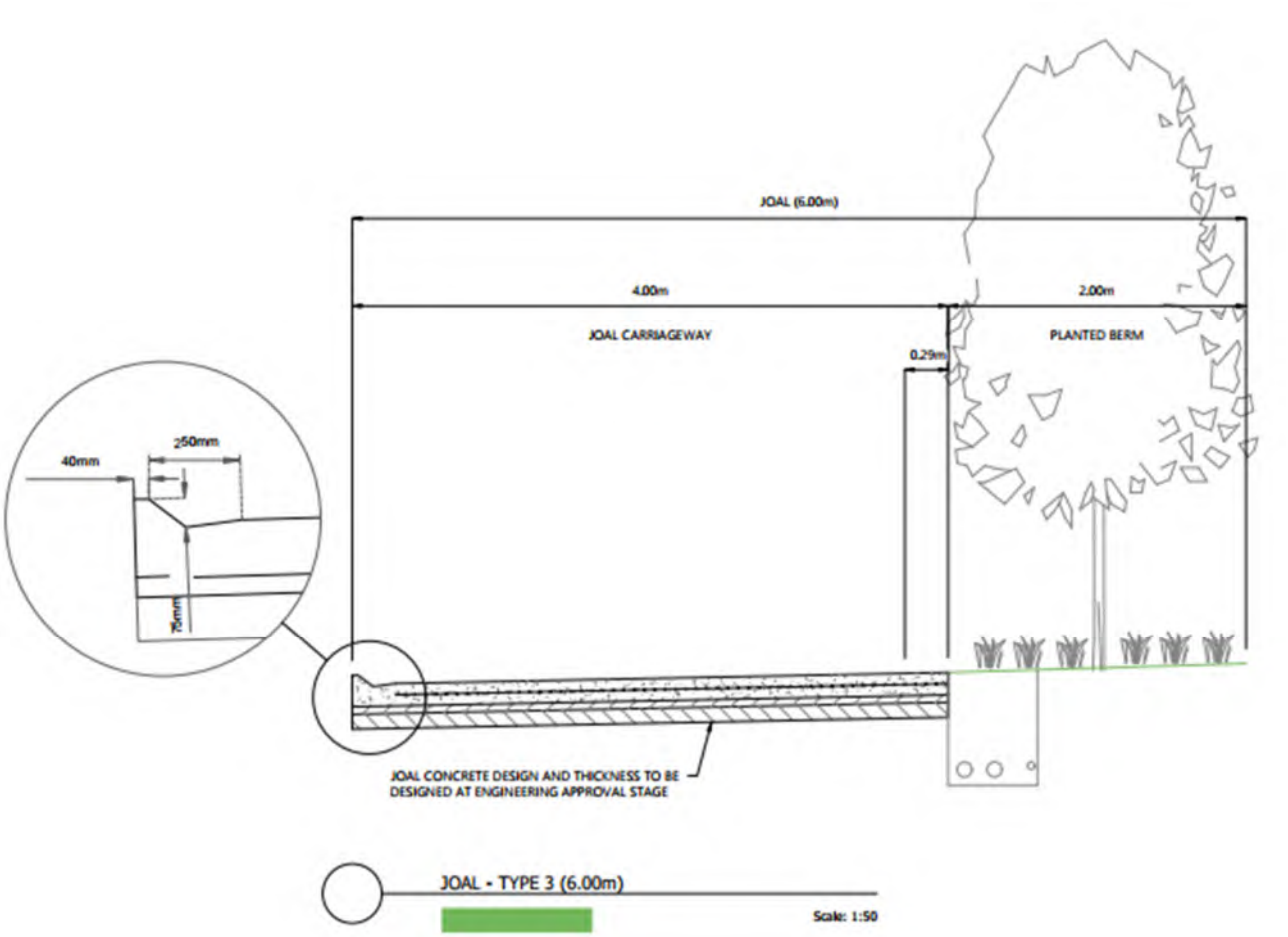
The cross-section of the Type 3 JOAL is shown in Figure 25 and will have the following features:

- 6.0 m legal access width with a 4.0 m carriageway providing for two-way movement
- A 10 m wide accessway is proposed along the Type 3 JOALs, providing a 1.8 m footpath and landscaping amenities.

Three type 3 JOALs are proposed on the Site.

- The first (LOT 2000) will have access off Access Road AR01 and serve Lots 121 and 122
- The second (LOT 2002 and 2003) will link Access Road AR01 and Access Road AR02 and serve lots 125 to 128.
- The third (LOT 2004 and 2005) will link Access Road AR02 and Access Road AR03 and serve lots 140 to 143.

Figure 25: Type 3 JOAL cross-section



8.5.6 JOAL Type 4

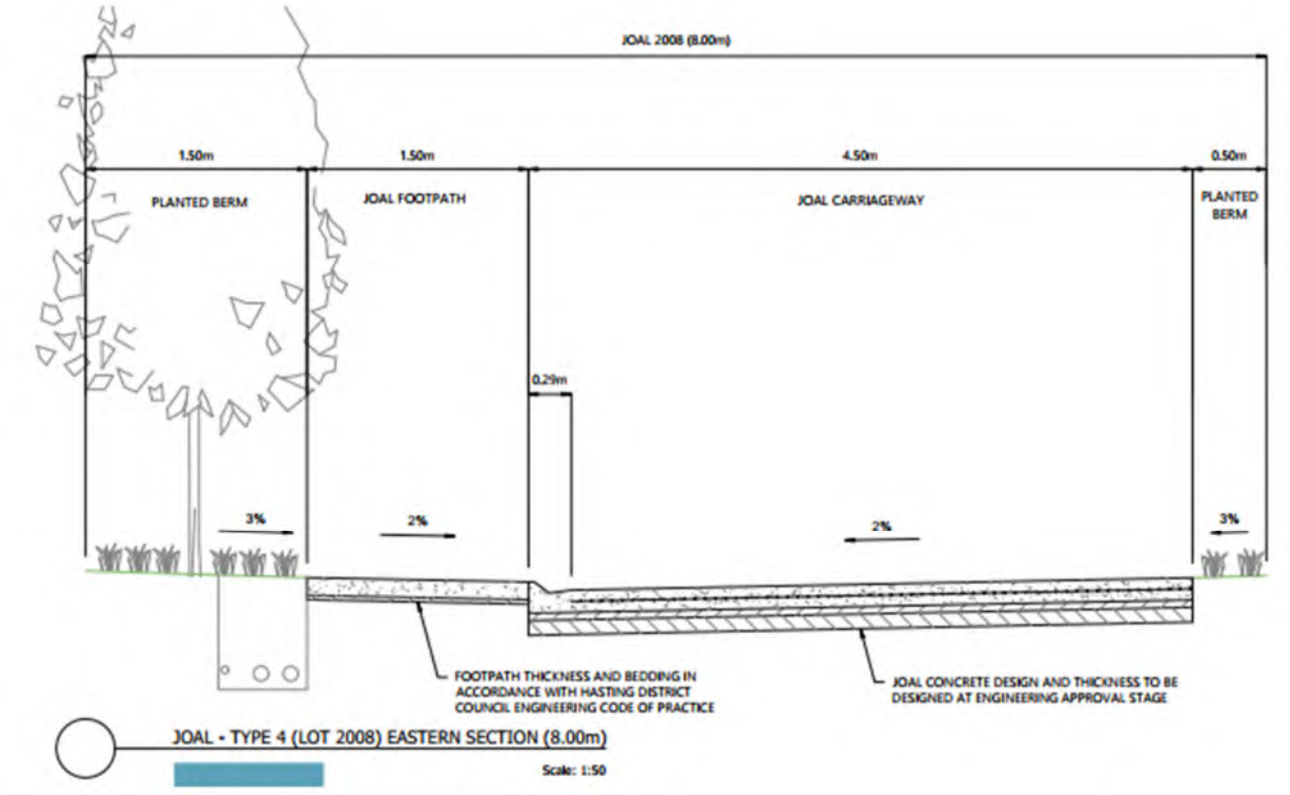
The cross-section of the Type 4 JOAL is shown in Figure 26 and will have the following features

- occupy Lot 2008
- a minimum 8 m legal access width at entry, widening to a 25.36 m width at its centre
- 5.5 m carriageway width providing for two-way movement
- a 1.5 m footpath connecting to Arataki Road in the east-west direction
- 1 m back berm
- central landscaping island with vehicle turnaround around its circumference

JOAL type 4 is proposed to have vehicle access from Access Road AR02. The western end of the proposed JOAL will have pedestrian-only access from Arataki Road.

It will serve Lots 34 to 37, 40, and 42 to 45.

Figure 26: Type 4 JOAL cross-section



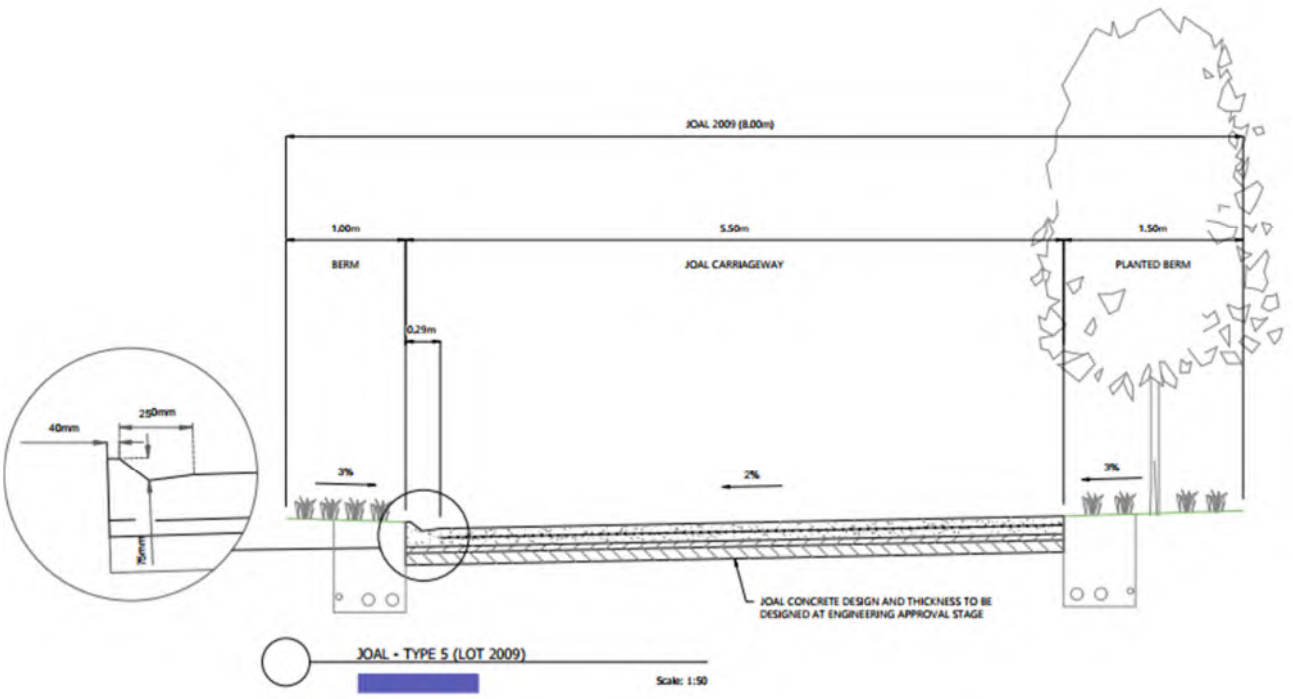
8.5.7 JOAL Type 5

The cross-section of the Type 5 JOAL is shown in Figure 27 and will have the following features:

- occupy Lot 2009
- an 8 m legal access width
- 5.5 m carriageway width providing for two-way movement to be shared with pedestrians
- 1.25 m back berms on both sides
- five 90-degree car parking spaces on its northern end.

JOAL type 5 is proposed to have two vehicle accesses from Access Road AR04, providing a north-south connection. It provides access to Lots 103, 104 and 109 to 115.

Figure 27: Type 5 JOAL cross-section



8.5.8 Internal traffic calming measures

A variety of traffic calming measures will be used throughout the Site to manage speeds and deliver a slow-speed environment. The location and type of these treatments are shown in Figure 28. These include

- flush surface treatments through a change in materiality at the new intersections with the new access roads
- flush surface treatments at mid-block sections throughout the new road network, including at L-shaped bends
- kerb buildouts at the new intersections and some mid-block crossing points, providing safe opportunity to cross the new roads as well as Arataki Road
- corners in the new roads
- a new road network layout that provides multiple short length roads and limits long straight sections of roads

These measures will help to manage speeds throughout the Site and Arataki Road and will also help to communicate the residential environment internal to the Site.

Figure 28: Proposed traffic calming (Areas with red pavement)

8.6 Intersections

As shown in Figure 29, the Arataki Project proposes 7 intersections into the Site from Arataki Road in the form of priority controlled intersections. The total length of the Site frontage to Arataki Road is about 740 m, with new intersection spacing being between about 80 m (between intersection 3 and 4) to about 140 m (between intersection 2 and 3). This intersection spacing is not uncommon for low volume local residential streets.

On street parking along Arataki Road will be restricted to allow clear sight lines from intersections.

There are no road intersections onto Brookvale Road.

Figure 29: Arataki Project location of Arataki Road intersections

Intersections 1, 3, 5 and 7 are proposed to be priority controlled intersections with kerb buildouts and surface treatment at the crossing points. This design will encourage reduced speeds entering the Site and provide a safer crossing point for pedestrians.

Intersections 2, 4 and 6 will form crossroads with the following existing intersections.

- Grooby Place/Arataki Road
- Te Heipora Place/Arataki Road
- Meissener Road/Arataki Road.

It is anticipated that in the future, Arataki Road will not be a strategic route, as it is more likely that Brookvale Road will be the main strategic route near the Site. The proposed addition of multiple intersections into the Site is expected to have less than minor effects on the wider transport network.

We have liaised with Hastings District Council and Hawke's Bay Regional Council transport representatives, where we note that the Council transport engineers are supportive of these proposed intersections. Our meeting minutes with the Councils are attached as Appendix H[9].

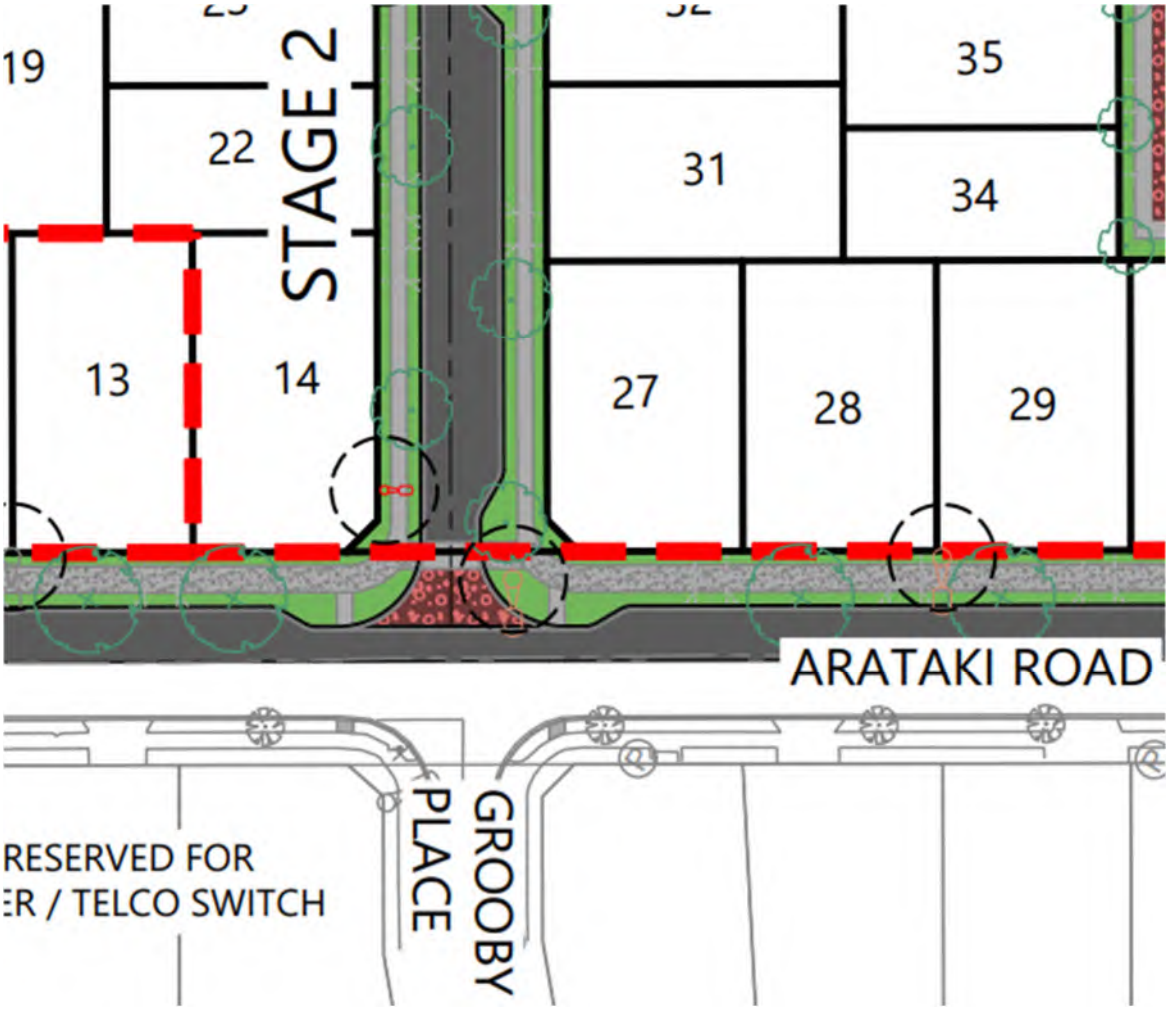
8.6.1 Grooby Place/Arataki Road/Access Road AR02 intersection

We note the following details of the proposed design of the Grooby Place/Arataki Road/Access Road AR02 intersection shown in Figure 30.

- Grooby Place is a low-volume cul-de-sac
- A design speed of 50 km/hr has been used
- A priority-controlled intersection is proposed
- Adequate sightlines of about 97 m for safe intersection sight distance (SISD) to the intersection are provided, as shown in the sight distance plans provided by Woods. The existing horizontal geometry of the roads does not impede the sight distance.

[9] Meeting held 13 February 2025

Figure 30: Proposed layout of the Grooby Place/Arataki Road/ Access Road AR02 intersection

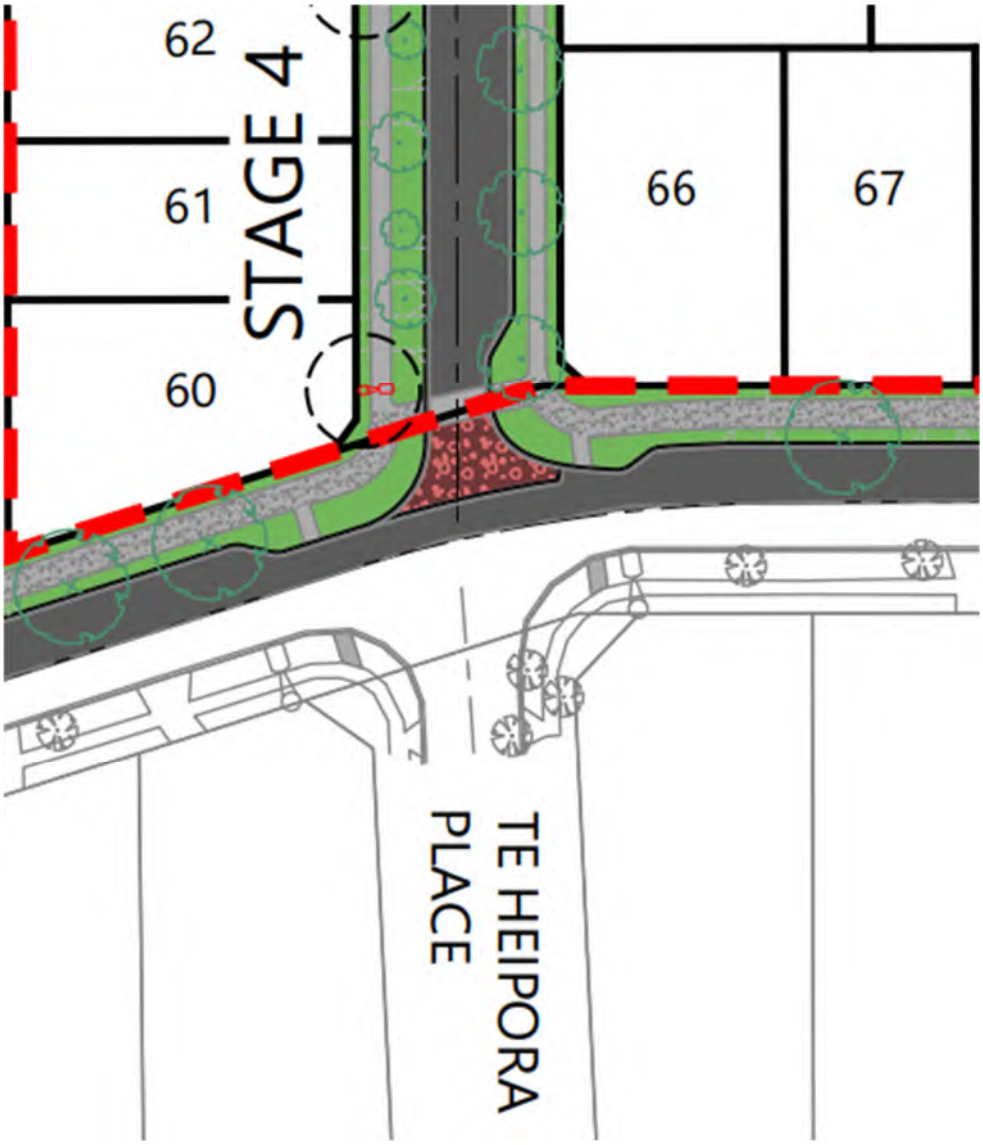


8.6.2 Te Heipora Place/Arataki Road/Access Road AR03 intersection

We note the following details of the proposed design of the Te Heipora Place/Arataki Road/Access Road AR03 intersection, as shown in Figure 31.

- Te Heipora Place is a low-volume cul-de-sac
- A design speed of 50 km/hr has been used
- A priority-controlled intersection is proposed
- Adequate sightlines of about 97 m for safe intersection sight distance (SISD) to the intersection are provided, as shown in the sight distance plans provided by Woods.
- The existing horizontal geometry of the roads does not impede the sight distance.

Figure 31: Proposed layout of the Te Heipora Place/Arataki Road/Access Road AR03 intersection

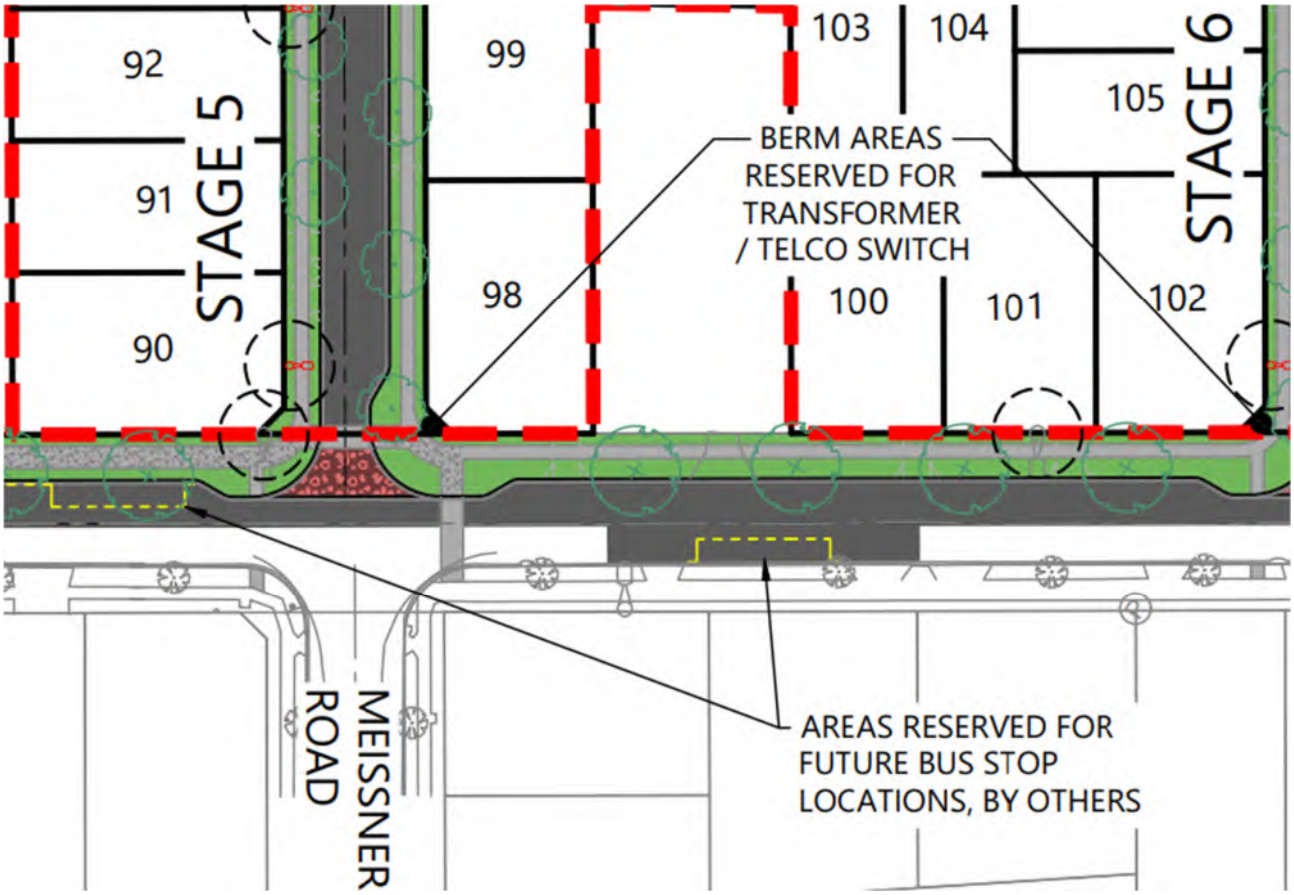


8.6.3 Meissener Road/Arataki Road/Access Road AR04 intersection

We note the following details of the proposed design of the Meissener Road/Arataki Road/Access Road AR04 intersection, as shown in Figure 32.

- Meissener Road is a local access road
- A design speed of 50 km/hr has been used
- A priority-controlled intersection is proposed
- Adequate sightlines of about 97 m for safe intersection sight distance (SISD) to the intersection are provided as shown in the sight distance plans provided by Woods
- The sight distance is not impeded by the existing horizontal geometry of the roads
- On street parking will be restricted to allow clear sight lines from the intersection.

Figure 32: Proposed layout of Meissener Road/Arataki Road/Access Road AR04 intersection



8.7 Lot vehicle access assessment

The Arataki Project provides indicative vehicle access locations along each of the proposed roads. It is proposed that each lot has a single vehicle crossing.

8.7.1 Vehicle crossing widths

The District Plan requirements for residential zoning vehicle crossing widths are

- for vehicle crossings serving 1 to 2 household units, the District Plan specifies a minimum and maximum width of 3.0 m and 4.4 m at the boundary
- for vehicle crossings serving 4 to 6 household units, the District Plan specifies a minimum and maximum width of 4.5 m and 4.8 m at the boundary
- for vehicle crossings serving 7 and more household units, the District Plan specifies a minimum and maximum width of 6.0 m and 9.0 m at the boundary.

The design of the proposed vehicle crossings comply with these District Plan requirements.

- Vehicle crossings serving individual lots are 3.0 m wide
- Vehicle crossings serving 7 or more units have a minimum width of 6.0 m.

8.7.2 Vehicle crossing locations

The District Plan requirements for the location of vehicle crossings in a residential zone are

- the distance of a vehicle access to any property will be a minimum of 15.0 m or the extent of the property boundary from any Access Road intersection
- where there are 2 adjacent accesses, vehicle crossings will be offset from the legal property boundary by 1.5 m.
- vehicle access to any property will not be located within 30 m of an intersection of a State Highway

Most vehicle crossings comply with these District Plan standards. However, the following vehicle crossings are located less than 15.0 m from an intersection. Although each crossing has been located at the end of their respective proposed property boundaries to maximise the distance to the intersection, they still do not meet the requirements. The distance between the vehicle crossing and the adjacent intersection is given in brackets.

- Lot 4 (12.5 m[10])
- Lot 11 (12.9 m)
- Lot 27 (14 m)
- Lot 54 (11 m)
- Lot 60 (8.4 m)
- Lot 90 (13.8 m)
- Lot 98 (14.4 m).

We consider the proposed separation distances to be appropriate for the following reasons

- The vehicle crossings in question are low-volume and serve only a single lot each
- Operating speeds within the residential development are expected to be low, and this low-speed environment is supported by traffic calming measures such as intersection surface treatments
- As outlined in Section 8.7.3, all vehicle crossings will achieve adequate sight distances
- As discussed in Section 8.6, all proposed intersections will also achieve adequate sight distances
- The traffic volumes expected at the affected intersections are low, particularly as development-related trips will be dispersed across multiple local roads.

8.7.3 Vehicle crossing visibility

Most of the vehicle crossings are located on a straight section of road/JOAL where there will be no obstructions to sight lines. Some vehicle crossings are located near the inside of tight horizontal curves, which may restrict visibility.

- We note that vehicle access and intersections have been located to ensure that safe sightline distances are maintained

[10] The distance between the vehicle crossing and intersections

- For vehicle accesses, we have assessed visibility against the RTS6 guidelines
- Proposed intersections have been evaluated with SISD, as described in the sections above.

We consider that all vehicle crossings will be provided with sufficient visibility.

8.7.4 JOAL gradients

The District Plan specifies a maximum sealed vehicle access of 1:5 (20%) for both rural and urban zoning. The Arataki Project will comply with this requirement.

8.8 Parking and servicing assessment

8.8.1 Number of car parking spaces

The District Plan specifies no minimum or maximum parking rate for residential activities within the applicable zone.

- Future dwellings will have their garages and/or outdoor parking spaces within their properties that can accommodate parking.
- As per the proposed cross sections for the new access roads, on street parking is proposed along one side of the road
- On street parking will be restricted in some areas to ensure clear sightlines are achieved.

8.8.2 Car parking space dimensions and manoeuvring

Parking is compliant with the District Plan dimensions.

- Parking spaces for residential activities in any Residential zone have the minimum internal dimensions of 3.0 m (width) by 5.0 m (length).
- All parking spaces and access and manoeuvring areas, including ramps, will be of sufficient size and suitable layout to accommodate a passenger vehicle" as defined in the "Austroads Design Vehicles and Turning Path Templates Guide"[11]

Vehicle tracking of the proposed parking spaces is provided in Appendix I.

8.8.3 Bicycle parking requirements and assessment

The District Plan requires the following minimum bicycle parking where on-site parking is required.

- 1 bicycle stand per 5 spaces that are required

It is considered that all future dwellings are likely to have garages that could accommodate bicycle parking on-site.

End-of-trip facilities are not required as the development is for detached residential dwellings.

[11] AP-G34-13, Austroads, 2013

8.8.4 Servicing and loading assessment

The Arataki Project proposes residential activities, and the District Plan does not require any loading spaces for residential activities.

Notwithstanding this, we note the following.

- The collection of waste and residents moving in and out are activities that can be accommodated through the proposed local road network as well as through JOALs
- Trucks and vehicles needing to turn around can do so via minimal reverse manoeuvring and using the public road network and JOALs, which mostly do not require reversing
- The typical truck used by waste collection services is an 8 m rigid truck. The largest truck would be an 8.0 m large rigid truck
- Tracking of an 8.0 m truck through all the relevant areas of the proposed development is shown in Appendix I. This demonstrates that this sized truck can access all the dwellings for loading and servicing and turn around as needed.

As per the specific performance standards and terms in the District Plan, the following is required in residential zones,

- a 5 m long Vehicle Standing Bay shall be located within the Vehicle Access to all garages and carports and notional garage spaces.

Compliant vehicle standing bays will be provided within the lots to ensure all loading and unloading will be carried out within the property without obstructing footpaths and road reserves. A condition will be applied for future lot developers to comply with the District Plan standards.

8.8.5 Fire and emergency access assessment

While not a matter outlined in the District Plan, throughout consultation with Council, it was highlighted that we should consider fire and emergency access through the proposed cul-de-sac as well as the JOAL that does not provide a through traffic function.

We have considered the tracking of a pumping appliance (an 8.0 m truck) as shown in Appendix I. This demonstrates that this sized truck can turn within the JOAL and cul-de-sac area as needed.

8.9 Pedestrian and cyclist access and connectivity

The main public pedestrian and cyclist access will be via the existing and proposed shared path and the existing and proposed footpath on Arataki Road. A series of internal paths and roadways will provide overall pedestrian and cyclist connectivity (cyclists could share the internal low speed and low-volume roads with general traffic).

The adjacent Brookvale plan change development proposes a future crossing across Brookvale Road. This will connect the Arataki Project to the additional pedestrian and cycle networks that have been proposed in the Brookvale structure plan area.

8.9.1 Internal pedestrian network

The proposed pedestrian footpath network within the Site is shown in green in Figure 33, noting that cyclists will share the internal roadways. A network of footpaths will be provided along the proposed internal roads and public accessways connecting the new shared path on Arataki Road.

- The minimum width of the paths internal to the Site is 1.5 m, which is sufficient for mobility scooter/wheelchair users
- Crossing points are provided where the paths cross the internal roads
- Kerb buildouts are provided at crossing points
- Within the Site, cyclists will share the internal low speed and low-volume roads with general traffic.

Figure 33: Arataki Project proposed pedestrian and cycle network

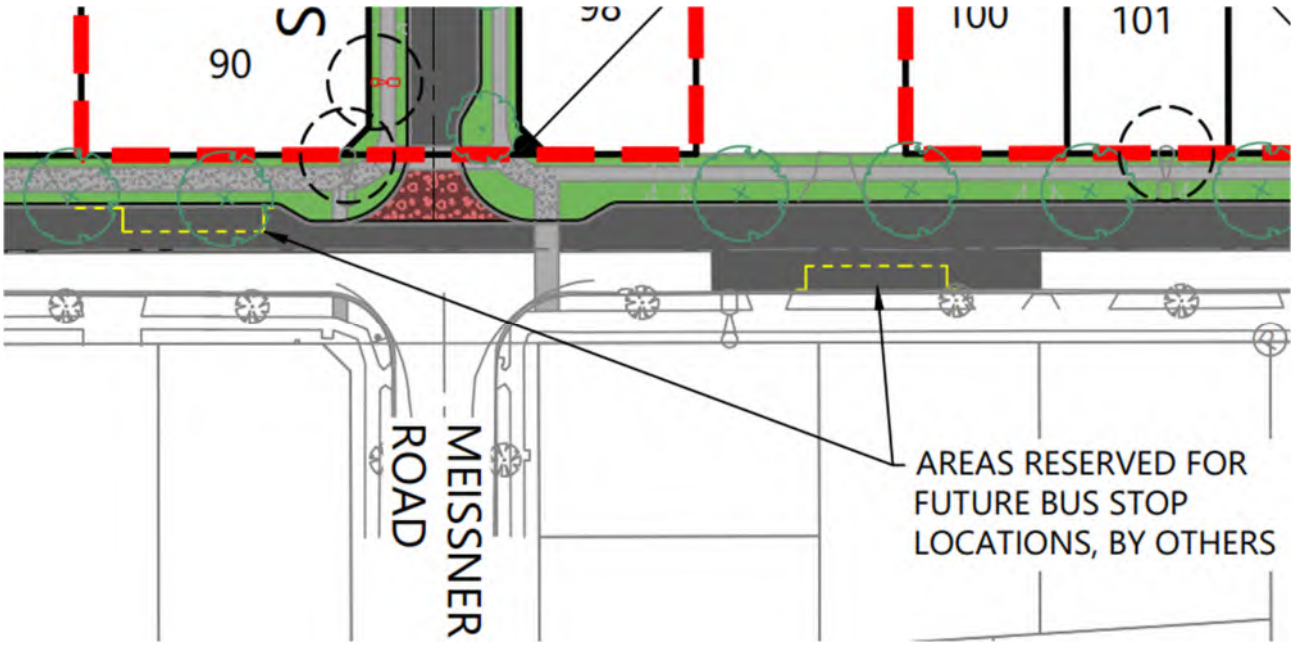
8.10 Public transport access

As mentioned above, there are currently no public transport bus stops within the immediate vicinity of the Arataki Project area, and no new or improved bus stops have been proposed as part of other developments.

An opportunity exists to provide a new bus route or an extension of the existing routes (potentially Route 21) to better serve the development and the residential areas in northeast Havelock North. This will enable users of the Arataki Project site to have closer access to public bus services.

The proposed Arataki Road upgrades and cross sections have included provisions for a bus stop outside the Site's frontage. Figure 34 presents the concept plan of the potential future bus stop positions.

Figure 34: Arataki Road proposed bus stop locations



The increased catchment of residents enabled by the Arataki Project will also support public transport by potentially increasing demand for services, which could result in services becoming more frequent in the future if additional funding becomes available and supported by Hawkes Bay Regional Council.

9 TRAFFIC ASSESSMENT

9.1 Traffic assessment methodology

We have used SIDRA intersection models to analyse the performance of key intersections in the surrounding transport network. SIDRA software enables isolated intersection modelling to understand the network capacity, predicted level of service (LOS) and anticipated queue lengths. The following key intersections were analysed.

- Romanes Drive/Brookvale Road/Bourke Place roundabout
- Arataki Road/Brookvale Road intersection
- Arataki Road/Te Mata Road roundabout.

We have provided an assessment of 4 traffic volume scenarios, which include

- **Base**: Existing traffic volume based on the surveyed data
- **Scenario 1**: Base plus the Brookvale Plan Change traffic
- **Scenario 2**: Scenario 1 plus Arataki Project traffic
- **Scenario 3 (highest traffic)**: Scenario 2, with the base traffic volumes increased by 2 % per annum for 5 years (2030).

We have also reviewed the proposed intersections along Arataki Road. Given that each intersection has a relatively small residential catchment area, we have not assessed each intersection's capacity and considered that these intersections will operate efficiently as priority controlled intersections.

9.1.1 Trip generation enabled by the Arataki Project

The peak hour vehicle trip rate was derived from the New South Wales Roads and Maritime Services Guide to Traffic Generating Developments (RMS guide, previously the RTA[12]).

The peak hour vehicle trip generation for the Arataki Project is summarised in Table 7.

Table 7: Trip Generation Summary of the Arataki Project – Peak hours

Activity	Size	Peak hour vehicle trip rate			Trip generation (vph)		
		Morning	Evening	Daily	Morning	Evening	Daily
Residential – Dwelling Houses (RTA)	171 dwellings	0.85/dwelling	0.85/dwelling	9/dwelling	146	146	1,539
Total					146	146	1,539

Overall, the Arataki Project is predicted to generate a total of 146 trips during both the morning and evening peak hours.

[12] Road and Traffic Authority of New South Wales (RTA), *Guide to Traffic Generating Developments, Version 2.2*

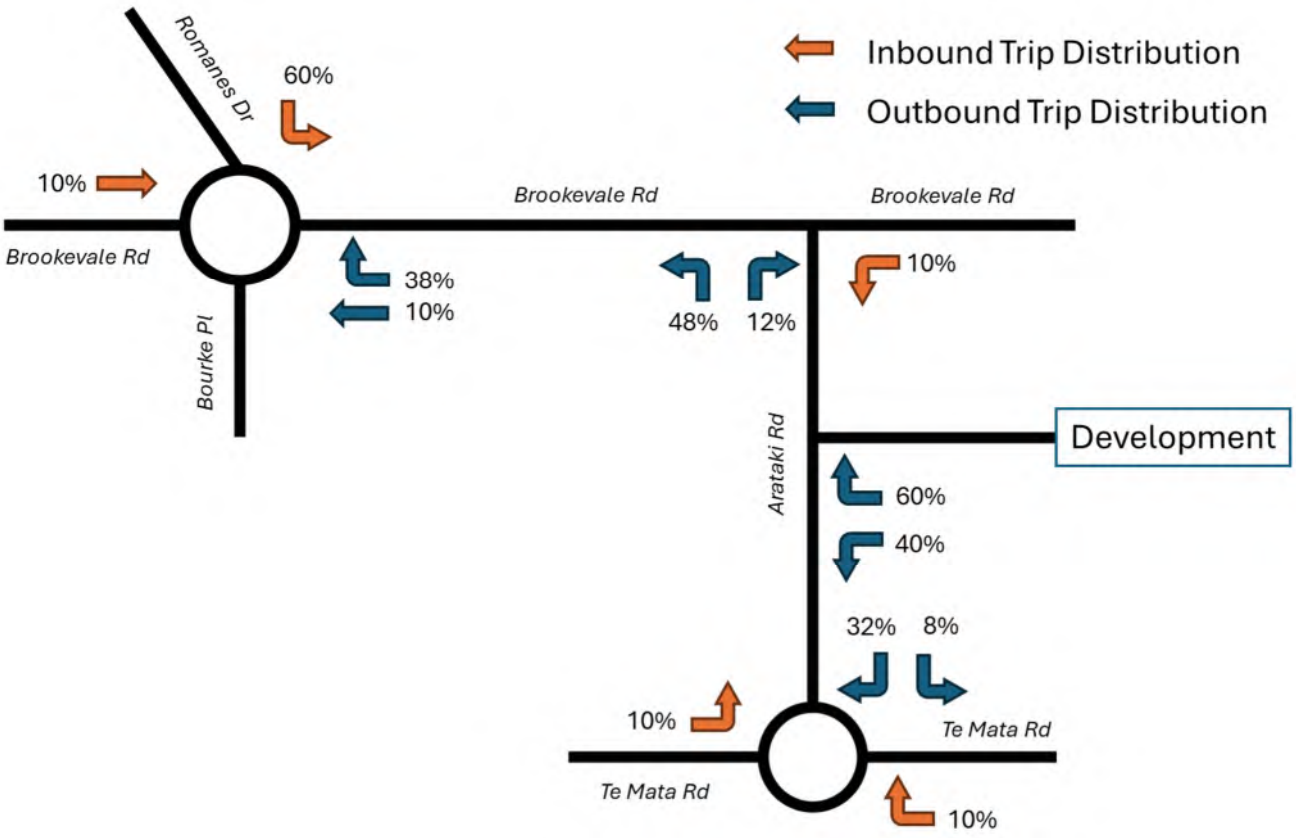
9.1.2 Trip distribution and assignment

We have applied peak period trip distribution ratios derived from the ITE Parking Generation Manual[13]. Based on the ITE trip generation for residential Single-Family Detached Housing (single-family detached home on an individual lot).

- A 25% / 75% inbound outbound split for the morning peak period
- A 65% / 35% inbound outbound split for the evening peak period

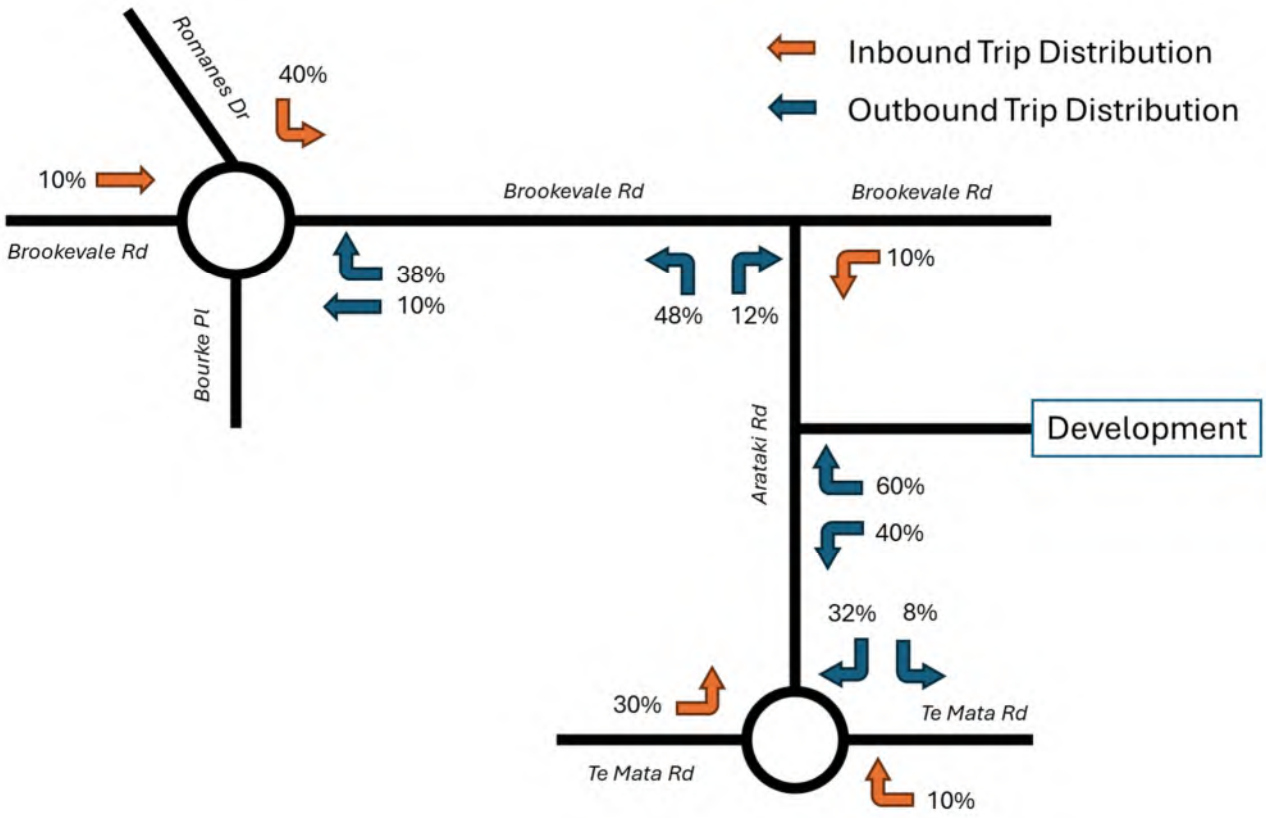
Our assumptions regarding the directional trip assignment for the morning and evening peak hours are given in Appendix F, with the resulting trips shown in Figure 35 and Figure 36.

Figure 35: Arataki Project trip distribution assumptions: Morning peak hour



[13] Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, September 2017.

Figure 36: Arataki Project trip distribution assumptions: Evening peak hour



9.1.3 SIDRA results

A summary of the SIDRA analysis for the 4 scenarios of the existing key intersections is outlined in Table 8 and Table 9 below, with the detailed SIDRA outputs shown in Appendix G.

Table 8: SIDRA summary for morning peak

Intersection	Approach	Base			Scenario 1			Scenario 2			Scenario 3		
		Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS
Romanes Drive/ Brookvale Road/ Bourke Place roundabout	Bourke Pl	7.5	0	A	9.0	1	A	9.5	0	A	10.0	1	B
	Brookvale Rd E	6.5	17	A	7.5	27	A	7.5	31	A	7.5	36	A
	Romanes Dr	5.5	9	A	5.0	12	A	5.0	13	A	5.0	14	A
	Brookvale Rd W	4.5	10	A	6.0	13	A	6.0	14	A	6.5	17	A
Arataki Road/Brookvale Road intersection	Arataki Rd	5.0	1	A	5.0	1	A	5.0	3	A	5.0	3	A
	Brookvale Rd E	0	0	A	1.0	0	A	1.0	0	A	1.0	0	A
	Brookvale Rd W	0	1	A	2.0	1	A	3.0	2	A	2.5	2	A
Arataki Road/Te Mata Road roundabout	Te Mata Rd E	4.0	11	A	4.0	11	A	4.0	12	A	4.0	14	A
	Arataki Rd	7.0	4	A	7.0	4	A	7.0	6	A	7.0	7	A
	Te Mata Rd W	3.0	11	A	3.0	11	A	3.0	11	A	3.0	13	A

Table 9: SIDRA summary for evening peak

Intersection	Approach	Base			Scenario 1			Scenario 2			Scenario 3		
		Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS	Average Delay (sec)	95th% queue (m)	LOS
Romanes Drive/ Brookvale Road/ Bourke Place roundabout	Bourke Pl	5.0	0	A	6.0	0	A	6.0	0	A	6.0	0	A
	Brookvale Rd E	6.5	6	A	7.0	13	A	7.0	14	A	7.0	15	A
	Romanes Dr	5.0	9	A	4.5	14	A	4.5	16	A	4.5	18	A
	Brookvale Rd W	3.5	7	A	4.5	9	A	4.5	10	A	5.0	11	A
Arataki Road/Brookvale Road intersection	Arataki Rd	5.0	1	A	5.0	1	A	5.0	2	A	5.0	2	A
	Brookvale Rd E	1.5	0	A	1.0	0	A	2.0	0	A	2.0	0	A
	Brookvale Rd W	3.0	2	A	2.0	2	A	3.0	3	A	3.0	3	A
Arataki Road/Te Mata Road roundabout	Te Mata Rd E	3.5	8	A	3.5	8	A	3.5	8	A	4.0	9	A
	Arataki Rd	7.0	4	A	7.0	4	A	7.0	4	A	7.0	5	A
	Te Mata Rd W	3.0	10	A	3.0	10	A	3.0	10	A	3.0	12	A

The results indicate the following.

- All approaches for all 3 intersections operate well at a Level of Service (LOS) A and remain at LOS A for all approaches besides Bourke Place during the morning peak, which drops to a LOS B and an average delay of 10 seconds
- The longest 95th percentile queue is predicted to be 36 m at the Brookvale East approach at the Romanes Drive/ Brookvale Road, Bourke Place roundabout, for the highest traffic scenario. This does not reach any adjacent intersections
- Average delay time does not change significantly for most approaches and movements at the intersections, and only increases by up to 2 to 3 seconds for the 3 scenarios
- The entire network is significantly under capacity, with all 3 intersections able to easily accommodate additional traffic.

The results indicate that there are no operational issues with the key intersections. We consider that the trip generation associated with the Arataki Project will not have any noticeable effect on the wider transportation network.

9.2 Traffic effects summary

The Arataki Project is predicted to generate a total of 146 trips during both the morning and evening peak hours. The peak hour traffic generation is anticipated to have no noticeable effect on the wider transportation network.

Overall, the predicted traffic level can be easily accommodated by the surrounding road network and is considered negligible, given the network's capacity.

10 TRANSPORT SAFETY ASSESSMENT

The Arataki Project will not generate any adverse safety effects on the surrounding road network.

- There is no evidence of any existing crash trends, and the low volume of additional vehicle traffic will not create any new issues
- The proposed intersections and vehicle crossings have been designed to have adequate visibility and will carry low volumes of traffic
- The proposed intersections will have surface treatments and localised narrowing to convey the low speed and residential nature of the Arataki Project
- Within the Arataki Project area, the proposed roads will provide a low-speed, low-volume traffic environment that supports safe and comfortable movement for residents and visitors
- The proposed gateway treatment on Brookvale Road will help to reduce vehicle speeds into the urban environment
- The urbanisation of the full width of Arataki Road will further convey the low speed and residential nature of the Arataki Project
- Footpaths are proposed to be separated from the roads with a front berm, and there is connectivity throughout the Arataki Project area to the proposed Arataki Road shared path.
- Our SIDRA intersection assessment indicates that the key intersections surrounding the Arataki Project will continue to operate efficiently. The trip generation associated with the Arataki Project is not expected to have any noticeable effect on the wider transportation network.

11 CONSULTATION

We have consulted with transport representatives from the local Councils[14] during this project, with consultation expected to continue as the development of the Arataki Project and initial stages are developed.

11.1 Key discussion points

We have summarised the key topics raised in these meetings to date and how the Arataki Project addresses these topics. A copy of the meeting minutes from the meeting held on 13 February 2025 is included in Appendix H.

11.1.1 Arataki Road/ Brookvale Road intersection

- We noted that the proposed design would seek to improve visibility back down into the kerb. Treatment around the existing property could include kerb and channelling on the development side of the road to emphasise the urban environment. There would be some form of gateway treatment required.
- Council representatives agreed that kerb and channel would be necessary to show the urban environment.

11.1.2 Road cross sections

- It was noted that it is important for the Arataki Project to have some sort of redundancy with services provided for in the cross sections. There will be properties with services needing maintenance and some houses with frontages to the street. The key matter with the provision of a back berm is to ensure roads are still operatable when there is servicing and maintenance work required for services
- It was also noted that footpaths on both sides are important.

11.1.3 Development Intersection placement and design layout

- The Council representatives were supportive of the proposed layout of the Arataki Project and its proposed intersections with Arataki Road
- It was noted that in the future, Brookvale Road will end up being the main strategic route, and Arataki Road will be secondary. It is unlikely that there will be concerns with the additional intersections.

11.1.4 Shared path

- It was noted that front fence controls could be applied with no closed fences and low fences to ensure visibility from vehicle crossings to users on the shared path. A back berm width should also be provided for safety to ensure that the safety and intervisibility of path users have been considered.

[14] Hastings District Council and Hawkes Bay Regional Council

11.1.5 Traffic calming

- It was noted that the traffic calming measures proposed in the Arataki Project should be horizontal traffic calming rather than vertical. This could include creating buildouts to reduce road widths, providing changes of materiality at intersections and providing kinks in straight alignments. Flush treatments are effective and help users identify a change of activity.

11.1.6 Public transport

Council representatives noted that there is a public transport plan for Havelock North that is currently in the works and will go out to consultation this year (2025).

- The main trunk route will start at the Havelock bell tower, and there will be two routes extending from it. There is the possibility of one routing down Arataki Road and maybe looping through Brookvale Road. Arataki Road would be a prime road to take a bus down, and this proposed bus route would be bidirectional rather than a loop
- It was noted that the Arataki Project should account for future bus stops along the Arataki Road frontage to accommodate these future services. It was noted that on street parking areas and landscaping should be future-proofed for future public transport infrastructure. The provision of future public transport infrastructure would depend on the demand and the catchment that it will service.

11.1.7 Rubbish collection

It was noted that the current rubbish collection vehicles in the area are 8 m trucks. These public rubbish collections would only service JOALs if a previous agreement and amenity had been provided by landowners.

11.2 Key discussion points

A further consultation meeting was held on 6 May 2025. Although transport matters were limited in the discussion, it was highlighted that we should consider fire and emergency vehicles in the design.

11.2.1 Fire and emergency access

It was noted that we should consider fire and emergency access at the turning head location, and the JOAL.

11.2.2 Ministry of Education (MoE)

MoE requested consideration of pedestrian connections to nearby schools in the transport assessment, with a focus on prioritising safe pedestrian access.

They also noted a preference for construction traffic to avoid school areas during pick-up and drop-off times, and for safe walking and cycling routes to be maintained throughout construction.

11.3 Outcome of consultation

All key transport-related matters raised during consultation have been considered. These have informed the Residential Design Framework, consent conditions, and the design of internal road networks within the Arataki Project.

12 ASSESSMENT OF CONSTRUCTION EFFECTS

The effects of construction traffic on the environment will need to be managed to ensure that, from a transport point of view, the surrounding road network operates safely for all modes of travel. A detailed Construction Traffic Management Plan (CTMP) will be prepared closer to the commencement of construction.

A CTMP will address the following key elements.

- A description of the construction site and a programme and scope of the works.
- Routes to be used by construction traffic to access and egress the site and the adoption of any measures on these routes to ensure a safe environment for all road users, including existing residents and pedestrians, to ensure that the surrounding road network will continue to operate efficiently.
- The amount of construction traffic expected during each phase of construction
- Access for construction vehicles onto the road network from the site and measures to be adopted at these access points to ensure a safe traffic environment for other road users, especially pedestrians.
- Parking for contractor vehicles on the development site and its effects on the transport network are minimised.

We propose the implementation of the CTMP be a condition of consent for the development.

Overall, it is anticipated that the effects of construction traffic will be safely managed through the preparation and adherence to a comprehensive CTMP.

13 PROPOSED MITIGATION MEASURES & CONDITIONS OF CONSENT

We recommend that the following matters be considered when drafting conditions of consent to address transport-related effects. These are not the wording of the conditions themselves, but rather a summary of the key matters that the conditions should address.

13.1 Developer conditions

13.1.1 Construction Traffic Management Plan (CTMP)

The condition should require the preparation of a detailed Construction Traffic Management Plan (CTMP) by a suitably qualified person, in consultation with Hastings District Council. The CTMP should be submitted for Council certification prior to construction commencing. The CTMP should address the following matters

- Management of the transport network to minimise congestion and delays during construction
- Public communication about traffic management throughout the construction period
- Safe passage of pedestrians and cyclists, including school children
- Minimise construction traffic during school drop-off and pick-up times, including avoidance of routes past schools during these periods
- Maintenance of pedestrian access to private property at all times
- Retention of vehicle access to private property wherever practicable
- Management of traffic effects from construction yards on adjacent properties
- Avoidance of construction traffic (particularly heavy vehicles) using Meissener Road
- Timing of construction traffic movements to avoid school drop-off and pick-up periods
- Identification of any road closures, detours or traffic restrictions required and their duration
- Management of construction material and equipment deliveries, including site-specific Traffic Management Plans (TMPs)
- Provision for safe, clearly identified pedestrian and cyclist access adjacent to works, with attention to minimising detours, particularly for mobility-impaired users
- Monitoring measures to track traffic impacts and adjust traffic management as needed to address safety or operational issue
- Site access arrangements, particularly where two-way traffic is not feasible, to minimise reversing and road blockage
- Availability of contractor parking, including on-street/off-street assessment and measures to reduce demand on public parking
- Maintenance of public refuse collection services for all affected properties.

The CTMP should also:

- be consistent with the New Zealand guide to temporary traffic management (NZGTTM) (or any equivalent documentation that supersedes this at the time of construction)

- include measures to ensure any damage to the road corridor caused by construction traffic is promptly repaired within an agreed timeframe.

13.1.2 Avoidance of Damage to Public Assets

The condition should clarify that no damage to public roads, footpaths, berms, kerbs, drains, reserves, or other public assets is permitted unless specifically authorised. Any damage that does occur must be reported to Council within 24 hours and promptly repaired at the consent holder's expense.

13.1.3 Fencing height along Arataki Road

The condition should specify that any boundary fencing along Arataki Road should be to ensure intervisibility between pedestrians and vehicles.

13.1.4 On-site parking provision

On-site vehicle standing bays of 5 m to be provided in front of garage spaces.

13.1.5 Consent Notices

On Lots 19, 20, 71, 72, 121, 152 a requirement that on-site vehicle manoeuvring is undertaken that enables forward entry and forward exit movements onto the accessways to avoid extended reverse manoeuvres onto the public roads.

13.2 Adopted Residential Design Framework

Mandatory Design Standards apply to all proposed lots, integrating the Havelock North General Residential Zone (HNREZ), Medium Density Residential Standards (MDRS), and site-specific rules. These standards are designed to manage increased density, address rural-urban interface considerations, and ensure high-quality, visually cohesive neighbourhoods. They focus on maintaining streetscape amenity, safety, and efficient access. For transportation, mainly the existing HDC rules are adopted.

13.2.1 The general transport standards

The general transport standards purpose is to ensure safe, efficient, and well-integrated vehicle access and parking while minimising impacts on pedestrian safety and the public realm. These general transport standards are summarised below

13.2.1.1 Access

- One vehicle crossing per site
- Access to be from the lower order road where multiple frontages exist
- Safe access required from road edge to lot boundary
- Legal access widths
    - 1–2 households: 3.0 to 4.8 m
    - 3 households: 3.6 to 4.8 m
    - 4–6 households: 4.5 to 4.8 m

- 7+ households: 6.0 m

- Maximum crossing gradient: 20 %
- Minimum formed lane width: 2.75m (excluding shoulders).

13.2.1.2 Vehicle Access Distance from Intersections

- Minimum 15 m from an Access Road intersection (or to the site boundary, whichever is less).
- Adjacent accesses to be offset 1.5m from side boundaries.

13.2.1.3 Parking

- No minimum or maximum parking requirements
- Minimum parking space size: 3.0 m (width) by5.0 m (length.

14 CONCLUSION

Based on the analysis described in this report, we conclude that the Arataki Project will deliver a development and activities that can operate safely and efficiently from a transportation perspective. We conclude that the transport effects of this Fast Track application are appropriate. In particular,

- the proposed new road intersections will operate well, and the 7 new intersections will not have any adverse safety or operational effects
- within the development area, there is appropriate traffic calming and the new road cross sections encourage a low speed, local road environment
- the design of roads promotes a low-speed, pedestrian and cycle-friendly environment with strategic use of changes in materiality at intersections, kerb buildouts and staggered on-street parking to calm traffic. Pedestrian and cycle connectivity is well integrated, with footpaths and road crossings throughout the site and strong connections to the shared path network beyond Arataki Road
- the proposed car parking and vehicle access design is compliant with District Plan requirements and is anticipated to operate well
- the proposed application aligns with local and national policies
- the additional peak hour traffic volumes generated by the Arataki Project are low and can be accommodated on the surrounding road network which is currently operating well below capacity
- the transport design aspects of the Arataki Project will function safely and efficiently and any infringements with the transport design requirements of the District Plan will be very minor in nature
- The Residential Design Framework includes the proposed transportation / design standards for future buildings on the site which ensures appropriate transport design outcomes
- There are no existing road safety concerns on the roads surrounding the Arataki Project, and we anticipate that the Arataki Project will not create any new road safety issues.

Additionally, we note that the construction traffic likely to be generated can be adequately managed by a Construction Traffic Management Plan. This will include the implementation of mitigation measures to minimise the effects of heavy vehicles on existing residents and road users in the area.

We conclude that the Arataki Project results in negligible effects relating to the function, capacity, and safety of the surrounding transport network.

APPENDIX A District Plan assessment tables

PART 2 – DISTRICT-WIDE MATTERS - TRANSPORT ASSESSMENT

Transport Standards

26.1.6 GENERAL PERFORMANCE STANDARDS AND TERMS	Assessment
26.1.6A Access	
1. Access to Property	
a) Every owner or occupier shall provide a legal, safe and effective vehicular access to any activity undertaken on a site, and required parking or loading areas from an existing, formed legal road, to enable vehicles to enter the site, except where the site has Designated Retail Frontage (see Appendix 30) or where the site is within the Flaxmere Commercial Zone. b) There shall be a maximum of one vehicle crossing per property within the Residential Zone. Where a property is bordered by 2 or more the vehicle access to the property shall be from the lower category road. The category of the road will be determined by its Road Hierarchy status in Appendix 69 or traffic volumes when hierarchy status is equal c) The minimum legal widths for private access are contained in Table 26.1.6.1-1 below. Private access to properties shall allow the safe passage from the edge of the road to the legal boundary of the lot for a single site or household unit. For two or more sites or household units or for any Right of Way, formation of the access to the activity undertaken on the site is required in compliance with Table 26.1.6.1-1. d) A property access which crosses the rail network does not constitute legal access. Sites which adjoin the railway line or designation shall provide an alternative access to a legal road which does not require a crossing of the railway line or designation. For a locality serviced 4-6 households, • Target operating speed of 10km/hr • Minimum Legal Access Width – 4.5m • Maximum width of vehicle crossing – 4.8m • Max grade – 20% • Pedestrian – Shared (in movement lane) • Passing parking, loading, and shoulder – Allow for passing every 50m • Cyclists - Shared (in movement lane) • Minimum formed movement lane – 2.75m	**Complies** The proposed accesses to properties are compliant with the standards. Vehicle crossings serving individual lots are 3 m wide. Vehicle crossings serving 7 or more units have a minimum width of 6 m. There shall be a maximum of one vehicle crossing per property within the Residential Zone
2. Distance of Vehicle Accesses from Road Intersections	
a) Residential, Industrial and Commercial Zones The distance that a vehicle access to any property may be sited from any Access Road intersection as defined in the Roading Hierarchy in Appendix 69, shall be a minimum of 15m or the extent of the property boundary whichever is the least. Where there are two adjacent accesses, vehicle crossings shall be offset from the legal property boundary (side boundary) by 1.5 metres. Vehicle access to any property shall not be sited within 30 metres of an intersection of a State Highway. Note: Vehicle access in relation to Collector or Arterial Road intersections as defined in the Roading Hierarchy in Appendix 69 shall be subject to Road Safety Audit as deemed necessary by the Road Controlling Authority. b) Rural Residential, Rural, Plains Production and Special Character Zones Vehicle access to any property shall be sited a minimum of 100 meters from an intersection of a State Highway.	**Does not comply** The vehicle crossings for Lots 4 (12.5 m), 11 (12.9 m), 27 (14 m), 54 (11 m), 60 (8.4 m), 90 (13.8 m) and 98 (14.4 m) are located within 15 m of intersections. However, these crossings are proposed at the end of their respective proposed property boundaries. Where there are two adjacent accesses, vehicle crossings are offset from the legal property boundary (side boundary) by more than 1.5 metres.

26.1.6B SAFE SIGHTLINE DISTANCES	
1. Intersections shall be located to ensure that Safe Sightline Distances are maintained. Note: For vehicle accesses fronting an Access, Collector or Arterial Route (as defined in the Roading Hierarchy in Appendix 69) compliance with Austroads Standards is deemed an acceptable means of compliance. For vehicle accesses and intersections fronting a State Highway, compliance with the NZ Transport Agency's standards for entrance/access ways is deemed an acceptable means of compliance. 2. All existing and new accesses that cross the rail network via a level crossing must be maintained in accordance with the sight triangles provided in Appendix 78 (Railway Level Crossing Sight Triangles and Explanations) with the exception that existing buildings associated with existing accesses will not have to meet the sight triangles.	**Complies** Intersections have been assessed to ensure that Safe Intersection Sight Distance is provided. These are compliant and have been provided in the Woods Civil Drawings set.
26.1.6C LOADING	
1) All Activities except Residential Activities a. Provision of Loading Spaces (i) Every owner or occupier who proposes to construct or substantially alter, reconstruct or add to a building on any site, or change the activity carried out on the site shall provide a Loading Space. The Loading Space shall provide for the suitable or efficient accommodation of any loading or fuelling of vehicles which are likely to arise from the use of any building or activity carried out on the site, except where a service lane is designated or provided, or where the site has Designated Retail Frontage (see Appendix 30). Separate Loading Spaces shall be provided for each occupier of the site if there are more than one. The Loading Space shall be additional to the parking required in {Link,19762,Table 26.1.6.1-4}. (ii) Every Loading Space, together with access, shall be designed so that it is not necessary to reverse vehicles either on to or off the street. The Loading Space shall not be stacked or located within vehicle manoeuvring areas. (iii) The provision of a Loading Space in respect of any site may be made as part of the side and/or rear yard space, but not as part of the front yard space of that site. (iv) The method of loading shall ensure that the footpath or access to adjacent properties shall remain clear at all times and ensure traffic safety is maintained on the roads. b. Design of Loading Spaces The design of Loading Spaces and the layout adopted will depend on the area and shape of the land available, the purpose for which loading is required, and the functional design of the building. The layout shall be of sufficient size to accommodate the following design vehicles: (i) Activities requiring loading facilities or servicing from heavy vehicles: A "Single Unit Bus / Truck" as defined in the "Austroads Design Vehicles and Turning Path Templates Guide" AP-G34-13, Austroads, 2013 - refer to Appendix 72 for the dimensions of this vehicle. (ii) Where articulated vehicles or trucks and trailers are anticipated: A "Prime Mover and Semi-Trailer" as defined in the "Austroads Design Vehicles and Turning Path Templates Guide" AP-G34-13, Austroads, 2013 - refer to Appendix 72 for the dimensions of this vehicle. (iii) The following minimum dimensions are provided as a means of compliance: Warehouses, Transport depots, bulk stores and similar must have a minimum length of 20 metres and a minimum width of 3 metres. Retail activities, offices, manufacturing premises and similar must have a minimum length of 8.5 metres and a minimum width of 3 metres. Non-residential activities such as day care centres and similar must have a minimum length of 5.5 metres and a minimum width of 3 metres.	**Complies** No loading space is required as residential activities are proposed. There are no loading spaces proposed.

<table>
<tr><th>26.1.6D PARKING</th><th></th></tr>
<tr><td>

1. Provision of On-Site Parking

The District Plan no longer contains provisions that require on-site vehicle parking, with exception to those included in the general and specific performance standards of this section of the Plan.

Note: For guidance on the number of parking spaces for activities, refer to the Hastings Parking Guide

2. Parking Spaces for People with Disabilities

a) A minimum of accessible car parking spaces shall be provided according table below:

<table>
<tr><th>Total Number of Car Parks</th><th>Number of Accessible Spaces</th></tr>
<tr><td>1-20</td><td>Not less than 1</td></tr>
<tr><td>21-51</td><td>Not less than 2</td></tr>
<tr><td>For every additional 50 car park spaces</td><td>Not less than 1</td></tr>
</table>

3. Design and Construction of Parking Areas

(a) Vehicle Dimensions

All parking spaces and access and manoeuvring areas, including ramps shall be of a sufficient size and suitable layout to accommodate a passenger vehicle" as defined in the "Austroads Design Vehicles and Turning Path Templates Guide" AP-G34-13, Austroads, 2013 - refer to Appendix 72 for the dimensions of this vehicle.

(b) Parking Spaces for Residential Activities

Parking spaces for Residential Activities in any Residential zone shall have a minimum internal dimension of 3.0 m (width) by 5.0 m (length).

(c) General Design and Construction Details

All public and required parking areas, and any outdoor display areas (such as car, caravan or boat sales yards) shall comply with the following general requirements:

(i) Parking areas in any Commercial or Industrial Zone shall be formed and sealed with an all-weather surface.

(ii) Parking areas shall be designed and constructed to ensure that stormwater runoff from the parking area does not adversely affect adjoining properties.

(iii) Parking areas, together with access and turning space, shall be designed to ensure that vehicles negotiate the parking area at a safe speed and are not required to reverse either on to or off a street, provided that this requirement shall not apply in any Residential Zone where a single accessway serves not more than two residential buildings. Vehicles using the parking area shall only enter or leave the site by the accessway.

(iv) Where a public or non-residential parking area is within or adjoins a Residential Zone, a 1.8 metre high, fully enclosed screen shall be erected or a landscape strip of a minimum width of 5 metres adjoining the boundary or the Residential Zone shall be provided. These requirements may be reduced or waived with the consent of the adjoining neighbour.

(v) A reservoir space shall be provided within public carparks to prevent vehicles queuing on the street.

(vi) Provision shall be made for the illumination of access drives and pedestrian areas within public carparks. Such illumination is to be directed away from adjoining residentially zoned sites.

(vii) Non-residential parking spaces required to be sealed by standard 26.1.6.D.5(c)(i) shall be marked out and where there is a separate requirement for staff parking such spaces shall be clearly identified.

</td><td>

Complies

The proposed parking spaces are compliant with the required minimum dimensions. Vehicle tracking for these carparks are provided in the Appendix H.

</td></tr>
<tr><th>26.1.7A ACCESS</th><th></th></tr>
</table>

1. Vehicle Standing Bay (a) Residential Zones In all Residential Zones, a 5 metre long Vehicle Standing Bay shall be located within the Vehicle Access to all garages and carports and notional garage spaces.	**Will Comply** We consider that future dwellings will provide the required vehicle standing bays
26.1.7B INFRASTRUCTURE TO SUPPORT ALTERNATIVE TRANSPORT MODES	
1. **Bicycle Spaces** Where on-site car parking is required provision shall also be made for purpose built bicycle stands on site. These shall be provided at a rate of 1 bicycle stand per 5 carpark spaces that are required except for supermarket where the ratio shall be 1 bicycle stand per 20 carpark spaces that are required. The bicycle stands shall meet the following requirements: (a) They shall be securely attached to a wall or the ground and shall support the bicycle frame. (b) Each cycle stand shall be adequately spaced to allow a cyclist to manoeuvre and attach a bicycle to the stand. (c) They shall allow the bicycle to be secured. (d) They shall be visible and signposted. 2. **Bicycle End of Journey Facilities** Commercial or Industrial Activities which employ more than 15 FTE staff members shall provide one male and one female shower and changing facilities for staff to encourage the use of alternative transport modes. 3. **Exemptions** Renewable Energy Generation Activities are exempt from the provisions of standard 26.1.7B	**Will Comply** Bike Parking will be provided within lots.

Assessment Criteria – Restricted Discretionary and Discretionary Activities

26.1.8 ASSESSMENT CRITERIA - RESTRICTED DISCRETIONARY AND DISCRETIONARY ACTIVITIES	
26.1.8A GENERAL	**Assessment**
26.1.8B ACTIVITIES WHICH DO NOT COMPLY WITH THE SETBACK DISTANCE FROM INTERSECTION STANDARD 26.1.6A.2	
a) Whether the dimensions of the site or the location of buildings or other physical features of land or buildings preclude a reasonable compliance with the minimum standard for distance from the road intersection. b) The current and expected traffic volume of the street which the property fronts, and whether the proposed location of the vehicle access and the expected traffic generated from the activities on the property will have no significant effect on the safety or efficient operation of the road intersection over and above that which is permitted. Note: A Design Safety Audit and Intersection Performance Assessment undertaken by a suitably qualified Transport Engineer may be required to ascertain the effects of the proposal on the safety and efficiency of the intersection.	a) These crossings are proposed at the end of their respective proposed property boundaries. b) The traffic volumes on the adjacent roads are expected to be low. Each vehicle crossing will only serve one residential lot, as such, volume and frequency of vehicle crossing use is very low. The intersections with Arataki Road has been designed with traffic calming in mind, as such, operating speeds are expected to be low. We expected the proposed intersections and vehicle crossings to operate safely and effective.

APPENDIX B Relevant central and local policy guidance

Relevant central and local policy and guidance

Government Policy Statement on Land Transport

The Government Policy Statement on Land Transport 2024 (GPS 2024) sets out the Government's priorities for transport investment over the next decade, with a strong emphasis on supporting economic growth and productivity. It directs funding toward improving road maintenance and resilience, enhancing safety, and delivering value for money. GPS 2024 reintroduces the Roads of National Significance (RoNS) programme and establishes new Roads of Regional Significance (RoRS), while also committing substantial investment in public transport services and infrastructure. The statement marks a shift in emphasis from previous versions, signalling a renewed focus on core transport infrastructure and network efficiency..

https://www.transport.govt.nz/area-of-interest/strategy-and-direction/government-policy-statement-on-land-transport-2024

Brookvale Structure Plan

The Brookvale Structure Plan sets out a pattern of land uses and the supporting infrastructure network for the future development of the Brookvale area in Havelock North.

A request to rezone the land at Brookvale was made to Council as part of public submissions on the Proposed District Plan back in 2014. The Council rejected the submission at the time as the Brookvale area was not identified in the regional growth strategy (known as the Heretaunga Plains Urban Development Strategy or HPUDS) as an appropriate growth area. The Council's decision was appealed to the Environment Court in October 2015. Following the review of HPUDS in 2016, the Brookvale area was included in the 2017 revised strategy as a Greenfield Growth Area. This allowed the Council to consider this area for rezoning to replace the Arataki Extension area (which was affected by the Te Mata odour issue)

https://www.hastingsdc.govt.nz/services/district-plan/changes/brookvale-new-urban-development-area/

Hastings and Napier Future Development Strategy

Hastings District Council, Napier City Council, the Hawke's Bay Regional Council and iwi and hapū partners are jointly developing the Hastings and Napier Future Development Strategy (FDS). The FDS will guide development across existing urban areas and areas close by across the two districts over the next 30 years. The FDS study area is shown in Figure 3. The draft FDS has been developed in accordance with the NPS-UD and aims to

- achieve 'well-functioning urban environments' in Napier and Hastings' current and future urban areas.
- identify the big issues around growth, things like housing, transport, employment, cultural wellbeing, the environment, climate change and resilience.

- Show the infrastructure needed to support and service that growth, and Development constraints.

Figure 37: Hastings and Napier FDS Study Area

https://www.hastingsdc.govt.nz/hastingsnapierfuturedevelopment/

APPENDIX C Existing traffic conditions

Intersection turning movement counts

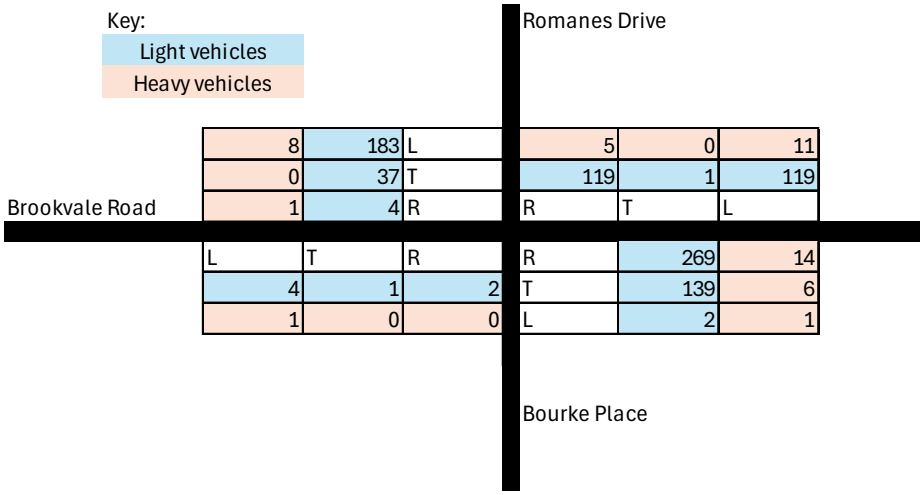
Intersection traffic surveys[15] were undertaken during both the morning and evening peak periods for the following intersections.

- Romanes Drive/ Brookvale Road, Bourke Place roundabout
- Arataki Road/Brookvale Road intersection
- Arataki Road/Te Mata Road roundabout

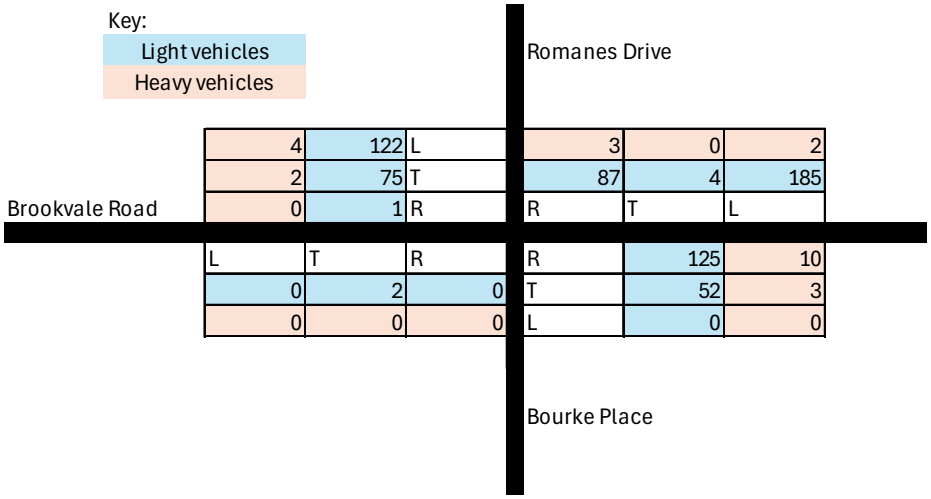
The results of these surveys are shown in the figures below

Existing volumes - Brookvale Road/Romanes Drive/Bourke Place roundabout

Morning peak hour (vph)



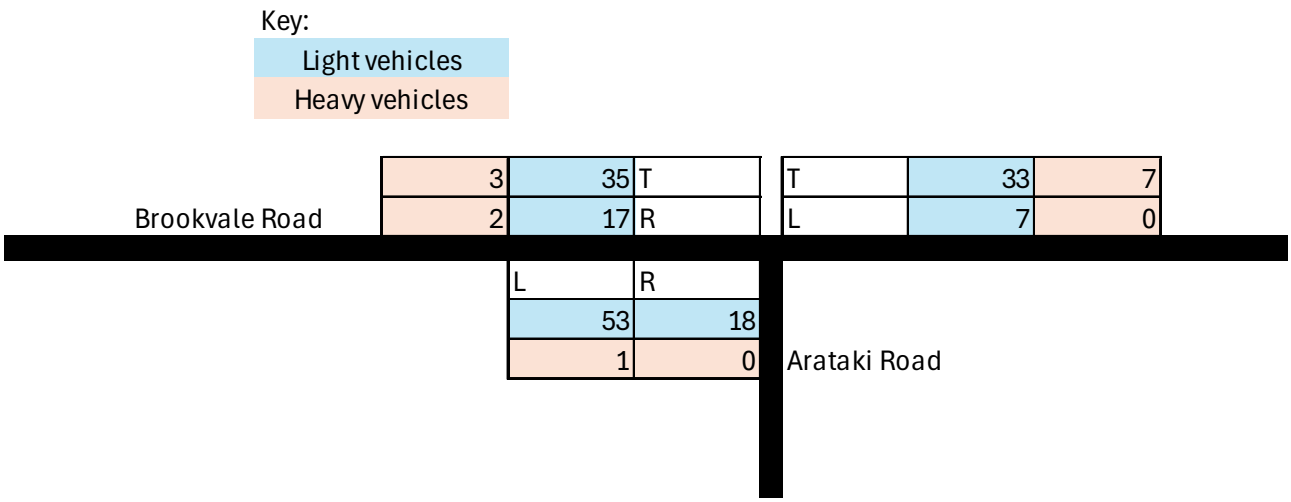
Evening hour (vph)



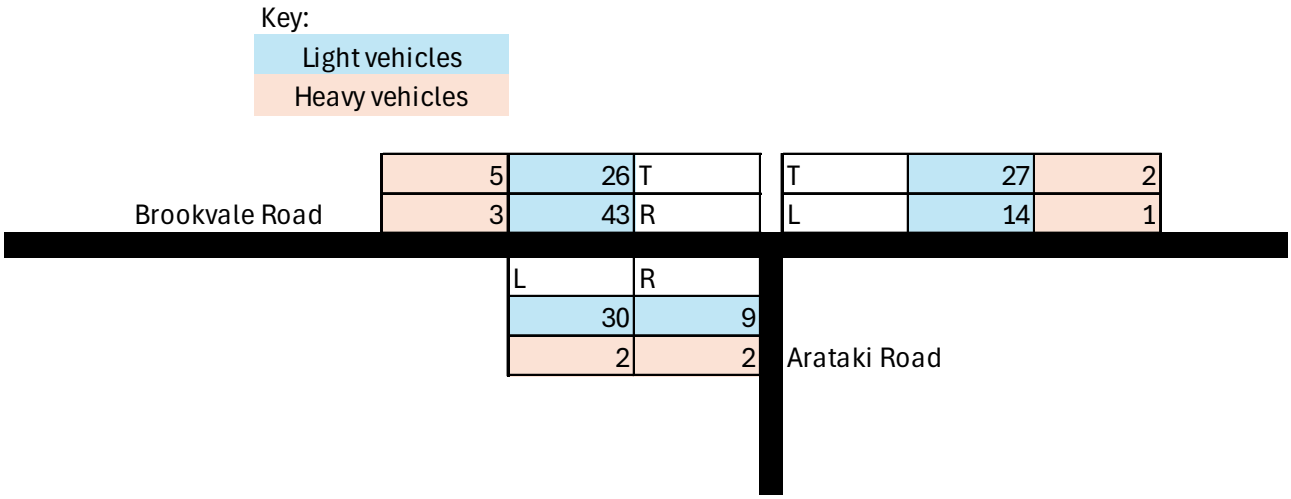
[15] As undertaken October 2024

Existing volumes - Arataki Road/Brookvale Road intersection

Morning peak hour (vph)

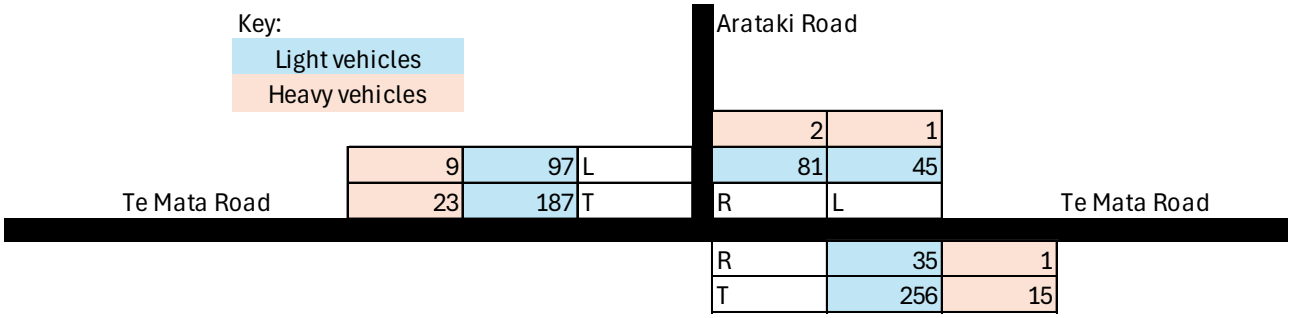


Evening peak hour (vph)

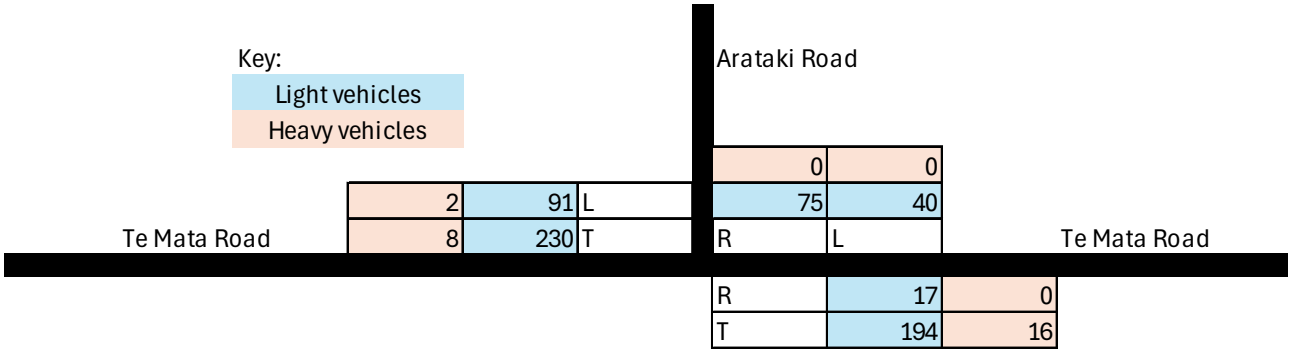


Existing volumes - Arataki Road/Te Mata Road roundabout

Morning peak hour (vph)



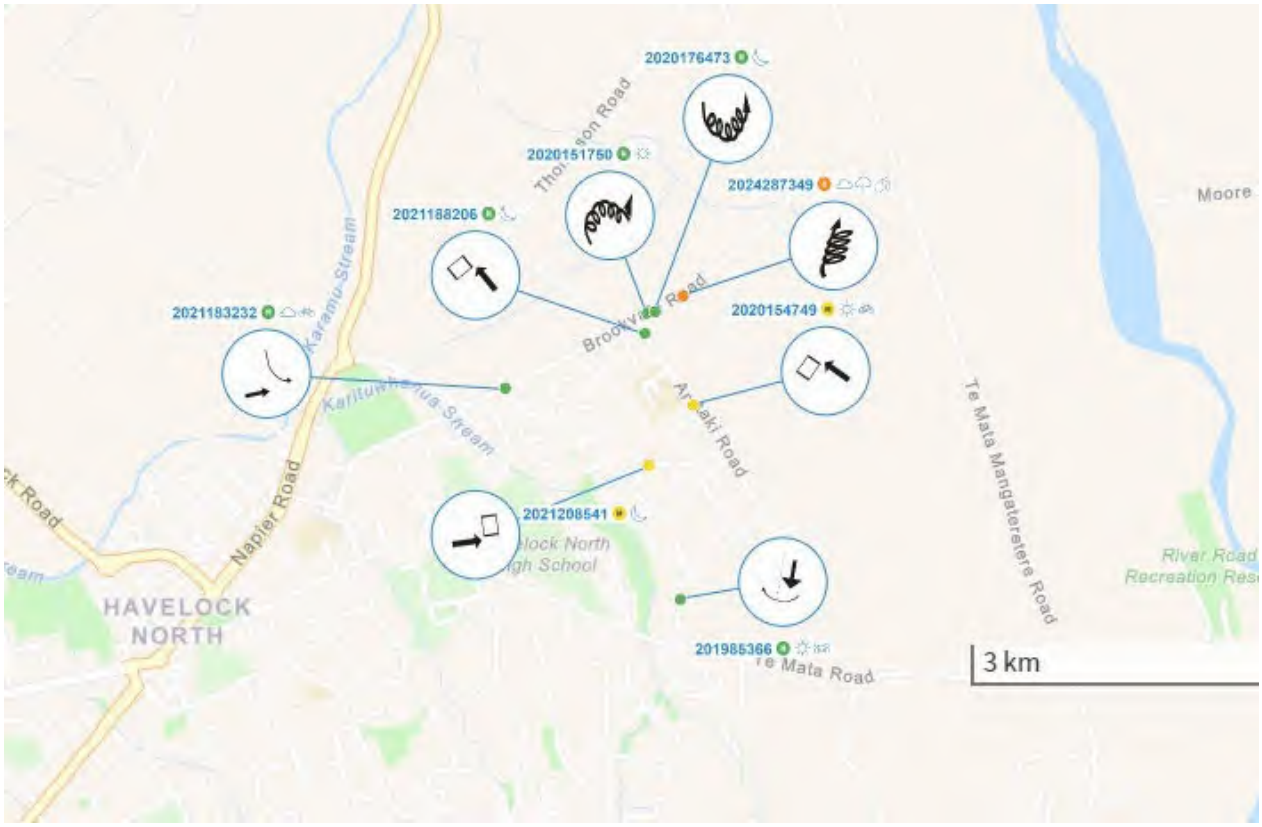
Evening peak hour (vph):



APPENDIX D Existing road safety record

The search area for the wider network is shown below and includes areas to the west of the Arataki Project site. This includes Meissner Road, the length of Arataki Road until its intersection with Te Mata Road and the extensions of Brookvale Road.

Crash search history of the wider transport network, 2018 – 2023



A total of 8 crashes were reported, summarised as follows

- There was 1 serious injury crash, 2 minor injury crashes, and 5 non-injury crashes
- There was 1 serious injury crash that occurred on Brookvale Road when a driver lost control in wet conditions, resulting in the vehicle entering the drainage ditch. There were no other parties involved. It is noted that this occurred in the 100km/hr section of Brookvale Road to the east of the Arataki Project area
- There was 1 minor injury involving a cyclist
- The most common crash types were loss of control and collision with a parked vehicle. These consist of 3 crashes for both types (38% each) of the total 8 crashes respectively.

Considering the infrequent occurrence of serious crashes and the relatively low severity of the reported crashes in this area, there are no discernible concerning crash trends. In noting this, however, the recurrence of loss of control crashes along Brookvale Road could be partially attributed to the alignment, form and high speeds of the road. This indicates an opportunity to improve road safety by upgrading Brookvale Road along the site frontage to an urban form. Road upgrades can achieve this, as are proposed for the Arataki Project and associated speed limit reductions.

APPENDIX E Concept drawings of Arataki Road

LEGEND

- PROPOSED ASPHALT PAVING
- PROPOSED BERM
- PROPOSED FOOTPATH
- PROPOSED INFORMAL PATH
- PROPOSED SHARED PATH
- PROPOSED DECORATIVE CONCRETE
- EXISTING STREETLIGHT AND 5m SEPARATION
- RELOCATED STREETLIGHT AND 5m SEPARATION
- PROPOSED STREETLIGHT AND 5m SEPARATION
- PROPOSED TREE
- EXISTING TREES TO BE RETAINED

NOTES

1. ALL WORKS & MATERIALS TO COMPLY WITH HASTINGS DISTRICT COUNCIL ENGINEERING COP STANDARDS. ANY AMBIGUITY BETWEEN THESE DRAWINGS & THE STANDARDS IS TO BE REFERRED TO THE ENGINEER FOR CLARIFICATION.
2. ALL KERB & CHANNEL / NIB TO BE SLIP-FORM, 25MPA FIBRE REINFORCED.
3. ALL SUMPS TO BE SEMI-RECESSED 800X500 WITH 1.2M LINTEL UNLESS SPECIFIED OTHERWISE.
4. FOOTPATHS TO BE CONSTRUCTED AS PER THE TYPICAL CROSS SECTIONS.
5. PRAM CROSSINGS TO BE CONSTRUCTED AS PER HASTINGS DISTRICT COUNCIL ENGINEERING COP STANDARDS.
6. VEHICLE CROSSINGS SHOWN ON THIS PLAN ARE FOR PLANNING PURPOSES ONLY & WILL NOT BE CONSTRUCTED UNLESS OTHERWISE NOTED.
7. ALL LINE MARKING & ROAD SIGNAGE IS TO BE CONSTRUCTED AS PER NEW ZEALAND TRANSPORT AGENCY MANUAL OF SIGNS & MARKINGS.
8. REFER TO LIGHTING DESIGN FOR STREETLIGHT TYPES AND DETAILS.
9. REFER TO LANDSCAPING PLAN FOR LANDSCAPING DETAILS AND TREE TYPES.

WOODS Est.1970

EXISTING 50km/hr SPEED SIGNS

PROPOSED GATEWAY TREATMENT TO BE DESIGNED IN AGREEMENT WITH HASTINGS DISTRICT COUNCIL

BROOKVALE ROAD

BROOKVALE ROAD IMPACTED BY DRAINAGE WORKS TO BE REINSTATED WITH LIKE FOR LIKE OR BETTER

REFER SHEET 2001

REFER SHEET 2002

REFER SHEET 2003

STAGE 1 STAGE 2 STAGE 3 STAGE 4 STAGE 5 STAGE 6

ROAD AR01 ROAD AR02 ROAD AR03 ROAD AR04

SHAGGY RANGE DRIVEWAY

ARATAKI ROAD

GROOBY PLACE

TE HEIPORA PLACE

MEISSNER ROAD

BERM AREAS RESERVED FOR TRANSFORMER / TELCO SWITCH

AREAS RESERVED FOR FUTURE BUS STOP LOCATIONS, BY OTHERS

SCALEBAR (m) 0 20 40 100

SCALE | 1:2000 @A3 | 1:1000 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	TB	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

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AUCKLAND 1023
+64 9 308 9229
WOODS.CO.NZ

CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD PLAN

STATUS	ISSUED FOR CONSENT
SCALE	1:2000 @ A3
COUNCIL	HASTINGS DISTRICT COUNCIL
DWG NO	P24-244-00-2000-RD
REV	2

Plot Date: 9:59:17 am,26 June 2025, TIMOTHYB

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LEGEND

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PROPOSED GATEWAY TREATMENT TO BE DESIGNED IN AGREEMENT WITH HASTINGS DISTRICT COUNCIL

BROOKVALE ROAD

BROOKVALE ROAD IMPACTED BY DRAINAGE WORKS TO BE REINSTATED WITH LIKE FOR LIKE OR BETTER

ROAD AR01

ROAD AR02

STAGE 1

STAGE 2

STAGE 3

BERM AREAS RESERVED FOR TRANSFORMER / TELCO SWITCH

ARATAKI ROAD

ARATAKI ROAD

SCALEBAR (m) 0 10 20 50

SCALE | 1:1000 @A3 | 1:500 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
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				CHECKED	BLO
				APPROVED	BF

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AUCKLAND 1023
+64 9 308 9229

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ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD PLAN - SHEET 1

STATUS	ISSUED FOR CONSENT
SCALE	1:1000 @ A3
COUNCIL	HASTINGS DISTRICT COUNCIL
DWG NO	P24-244-00-2001-RD

REV 2

Plot Date: 9:59:18 am,26 June 2025, TIMOTHYB

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WOODS Est.1970

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
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				DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

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CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD PLAN - SHEET 2

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1000 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2002-RD	

Plot Date: 9:59:19 am,26 June 2025, TIMOTHYB

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NOTES

1. ALL WORKS & MATERIALS TO COMPLY WITH HASTINGS DISTRICT COUNCIL ENGINEERING COP STANDARDS. ANY AMBIGUITY BETWEEN THESE DRAWINGS & THE STANDARDS IS TO BE REFERRED TO THE ENGINEER FOR CLARIFICATION.
2. ALL KERB & CHANNEL / NIB TO BE SLIP-FORM, 25MPA FIBRE REINFORCED.
3. ALL SUMPS TO BE SEMI-RECESSED 800X500 WITH 1.2M LINTEL UNLESS SPECIFIED OTHERWISE.
4. FOOTPATHS TO BE CONSTRUCTED AS PER THE TYPICAL CROSS SECTIONS.
5. PRAM CROSSINGS TO BE CONSTRUCTED AS PER HASTINGS DISTRICT COUNCIL ENGINEERING COP STANDARDS.
6. VEHICLE CROSSINGS SHOWN ON THIS PLAN ARE FOR PLANNING PURPOSES ONLY & WILL NOT BE CONSTRUCTED UNLESS OTHERWISE NOTED.
7. ALL LINE MARKING & ROAD SIGNAGE IS TO BE CONSTRUCTED AS PER NEW ZEALAND TRANSPORT AGENCY MANUAL OF SIGNS & MARKINGS.

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
2	ISSUED FOR CONSENT	TB	JUNE 2025	DESIGNED	AB
				DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229

WOODS.CO.NZ

CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD PLAN - SHEET 3

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:1000 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2003-RD	

WOODS Est.1970

Plot Date: 9:59:19 am,26 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2000-RD_ROAD PLAN.DWG

LEGEND

STAGE BOUNDARIES

BOUNDARIES

STREETS

ARATAKI ROAD - SECTION 1 (20.10m)

ARATAKI ROAD - SECTION 2 (20.10m)

ARATAKI ROAD - SECTION 3 (20.10m)

ACCESS ROAD (AR) - TYPE 1 (16.00m)

ACCESS ROAD (AR) - TYPE 2 (18.00m)

JOINT OWNED ACCESS LOTS (JOAL)

JOAL - TYPE 1 (3.00m)

JOAL - TYPE 2 (4.00m)

JOAL - TYPE 3 (6.00m)

JOAL - TYPE 4 (LOT 2008)

JOAL - TYPE 5 (LOT 2009)

DEDICATED PATHS

ACCESSWAY (10.0m)

INFORMAL RECREATIONAL PATH (VARIES)

WOODS
Est.1970

Plot Date: 10:03:30 am,26 June 2025, TIMOTHYB

BROOKVALE ROAD

ACCESS ROAD AR01

ACCESS ROAD AR02

ACCESS ROAD AR03

ACCESS ROAD AR04

STAGE 1

STAGE 2

STAGE 3

STAGE 4

STAGE 5

STAGE 6

ARATAKI ROAD

GROOBY PLACE

TE HEIPORA PLACE

MEISSNER ROAD

SCALEBAR (m) 0 20 40 100

SCALE | 1:2000 @A3 | 1:1000 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
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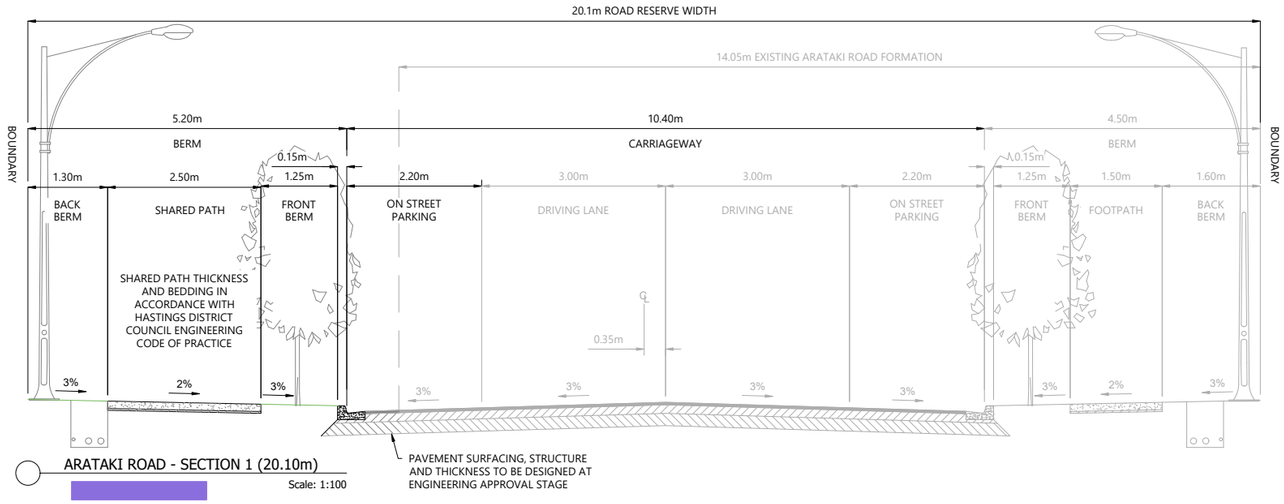
NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD TYPOLOGY PLAN

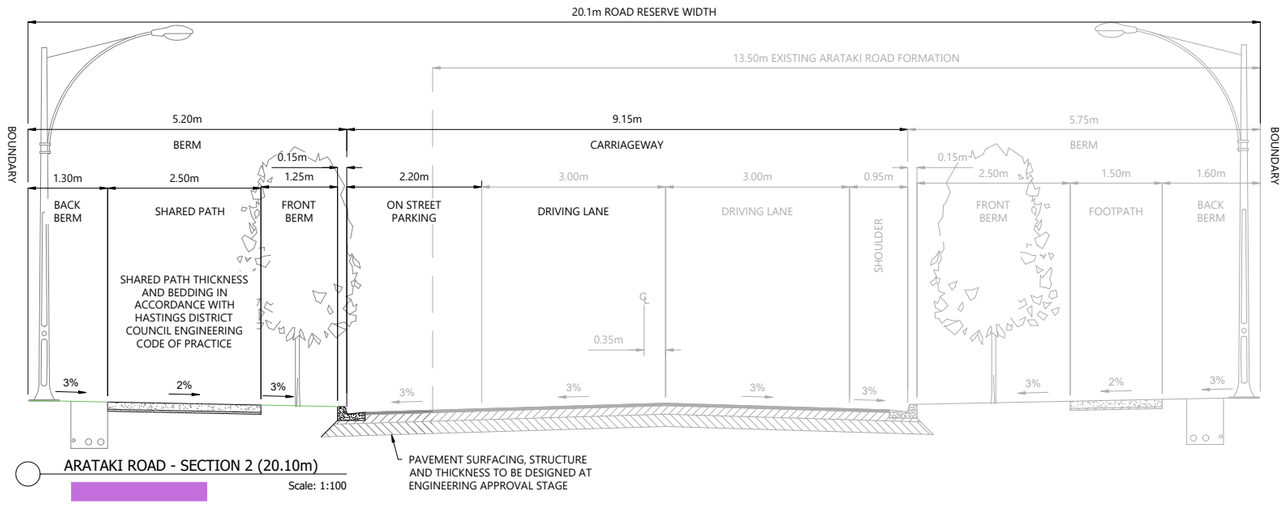
STATUS	ISSUED FOR CONSENT	REV
SCALE	1:2000 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2200-RD	

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2200-RD_ROAD TYPOLOGY PLAN.DWG



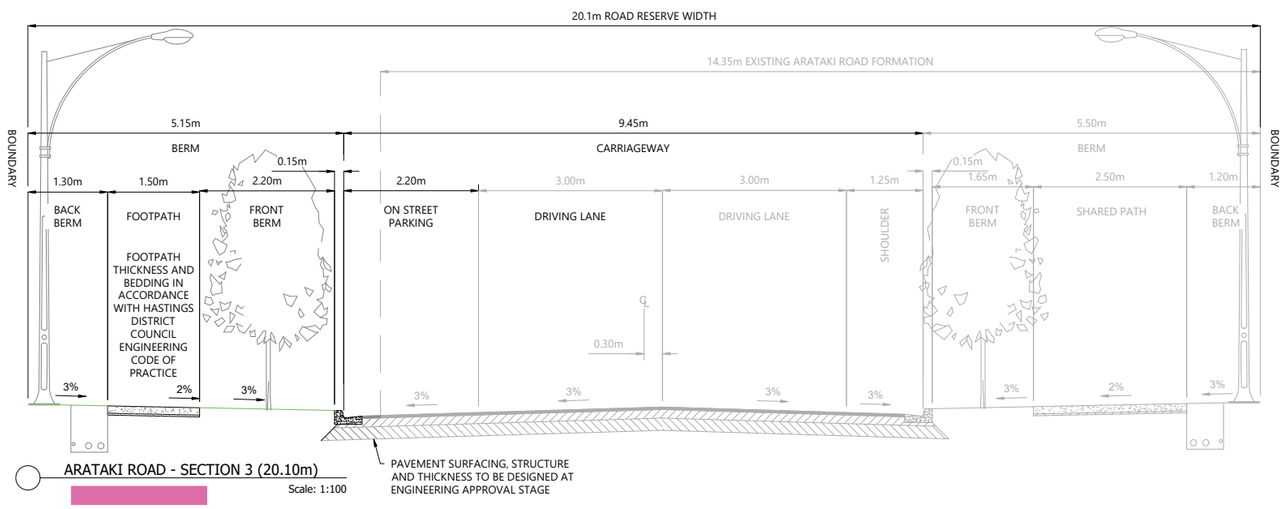
ARATAKI ROAD - SECTION 1 (20.10m)

Scale: 1:100



ARATAKI ROAD - SECTION 2 (20.10m)

Scale: 1:100



ARATAKI ROAD - SECTION 3 (20.10m)

Scale: 1:100

SCALEBAR (m) 0 1 2 5

SCALE | 1:100 @A3 | 1:50 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
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CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

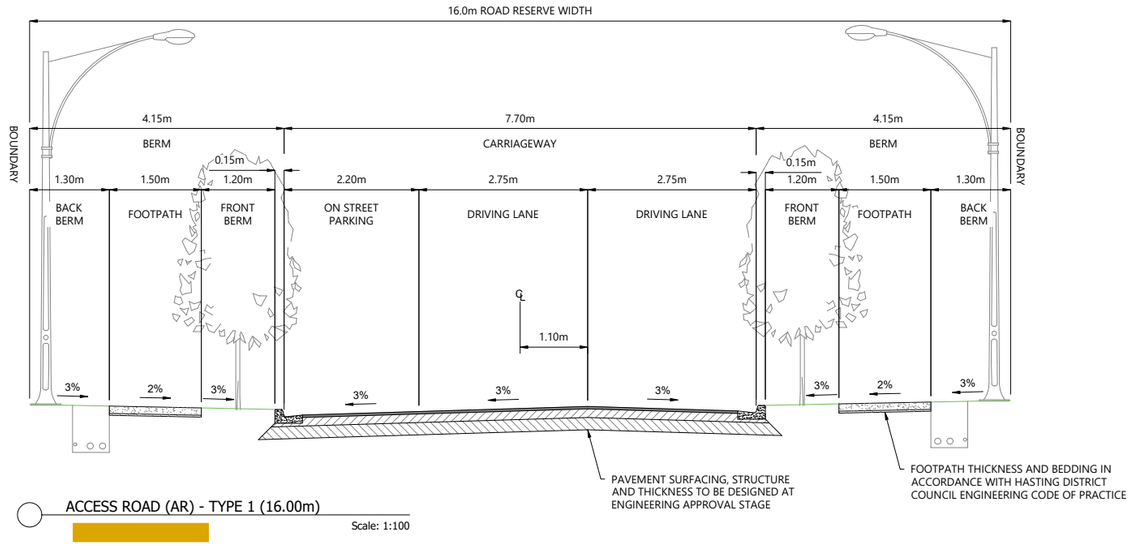
TYPICAL CROSS SECTIONS ARATAKI ROAD

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:100 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2201-RD	

WOODS Est.1970

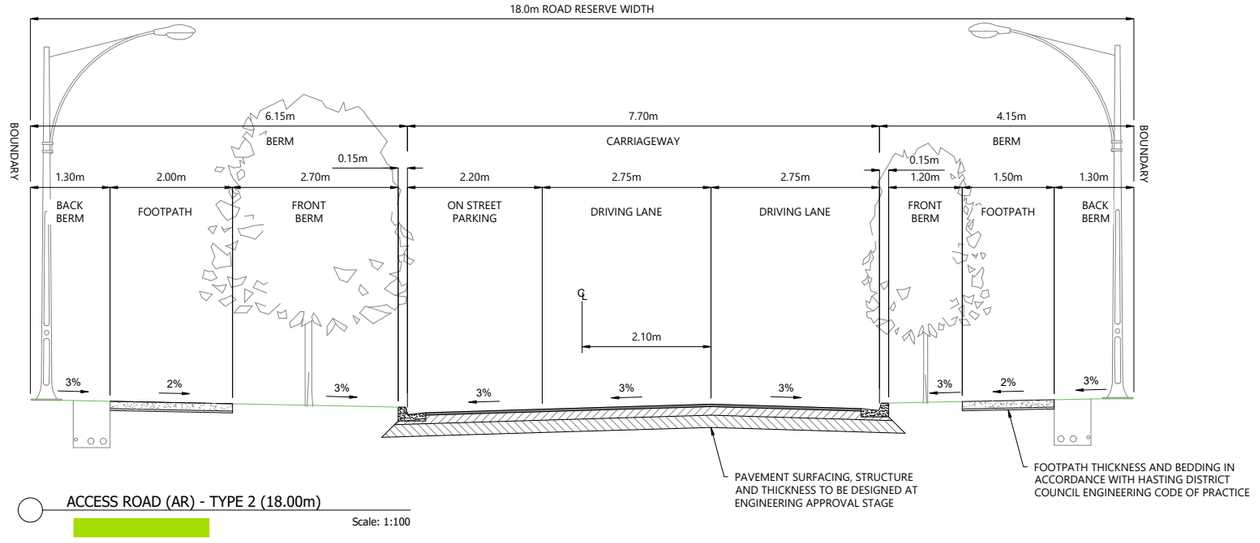
Plot Date: 11:46:26 am,26 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2201-RD_ TYPICAL ROAD CROSS SECTIONS PLAN.DWG



ACCESS ROAD (AR) - TYPE 1 (16.00m)

Scale: 1:100



ACCESS ROAD (AR) - TYPE 2 (18.00m)

Scale: 1:100

SCALEBAR (m) 0 1 2 5

SCALE | 1:100 @A3 | 1:50 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229
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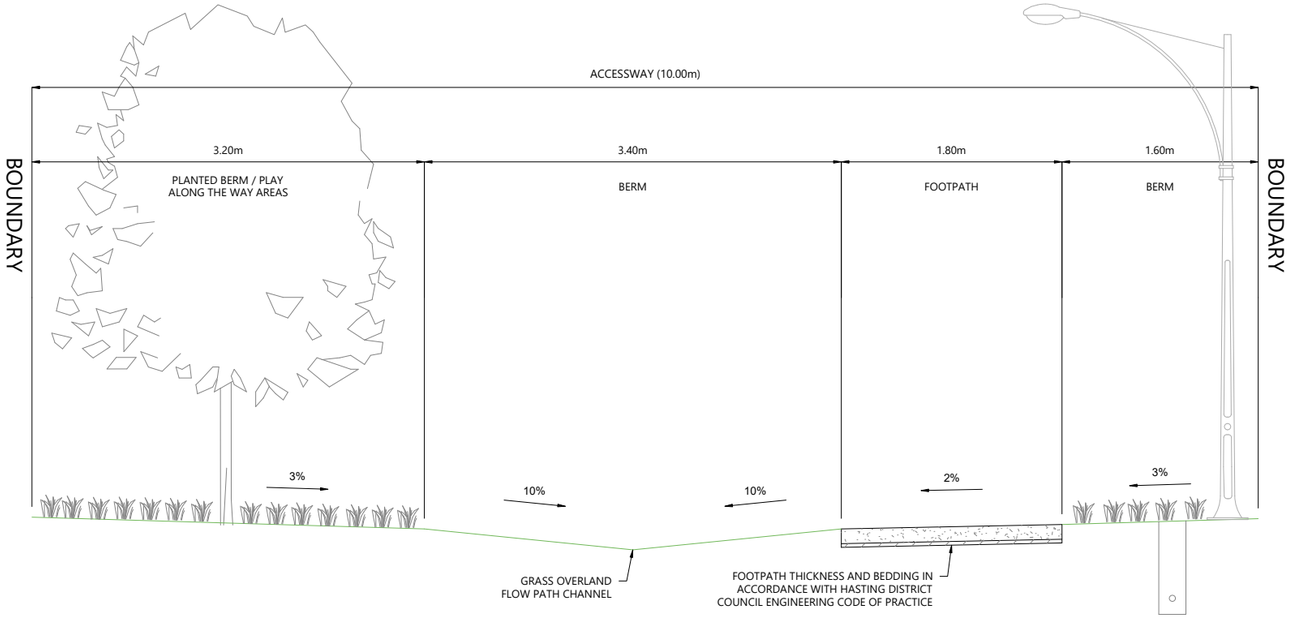
ARATAKI DEVELOPMENT - HAVELOCK NORTH

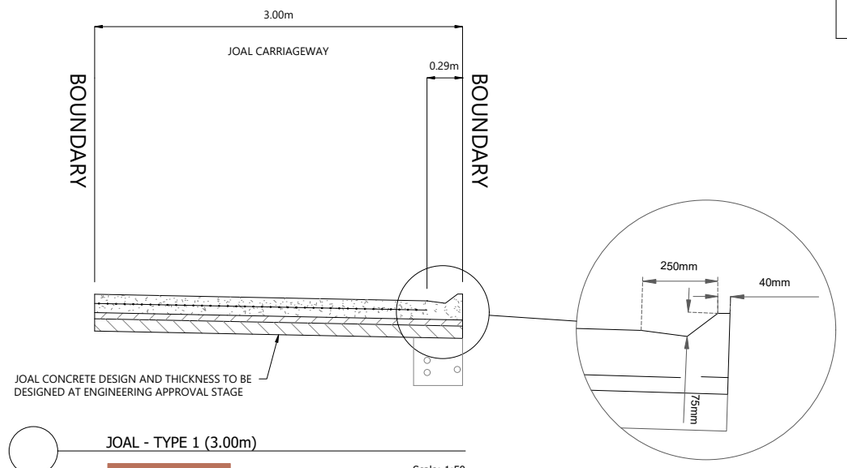
TYPICAL CROSS SECTIONS
ACCESS ROAD TYPE 1 & TYPE 2

STATUS	ISSUED FOR CONSENT
SCALE	1:100 @ A3
COUNCIL	HASTINGS DISTRICT COUNCIL
DWG NO	P24-244-00-2202-RD
REV	2



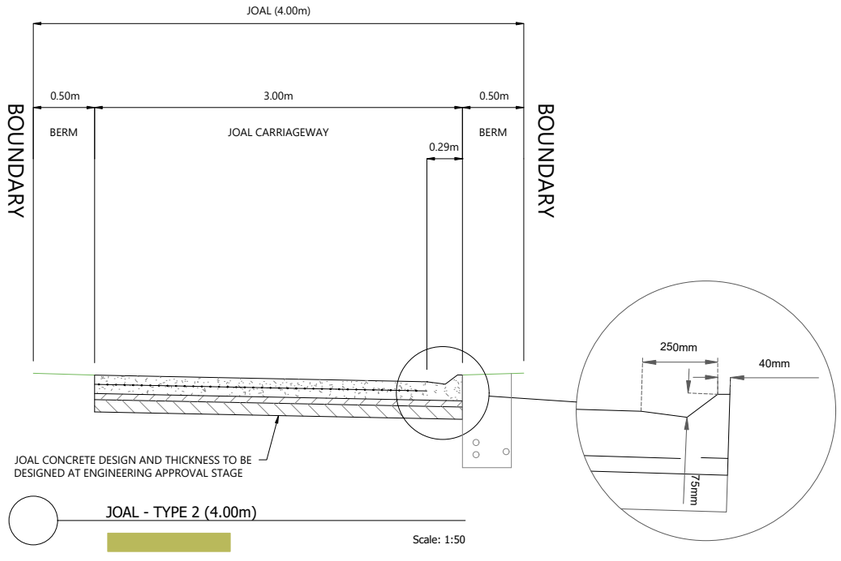
ACCESSWAY (10.00m)

Scale: 1:50



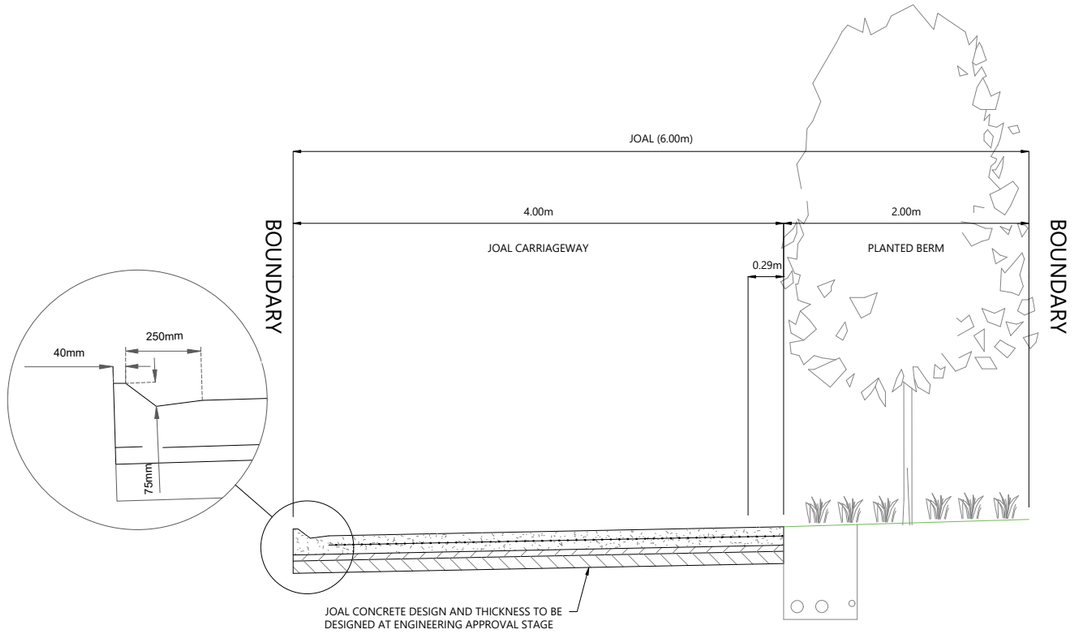
JOAL - TYPE 1 (3.00m)

Scale: 1:50



JOAL - TYPE 2 (4.00m)

Scale: 1:50



JOAL - TYPE 3 (6.00m)

Scale: 1:50

SCALEBAR (m) 0 0.5 1 2.5

SCALE | 1:50 @A3 | 1:25 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
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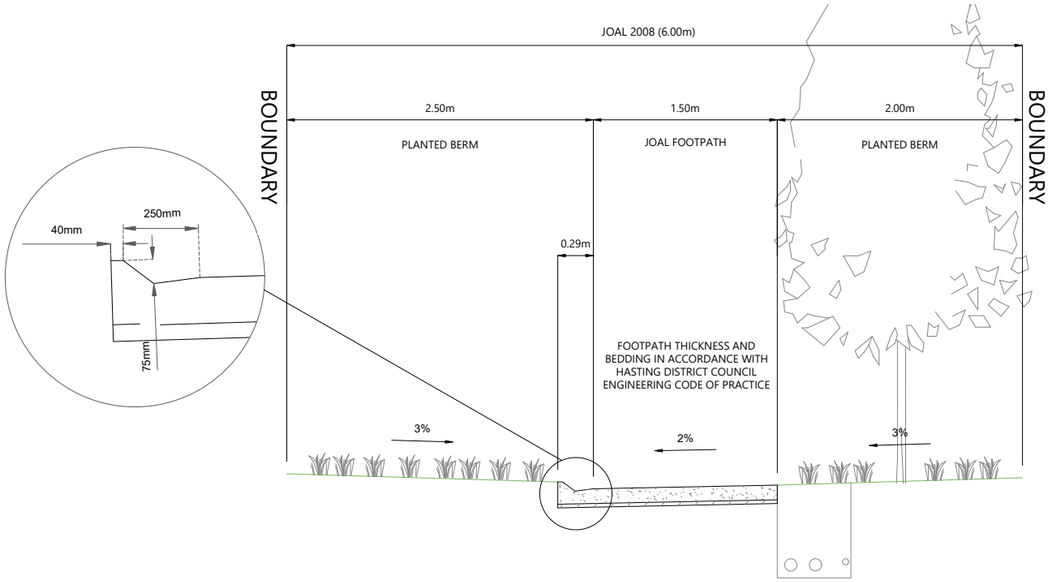
ARATAKI DEVELOPMENT - HAVELOCK NORTH

TYPICAL CROSS SECTIONS ACCESSWAY, JOAL TYPE 2 & TYPE 3

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:50 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2203-RD	

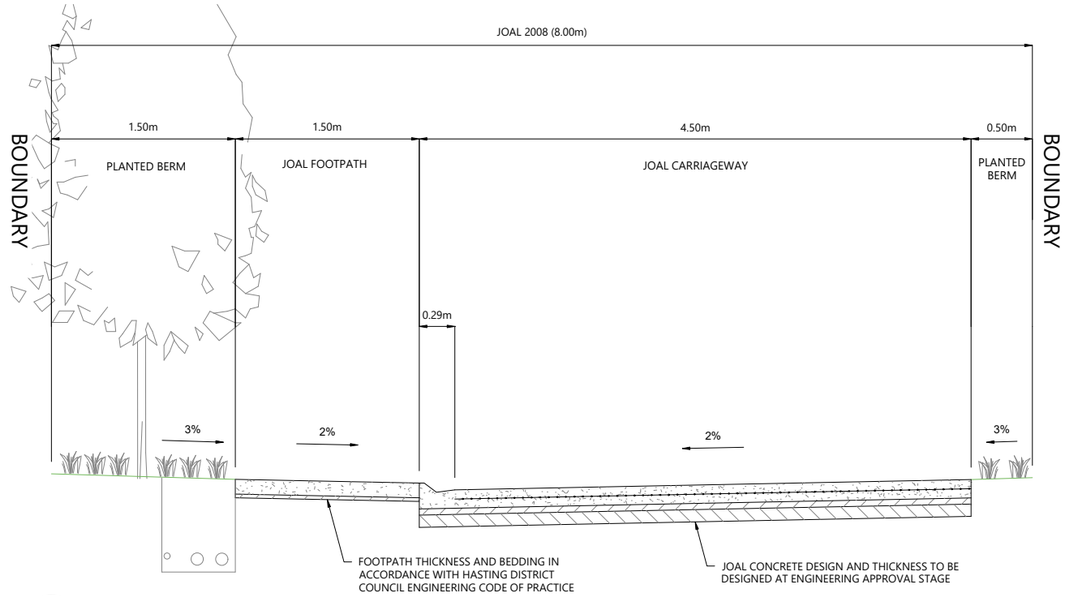
Plot Date: 11:46:27 am,26 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2201-RD_ TYPICAL ROAD CROSS SECTIONS PLAN.DWG



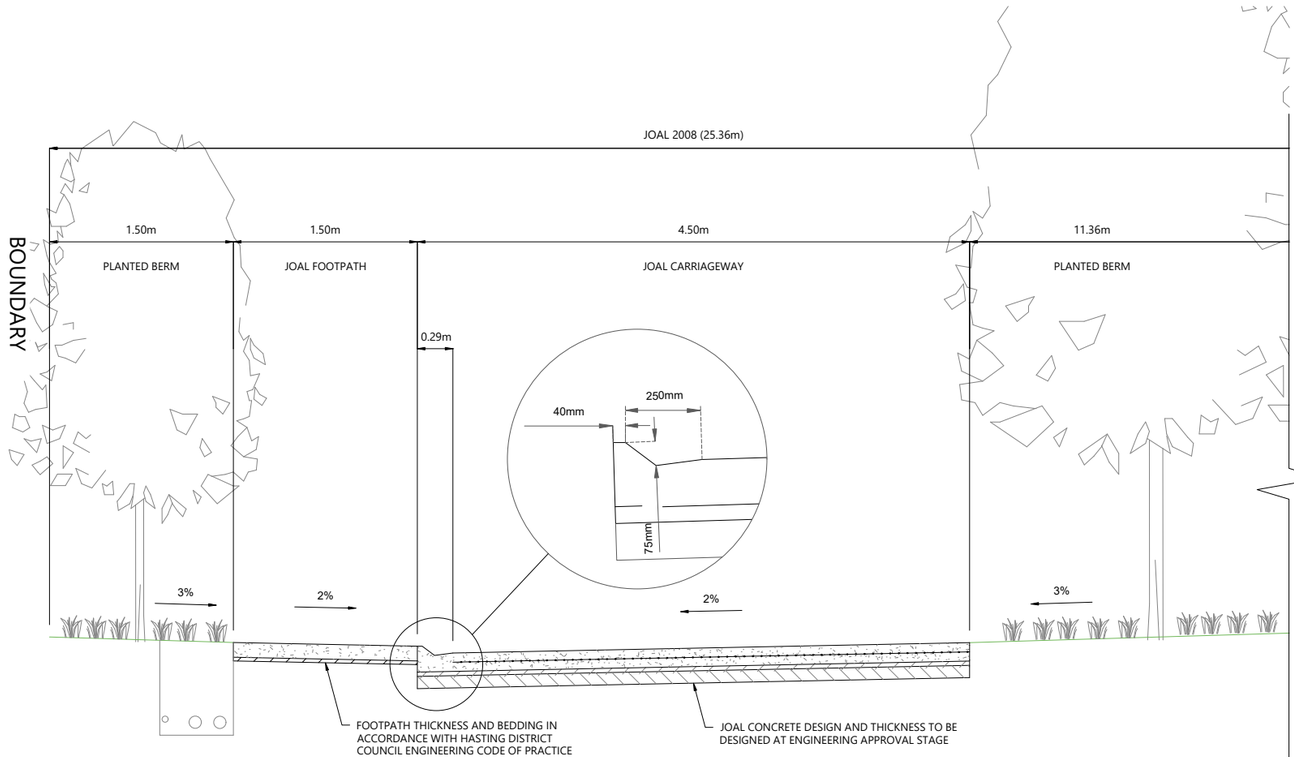
JOAL - TYPE 4 (LOT 2008) WESTERN SECTION (6.00m)

Scale: 1:50



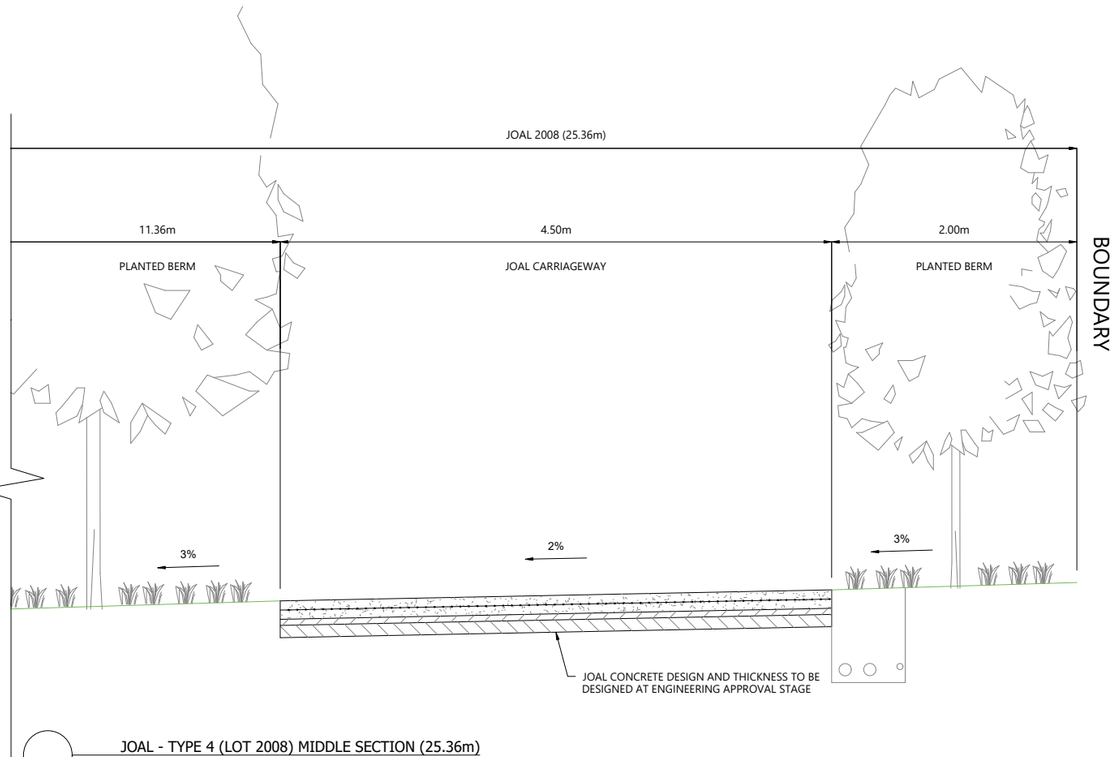
JOAL - TYPE 4 (LOT 2008) EASTERN SECTION (8.00m)

Scale: 1:50



JOAL - TYPE 4 (LOT 2008) MIDDLE SECTION (25.36m)

Scale: 1:50



JOAL - TYPE 4 (LOT 2008) MIDDLE SECTION (25.36m)

Scale: 1:50

SCALEBAR (m) 0 0.5 1 2.5

SCALE | 1:50 @A3 | 1:25 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229
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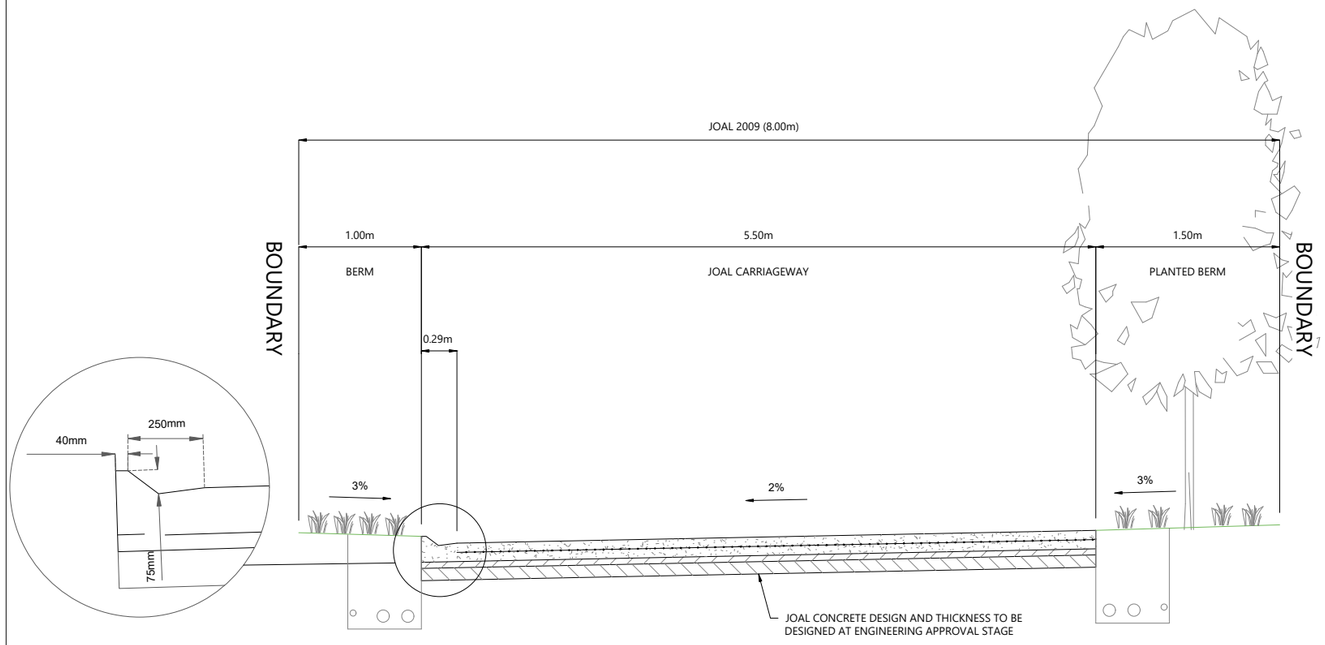
ARATAKI DEVELOPMENT - HAVELOCK NORTH

TYPICAL CROSS SECTIONS JOAL TYPE 4

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:50 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2204-RD	

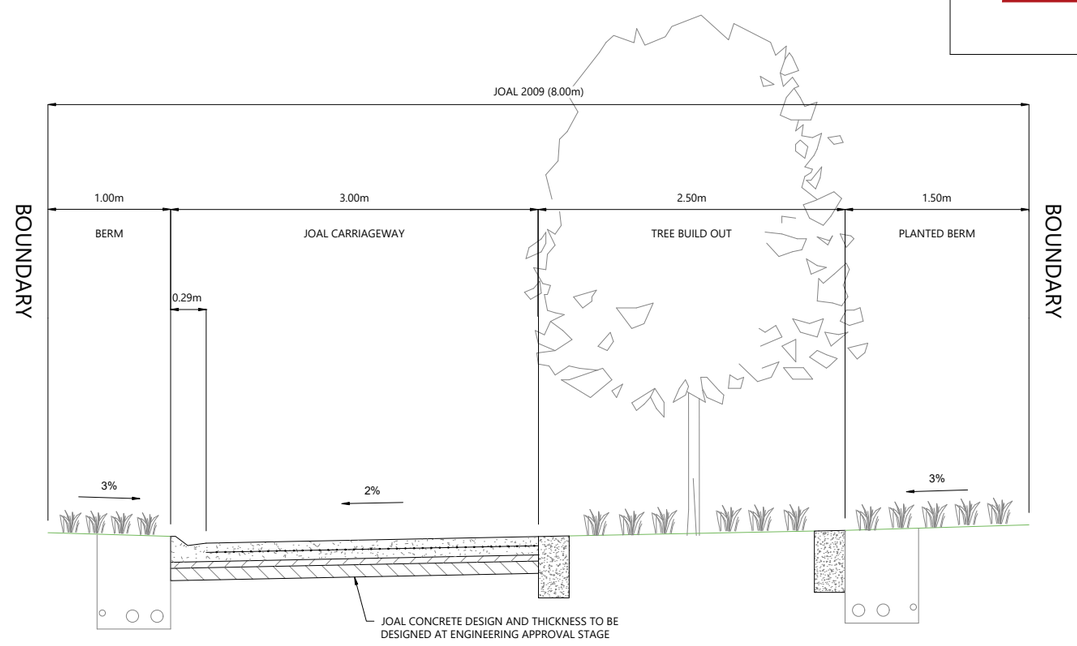
Plot Date: 11:46:28 am,26 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2201-RD_ TYPICAL ROAD CROSS SECTIONS PLAN.DWG



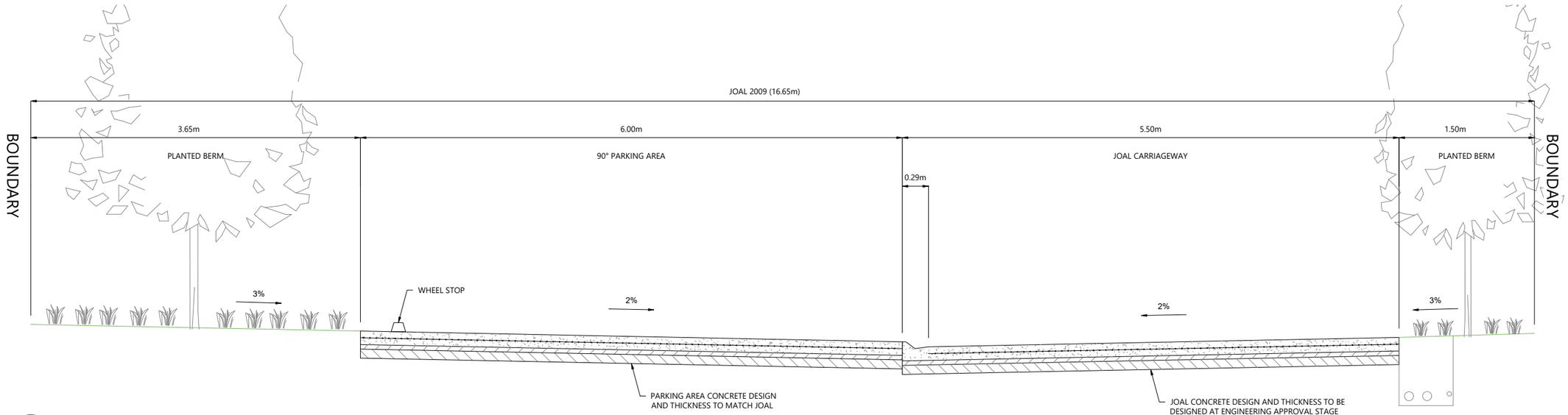
JOAL - TYPE 5 (LOT 2009)

Scale: 1:50



JOAL - TYPE 5 (LOT 2009) TREE BUILD OUT (8.00m)

Scale: 1:50



JOAL - TYPE 5 (LOT 2009) PARKING AREA (16.65m)

Scale: 1:50

SCALEBAR (m) 0 0.5 1 2.5

SCALE | 1:50 @A3 | 1:25 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229

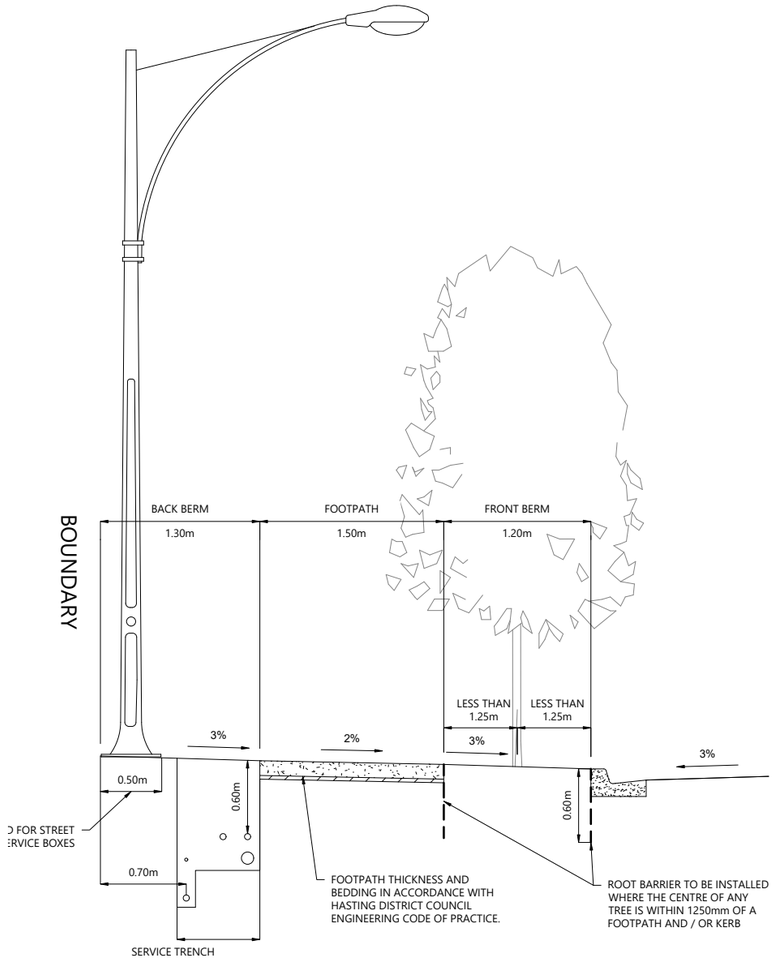
WOODS.CO.NZ

CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

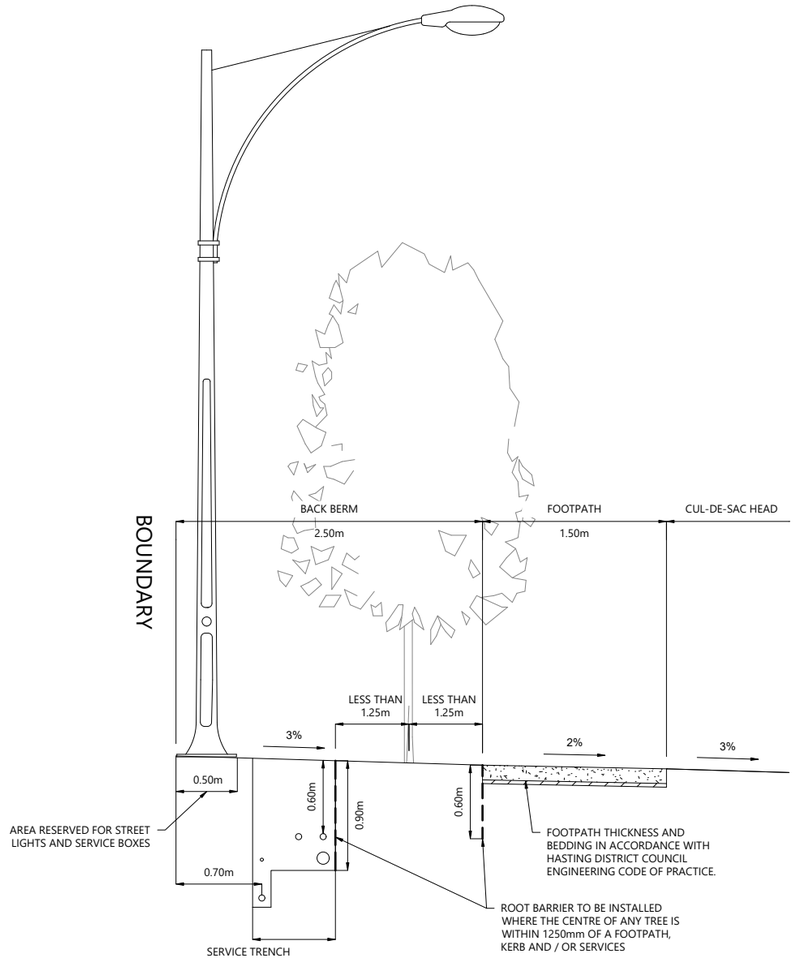
TYPICAL CROSS SECTIONS
JOAL TYPE 5

STATUS	ISSUED FOR CONSENT
SCALE	1:50 @ A3
COUNCIL	HASTINGS DISTRICT COUNCIL
DWG NO	P24-244-00-2205-RD
REV	2



TYPICAL BERM ARRANGEMENT

Scale: 1:50



TYPICAL BERM ARRANGEMENT AT CUL-DE-SAC HEAD

Scale: 1:50

SCALEBAR (m) 0 0.5 1 2.5

SCALE | 1:50 @A3 | 1:25 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	BM	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	BM
				CHECKED	BLO
				APPROVED	BF

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ARATAKI DEVELOPMENT - HAVELOCK NORTH

TYPICAL CROSS SECTIONS
TYPICAL BERM ARRANGEMENT

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:50 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2206-RD	

Plot Date: 11:46:29 am,26 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2201-RD_ TYPICAL ROAD CROSS SECTIONS PLAN.DWG

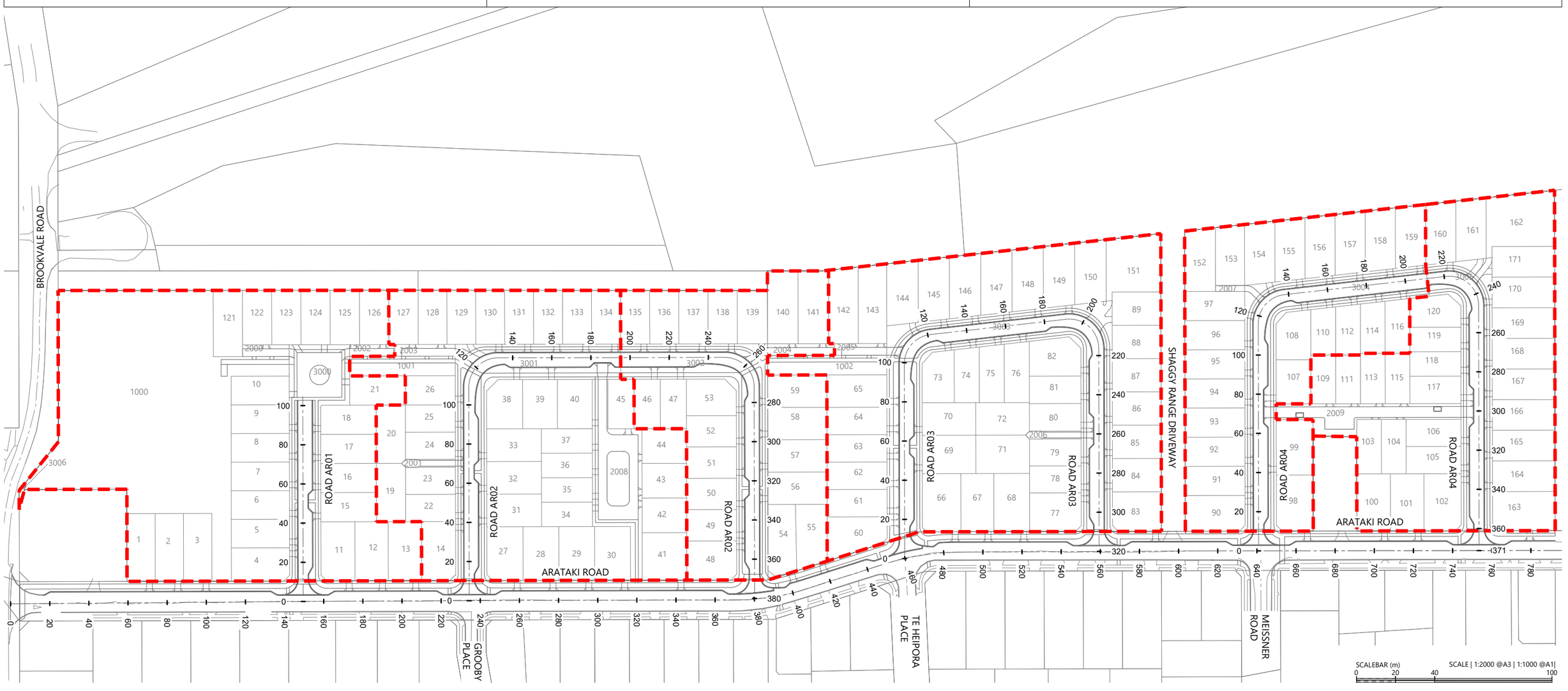
LEGEND

STAGE BOUNDARIES

PROPOSED BOUNDARIES

ROAD CENTRELINE

0 20 40



REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	TB	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
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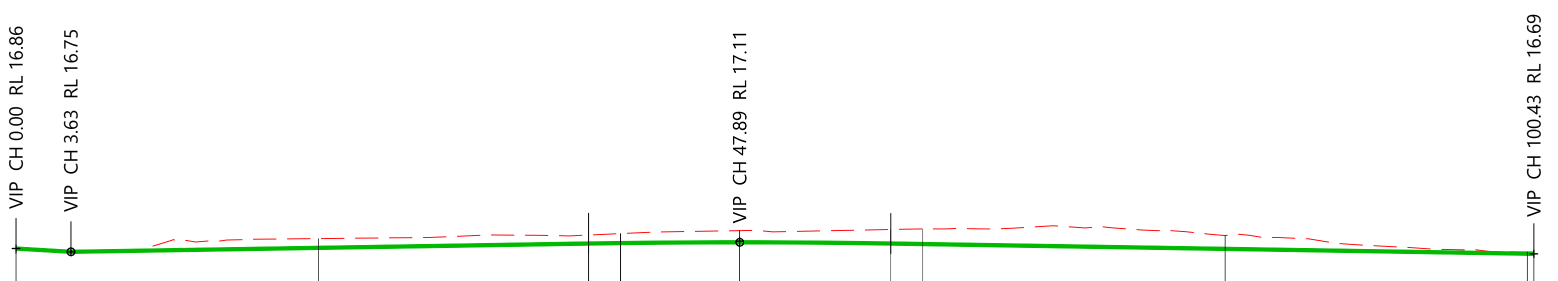
ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD CENTRELINE PLAN

STATUS	ISSUED FOR CONSENT	REV
SCALE	1:2000 @ A3	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2500-RD	

Plot Date: 2:11:59 pm,17 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG



Horizontal Curve Length (m)

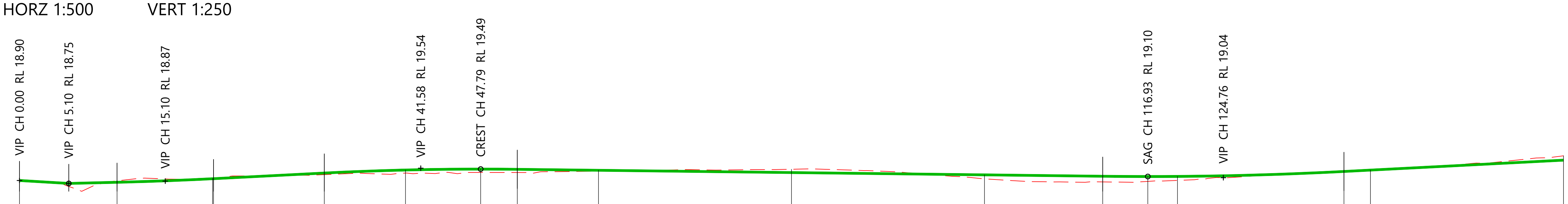
Vertical Geometry K value/Grade (%) | Vertical Grade/ Curve Length (m): -3% / 3.63 m; 0.8% / 34.26 m; K: 12.5 / VC 20 m; -0.8% / 42.55 m

DATUM R.L. = 6.00

EXISTING SURFACE	16.86	17.19	17.31	17.36	17.46	17.49	17.51	17.29	16.75	16.75
CUT / FILL DEPTH	0.00	-0.31	-0.28	-0.31	-0.39	-0.47	-0.50	-0.44	-0.06	-0.06
CL DESIGN LEVELS	16.86	16.89	17.03	17.04	17.07	17.03	17.01	16.85	16.69	16.69
CHAINAGE	0.00	20.00	37.89	40.00	47.89	57.89	60.00	80.00	100.00	100.43

ROAD AR01 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250



Horizontal Curve Length (m): 15 R

Vertical Geometry K value/Grade (%) | Vertical Grade/ Curve Length (m): -3% / 5.1 m; 1.21% / 5 m; K: 7.51 / VC 10 m; 2.54% / 11.48 m; K: 6.38 / VC 20 m; -0.59% / 60.67 m; K: 7.86 / VC 25 m; 2.59% / 115.3 m

DATUM R.L. = 8.00

EXISTING SURFACE	18.90	18.88	19.01	19.02	19.20	19.28	19.32	19.31	19.38	19.48	18.98	18.82	18.85	18.90	19.35	19.41	20.18
CUT / FILL DEPTH	-0.00	-0.07	-0.02	-0.02	0.08	0.16	0.18	0.17	0.05	-0.17	0.21	0.30	0.25	0.21	0.02	0.02	-0.23
CL DESIGN LEVELS	18.90	18.81	18.99	18.99	19.29	19.44	19.49	19.48	19.43	19.31	19.19	19.12	19.10	19.11	19.37	19.44	19.96
CHAINAGE	0.00	10.10	20.00	20.10	31.58	40.00	47.79	51.58	60.00	80.00	100.00	112.26	116.93	120.00	137.26	140.00	160.00

ROAD AR02 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250

SCALEBAR (m) HOR. 0 5 10 25; VERT. 2.5 5.0 12.5
SCALE | 1:500 @A3 | 1:250 @A1|
SCALE | 1:250 @A3 | 1:150 @A1|

REVISION DETAILS		INT	DATE
1	ISSUED FOR DISCUSSION	TB	APR 2025
2	ISSUED FOR CONSENT	TB	JUNE 2025

SURVEYED	WOODS
DESIGNED	AB
DRAWN	TB
CHECKED	BLO
APPROVED	BF

WOODS Est.1970
BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229
WOODS.CO.NZ

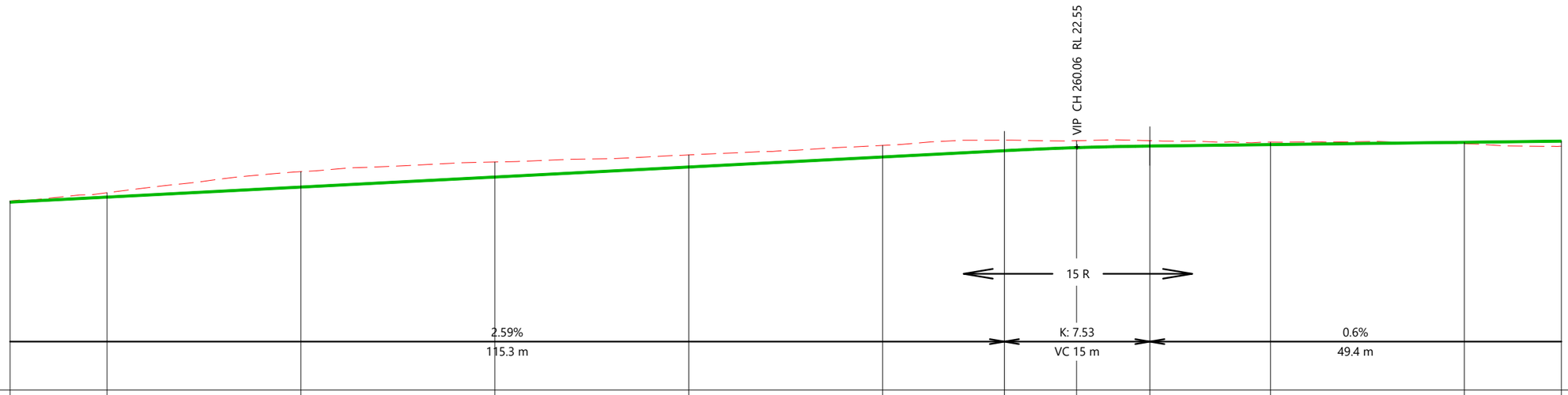
CDL LAND NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD LONGSECTIONS - SHEET 1

STATUS	ISSUED FOR CONSENT
SCALE	AS SHOWN
COUNCIL	HASTINGS DISTRICT COUNCIL
DWG NO	P24-244-00-2501-RD
REV	2

Plot Date: 2:11:59 pm,17 June 2025, TIMOTHYB
File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG

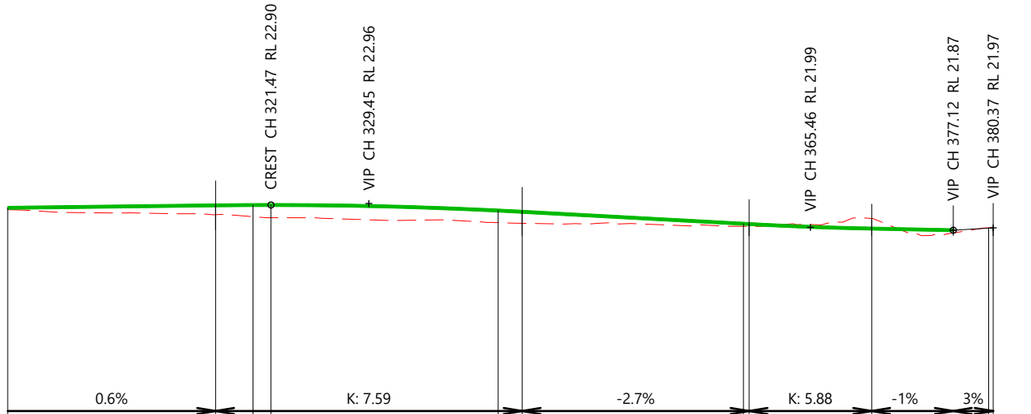


DATUM R.L. = 10.00

EXISTING SURFACE	19.76	20.18	21.27	21.77	22.13	22.62	22.90	22.87	22.87	22.79	22.71	22.58
CUT / FILL DEPTH	-0.06	-0.23	-0.80	-0.78	-0.62	-0.60	-0.55	-0.36	-0.28	-0.13	0.07	0.26
CL DESIGN LEVELS	19.70	19.96	20.47	20.99	21.51	22.03	22.35	22.51	22.59	22.66	22.78	22.84
CHAINAGE	150.00	160.00	180.00	200.00	220.00	240.00	252.56	260.00	267.56	280.00	300.00	310.00

ROAD AR02 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250



DATUM R.L. = 12.00

EXISTING SURFACE	22.71	22.50	22.42	22.38	22.18	22.15	22.03	22.03	22.35	21.97	21.97
CUT / FILL DEPTH	0.07	0.38	0.47	0.52	0.49	0.47	0.11	0.09	-0.41	-0.01	-0.00
CL DESIGN LEVELS	22.78	22.88	22.90	22.90	22.67	22.62	22.13	22.12	21.94	21.96	21.97
CHAINAGE	300.00	316.95	320.00	321.47	340.00	341.95	360.00	360.46	370.46	380.00	380.37

ROAD AR02 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250

SCALEBAR (m) — SCALE | 1:500 @A3 | 1:250 @A1|
HOR. 0 5 10 25
VERT. 2.5 5.0 12.5
SCALE | 1:250 @A3 | 1:150 @A1|

REVISION DETAILS		INT	DATE
1	ISSUED FOR DISCUSSION	TB	APR 2025
2	ISSUED FOR CONSENT	TB	JUNE 2025

SURVEYED	WOODS
DESIGNED	AB
DRAWN	TB
CHECKED	BLO
APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
AUCKLAND 1023
+64 9 308 9229
WOODS.CO.NZ

CDL LAND NEW ZEALAND LIMITED

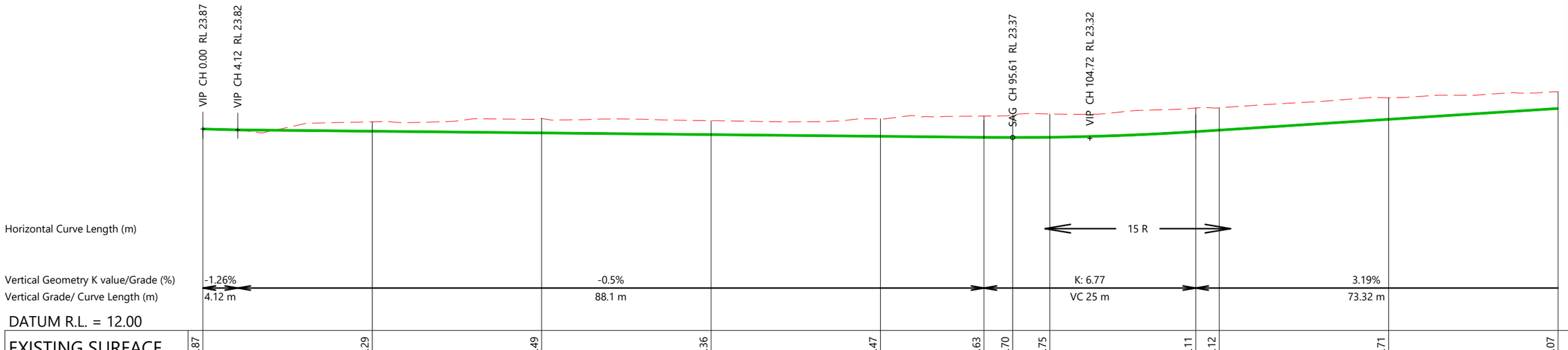
ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD LONGSECTIONS - SHEET 2

STATUS	ISSUED FOR CONSENT	REV
SCALE	AS SHOWN	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2502-RD	

Plot Date: 2:11:59 pm,17 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG



Horizontal Curve Length (m)

Vertical Geometry K value/Grade (%) | -1.26% | | | -0.5% | | | | | K: 6.77 | | 3.19%

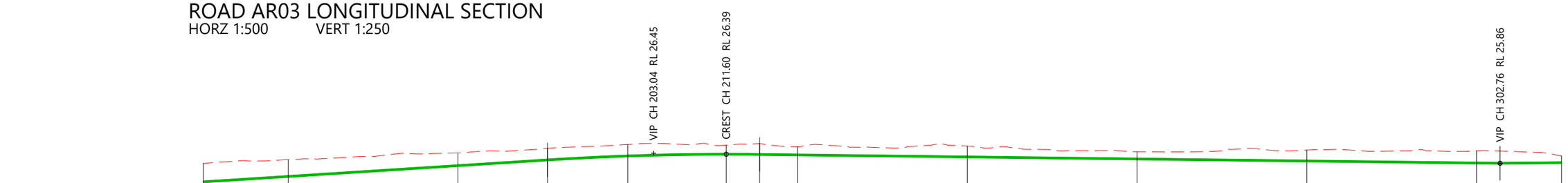
Vertical Grade/ Curve Length (m) | 4.12 m | | | 88.1 m | | | | | VC 25 m | | 73.32 m

DATUM R.L. = 12.00

EXISTING SURFACE	23.87	24.29	24.49	24.36	24.47	24.63	24.70	24.75	25.11	25.12	25.71	26.07			
CUT / FILL DEPTH	-0.00	-0.55	-0.85	-0.82	-1.03	-1.25	-1.33	-1.37	-1.40	-1.32	-1.27	-0.99			
CL DESIGN LEVELS	23.87	23.74	23.64	23.54	23.44	23.38	23.37	23.39	23.72	23.80	24.44	25.08			
CHAINAGE	0.00	20.00	40.00	60.00	80.00	92.22	95.61	100.00	117.22	120.00	140.00	160.00			

ROAD AR03 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250



Horizontal Curve Length (m)

Vertical Geometry K value/Grade (%) | 3.19% | | | | | K: 6.6 | | | -0.6% | | | | 0.5%

Vertical Grade/ Curve Length (m) | 73.32 m | | | | | VC 25 m | | | 87.22 m | | | | 14.03 m

DATUM R.L. = 14.00

EXISTING SURFACE	25.86	26.07	26.47	26.74	26.97	26.92	27.02	26.83	26.88	26.54	26.64	26.59	26.28		
CUT / FILL DEPTH	-1.10	-0.99	-0.75	-0.68	-0.68	-0.53	-0.64	-0.48	-0.64	-0.43	-0.65	-0.72	-0.39		
CL DESIGN LEVELS	24.76	25.08	25.72	26.06	26.29	26.39	26.38	26.35	26.23	26.11	25.99	25.88	25.89		
CHAINAGE	150.00	160.00	180.00	190.54	200.00	211.60	215.54	220.00	240.00	260.00	280.00	300.00	310.00		

ROAD AR03 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250

SCALEBAR (m)

HOR. 0 5 10 25

VERT. 2.5 5.0 12.5

SCALE | 1:500 @A3 | 1:250 @A1|

SCALE | 1:250 @A3 | 1:150 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	TB	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
8 NUGENT ST, GRAFTON,
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CDL LAND NEW ZEALAND LIMITED

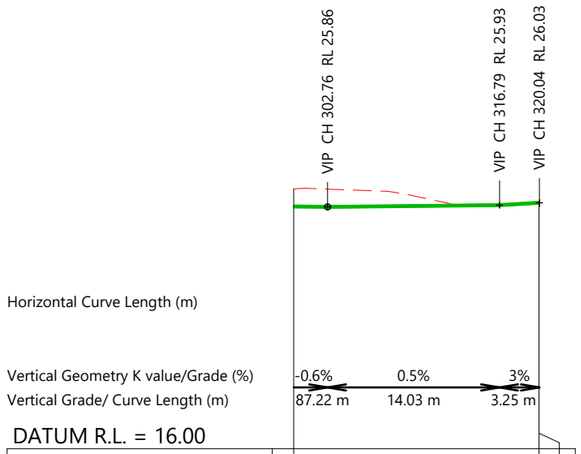
ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD LONGSECTIONS - SHEET 3

STATUS	ISSUED FOR CONSENT	REV
SCALE	AS SHOWN	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2503-RD	

Plot Date: 2:12:00 pm,17 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG

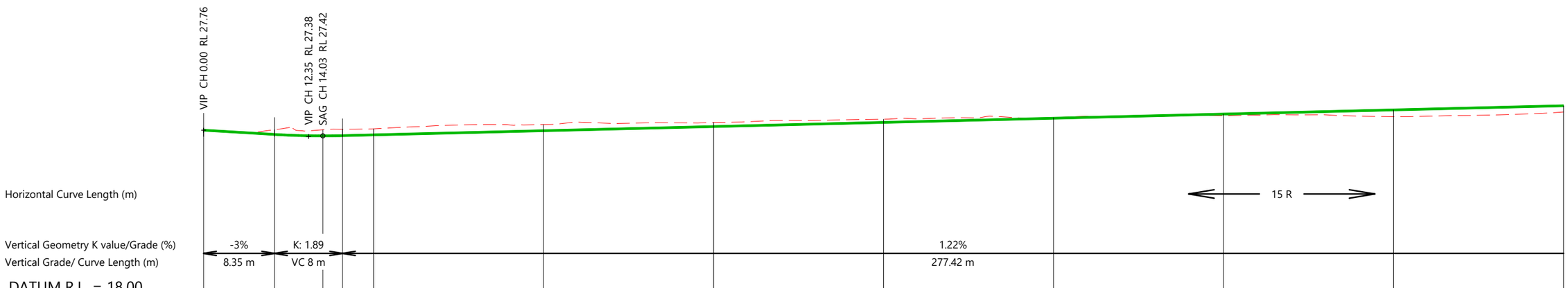


DATUM R.L. = 16.00

EXISTING SURFACE	26.59		26.03	26.03
CUT / FILL DEPTH	-0.72		-0.00	-0.00
CL DESIGN LEVELS	25.88		26.03	26.03
CHAINAGE	300.00		320.00	320.04

ROAD AR03 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250



DATUM R.L. = 18.00

EXISTING SURFACE	27.76	27.78	27.78	27.81	27.83	28.09	28.21	28.40	28.49	28.61	28.55	28.83
CUT / FILL DEPTH	0.00	-0.28	-0.36	-0.38	-0.35	-0.36	-0.24	-0.19	-0.03	0.09	0.40	0.37
CL DESIGN LEVELS	27.76	27.50	27.42	27.43	27.48	27.72	27.97	28.21	28.46	28.70	28.95	29.19
CHAINAGE	0.00	8.35	14.03	16.35	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00

ROAD AR04 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250

SCALEBAR (m) SCALE | 1:500 @A3 | 1:250 @A1|
HOR. 0 5 10 25
VERT. 2.5 5.0 12.5
SCALE | 1:250 @A3 | 1:150 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	TB	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

BUILDING B, LEVEL 1
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NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD LONGSECTIONS - SHEET 4

STATUS	ISSUED FOR CONSENT	REV
SCALE	AS SHOWN	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2504-RD	

Plot Date: 2:12:00 pm,17 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG

Horizontal Curve Length (m)

Vertical Geometry K value/Grade (%)

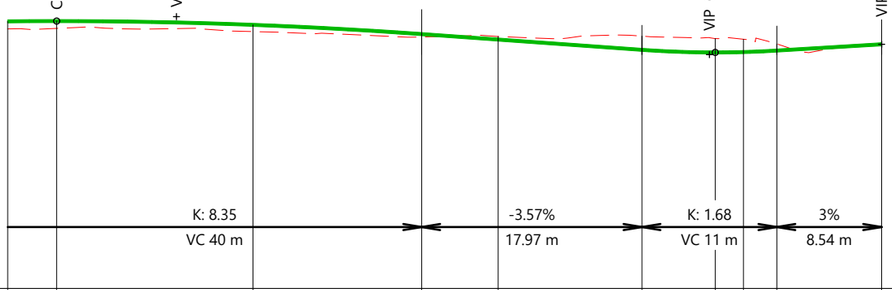
Vertical Grade/ Curve Length (m)

DATUM R.L. = 18.00

EXISTING SURFACE	28.63	28.83	29.25	30.31	30.59	31.19	31.07	30.79	30.56	30.58	30.60	30.57	
CUT / FILL DEPTH	0.44	0.37	0.19	-0.62	-0.66	-1.02	-0.65	-0.12	0.27	0.31	0.30	0.30	
CL DESIGN LEVELS	29.07	29.19	29.44	29.68	29.93	30.17	30.42	30.66	30.83	30.88	30.89	30.87	
CHAINAGE	150.00	160.00	180.00	200.00	220.00	240.00	260.00	280.00	293.76	300.00	303.99	310.00	

ROAD AR04 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250



Horizontal Curve Length (m)

Vertical Geometry K value/Grade (%)

Vertical Grade/ Curve Length (m)

DATUM R.L. = 20.00

EXISTING SURFACE	30.58	30.60	30.47	30.25	30.27	30.28	30.18	30.16	29.96	29.93
CUT / FILL DEPTH	0.31	0.30	0.27	0.11	-0.13	-0.56	-0.57	-0.52	-0.27	0.02
CL DESIGN LEVELS	30.88	30.89	30.74	30.36	30.14	29.72	29.62	29.63	29.69	29.95
CHAINAGE	300.00	303.99	320.00	333.76	340.00	351.73	357.70	360.00	362.73	371.27

ROAD AR04 LONGITUDINAL SECTION

HORZ 1:500 VERT 1:250

SCALEBAR (m) SCALE | 1:500 @A3 | 1:250 @A1|

HOR. 0 5 10 25

VERT. 2.5 5.0 12.5

SCALE | 1:250 @A3 | 1:150 @A1|

REVISION DETAILS		INT	DATE	SURVEYED	WOODS
1	ISSUED FOR DISCUSSION	TB	APR 2025	DESIGNED	AB
2	ISSUED FOR CONSENT	TB	JUNE 2025	DRAWN	TB
				CHECKED	BLO
				APPROVED	BF

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CDL LAND
NEW ZEALAND LIMITED

ARATAKI DEVELOPMENT - HAVELOCK NORTH

ROAD LONGSECTIONS - SHEET 5

STATUS	ISSUED FOR CONSENT	REV
SCALE	AS SHOWN	2
COUNCIL	HASTINGS DISTRICT COUNCIL	
DWG NO	P24-244-00-2505-RD	

Plot Date: 2:12:00 pm,17 June 2025, TIMOTHYB

File: C:\12DSYNERGY\DATA\WP-PEN-APP-01\P24-244 - ARATAKI - HAVELOCK NORTH_21690\02 DRAWINGS\01 ENG\P24-244-00-2500-RD_ROAD LONGSECTIONS.DWG

APPENDIX F Trip distribution assumptions and traffic volumes for each modelled scenario

TRIP DISTRIBUTION ASSUMPTION

Morning Peak

Outbound directional assignment

- 60% of traffic from the Proposal travels north on Arataki Road towards the Arataki Road/Brookvale Road intersection.
    - 80% of this traffic turns left onto Brookvale Road to head towards the Havelock North town, while 20% turns right.
    - Of the left-turn traffic, 80% of traffic turns right towards Romanes Drive, and 20% continues straight onto Brookvale Road.
- 40% of traffic from the Proposal travels south on Arataki Road towards the Arataki Road/Te Mata Road roundabout.
    - 80% of this traffic turns right onto Brookvale Road to head towards the Havelock North town, while 20% turns left.

Inbound directional assignment

- 80% of the traffic going to the Proposal arrives from the north (70% from Romanes Drive/ Brookvale Road/Bourke Place roundabout and 10% left turn from Brookvale Road/Arataki Road intersection)
- 20% of the traffic going to the Proposal arrives from the south via the Arataki Road/Te Mata Road roundabout, with an even left and right turn split.

Evening Peak

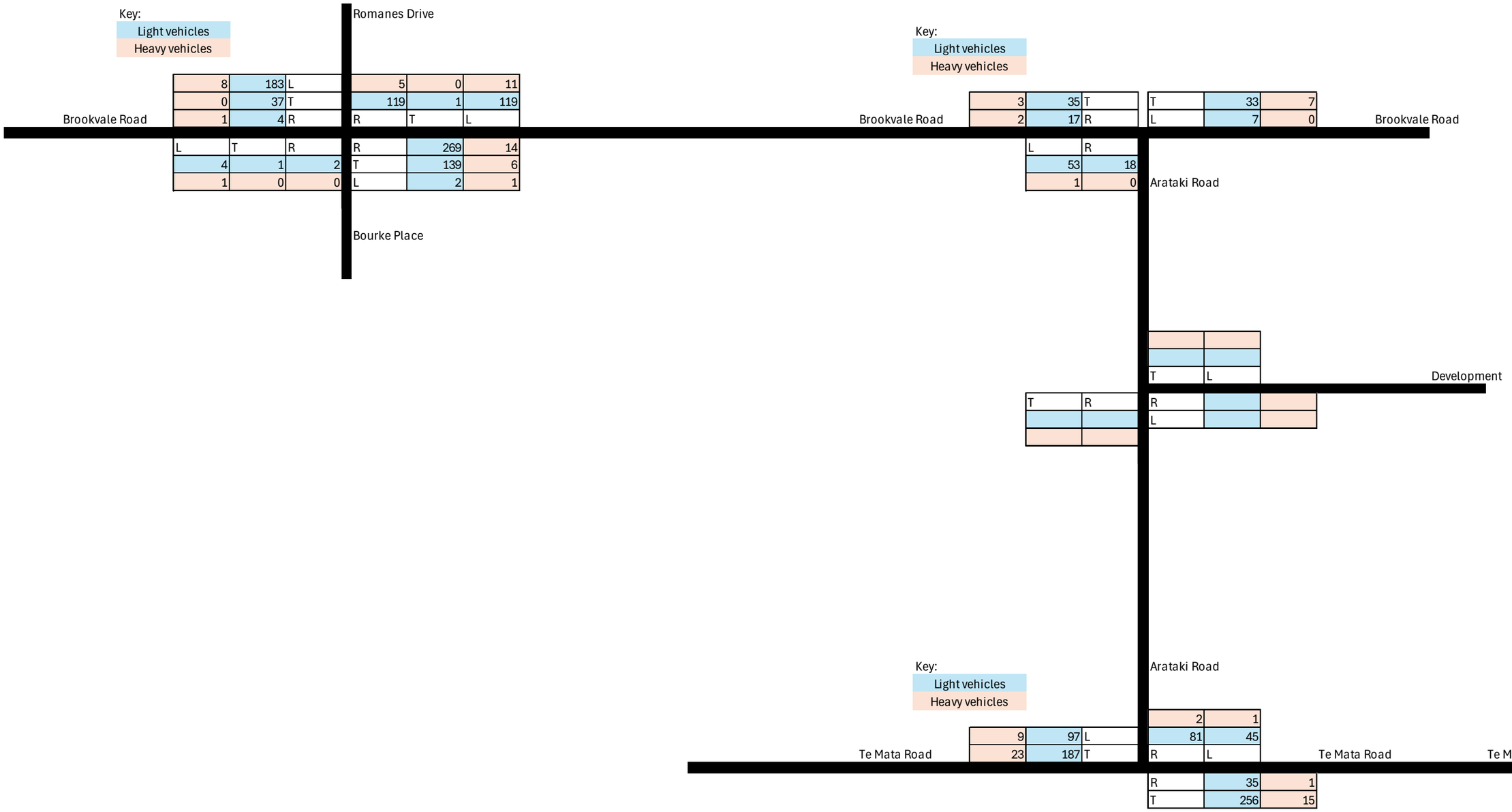
Outbound directional assignment

- The same assumptions as the morning peak

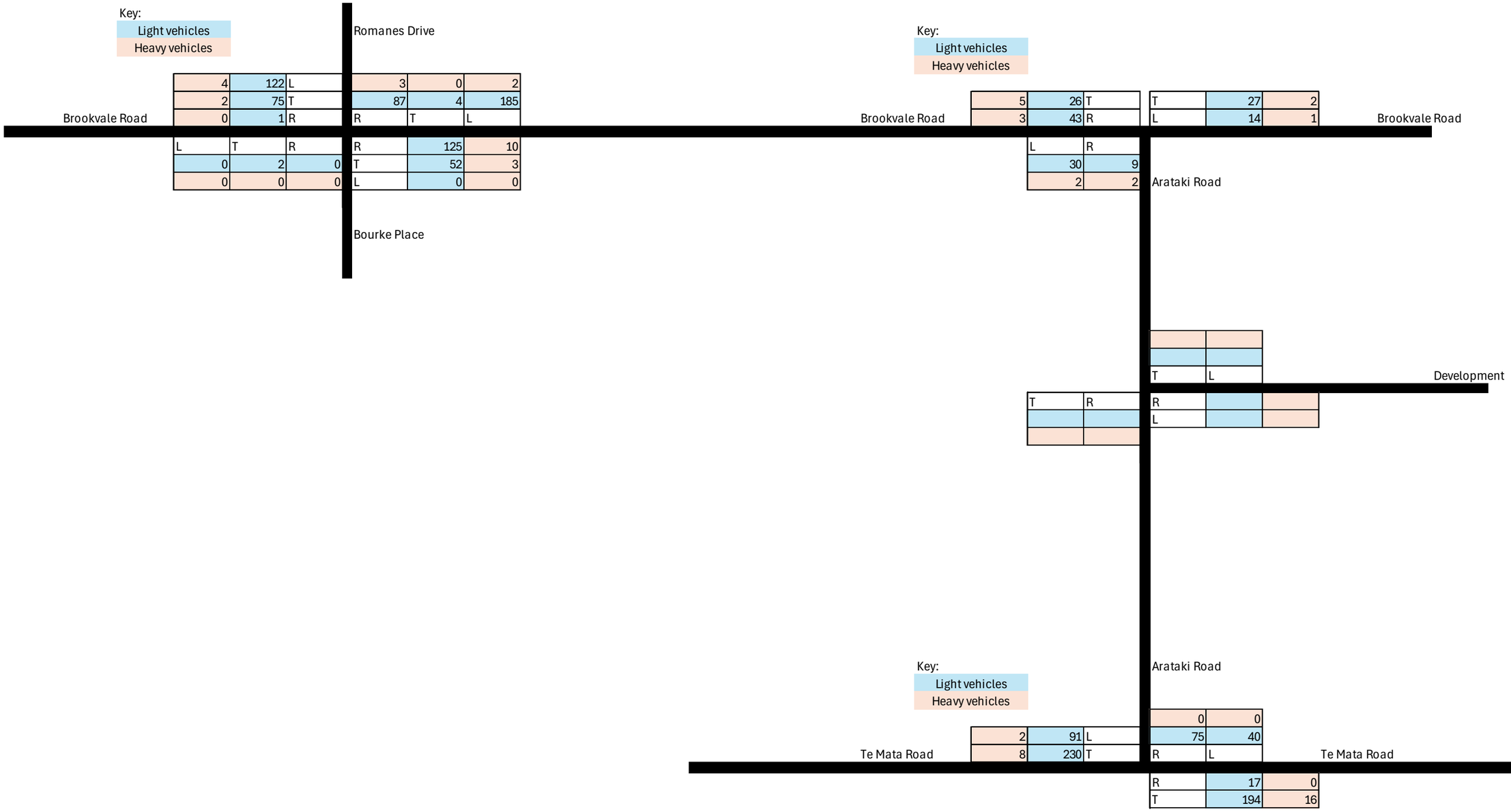
Inbound directional assignment

- 60% of the traffic going to the Proposal arrives from the north (50% from Romanes Drive/ Brookvale Road/Bourke Place roundabout and 10% left turn from Brookvale Road/Arataki Road intersection)
- 40% of the traffic going to the Proposal arrives from the south via the Arataki Road/Te Mata Road roundabout (30% left turn coming from the town centre and 10% right turn)

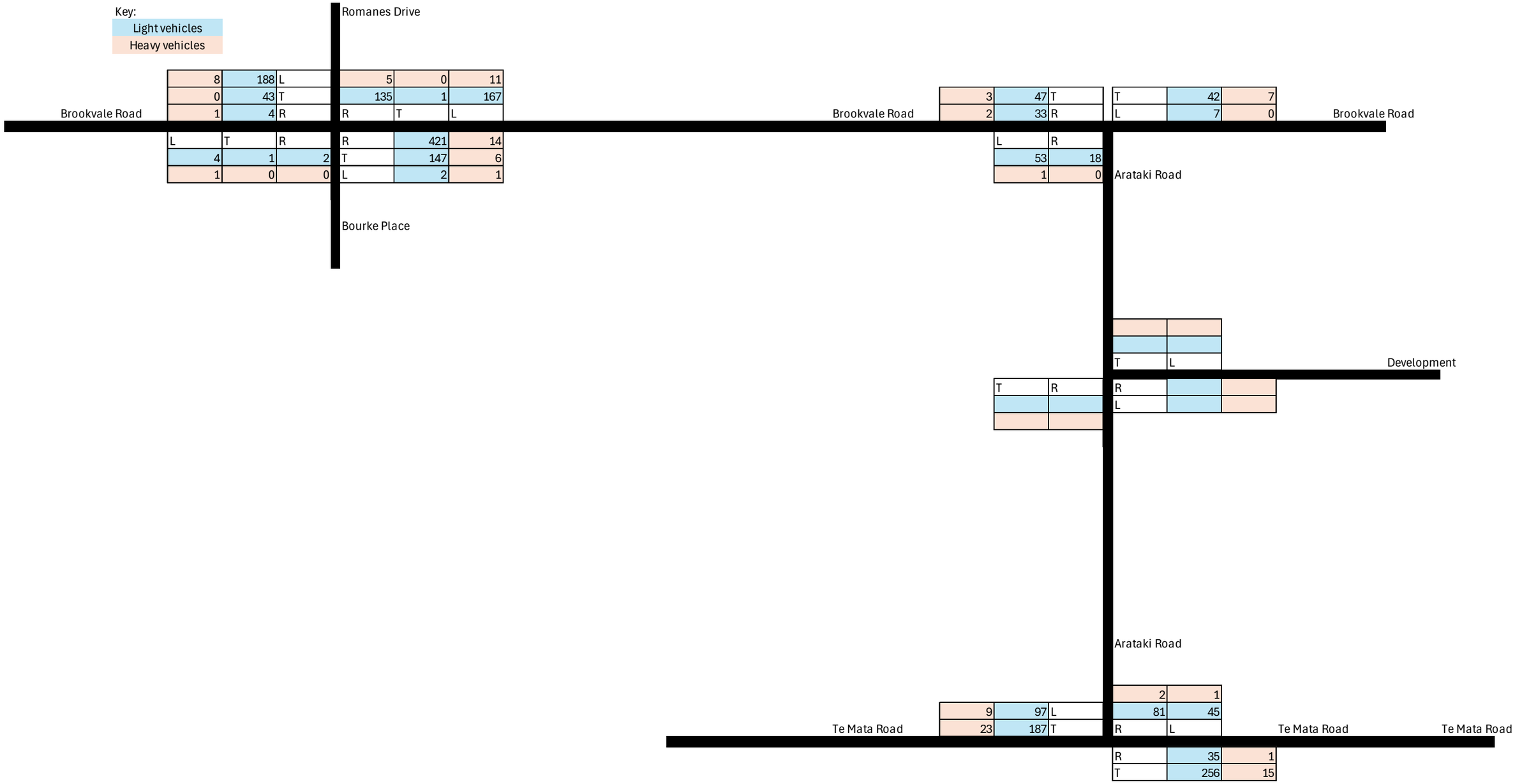
Existing volumes (Base) - Morning peak



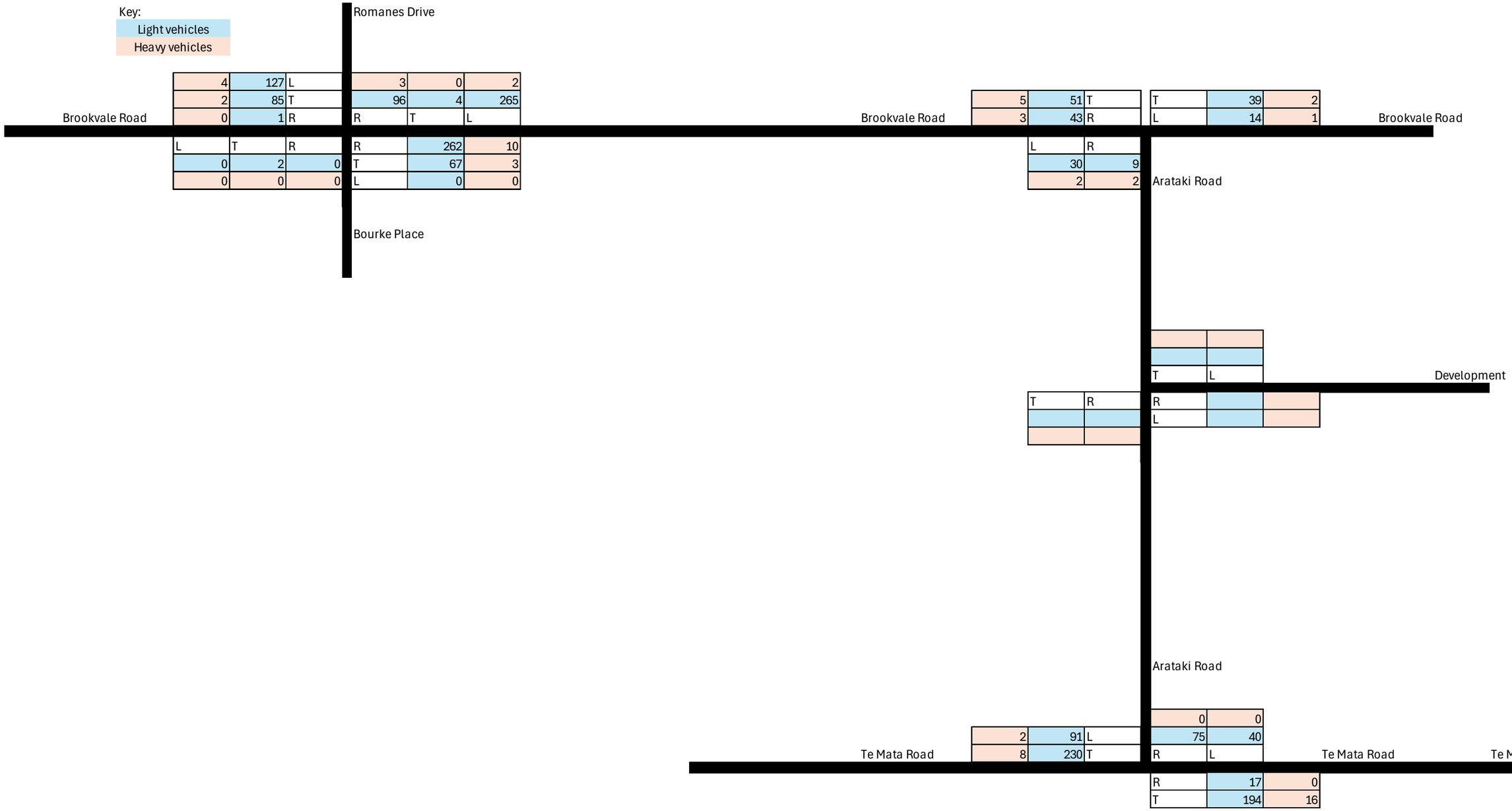
Existing Volumes (Base) - Evening peak



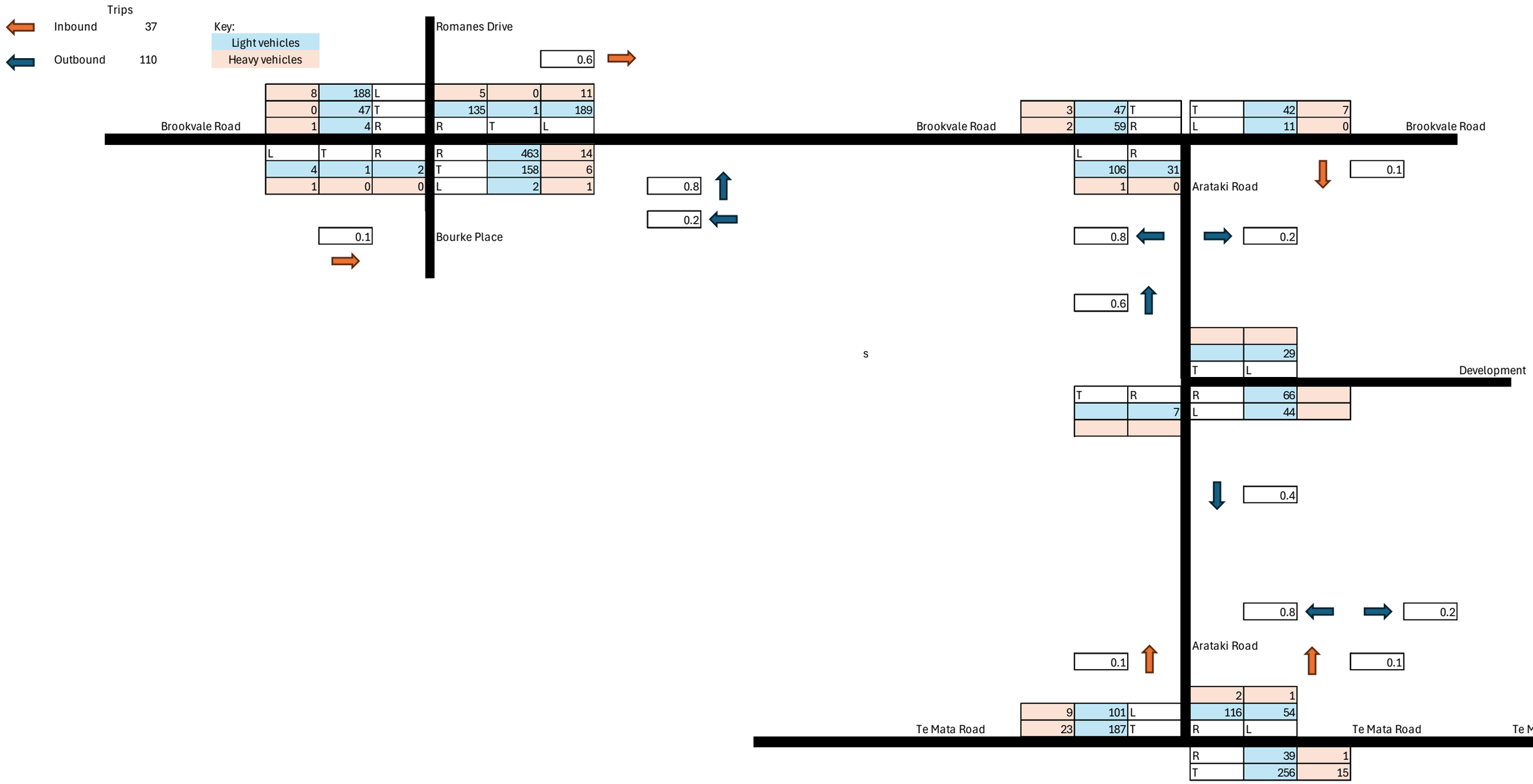
Scenario 1 (Base + Brookevale PC) - Morning peak



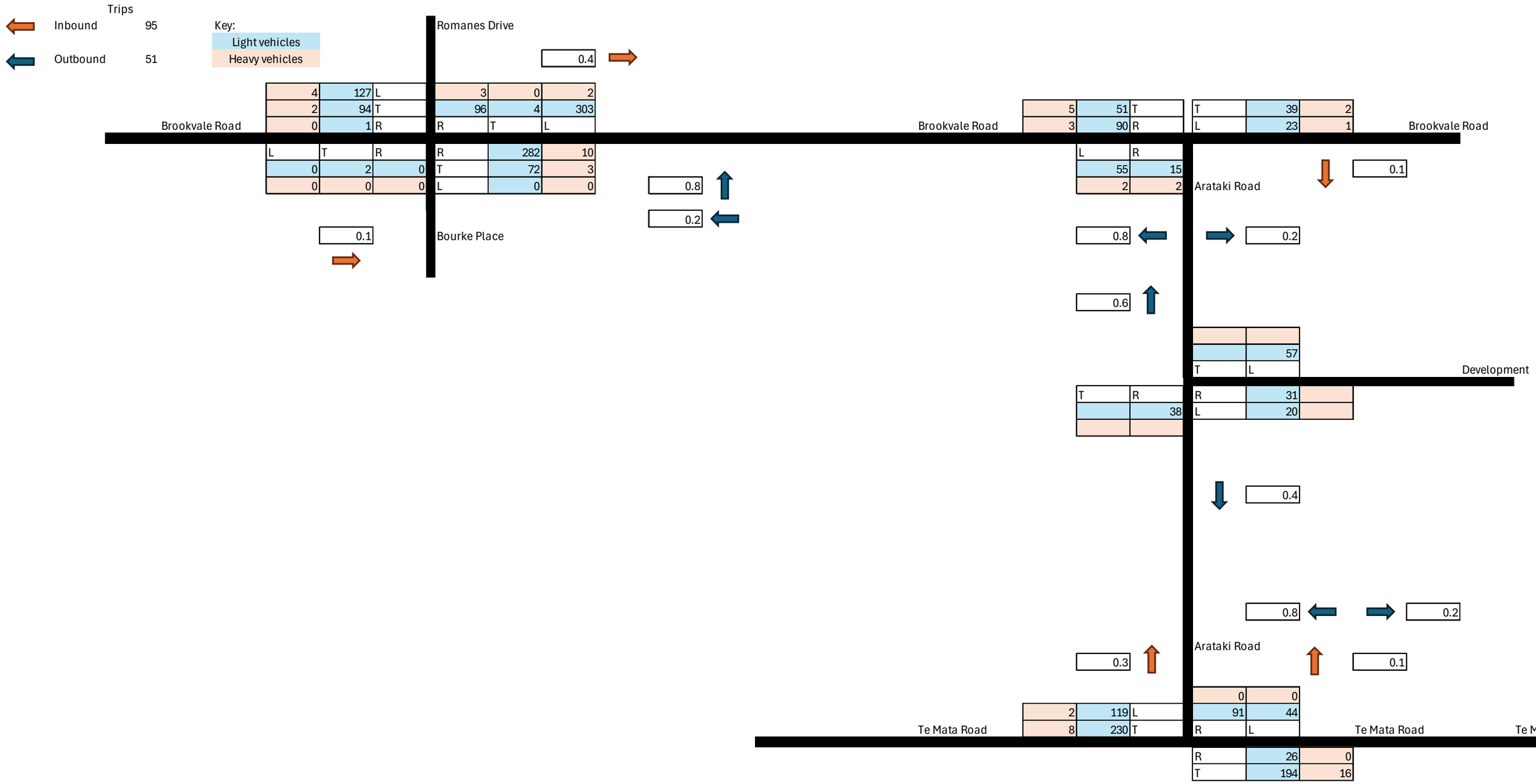
Scenario 1 (Base + Brookevale PC) - Evening peak



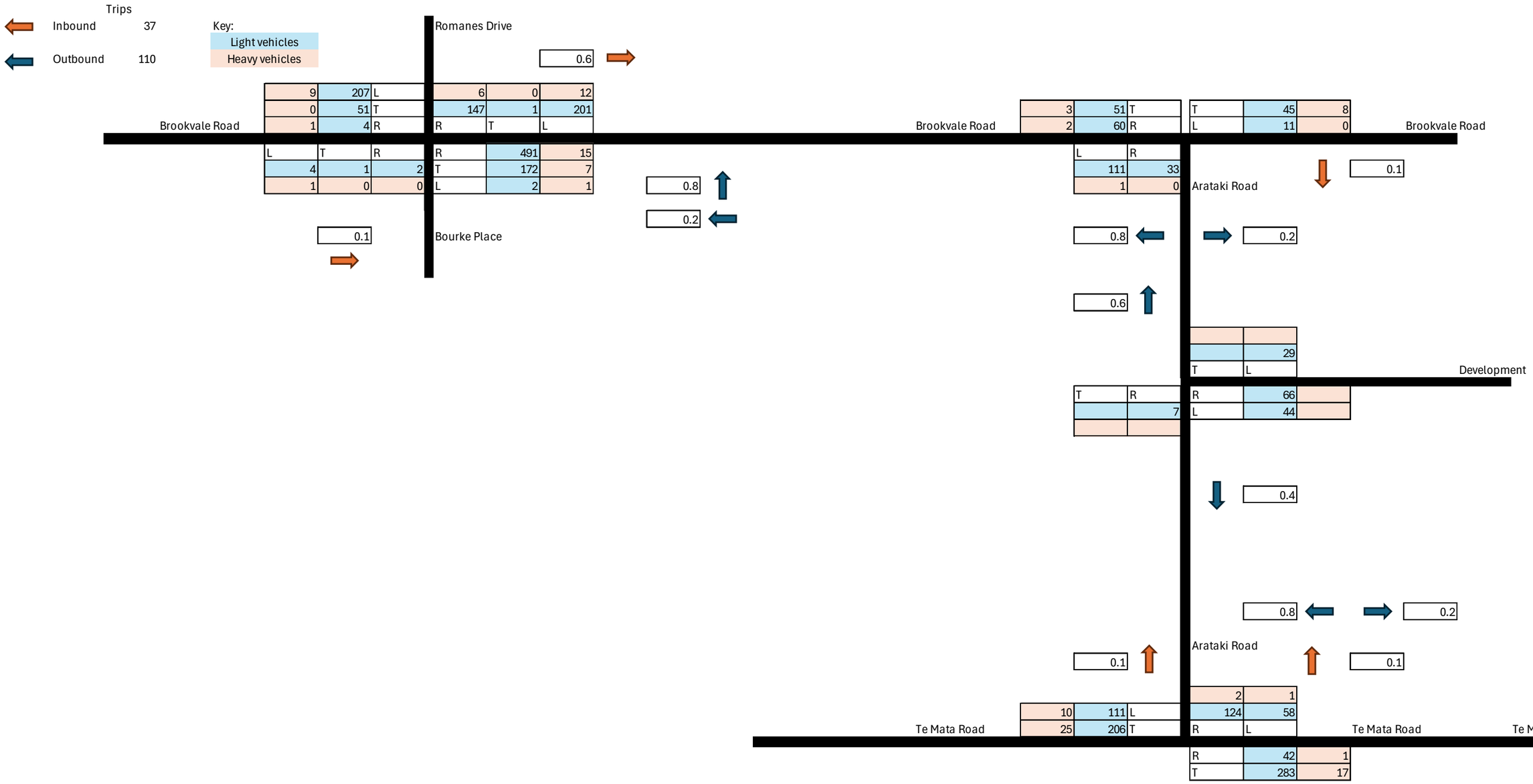
Scenario 2 (Base + Brookvale Plan Change + Development) - Morning peak



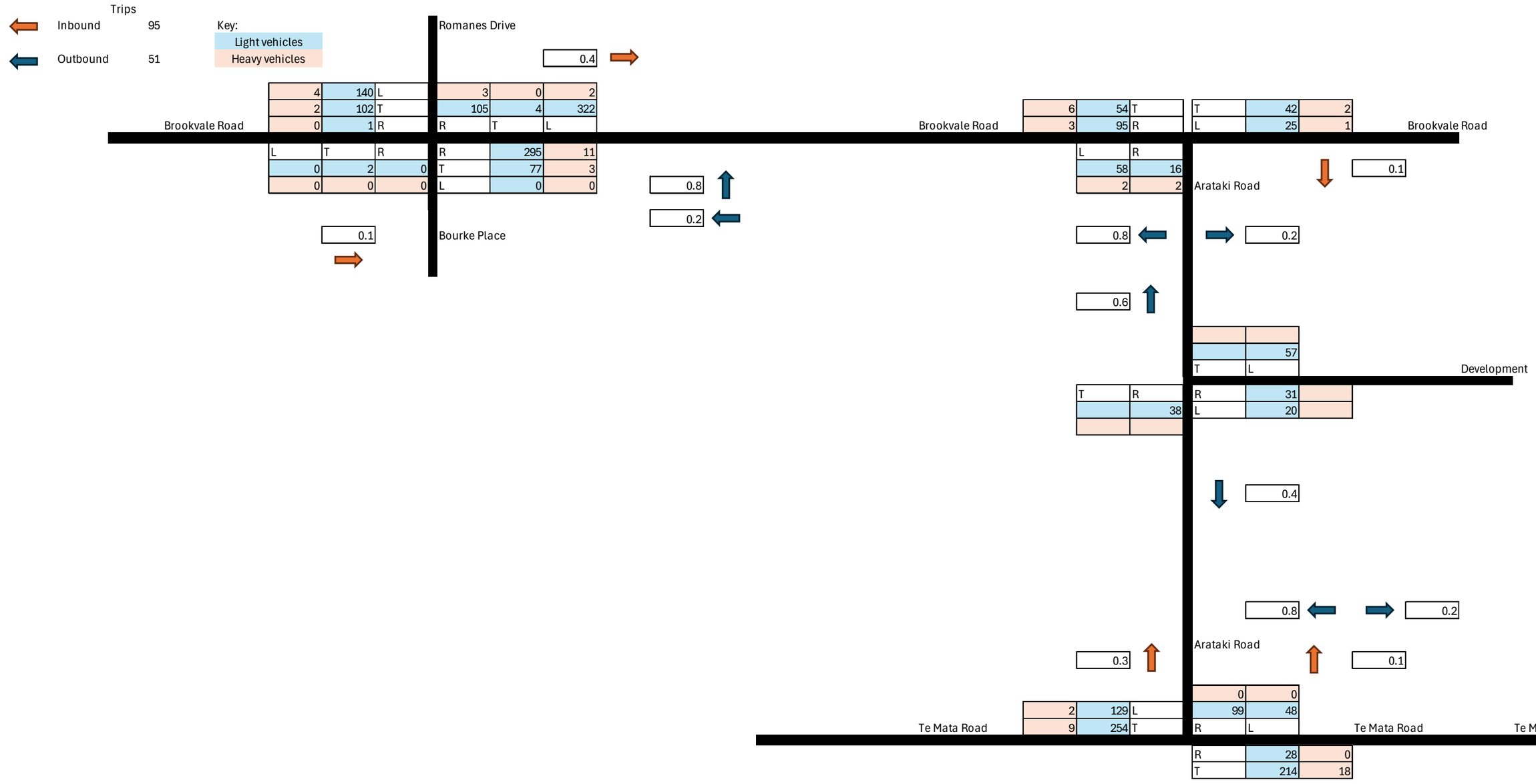
Scenario 2 (Base + Brookvale Plan Change + Development) - Evening peak



Scenario 3 (Base (2% Growth PA for 5 years) + Brookevale Plan Change + Development) - Morning peak



Scenario 3 (Base (2% Growth PA for 5 years) + Brookevale Plan Change + Development) - Evening peak



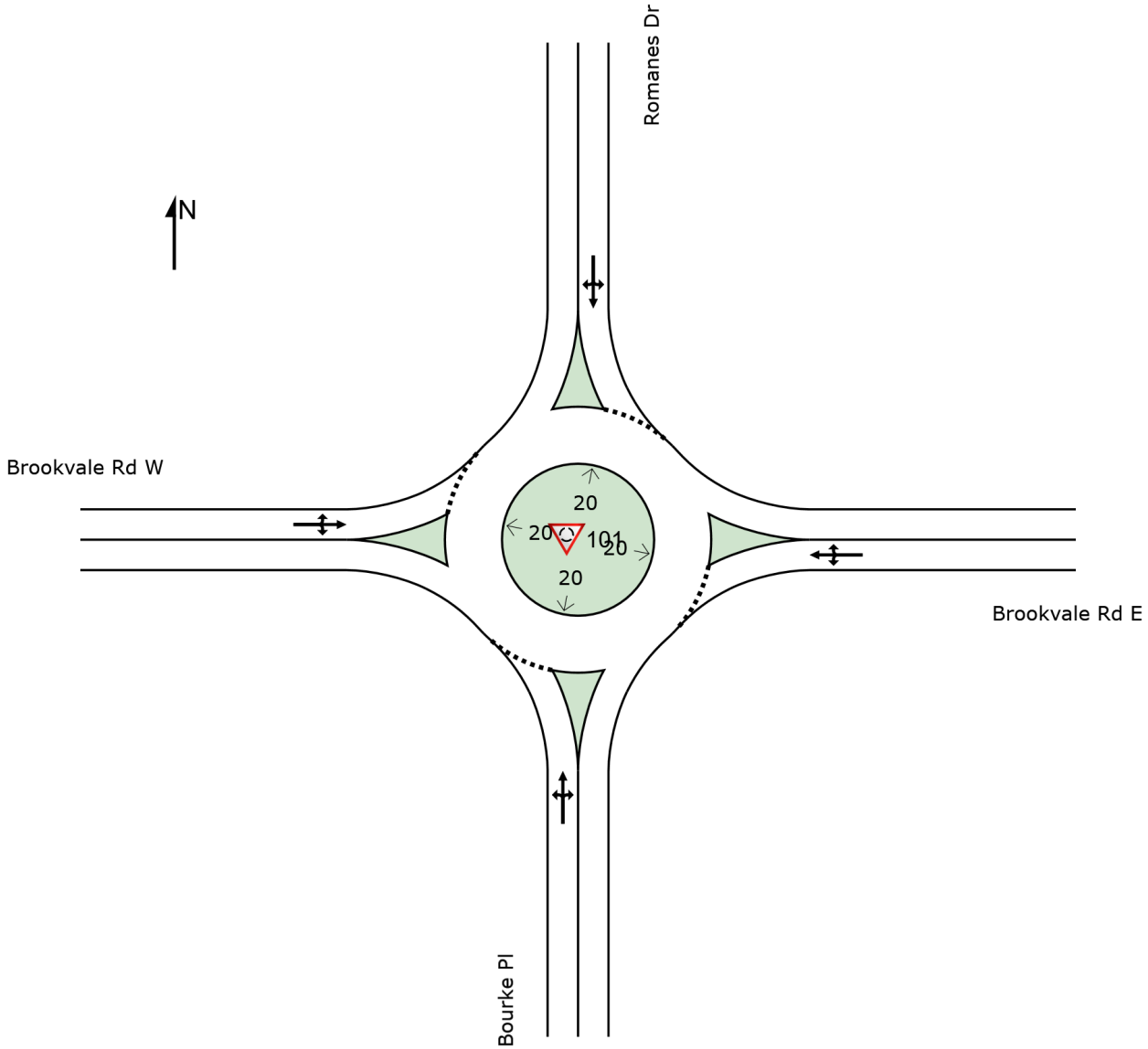
APPENDIX G SIDRA modelling results

SITE LAYOUT

Site: 101 [Existing AM (Site Folder: Romanes Dr/BrookVale Rd/Bourke Pl)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

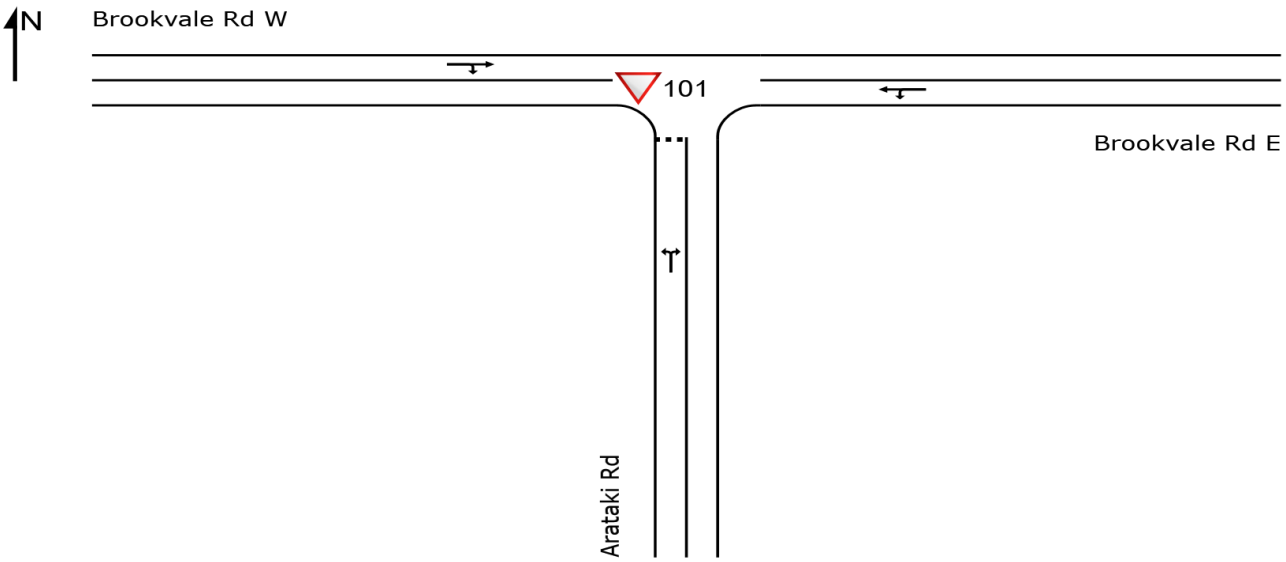


SITE LAYOUT

Site: 101 [Existing AM (Site Folder: Arataki Rd/Brookvale Rd)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.

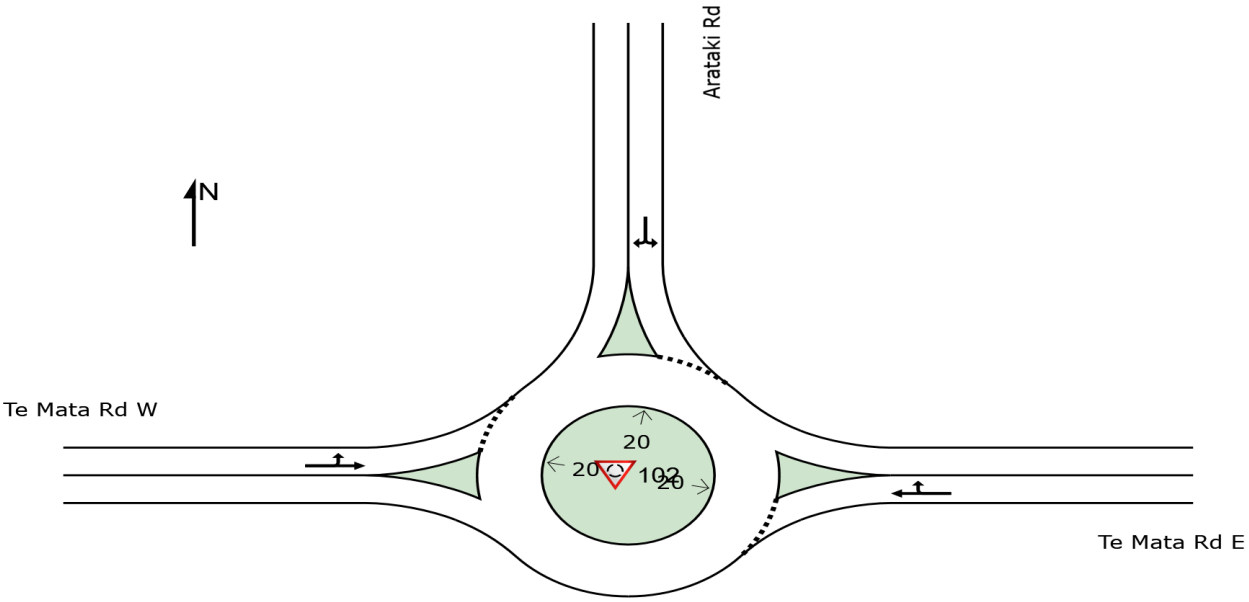


SITE LAYOUT

Site: 102 [Existing AM (Site Folder: Arataki Rd/Te Mata Rd)]

New Site
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [Existing AM (Site Folder: Romanes Dr/BrookVale Rd/Bourke Pl)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	5	20.0	5	20.0	0.011	6.4	LOS A	0.1	0.4	0.61	0.57	0.61	44.7
2	T1	All MCs	1	0.0	1	0.0	0.011	5.6	LOS A	0.1	0.4	0.61	0.57	0.61	45.1
3	R2	All MCs	2	0.0	2	0.0	0.011	10.2	LOS B	0.1	0.4	0.61	0.57	0.61	44.6
Approach			8	12.5	8	12.5	0.011	7.3	LOS A	0.1	0.4	0.61	0.57	0.61	44.7
East: Brookvale Rd E															
4	L2	All MCs	3	33.3	3	33.3	0.360	4.2	LOS A	2.3	17.1	0.38	0.53	0.38	44.7
5	T1	All MCs	153	4.1	153	4.1	0.360	3.6	LOS A	2.3	17.1	0.38	0.53	0.38	45.2
6	R2	All MCs	298	4.9	298	4.9	0.360	8.2	LOS A	2.3	17.1	0.38	0.53	0.38	44.6
Approach			454	4.9	454	4.9	0.360	6.6	LOS A	2.3	17.1	0.38	0.53	0.38	44.8
North: Romanes Dr															
7	L2	All MCs	137	8.5	137	8.5	0.192	3.1	LOS A	1.2	8.7	0.20	0.49	0.20	45.7
8	T1	All MCs	1	0.0	1	0.0	0.192	3.0	LOS A	1.2	8.7	0.20	0.49	0.20	46.0
9	R2	All MCs	131	4.0	131	4.0	0.192	7.5	LOS A	1.2	8.7	0.20	0.49	0.20	45.4
Approach			268	6.3	268	6.3	0.192	5.3	LOS A	1.2	8.7	0.20	0.49	0.20	45.6
West: Brookvale Rd W															
10	L2	All MCs	201	4.2	201	4.2	0.238	4.7	LOS A	1.4	10.1	0.52	0.53	0.52	46.1
11	T1	All MCs	39	0.0	39	0.0	0.238	4.5	LOS A	1.4	10.1	0.52	0.53	0.52	46.3
12	R2	All MCs	5	20.0	5	20.0	0.238	9.5	LOS A	1.4	10.1	0.52	0.53	0.52	45.5
Approach			245	3.9	245	3.9	0.238	4.7	LOS A	1.4	10.1	0.52	0.53	0.52	46.1
All Vehicles			976	5.1	976	5.1	0.360	5.8	LOS A	2.3	17.1	0.37	0.52	0.37	45.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Existing PM (Site Folder: Romanes Dr/BrookVale Rd/Bourke Pl)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	1	0.0	1	0.0	0.004	4.1	LOS A	0.0	0.1	0.42	0.45	0.42	45.8
2	T1	All MCs	2	0.0	2	0.0	0.004	4.0	LOS A	0.0	0.1	0.42	0.45	0.42	46.0
3	R2	All MCs	1	0.0	1	0.0	0.004	8.5	LOS A	0.0	0.1	0.42	0.45	0.42	45.4
Approach			4	0.0	4	0.0	0.004	5.2	LOS A	0.0	0.1	0.42	0.45	0.42	45.8
East: Brookvale Rd E															
4	L2	All MCs	1	0.0	1	0.0	0.160	3.3	LOS A	0.9	6.4	0.27	0.53	0.27	45.1
5	T1	All MCs	58	5.5	58	5.5	0.160	3.3	LOS A	0.9	6.4	0.27	0.53	0.27	45.3
6	R2	All MCs	142	7.4	142	7.4	0.160	7.9	LOS A	0.9	6.4	0.27	0.53	0.27	44.7
Approach			201	6.8	201	6.8	0.160	6.5	LOS A	0.9	6.4	0.27	0.53	0.27	44.9
North: Romanes Dr															
7	L2	All MCs	197	1.1	197	1.1	0.219	3.3	LOS A	1.3	9.2	0.26	0.47	0.26	46.1
8	T1	All MCs	4	0.0	4	0.0	0.219	3.2	LOS A	1.3	9.2	0.26	0.47	0.26	46.3
9	R2	All MCs	95	3.3	95	3.3	0.219	7.7	LOS A	1.3	9.2	0.26	0.47	0.26	45.7
Approach			296	1.8	296	1.8	0.219	4.7	LOS A	1.3	9.2	0.26	0.47	0.26	46.0
West: Brookvale Rd W															
10	L2	All MCs	133	3.2	133	3.2	0.178	3.6	LOS A	1.0	7.0	0.34	0.42	0.34	46.5
11	T1	All MCs	81	2.6	81	2.6	0.178	3.6	LOS A	1.0	7.0	0.34	0.42	0.34	46.8
12	R2	All MCs	1	0.0	1	0.0	0.178	8.0	LOS A	1.0	7.0	0.34	0.42	0.34	46.2
Approach			215	2.9	215	2.9	0.178	3.6	LOS A	1.0	7.0	0.34	0.42	0.34	46.6
All Vehicles			716	3.5	716	3.5	0.219	4.9	LOS A	1.3	9.2	0.29	0.47	0.29	45.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Existing AM (Site Folder: Arataki Rd/Brookvale Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	57	1.9	57	1.9	0.053	4.7	LOS A	0.2	1.4	0.13	0.51	0.13	45.6
3	R2	All MCs	19	0.0	19	0.0	0.053	4.9	LOS A	0.2	1.4	0.13	0.51	0.13	45.5
Approach			76	1.4	76	1.4	0.053	4.8	LOS A	0.2	1.4	0.13	0.51	0.13	45.6
East: Brookvale Rd E															
4	L2	All MCs	7	0.0	7	0.0	0.028	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.2
5	T1	All MCs	42	17.5	42	17.5	0.028	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.4
Approach			49	14.9	49	14.9	0.028	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.3
West: Brookvale Rd W															
11	T1	All MCs	40	7.9	40	7.9	0.034	0.1	LOS A	0.1	0.8	0.10	0.20	0.10	48.7
12	R2	All MCs	20	10.5	20	10.5	0.034	4.8	LOS A	0.1	0.8	0.10	0.20	0.10	47.2
Approach			60	8.8	60	8.8	0.034	1.7	NA	0.1	0.8	0.10	0.20	0.10	48.2
All Vehicles			185	7.4	185	7.4	0.053	2.7	NA	0.2	1.4	0.08	0.29	0.08	47.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Existing PM (Site Folder: Arataki Rd/Brookvale Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	34	6.3	34	6.3	0.033	4.7	LOS A	0.1	0.9	0.11	0.51	0.11	45.6
3	R2	All MCs	12	18.2	12	18.2	0.033	5.2	LOS A	0.1	0.9	0.11	0.51	0.11	45.2
Approach			45	9.3	45	9.3	0.033	4.8	LOS A	0.1	0.9	0.11	0.51	0.11	45.5
East: Brookvale Rd E															
4	L2	All MCs	16	6.7	16	6.7	0.025	4.6	LOS A	0.0	0.0	0.00	0.18	0.00	47.7
5	T1	All MCs	31	6.9	31	6.9	0.025	0.0	LOS A	0.0	0.0	0.00	0.18	0.00	48.9
Approach			46	6.8	46	6.8	0.025	1.6	NA	0.0	0.0	0.00	0.18	0.00	48.5
West: Brookvale Rd W															
11	T1	All MCs	33	16.1	33	16.1	0.047	0.1	LOS A	0.2	1.6	0.13	0.33	0.13	47.8
12	R2	All MCs	48	6.5	48	6.5	0.047	4.8	LOS A	0.2	1.6	0.13	0.33	0.13	46.4
Approach			81	10.4	81	10.4	0.047	2.9	NA	0.2	1.6	0.13	0.33	0.13	46.9
All Vehicles			173	9.1	173	9.1	0.047	3.1	NA	0.2	1.6	0.09	0.34	0.09	47.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Existing AM (Site Folder: Arataki Rd/Te Mata Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	285	5.5	285	5.5	0.244	3.3	LOS A	1.5	11.0	0.28	0.38	0.28	46.6
6	R2	All MCs	38	2.8	38	2.8	0.244	7.8	LOS A	1.5	11.0	0.28	0.38	0.28	46.0
Approach			323	5.2	323	5.2	0.244	3.8	LOS A	1.5	11.0	0.28	0.38	0.28	46.5
North: Arataki Rd															
7	L2	All MCs	48	2.2	48	2.2	0.121	4.0	LOS A	0.6	4.4	0.40	0.57	0.40	45.0
9	R2	All MCs	87	2.4	87	2.4	0.121	8.5	LOS A	0.6	4.4	0.40	0.57	0.40	44.7
Approach			136	2.3	136	2.3	0.121	6.9	LOS A	0.6	4.4	0.40	0.57	0.40	44.8
West: Te Mata Rd W															
10	L2	All MCs	112	8.5	112	8.5	0.234	3.1	LOS A	1.4	10.6	0.17	0.34	0.17	46.9
11	T1	All MCs	221	11.0	221	11.0	0.234	3.0	LOS A	1.4	10.6	0.17	0.34	0.17	47.2
Approach			333	10.1	333	10.1	0.234	3.0	LOS A	1.4	10.6	0.17	0.34	0.17	47.1
All Vehicles			792	6.8	792	6.8	0.244	4.0	LOS A	1.5	11.0	0.25	0.40	0.25	46.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Existing PM (Site Folder: Arataki Rd/Te Mata Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	221	7.6	221	7.6	0.183	3.2	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
6	R2	All MCs	18	0.0	18	0.0	0.183	7.6	LOS A	1.1	7.9	0.25	0.36	0.25	46.2
Approach			239	7.0	239	7.0	0.183	3.5	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
North: Arataki Rd															
7	L2	All MCs	42	0.0	42	0.0	0.107	4.1	LOS A	0.5	3.8	0.40	0.58	0.40	45.0
9	R2	All MCs	79	0.0	79	0.0	0.107	8.5	LOS A	0.5	3.8	0.40	0.58	0.40	44.7
Approach			121	0.0	121	0.0	0.107	7.0	LOS A	0.5	3.8	0.40	0.58	0.40	44.8
West: Te Mata Rd W															
10	L2	All MCs	98	2.2	98	2.2	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.2
11	T1	All MCs	251	3.4	251	3.4	0.223	2.8	LOS A	1.3	9.5	0.10	0.33	0.10	47.5
Approach			348	3.0	348	3.0	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.4
All Vehicles			708	3.9	708	3.9	0.223	3.8	LOS A	1.3	9.5	0.21	0.38	0.21	46.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 1 AM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	5	20.0	5	20.0	0.013	8.1	LOS A	0.1	0.6	0.72	0.63	0.72	43.9
2	T1	All MCs	1	0.0	1	0.0	0.013	7.1	LOS A	0.1	0.6	0.72	0.63	0.72	44.3
3	R2	All MCs	2	0.0	2	0.0	0.013	11.6	LOS B	0.1	0.6	0.72	0.63	0.72	43.7
Approach			8	12.5	8	12.5	0.013	8.9	LOS A	0.1	0.6	0.72	0.63	0.72	43.9
East: Brookvale Rd E															
4	L2	All MCs	3	33.3	3	33.3	0.493	4.6	LOS A	3.8	27.1	0.47	0.55	0.47	44.4
5	T1	All MCs	161	3.9	161	3.9	0.493	3.9	LOS A	3.8	27.1	0.47	0.55	0.47	44.8
6	R2	All MCs	458	3.2	458	3.2	0.493	8.4	LOS A	3.8	27.1	0.47	0.55	0.47	44.3
Approach			622	3.6	622	3.6	0.493	7.3	LOS A	3.8	27.1	0.47	0.55	0.47	44.4
North: Romanes Dr															
7	L2	All MCs	187	6.2	187	6.2	0.240	3.1	LOS A	1.6	11.7	0.23	0.48	0.23	45.8
8	T1	All MCs	1	0.0	1	0.0	0.240	3.0	LOS A	1.6	11.7	0.23	0.48	0.23	46.1
9	R2	All MCs	147	3.6	147	3.6	0.240	7.6	LOS A	1.6	11.7	0.23	0.48	0.23	45.5
Approach			336	5.0	336	5.0	0.240	5.1	LOS A	1.6	11.7	0.23	0.48	0.23	45.7
West: Brookvale Rd W															
10	L2	All MCs	201	4.2	201	4.2	0.281	5.8	LOS A	1.8	12.7	0.65	0.61	0.65	45.6
11	T1	All MCs	45	0.0	45	0.0	0.281	5.5	LOS A	1.8	12.7	0.65	0.61	0.65	45.9
12	R2	All MCs	5	20.0	5	20.0	0.281	10.8	LOS B	1.8	12.7	0.65	0.61	0.65	45.1
Approach			252	3.8	252	3.8	0.281	5.8	LOS A	1.8	12.7	0.65	0.61	0.65	45.7
All Vehicles			1218	4.1	1218	4.1	0.493	6.4	LOS A	3.8	27.1	0.44	0.55	0.44	45.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 1 PM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	1	0.0	1	0.0	0.004	4.9	LOS A	0.0	0.2	0.53	0.49	0.53	45.4
2	T1	All MCs	2	0.0	2	0.0	0.004	4.9	LOS A	0.0	0.2	0.53	0.49	0.53	45.6
3	R2	All MCs	1	0.0	1	0.0	0.004	9.4	LOS A	0.0	0.2	0.53	0.49	0.53	45.1
Approach			4	0.0	4	0.0	0.004	6.0	LOS A	0.0	0.2	0.53	0.49	0.53	45.4
East: Brookvale Rd E															
4	L2	All MCs	1	0.0	1	0.0	0.278	3.4	LOS A	1.7	12.5	0.32	0.54	0.32	44.8
5	T1	All MCs	74	4.3	74	4.3	0.278	3.4	LOS A	1.7	12.5	0.32	0.54	0.32	45.0
6	R2	All MCs	286	3.7	286	3.7	0.278	7.9	LOS A	1.7	12.5	0.32	0.54	0.32	44.4
Approach			361	3.8	361	3.8	0.278	7.0	LOS A	1.7	12.5	0.32	0.54	0.32	44.6
North: Romanes Dr															
7	L2	All MCs	281	0.7	281	0.7	0.290	3.3	LOS A	1.9	13.6	0.31	0.47	0.31	46.1
8	T1	All MCs	4	0.0	4	0.0	0.290	3.3	LOS A	1.9	13.6	0.31	0.47	0.31	46.3
9	R2	All MCs	104	3.0	104	3.0	0.290	7.8	LOS A	1.9	13.6	0.31	0.47	0.31	45.7
Approach			389	1.4	389	1.4	0.290	4.5	LOS A	1.9	13.6	0.31	0.47	0.31	46.0
West: Brookvale Rd W															
10	L2	All MCs	138	3.1	138	3.1	0.218	4.5	LOS A	1.3	9.0	0.49	0.50	0.49	46.1
11	T1	All MCs	92	2.3	92	2.3	0.218	4.4	LOS A	1.3	9.0	0.49	0.50	0.49	46.3
12	R2	All MCs	1	0.0	1	0.0	0.218	8.9	LOS A	1.3	9.0	0.49	0.50	0.49	45.8
Approach			231	2.7	231	2.7	0.218	4.5	LOS A	1.3	9.0	0.49	0.50	0.49	46.2
All Vehicles			985	2.6	985	2.6	0.290	5.4	LOS A	1.9	13.6	0.36	0.50	0.36	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 1 AM (Site Folder: Arataki Rd/ Brookvale Rd - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	57	1.9	57	1.9	0.053	4.7	LOS A	0.2	1.4	0.15	0.51	0.15	45.6
3	R2	All MCs	19	0.0	19	0.0	0.053	5.1	LOS A	0.2	1.4	0.15	0.51	0.15	45.4
Approach			76	1.4	76	1.4	0.053	4.8	LOS A	0.2	1.4	0.15	0.51	0.15	45.6
East: Brookvale Rd E															
4	L2	All MCs	7	0.0	7	0.0	0.033	4.6	LOS A	0.0	0.0	0.00	0.07	0.00	48.3
5	T1	All MCs	52	14.3	52	14.3	0.033	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	49.5
Approach			59	12.5	59	12.5	0.033	0.6	NA	0.0	0.0	0.00	0.07	0.00	49.4
West: Brookvale Rd W															
11	T1	All MCs	53	6.0	53	6.0	0.051	0.1	LOS A	0.2	1.4	0.12	0.24	0.12	48.4
12	R2	All MCs	37	5.7	37	5.7	0.051	4.8	LOS A	0.2	1.4	0.12	0.24	0.12	47.0
Approach			89	5.9	89	5.9	0.051	2.0	NA	0.2	1.4	0.12	0.24	0.12	47.8
All Vehicles			224	6.1	224	6.1	0.053	2.6	NA	0.2	1.4	0.10	0.29	0.10	47.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 1 PM (Site Folder: Arataki Rd/ Brookvale Rd - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	34	6.3	34	6.3	0.034	4.7	LOS A	0.1	0.9	0.13	0.51	0.13	45.6
3	R2	All MCs	12	18.2	12	18.2	0.034	5.4	LOS A	0.1	0.9	0.13	0.51	0.13	45.2
Approach			45	9.3	45	9.3	0.034	4.9	LOS A	0.1	0.9	0.13	0.51	0.13	45.5
East: Brookvale Rd E															
4	L2	All MCs	16	6.7	16	6.7	0.032	4.6	LOS A	0.0	0.0	0.00	0.14	0.00	47.9
5	T1	All MCs	43	4.9	43	4.9	0.032	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	49.2
Approach			59	5.4	59	5.4	0.032	1.2	NA	0.0	0.0	0.00	0.14	0.00	48.8
West: Brookvale Rd W															
11	T1	All MCs	59	8.9	59	8.9	0.062	0.1	LOS A	0.2	1.8	0.13	0.26	0.13	48.3
12	R2	All MCs	48	6.5	48	6.5	0.062	4.8	LOS A	0.2	1.8	0.13	0.26	0.13	46.8
Approach			107	7.8	107	7.8	0.062	2.2	NA	0.2	1.8	0.13	0.26	0.13	47.6
All Vehicles			212	7.5	212	7.5	0.062	2.5	NA	0.2	1.8	0.09	0.28	0.09	47.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 1 AM (Site Folder: Arataki Rd/Te Mata Rd - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	285	5.5	285	5.5	0.244	3.3	LOS A	1.5	11.0	0.28	0.38	0.28	46.6
6	R2	All MCs	38	2.8	38	2.8	0.244	7.8	LOS A	1.5	11.0	0.28	0.38	0.28	46.0
Approach			323	5.2	323	5.2	0.244	3.8	LOS A	1.5	11.0	0.28	0.38	0.28	46.5
North: Arataki Rd															
7	L2	All MCs	48	2.2	48	2.2	0.121	4.0	LOS A	0.6	4.4	0.40	0.57	0.40	45.0
9	R2	All MCs	87	2.4	87	2.4	0.121	8.5	LOS A	0.6	4.4	0.40	0.57	0.40	44.7
Approach			136	2.3	136	2.3	0.121	6.9	LOS A	0.6	4.4	0.40	0.57	0.40	44.8
West: Te Mata Rd W															
10	L2	All MCs	112	8.5	112	8.5	0.234	3.1	LOS A	1.4	10.6	0.17	0.34	0.17	46.9
11	T1	All MCs	221	11.0	221	11.0	0.234	3.0	LOS A	1.4	10.6	0.17	0.34	0.17	47.2
Approach			333	10.1	333	10.1	0.234	3.0	LOS A	1.4	10.6	0.17	0.34	0.17	47.1
All Vehicles			792	6.8	792	6.8	0.244	4.0	LOS A	1.5	11.0	0.25	0.40	0.25	46.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 1 PM (Site Folder: Arataki Rd/Te Mata Rd - Scenario 1)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	221	7.6	221	7.6	0.183	3.2	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
6	R2	All MCs	18	0.0	18	0.0	0.183	7.6	LOS A	1.1	7.9	0.25	0.36	0.25	46.2
Approach			239	7.0	239	7.0	0.183	3.5	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
North: Arataki Rd															
7	L2	All MCs	42	0.0	42	0.0	0.107	4.1	LOS A	0.5	3.8	0.40	0.58	0.40	45.0
9	R2	All MCs	79	0.0	79	0.0	0.107	8.5	LOS A	0.5	3.8	0.40	0.58	0.40	44.7
Approach			121	0.0	121	0.0	0.107	7.0	LOS A	0.5	3.8	0.40	0.58	0.40	44.8
West: Te Mata Rd W															
10	L2	All MCs	98	2.2	98	2.2	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.2
11	T1	All MCs	251	3.4	251	3.4	0.223	2.8	LOS A	1.3	9.5	0.10	0.33	0.10	47.5
Approach			348	3.0	348	3.0	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.4
All Vehicles			708	3.9	708	3.9	0.223	3.8	LOS A	1.3	9.5	0.21	0.38	0.21	46.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 2 AM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	5	20.0	5	20.0	0.014	8.6	LOS A	0.1	0.6	0.75	0.64	0.75	43.6
2	T1	All MCs	1	0.0	1	0.0	0.014	7.6	LOS A	0.1	0.6	0.75	0.64	0.75	44.0
3	R2	All MCs	2	0.0	2	0.0	0.014	12.1	LOS B	0.1	0.6	0.75	0.64	0.75	43.5
Approach			8	12.5	8	12.5	0.014	9.4	LOS A	0.1	0.6	0.75	0.64	0.75	43.7
East: Brookvale Rd E															
4	L2	All MCs	3	33.3	3	33.3	0.527	4.7	LOS A	4.2	30.5	0.49	0.56	0.49	44.3
5	T1	All MCs	164	3.8	164	3.8	0.527	4.0	LOS A	4.2	30.5	0.49	0.56	0.49	44.7
6	R2	All MCs	502	2.9	502	2.9	0.527	8.5	LOS A	4.2	30.5	0.49	0.56	0.49	44.2
Approach			669	3.3	669	3.3	0.527	7.4	LOS A	4.2	30.5	0.49	0.56	0.49	44.3
North: Romanes Dr															
7	L2	All MCs	211	5.5	211	5.5	0.258	3.2	LOS A	1.8	12.8	0.24	0.48	0.24	45.9
8	T1	All MCs	1	0.0	1	0.0	0.258	3.0	LOS A	1.8	12.8	0.24	0.48	0.24	46.1
9	R2	All MCs	147	3.6	147	3.6	0.258	7.6	LOS A	1.8	12.8	0.24	0.48	0.24	45.5
Approach			359	4.7	359	4.7	0.258	5.0	LOS A	1.8	12.8	0.24	0.48	0.24	45.7
West: Brookvale Rd W															
10	L2	All MCs	206	4.1	206	4.1	0.304	6.1	LOS A	1.9	14.0	0.69	0.63	0.69	45.4
11	T1	All MCs	49	0.0	49	0.0	0.304	5.9	LOS A	1.9	14.0	0.69	0.63	0.69	45.7
12	R2	All MCs	5	20.0	5	20.0	0.304	11.2	LOS B	1.9	14.0	0.69	0.63	0.69	44.9
Approach			261	3.6	261	3.6	0.304	6.2	LOS A	1.9	14.0	0.69	0.63	0.69	45.5
All Vehicles			1298	3.8	1298	3.8	0.527	6.5	LOS A	4.2	30.5	0.46	0.55	0.46	44.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 2 PM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	1	0.0	1	0.0	0.005	5.1	LOS A	0.0	0.2	0.55	0.50	0.55	45.3
2	T1	All MCs	2	0.0	2	0.0	0.005	5.0	LOS A	0.0	0.2	0.55	0.50	0.55	45.6
3	R2	All MCs	1	0.0	1	0.0	0.005	9.5	LOS A	0.0	0.2	0.55	0.50	0.55	45.0
Approach			4	0.0	4	0.0	0.005	6.2	LOS A	0.0	0.2	0.55	0.50	0.55	45.4
East: Brookvale Rd E															
4	L2	All MCs	1	0.0	1	0.0	0.297	3.4	LOS A	1.9	13.7	0.33	0.54	0.33	44.8
5	T1	All MCs	79	4.0	79	4.0	0.297	3.4	LOS A	1.9	13.7	0.33	0.54	0.33	45.0
6	R2	All MCs	307	3.4	307	3.4	0.297	7.9	LOS A	1.9	13.7	0.33	0.54	0.33	44.4
Approach			387	3.5	387	3.5	0.297	7.0	LOS A	1.9	13.7	0.33	0.54	0.33	44.5
North: Romanes Dr															
7	L2	All MCs	321	0.7	321	0.7	0.322	3.4	LOS A	2.2	15.7	0.34	0.47	0.34	46.1
8	T1	All MCs	4	0.0	4	0.0	0.322	3.3	LOS A	2.2	15.7	0.34	0.47	0.34	46.3
9	R2	All MCs	104	3.0	104	3.0	0.322	7.9	LOS A	2.2	15.7	0.34	0.47	0.34	45.7
Approach			429	1.2	429	1.2	0.322	4.5	LOS A	2.2	15.7	0.34	0.47	0.34	46.0
West: Brookvale Rd W															
10	L2	All MCs	138	3.1	138	3.1	0.230	4.7	LOS A	1.3	9.6	0.52	0.51	0.52	46.0
11	T1	All MCs	101	2.1	101	2.1	0.230	4.5	LOS A	1.3	9.6	0.52	0.51	0.52	46.3
12	R2	All MCs	1	0.0	1	0.0	0.230	9.0	LOS A	1.3	9.6	0.52	0.51	0.52	45.7
Approach			240	2.6	240	2.6	0.230	4.6	LOS A	1.3	9.6	0.52	0.51	0.52	46.1
All Vehicles			1061	2.4	1061	2.4	0.322	5.4	LOS A	2.2	15.7	0.38	0.50	0.38	45.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 2 AM (Site Folder: Arataki Rd/ Brookvale Rd - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	113	0.9	113	0.9	0.102	4.7	LOS A	0.4	2.9	0.15	0.51	0.15	45.6
3	R2	All MCs	33	0.0	33	0.0	0.102	5.2	LOS A	0.4	2.9	0.15	0.51	0.15	45.4
Approach			145	0.7	145	0.7	0.102	4.9	LOS A	0.4	2.9	0.15	0.51	0.15	45.6
East: Brookvale Rd E															
4	L2	All MCs	12	0.0	12	0.0	0.035	4.6	LOS A	0.0	0.0	0.00	0.10	0.00	48.1
5	T1	All MCs	52	14.3	52	14.3	0.035	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	49.3
Approach			63	11.7	63	11.7	0.035	0.8	NA	0.0	0.0	0.00	0.10	0.00	49.1
West: Brookvale Rd W															
11	T1	All MCs	53	6.0	53	6.0	0.067	0.2	LOS A	0.3	2.1	0.15	0.31	0.15	47.9
12	R2	All MCs	64	3.3	64	3.3	0.067	4.8	LOS A	0.3	2.1	0.15	0.31	0.15	46.5
Approach			117	4.5	117	4.5	0.067	2.7	NA	0.3	2.1	0.15	0.31	0.15	47.2
All Vehicles			325	4.2	325	4.2	0.102	3.3	NA	0.4	2.9	0.12	0.36	0.12	46.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 2 PM (Site Folder: Arataki Rd/ Brookvale Rd - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	60	3.5	60	3.5	0.057	4.7	LOS A	0.2	1.6	0.14	0.51	0.14	45.6
3	R2	All MCs	18	11.8	18	11.8	0.057	5.6	LOS A	0.2	1.6	0.14	0.51	0.14	45.3
Approach			78	5.4	78	5.4	0.057	4.9	LOS A	0.2	1.6	0.14	0.51	0.14	45.5
East: Brookvale Rd E															
4	L2	All MCs	25	4.2	25	4.2	0.037	4.6	LOS A	0.0	0.0	0.00	0.20	0.00	47.6
5	T1	All MCs	43	4.9	43	4.9	0.037	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.9
Approach			68	4.6	68	4.6	0.037	1.7	NA	0.0	0.0	0.00	0.20	0.00	48.4
West: Brookvale Rd W															
11	T1	All MCs	59	8.9	59	8.9	0.091	0.2	LOS A	0.4	3.1	0.16	0.35	0.16	47.7
12	R2	All MCs	98	3.2	98	3.2	0.091	4.8	LOS A	0.4	3.1	0.16	0.35	0.16	46.3
Approach			157	5.4	157	5.4	0.091	3.1	NA	0.4	3.1	0.16	0.35	0.16	46.8
All Vehicles			303	5.2	303	5.2	0.091	3.2	NA	0.4	3.1	0.12	0.36	0.12	46.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 2 AM (Site Folder: Arataki Rd/Te Mata Rd - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	285	5.5	285	5.5	0.260	3.5	LOS A	1.6	11.8	0.35	0.41	0.35	46.3
6	R2	All MCs	42	2.5	42	2.5	0.260	8.0	LOS A	1.6	11.8	0.35	0.41	0.35	45.8
Approach			327	5.1	327	5.1	0.260	4.1	LOS A	1.6	11.8	0.35	0.41	0.35	46.3
North: Arataki Rd															
7	L2	All MCs	58	1.8	58	1.8	0.161	4.1	LOS A	0.9	6.1	0.41	0.58	0.41	44.9
9	R2	All MCs	124	1.7	124	1.7	0.161	8.5	LOS A	0.9	6.1	0.41	0.58	0.41	44.5
Approach			182	1.7	182	1.7	0.161	7.1	LOS A	0.9	6.1	0.41	0.58	0.41	44.7
West: Te Mata Rd W															
10	L2	All MCs	116	8.2	116	8.2	0.239	3.1	LOS A	1.5	11.1	0.18	0.34	0.18	46.9
11	T1	All MCs	221	11.0	221	11.0	0.239	3.0	LOS A	1.5	11.1	0.18	0.34	0.18	47.2
Approach			337	10.0	337	10.0	0.239	3.1	LOS A	1.5	11.1	0.18	0.34	0.18	47.1
All Vehicles			846	6.3	846	6.3	0.260	4.3	LOS A	1.6	11.8	0.30	0.42	0.30	46.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 2 PM (Site Folder: Arataki Rd/Te Mata Rd - Development Scenario 2)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	221	7.6	221	7.6	0.183	3.2	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
6	R2	All MCs	18	0.0	18	0.0	0.183	7.6	LOS A	1.1	7.9	0.25	0.36	0.25	46.2
Approach			239	7.0	239	7.0	0.183	3.5	LOS A	1.1	7.9	0.25	0.36	0.25	46.7
North: Arataki Rd															
7	L2	All MCs	42	0.0	42	0.0	0.107	4.1	LOS A	0.5	3.8	0.40	0.58	0.40	45.0
9	R2	All MCs	79	0.0	79	0.0	0.107	8.5	LOS A	0.5	3.8	0.40	0.58	0.40	44.7
Approach			121	0.0	121	0.0	0.107	7.0	LOS A	0.5	3.8	0.40	0.58	0.40	44.8
West: Te Mata Rd W															
10	L2	All MCs	98	2.2	98	2.2	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.2
11	T1	All MCs	251	3.4	251	3.4	0.223	2.8	LOS A	1.3	9.5	0.10	0.33	0.10	47.5
Approach			348	3.0	348	3.0	0.223	2.9	LOS A	1.3	9.5	0.10	0.33	0.10	47.4
All Vehicles			708	3.9	708	3.9	0.223	3.8	LOS A	1.3	9.5	0.21	0.38	0.21	46.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 3 AM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	5	20.0	5	20.0	0.015	9.5	LOS A	0.1	0.7	0.79	0.66	0.79	43.2
2	T1	All MCs	1	0.0	1	0.0	0.015	8.4	LOS A	0.1	0.7	0.79	0.66	0.79	43.6
3	R2	All MCs	2	0.0	2	0.0	0.015	12.9	LOS B	0.1	0.7	0.79	0.66	0.79	43.0
Approach			8	12.5	8	12.5	0.015	10.2	LOS B	0.1	0.7	0.79	0.66	0.79	43.2
East: Brookvale Rd E															
4	L2	All MCs	3	33.3	3	33.3	0.579	5.0	LOS A	5.0	35.7	0.55	0.57	0.55	44.2
5	T1	All MCs	188	3.9	188	3.9	0.579	4.2	LOS A	5.0	35.7	0.55	0.57	0.55	44.6
6	R2	All MCs	533	3.0	533	3.0	0.579	8.7	LOS A	5.0	35.7	0.55	0.57	0.55	44.1
Approach			724	3.3	724	3.3	0.579	7.5	LOS A	5.0	35.7	0.55	0.57	0.55	44.2
North: Romanes Dr															
7	L2	All MCs	224	5.6	224	5.6	0.279	3.2	LOS A	2.0	14.4	0.26	0.48	0.26	45.8
8	T1	All MCs	1	0.0	1	0.0	0.279	3.1	LOS A	2.0	14.4	0.26	0.48	0.26	46.1
9	R2	All MCs	161	3.9	161	3.9	0.279	7.6	LOS A	2.0	14.4	0.26	0.48	0.26	45.4
Approach			386	4.9	386	4.9	0.279	5.0	LOS A	2.0	14.4	0.26	0.48	0.26	45.7
West: Brookvale Rd W															
10	L2	All MCs	227	4.2	227	4.2	0.347	6.5	LOS A	2.3	16.7	0.73	0.65	0.73	45.2
11	T1	All MCs	54	0.0	54	0.0	0.347	6.2	LOS A	2.3	16.7	0.73	0.65	0.73	45.5
12	R2	All MCs	5	20.0	5	20.0	0.347	11.6	LOS B	2.3	16.7	0.73	0.65	0.73	44.7
Approach			286	3.7	286	3.7	0.347	6.5	LOS A	2.3	16.7	0.73	0.65	0.73	45.3
All Vehicles			1405	3.9	1405	3.9	0.579	6.7	LOS A	5.0	35.7	0.51	0.56	0.51	44.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 3 PM (Site Folder: Romanes Dr/ BrookVale Rd/Bourke Pl - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Bourke Pl															
1	L2	All MCs	1	0.0	1	0.0	0.005	5.3	LOS A	0.0	0.2	0.57	0.51	0.57	45.3
2	T1	All MCs	2	0.0	2	0.0	0.005	5.2	LOS A	0.0	0.2	0.57	0.51	0.57	45.5
3	R2	All MCs	1	0.0	1	0.0	0.005	9.7	LOS A	0.0	0.2	0.57	0.51	0.57	44.9
Approach			4	0.0	4	0.0	0.005	6.3	LOS A	0.0	0.2	0.57	0.51	0.57	45.3
East: Brookvale Rd E															
4	L2	All MCs	1	0.0	1	0.0	0.317	3.5	LOS A	2.1	14.9	0.35	0.54	0.35	44.8
5	T1	All MCs	84	3.8	84	3.8	0.317	3.5	LOS A	2.1	14.9	0.35	0.54	0.35	44.9
6	R2	All MCs	322	3.6	322	3.6	0.317	8.0	LOS A	2.1	14.9	0.35	0.54	0.35	44.4
Approach			407	3.6	407	3.6	0.317	7.1	LOS A	2.1	14.9	0.35	0.54	0.35	44.5
North: Romanes Dr															
7	L2	All MCs	341	0.6	341	0.6	0.348	3.5	LOS A	2.5	17.5	0.36	0.47	0.36	46.0
8	T1	All MCs	4	0.0	4	0.0	0.348	3.4	LOS A	2.5	17.5	0.36	0.47	0.36	46.3
9	R2	All MCs	114	2.8	114	2.8	0.348	8.0	LOS A	2.5	17.5	0.36	0.47	0.36	45.6
Approach			459	1.1	459	1.1	0.348	4.6	LOS A	2.5	17.5	0.36	0.47	0.36	45.9
West: Brookvale Rd W															
10	L2	All MCs	152	2.8	152	2.8	0.255	4.8	LOS A	1.5	10.9	0.54	0.52	0.54	46.0
11	T1	All MCs	109	1.9	109	1.9	0.255	4.7	LOS A	1.5	10.9	0.54	0.52	0.54	46.2
12	R2	All MCs	1	0.0	1	0.0	0.255	9.1	LOS A	1.5	10.9	0.54	0.52	0.54	45.6
Approach			262	2.4	262	2.4	0.255	4.8	LOS A	1.5	10.9	0.54	0.52	0.54	46.1
All Vehicles			1133	2.3	1133	2.3	0.348	5.5	LOS A	2.5	17.5	0.40	0.51	0.40	45.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 3 AM (Site Folder: Arataki Rd/ Brookvale Rd - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	118	0.9	118	0.9	0.108	4.8	LOS A	0.4	3.1	0.16	0.51	0.16	45.6
3	R2	All MCs	35	0.0	35	0.0	0.108	5.3	LOS A	0.4	3.1	0.16	0.51	0.16	45.4
Approach			153	0.7	153	0.7	0.108	4.9	LOS A	0.4	3.1	0.16	0.51	0.16	45.5
East: Brookvale Rd E															
4	L2	All MCs	12	0.0	12	0.0	0.038	4.6	LOS A	0.0	0.0	0.00	0.09	0.00	48.2
5	T1	All MCs	56	15.1	56	15.1	0.038	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	49.4
Approach			67	12.5	67	12.5	0.038	0.8	NA	0.0	0.0	0.00	0.09	0.00	49.2
West: Brookvale Rd W															
11	T1	All MCs	57	5.6	57	5.6	0.070	0.2	LOS A	0.3	2.2	0.15	0.31	0.15	48.0
12	R2	All MCs	65	3.2	65	3.2	0.070	4.8	LOS A	0.3	2.2	0.15	0.31	0.15	46.6
Approach			122	4.3	122	4.3	0.070	2.6	NA	0.3	2.2	0.15	0.31	0.15	47.2
All Vehicles			342	4.3	342	4.3	0.108	3.3	NA	0.4	3.1	0.13	0.36	0.13	46.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Dev Scenario 3 PM (Site Folder: Arataki Rd/ Brookvale Rd - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Arataki Rd															
1	L2	All MCs	61	3.4	61	3.4	0.059	4.7	LOS A	0.2	1.6	0.14	0.51	0.14	45.6
3	R2	All MCs	19	11.1	19	11.1	0.059	5.7	LOS A	0.2	1.6	0.14	0.51	0.14	45.3
Approach			80	5.3	80	5.3	0.059	5.0	LOS A	0.2	1.6	0.14	0.51	0.14	45.5
East: Brookvale Rd E															
4	L2	All MCs	27	3.8	27	3.8	0.040	4.6	LOS A	0.0	0.0	0.00	0.20	0.00	47.6
5	T1	All MCs	46	4.5	46	4.5	0.040	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.8
Approach			74	4.3	74	4.3	0.040	1.7	NA	0.0	0.0	0.00	0.20	0.00	48.4
West: Brookvale Rd W															
11	T1	All MCs	63	10.0	63	10.0	0.097	0.2	LOS A	0.5	3.3	0.17	0.35	0.17	47.7
12	R2	All MCs	103	3.1	103	3.1	0.097	4.8	LOS A	0.5	3.3	0.17	0.35	0.17	46.3
Approach			166	5.7	166	5.7	0.097	3.1	NA	0.5	3.3	0.17	0.35	0.17	46.8
All Vehicles			320	5.3	320	5.3	0.097	3.2	NA	0.5	3.3	0.13	0.35	0.13	46.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 3 AM (Site Folder: Arataki Rd/Te Mata Rd - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	316	5.7	316	5.7	0.289	3.6	LOS A	1.9	13.6	0.37	0.42	0.37	46.3
6	R2	All MCs	45	2.3	45	2.3	0.289	8.0	LOS A	1.9	13.6	0.37	0.42	0.37	45.7
Approach			361	5.2	361	5.2	0.289	4.1	LOS A	1.9	13.6	0.37	0.42	0.37	46.2
North: Arataki Rd															
7	L2	All MCs	62	1.7	62	1.7	0.175	4.2	LOS A	0.9	6.7	0.44	0.58	0.44	44.8
9	R2	All MCs	133	1.6	133	1.6	0.175	8.6	LOS A	0.9	6.7	0.44	0.58	0.44	44.5
Approach			195	1.6	195	1.6	0.175	7.2	LOS A	0.9	6.7	0.44	0.58	0.44	44.6
West: Te Mata Rd W															
10	L2	All MCs	127	8.3	127	8.3	0.264	3.1	LOS A	1.7	12.6	0.20	0.35	0.20	46.9
11	T1	All MCs	243	10.8	243	10.8	0.264	3.1	LOS A	1.7	12.6	0.20	0.35	0.20	47.1
Approach			371	9.9	371	9.9	0.264	3.1	LOS A	1.7	12.6	0.20	0.35	0.20	47.0
All Vehicles			926	6.4	926	6.4	0.289	4.4	LOS A	1.9	13.6	0.31	0.42	0.31	46.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Dev Scenario 3 PM (Site Folder: Arataki Rd/Te Mata Rd - Development Scenario 3)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Te Mata Rd E															
5	T1	All MCs	242	7.0	242	7.0	0.213	3.4	LOS A	1.3	9.4	0.30	0.39	0.30	46.5
6	R2	All MCs	29	0.0	29	0.0	0.213	7.8	LOS A	1.3	9.4	0.30	0.39	0.30	45.9
Approach			272	6.2	272	6.2	0.213	3.8	LOS A	1.3	9.4	0.30	0.39	0.30	46.4
North: Arataki Rd															
7	L2	All MCs	51	0.0	51	0.0	0.140	4.2	LOS A	0.7	5.1	0.44	0.59	0.44	44.9
9	R2	All MCs	104	0.0	104	0.0	0.140	8.7	LOS A	0.7	5.1	0.44	0.59	0.44	44.5
Approach			155	0.0	155	0.0	0.140	7.2	LOS A	0.7	5.1	0.44	0.59	0.44	44.6
West: Te Mata Rd W															
10	L2	All MCs	138	1.5	138	1.5	0.273	3.0	LOS A	1.7	12.3	0.15	0.34	0.15	47.1
11	T1	All MCs	277	3.4	277	3.4	0.273	2.9	LOS A	1.7	12.3	0.15	0.34	0.15	47.3
Approach			415	2.8	415	2.8	0.273	2.9	LOS A	1.7	12.3	0.15	0.34	0.15	47.2
All Vehicles			841	3.4	841	3.4	0.273	4.0	LOS A	1.7	12.3	0.25	0.40	0.25	46.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX H Council consultation meeting minutes

flow
TRANSPORTATION SPECIALISTS

meeting minutes

PROJECT	**ARATAKI ROAD, HAVELOCK NORTH**		
SUBJECT OF MEETING	INTIAL TRANSPORTATION CONSULATION		
DATE OF MEETING	13 FEBUARY 2025		
LOCATION	TEAMS		
ATTENDEES	BRUCE CONAGHAN	HASTINGS DISTRICT COUNCIL	BCO
	BRANDON OLVER	WOODS	BO
	EMMA HOWIE	WOODS	EH
	BRYCE CULLEN	HAWKES BAY REGIONAL COUNCIL	BCU
	GERHARD VAN DER WESTHUIZEN	FLOW	GVW
	TERRY CHURCH	FLOW	TC
	CHARYNE SUNDGREN	FLOW	CS
DISTRIBUTION	AS ABOVE PLUS		

	ITEM	ACTION	
		BY	**DATE**
1	**Introductions** Nothing to note		

2	**Project Overview**
	• GVW gave overview of the Arataki Project draft plan and its location, noting
	  ○ Shared path to be extended until Brookvale Road
	  ○ Crossing facilities
	  ○ New intersections, primarily serving smaller sections of residential blocks - serving about 160 residential dwellings on site
	  ○ Pedestrian connectivity will be provided through JOALS
	  ○ On site, main pedestrian connectivity is shown but there will be footpaths on both sides of the roads to be vested		

	○ JOALS will be used to serve a small number of lots • GvW discussed the proposed internal road cross section, noting that it has been amended since BCO has seen it, but there are still issues being worked through. ○ Minimum back berm of 1.3m as per guidelines ○ Reduced front berm in response • BCO noted that there are a few things to think about and look at regarding the proposed design noting ○ Important to have some sort of redundancy with services ○ Footpaths on both sides important ○ Thinking about the people that will be living in the area ○ Lighting important to think about ○ Intersection of Arataki Road and Brookvale Road may be an issue, would be good to have a good look at that		
3	**Public transport** • BCU noted that there is a public transport plan for Havelock North that is currently in the works and will go out to consultation this year. • The main trunk route will start at the Havelock bell tower and there would be two routes extending from it. There is the possibility of one routing down Arataki Road and maybe looping through Brookvale. Arataki Road would be a prime road to take a bus down and this proposed bus route would be bidirectional rather than a loop. • BCU noted that the project team will need to account for/consider bus stops along Arataki Road • EH noted that the project team could give indicative bus stop locations to serve development but that this would not mean that bus stops will be installed by development. • TC asked what the general requirement for bus stop infrastructure expected was, noting that the extent to which future bus stops can be blended into our road cross section may depend on this. • BCU noted that infrastructure would depend on demand and future use of the bus stops and when this is developed. Do it in a way that compliments the surrounding environment if possible.		

	• BCU also noted that on street parking area should have provision for bus stop and landscaping should have provision for bus stop infrastructure. • BCO suggested the project team look at Russell Robertson Drive and work out where there are decent catchments, linked by walkways that can increase the catchment size • BCO noted that a bus shelter would be required if there a decent number of patrons and highly likely to be elderly were expected. The team will need to think about who the bus stop will be servicing when determining the needed infrastructure • BCU noted that the council has Remix available to help understand the catchments and demand		
4	**Arataki/Brookvale intersection** • GvW discussed speed surveys done on Brookvale Road. The 7-day speed survey showed 85th percentile speeds between 54-57km/hr. • GvW noted that the design would seek to improve the Brookvale Road frontage of the site. Treatment around existing property would include kerb and channelling on the development side of the road to emphasise the urban environment. This would be some form of gateway treatment including landscaping. • BCO agreed that kerb and channel would be necessary to show the urban environment.		
5	**Development Intersection placement/design layout** • GvW noted that the council urban teams are generally happy with design proposed. • TC noted that the proposed crossroads are likely to be lightly trafficked and will be giveaway controlled. The roads will be opposite and not be staggered, with Arataki Road as the priority. • BCO raised that Te Hopura Place visibility may need to be checked with its dog leg design. • BCO noted that Brookvale Road will end up being the main strategic route and Arataki Road is just on the side. It is unlikely that there will be concerns. • TC noted that operationally the project team are not concerned but we are wanting to account for safety.		

6	**Shared path** • TC noted that the project team are wanting to ensure that safety for users although it will be a low trafficked shared path. Issues that other (example Auckland) councils have concerns about are often vehicle accesses across shared path and reversing over the shared path. • TC noted that front fence controls could be applied with no closed fences and low fences • BCO noted that the back berm width should be providing for that safety too and that it's important to provide for safety and account for the intervisibility. • BCO noted that given the Arataki Road existing layout with decent back berm width, personally has no issues and it's something that can mitigated. Project team should look at the existing layout and framework so as to provide consistency along Arataki Road		
7	**Traffic calming** • TC noted that the development proposed short roads and these will be managed in a way to reduce the opportunities to speed • BCO noted that traffic calming measures could include creating kinks in straight roads, creating buildouts to reduce road widths and coming up with a design that provides for a lower speed environment • TC inquired regarding where HDC sits with treatment for crossings etc • BCO noted that different paving on intersections for side roads could be used to indicate the different use. Flushed treatments effective through change in materiality. This helps in identifying when there's something different with the environment (residential), no through traffic and is only related to the area.		
8	**Standards or Guidance for JOALS in HN** • GvW inquired about the standards in Havelock north for JOALS. ○ 6m for more than 4 houses • BCO noted that details should be in engineering standards **Northwestern corner cul de sac** • GvW inquired if the proposed cul-de-sac design could be bespoke.		

	• BCO noted that the design needs to provide for an 8m rigid truck to u turn, rather than providing for a 3 point turn. This will help to ensure a truck does not need to do a reverse movement down a road. Worst case is 11m truck (capacity issues). • Usually only 2 trips per day for that area of collection. • Would like to avoid 3 points turn to prevent needing to reverse **Refuse** • Can only enter private lane with agreement and amenity • BCO people now days expect door to door service • The project team will track to ensure there's sufficient room for passing/trucks • BCO noted that there will be properties with services needing maintenance and some houses with frontages to the street. The main thing for having back berm for services is to ensure roads are still operatable when there are things needing to be done to services		
9	**Process/Other matters** • TC noted that the project is a fast track application and this conversation can be incorporated to the design and report. • Timeframes are short for submission • TC noted that the project team plans to re-present our design further down the line to give council time to look at and be comfortable with before submission due to the short review time • BCO requested to be party to the circulation of plans and noted that he is happy to meet again regarding the design. It is important to get the design right before submission. • Important to get location of streetlights into design, to ensure that trees do not end up clashing with the lighting • Light at an intersection = position for street name plate • CPTED issues when lighting isn't considered. Lighting requirements will dictate lighting design which in turn effects landscape design • BCU noted that Consultation for bus will likely occur through April, in conjunction with council plans. The Routes are mapped out, but Havelock North routes are not confirmed		

	Vehicle tracking • Flow/Woods to use 11m truck to check routes • Ensuring there is a clear path to get through past a parked truck		

Reference: P:\CDLL\001 Arataki Road Private Plan Change Havelock North\2.0 Communication\M1A250213 Meeting with Council.docx - Charyne Sundgren

APPENDIX I Vehicle tracking plans

OUT

IN

6
434m²

5
434m²

4
500m²

11
521m²

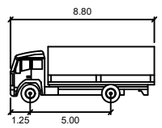
12
513m

Service vehicle Custom (8.8m)

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Austroads Design Vehicles

8.8m - Service vehicle

vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 1 ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 01 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
Level 1, 11 Blake Street, Ponsonby, Auckland | PO Box 47497 Ponsonby
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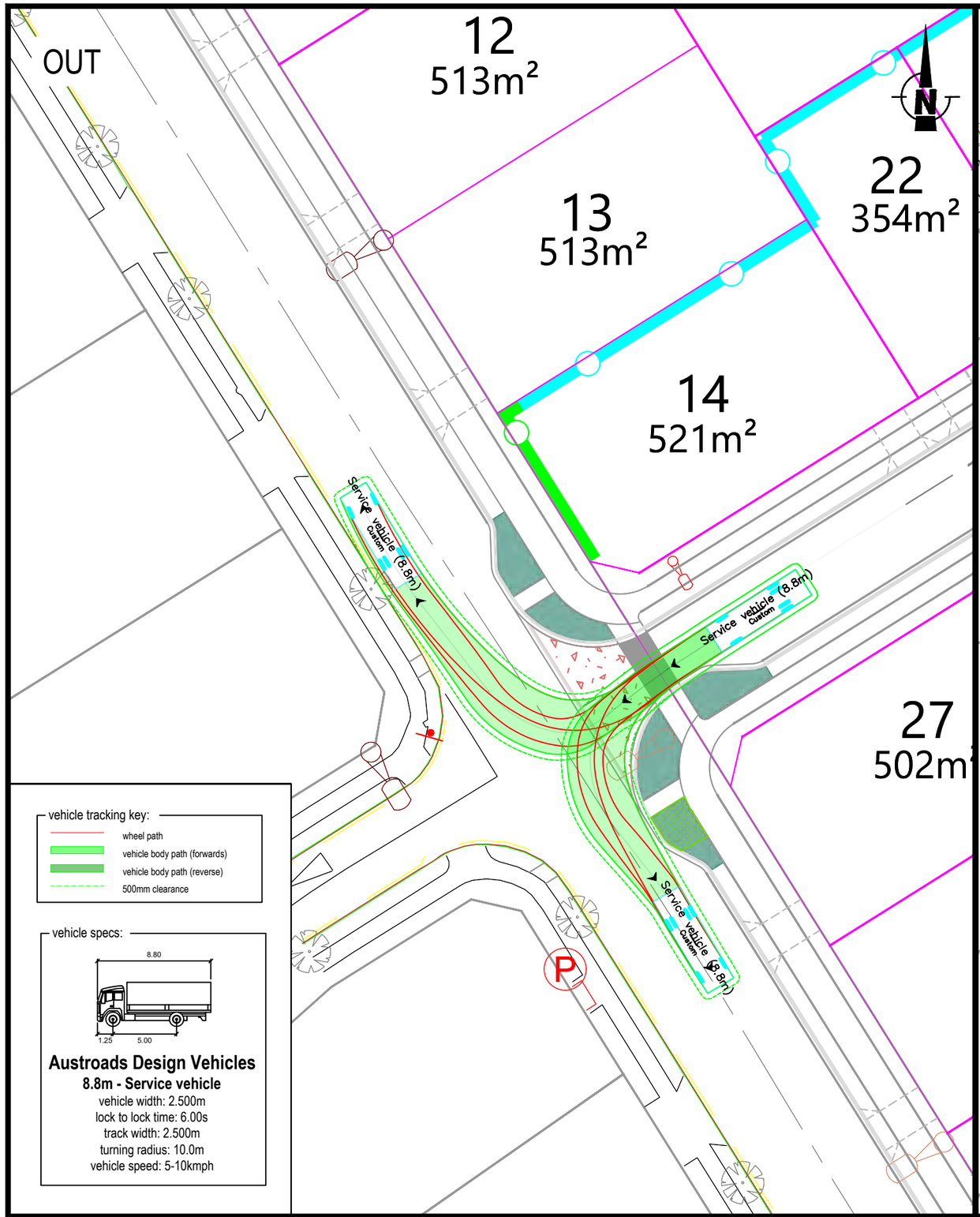

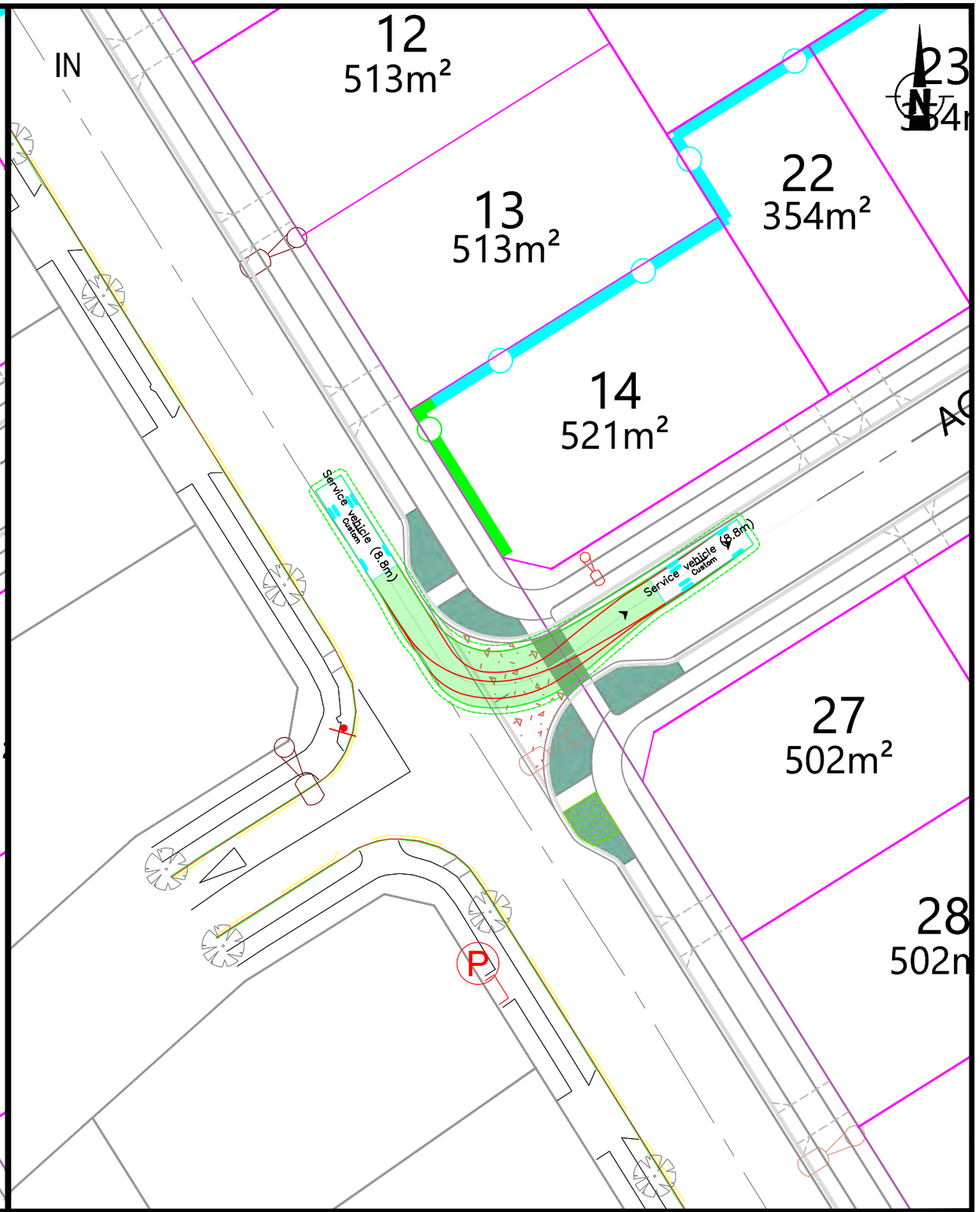

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

Austroads Design Vehicles

8.8m - Service vehicle

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track width: 2.500m
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REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 2 NORTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 02 of 20
REV: A

flow
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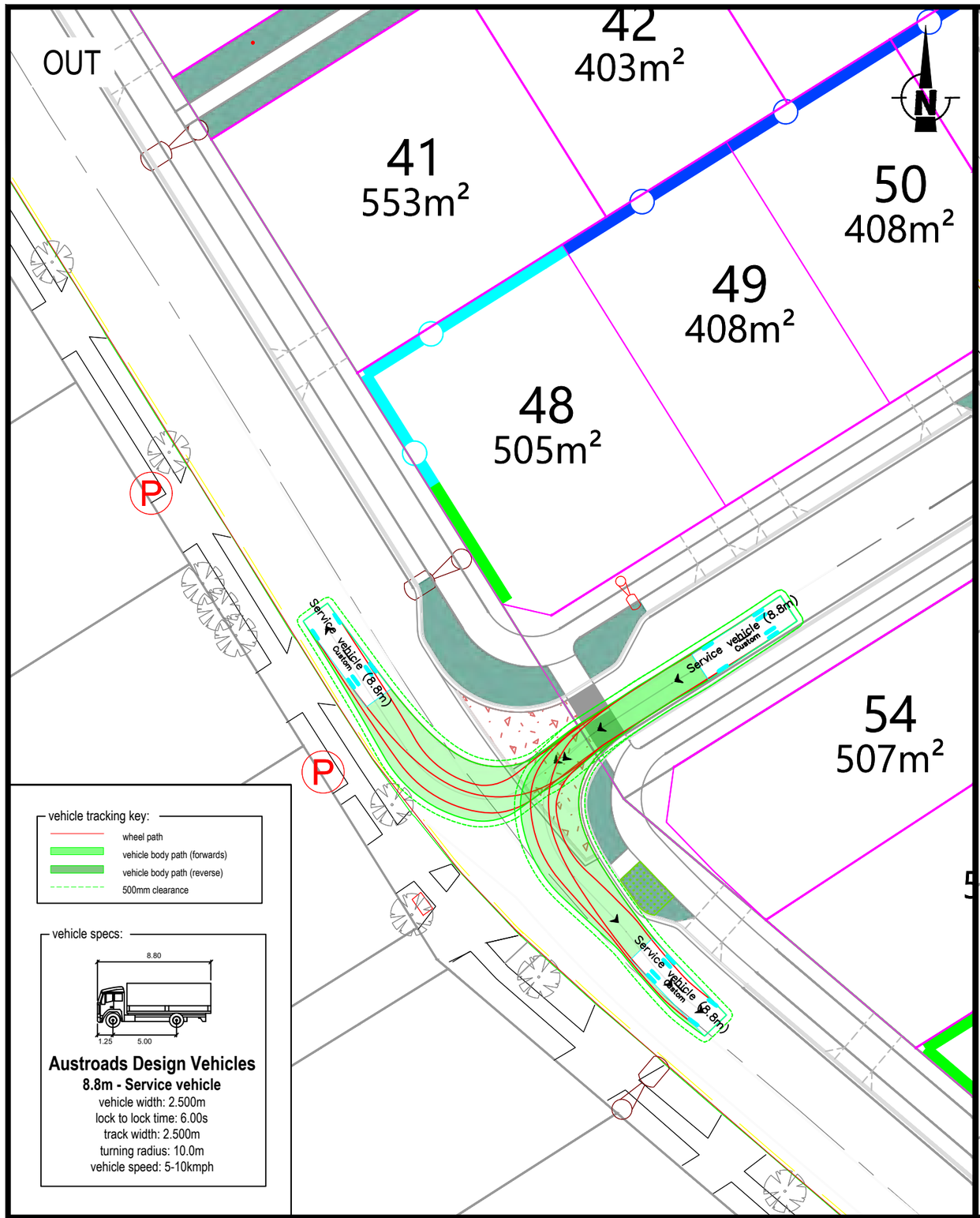

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

Austroads Design Vehicles

8.8m - Service vehicle

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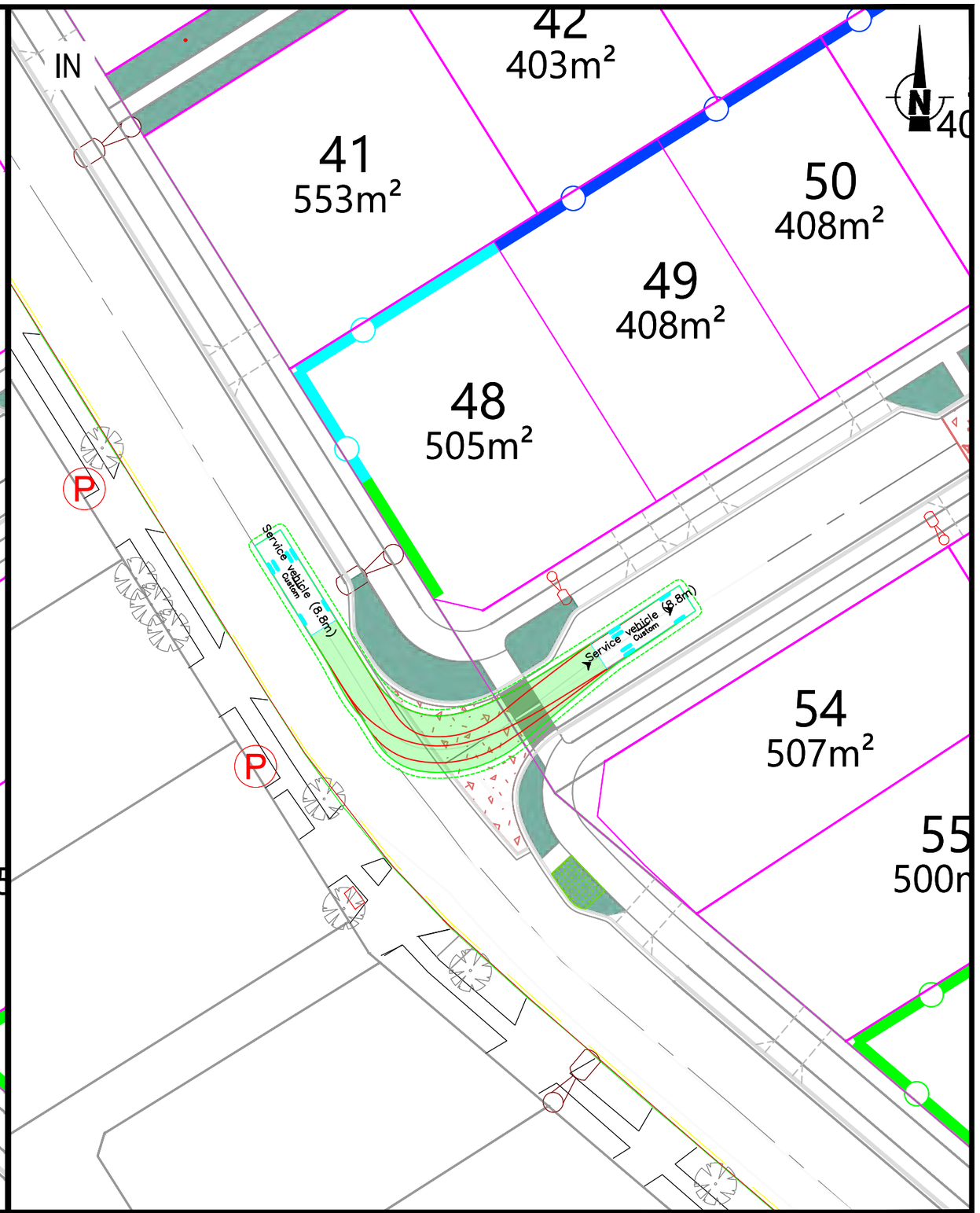
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph



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A	First Issue	01/07/2025

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CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 2 SOUTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 03 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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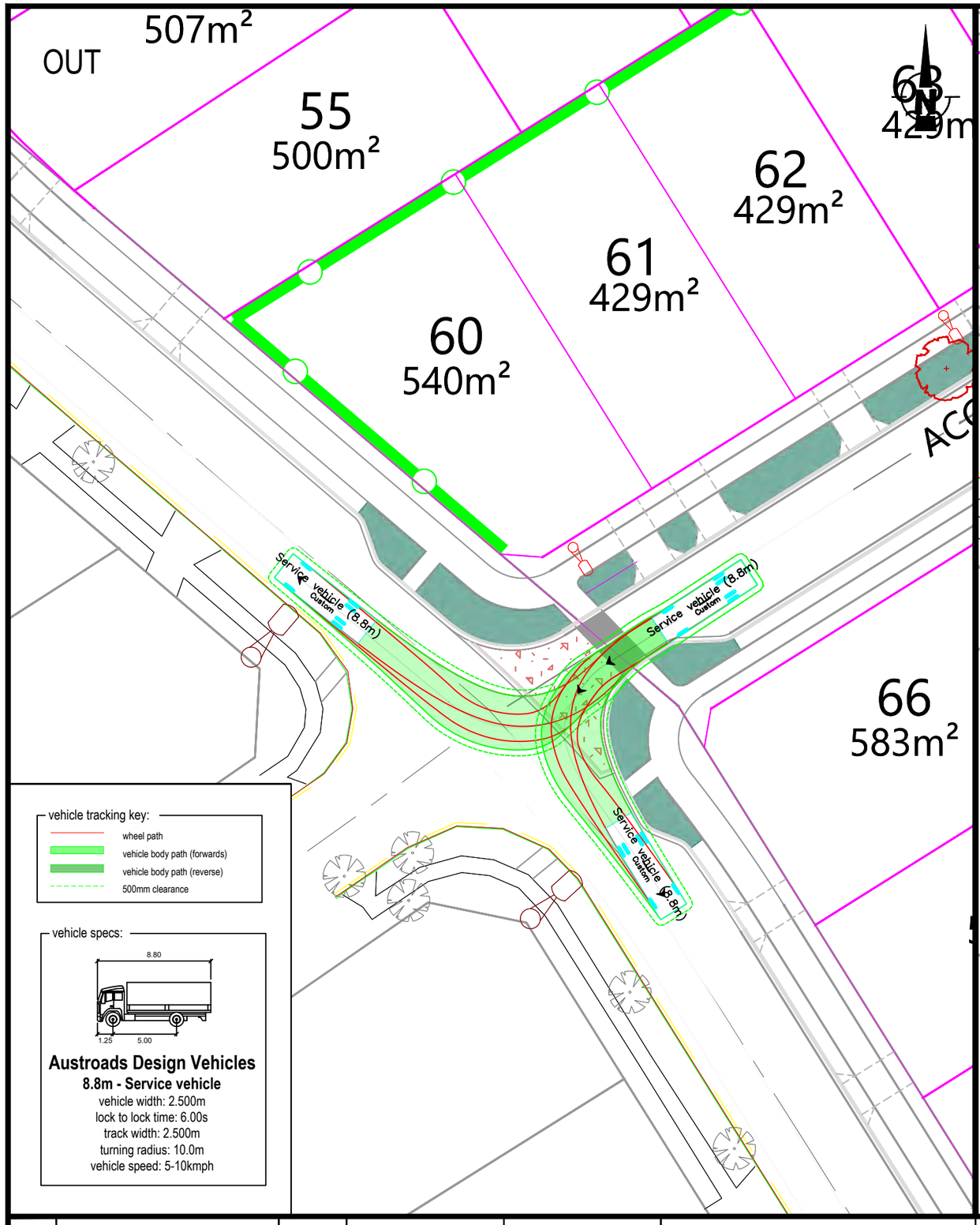

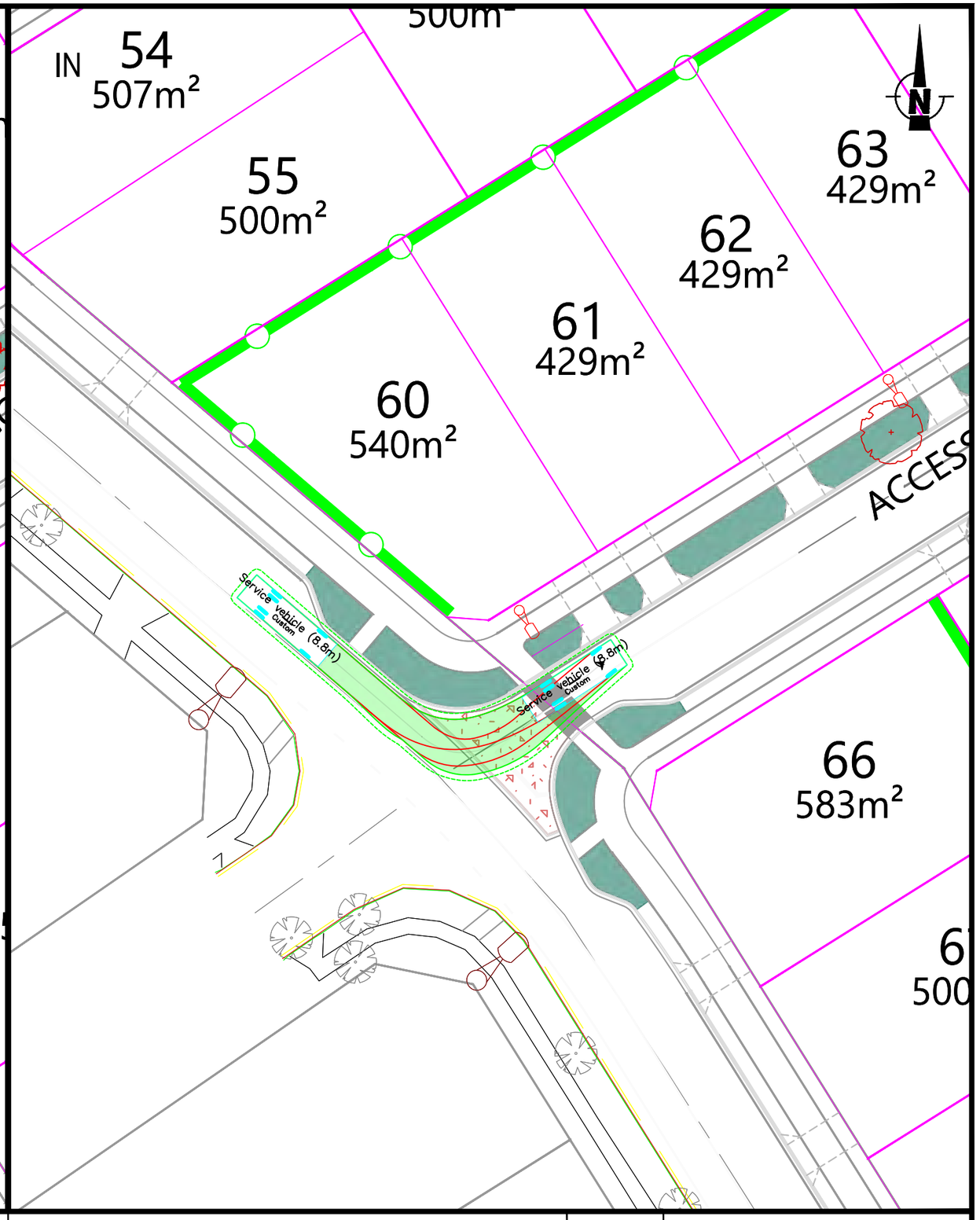

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A	First Issue	01/07/2025

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CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 3 NORTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 04 of 20
REV: A

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OUT

IN

68
543m²

77
516m²

78
363m²

79
363m²

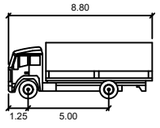
83
501m²

Service vehicle (8.8m)

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Austroads Design Vehicles

8.8m - Service vehicle

vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
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1:400 @ A3

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PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 3 SOUTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 05 of 20

REV: A

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OUT

IN

90
554m²

91
455m²

92
455m²

93
455m²

98
534m²

ACCE

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

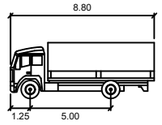
Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Austroads Design Vehicles

8.8m - Service vehicle

vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 4 NORTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 06 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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OUT

101
500m²

102
551m²

105
391m²

106
391m²

163
635m²

16
500

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

P

N

IN

100
500m²

101
500m²

102
551m²

105
391m²

106
391m²

163
635m²

164
500m²

Service vehicle Custom (8.8m)

Service vehicle Custom (8.8m)

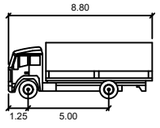
P

N

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Austroads Design Vehicles

8.8m - Service vehicle

vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD 4 NORTHERN ENTRY & EXIT
8.8m SERVICE TRUCK

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 07 of 20

REV: A

flow
TRANSPORTATION SPECIALISTS
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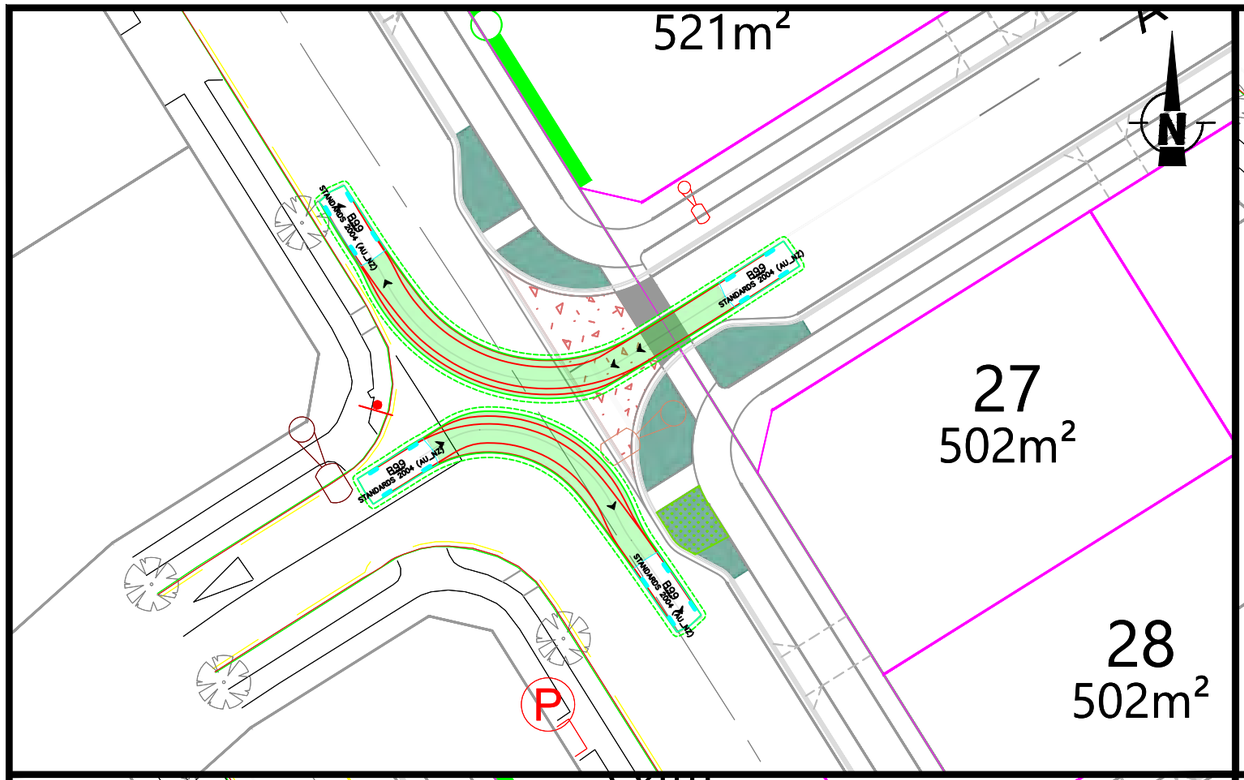
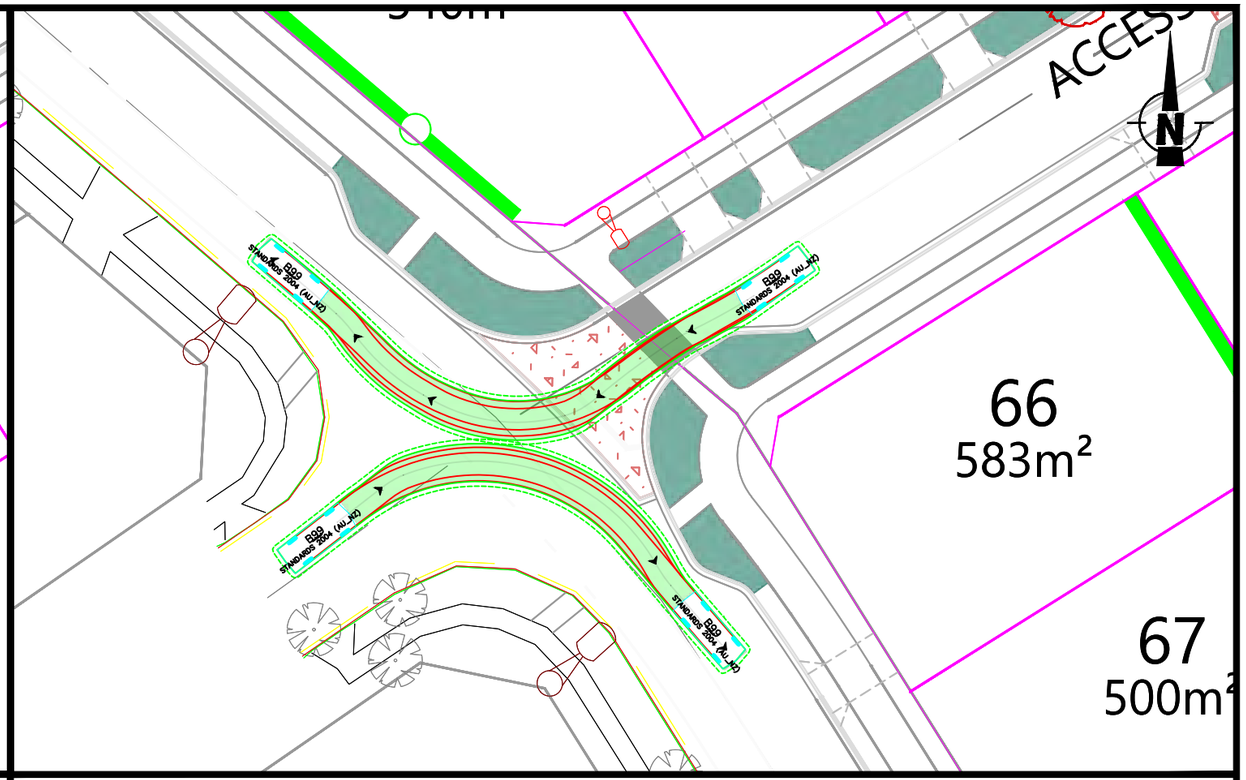
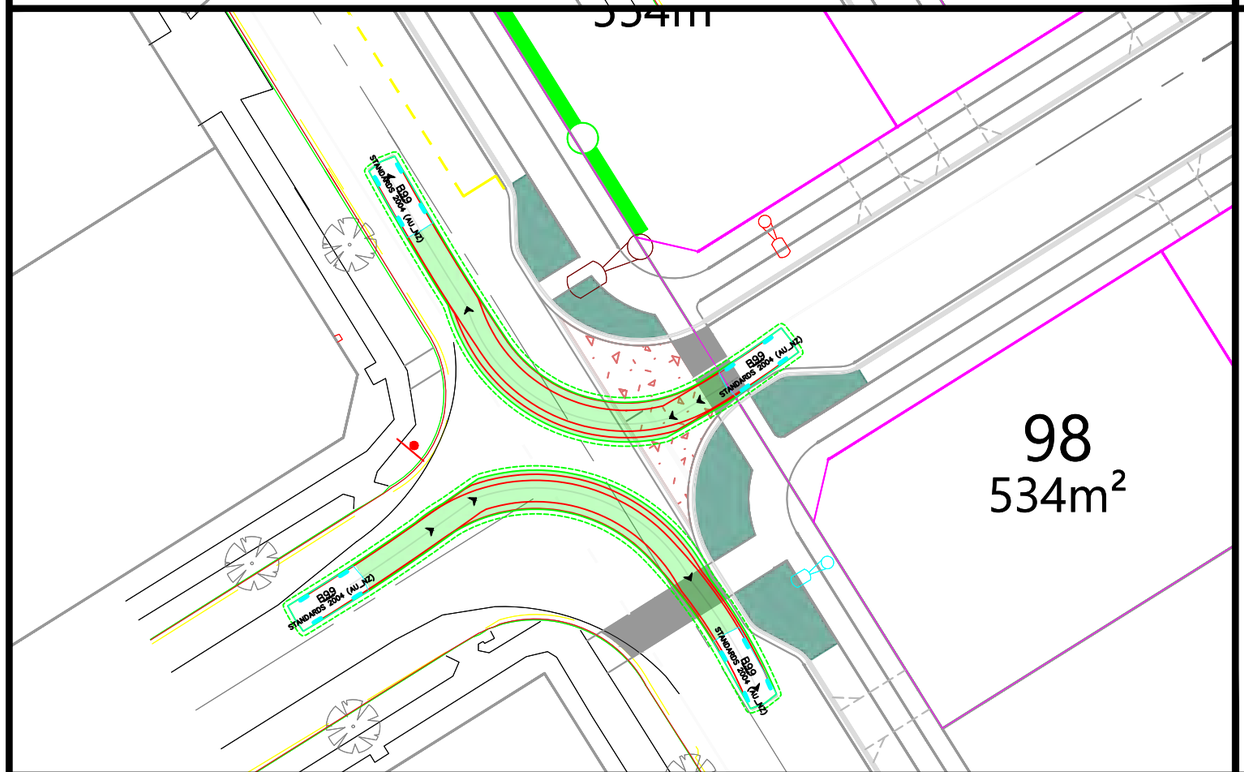
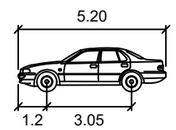






vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROADS OPPOSING RIGHT TURNS 99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 08 of 20

REV: A

flow
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IN

TO VEST AS ROAD

OUT

AS ROAD

131
407m²

132
407m²

133
407m²

134
407m²

135
407m²

38
447m²

39
447m²

40
447m²

37
325m²

36

45
338m²

46
338m²

47
338m²

44

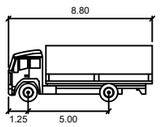
Service vehicle (8.8m)

Service vehicle Centreline

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:



Austroads Design Vehicles
8.8m - Service vehicle
vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD & JOAL ENTRY & EXIT
8.8m SERVICE VEHICLE

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 09 of 20
REV: A

flow
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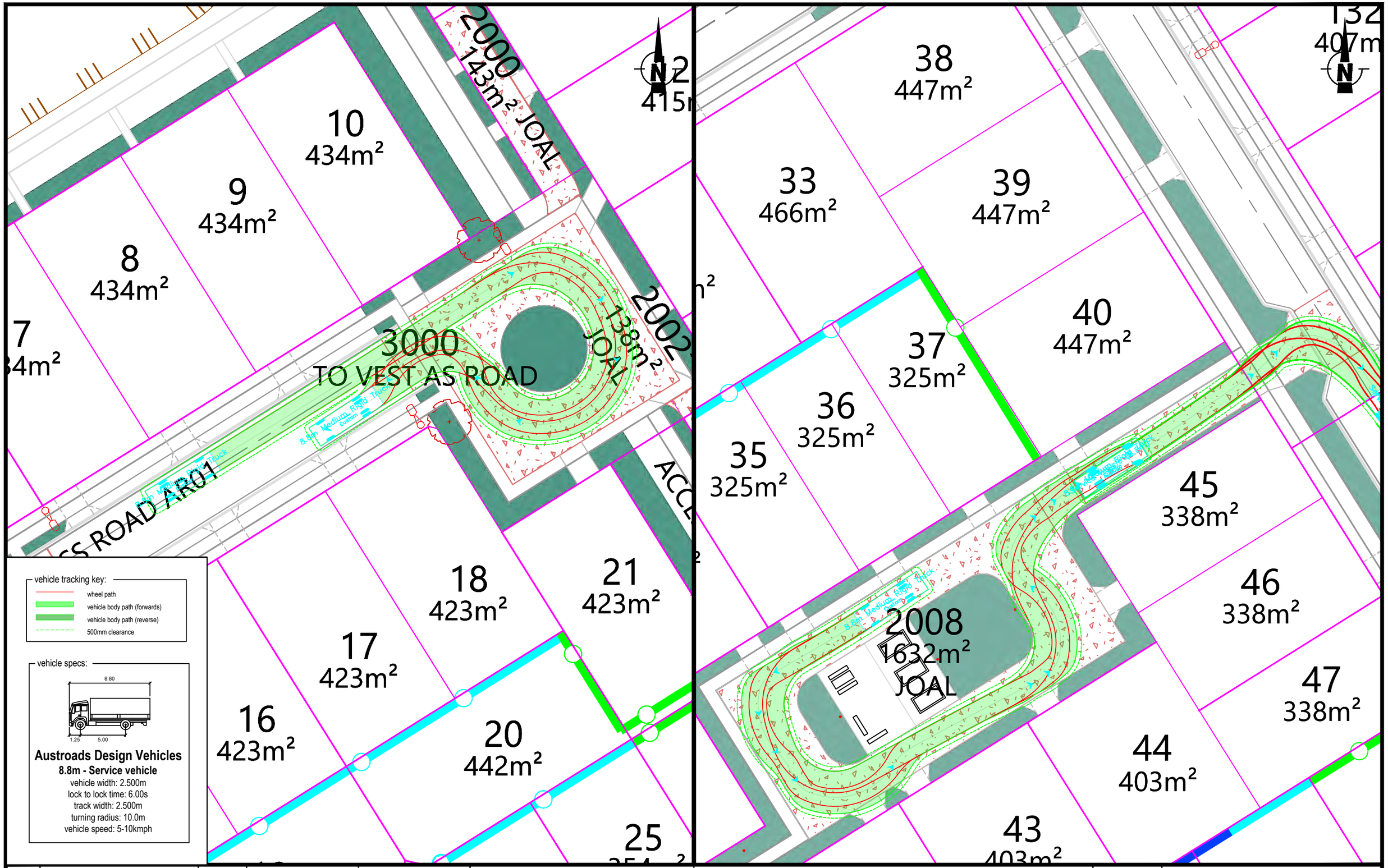

vehicle tracking key:

- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 500mm clearance

vehicle specs:

Austroads Design Vehicles

8.8m - Service vehicle

vehicle width: 2.500m
lock to lock time: 6.00s
track width: 2.500m
turning radius: 10.0m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ACCESS ROAD & JOAL CIRCULATION
8.8m SERVICE VEHICLE

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 10 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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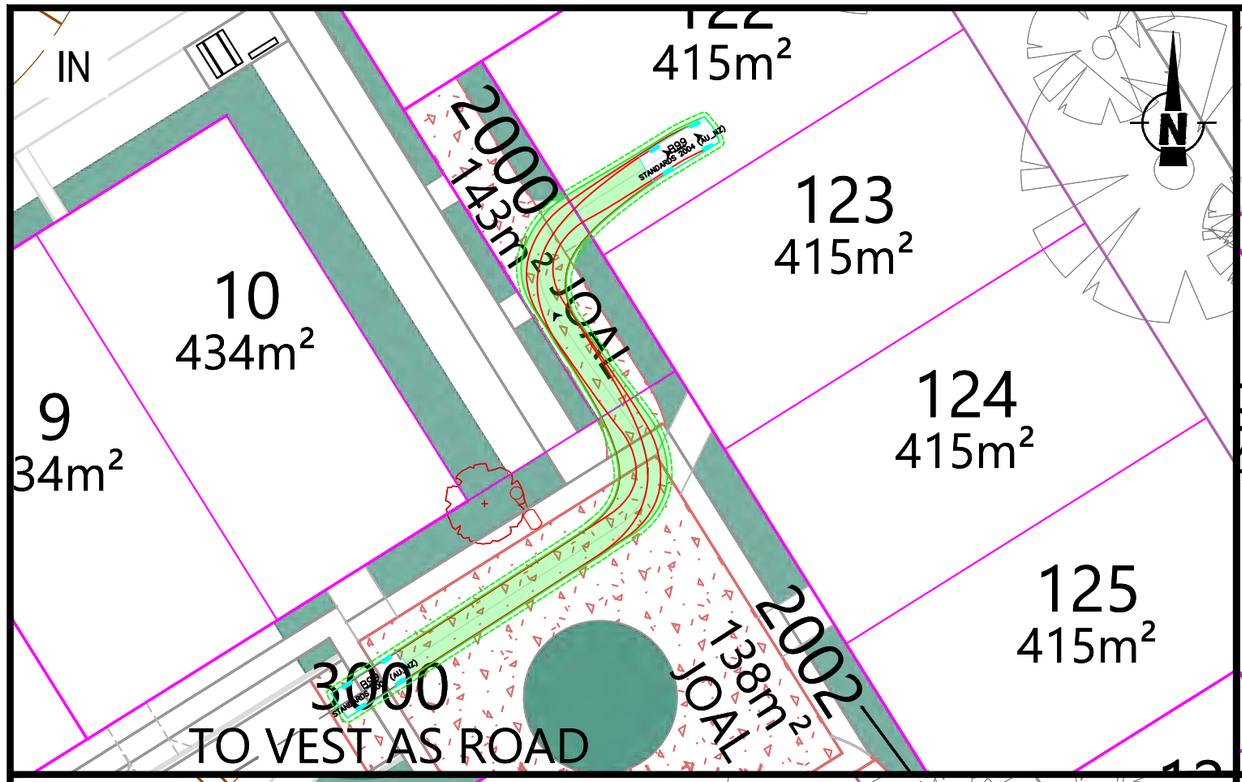

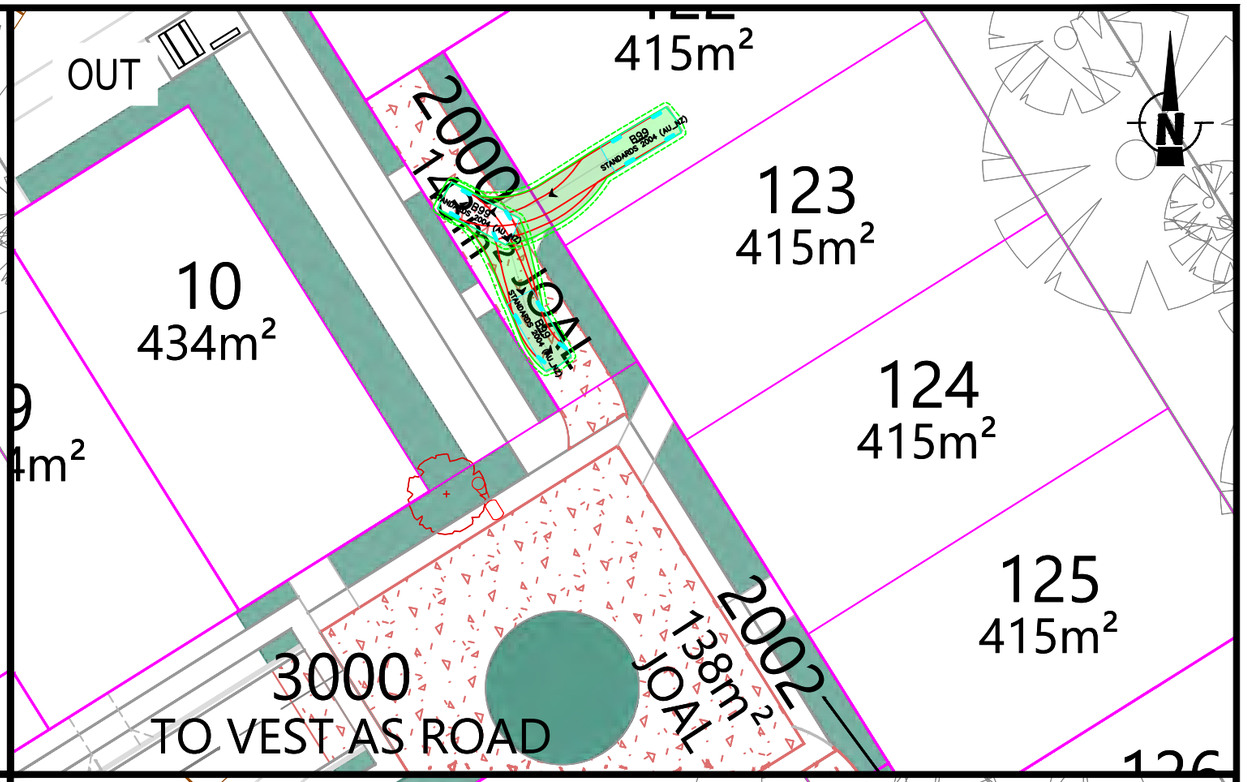

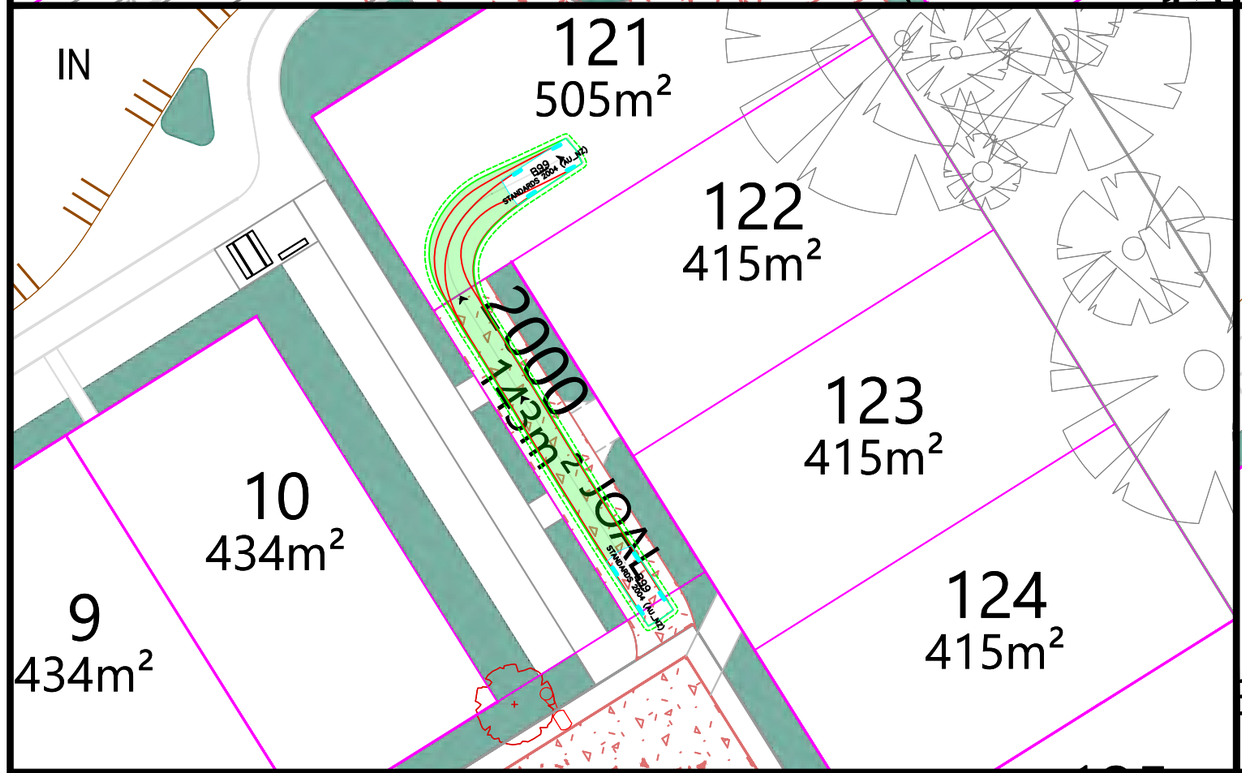

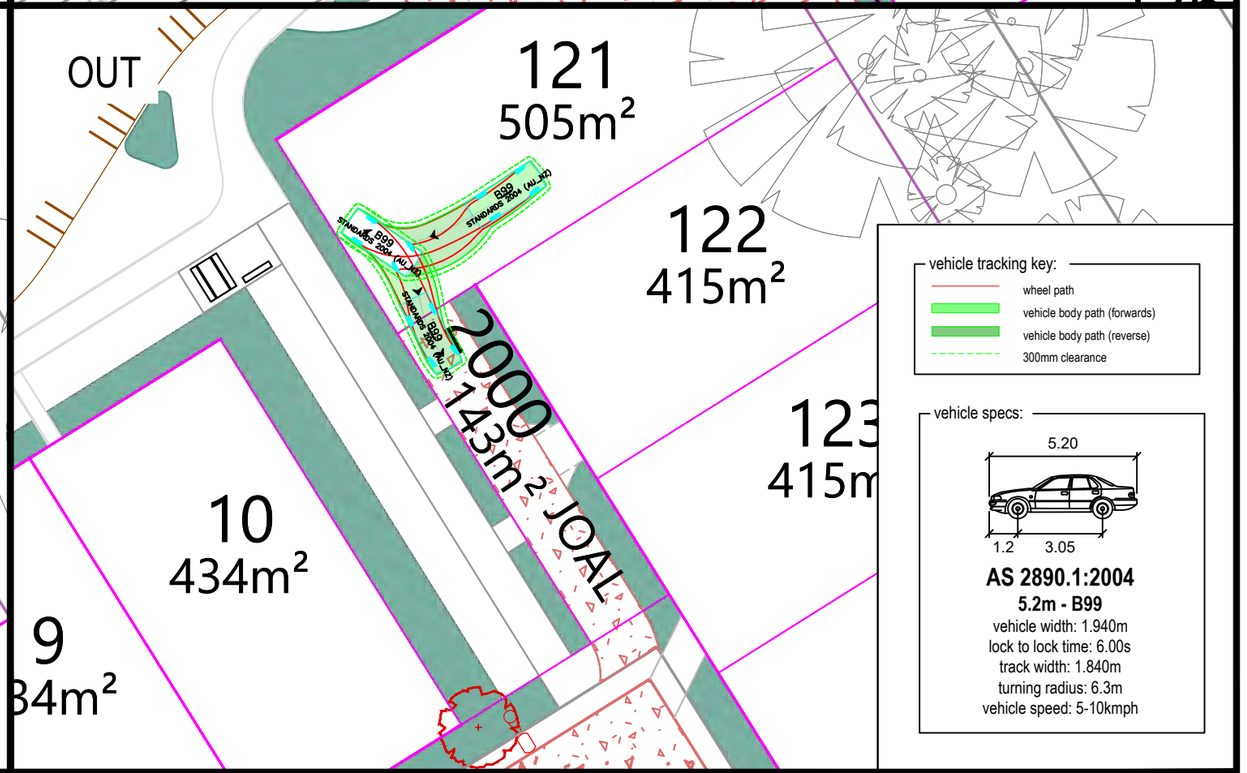

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 11 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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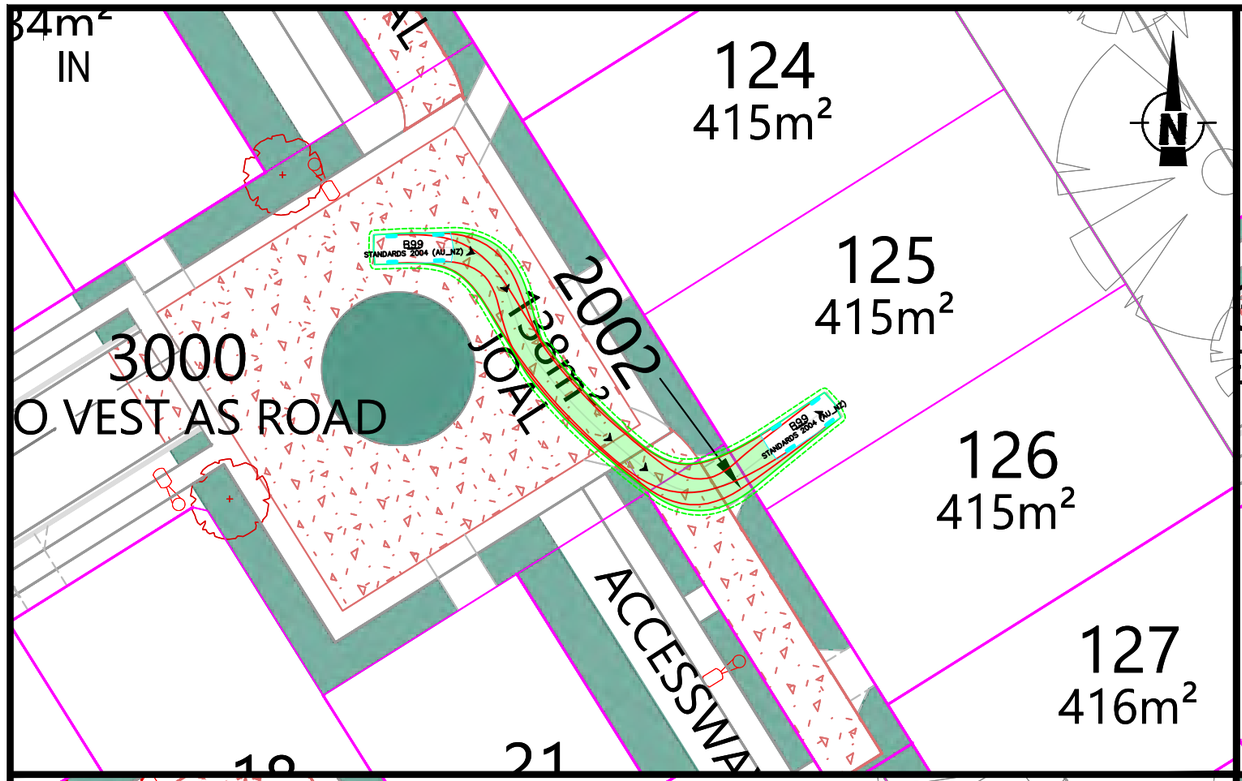

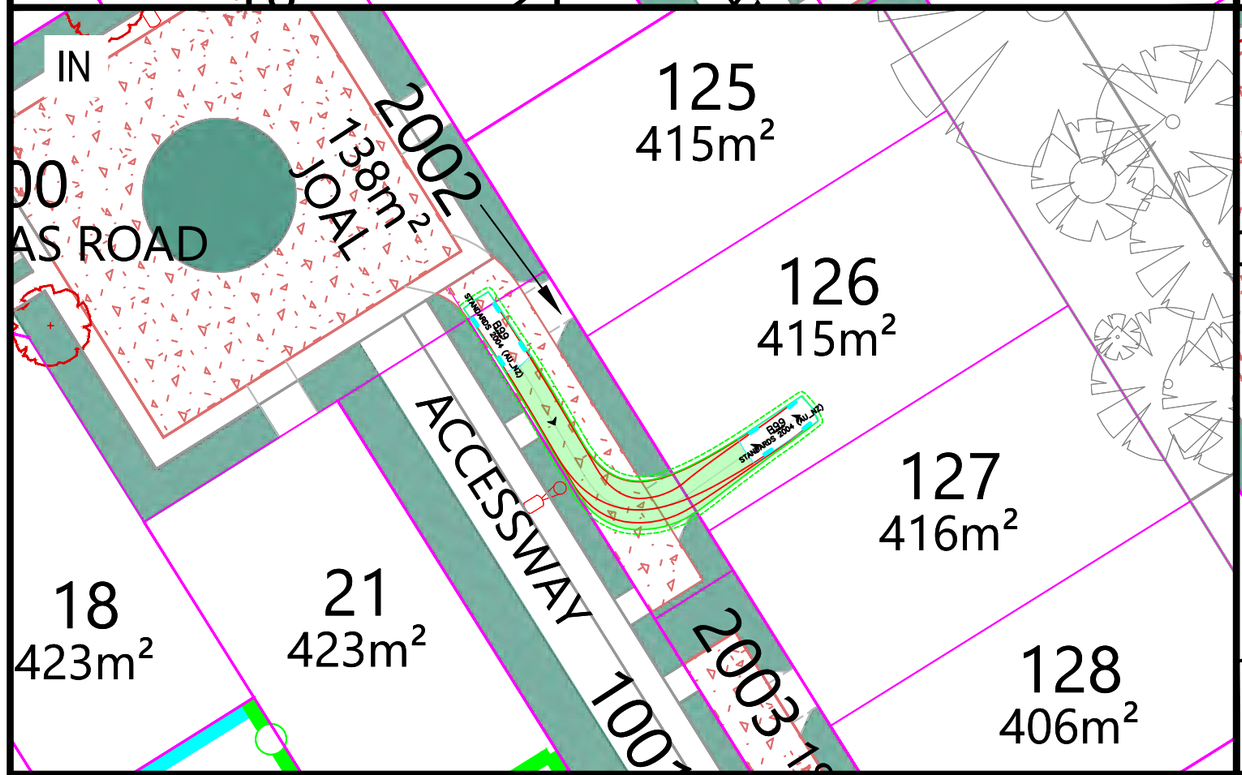

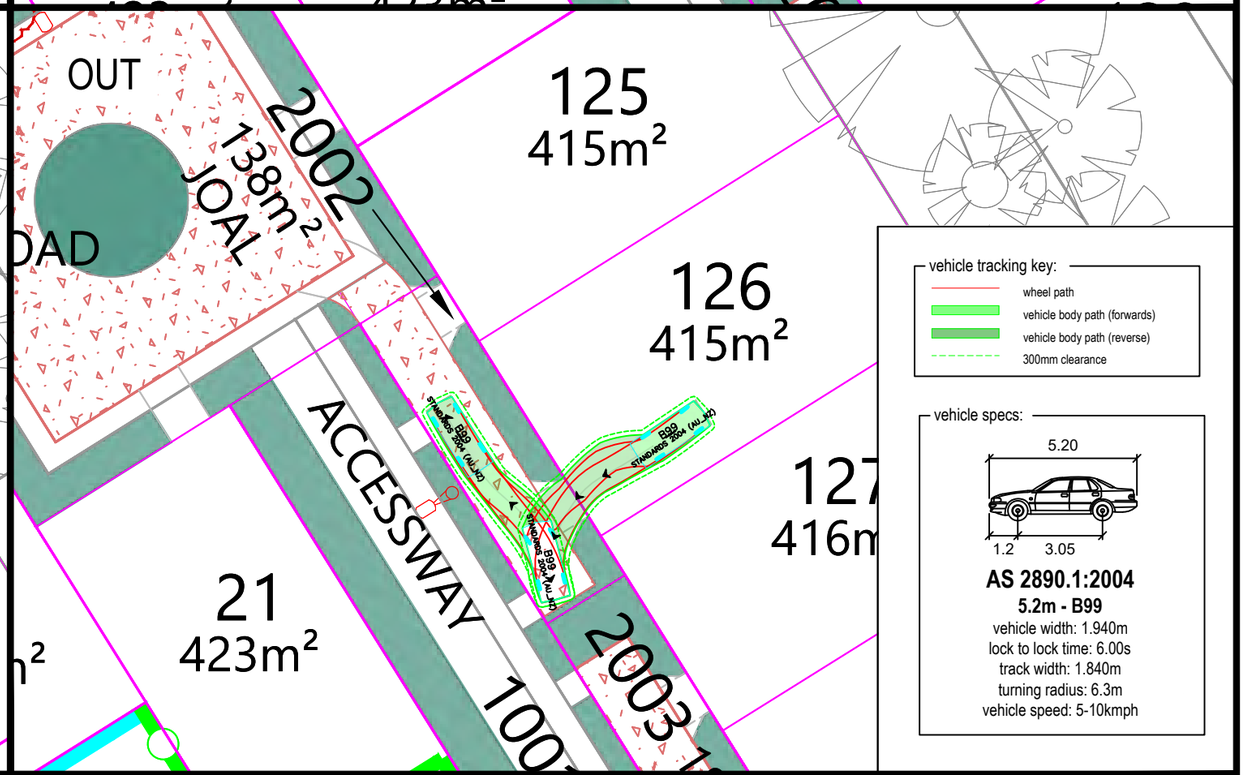

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 12 of 20
REV: A

flow
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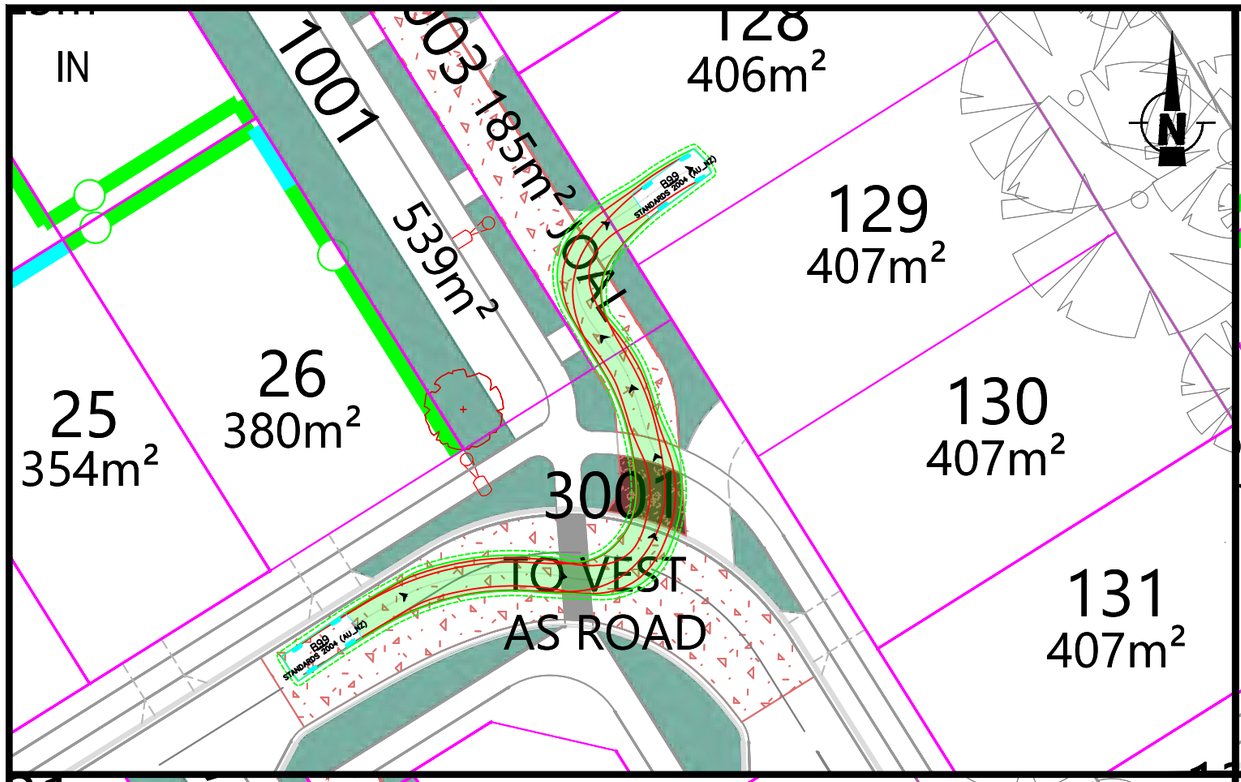

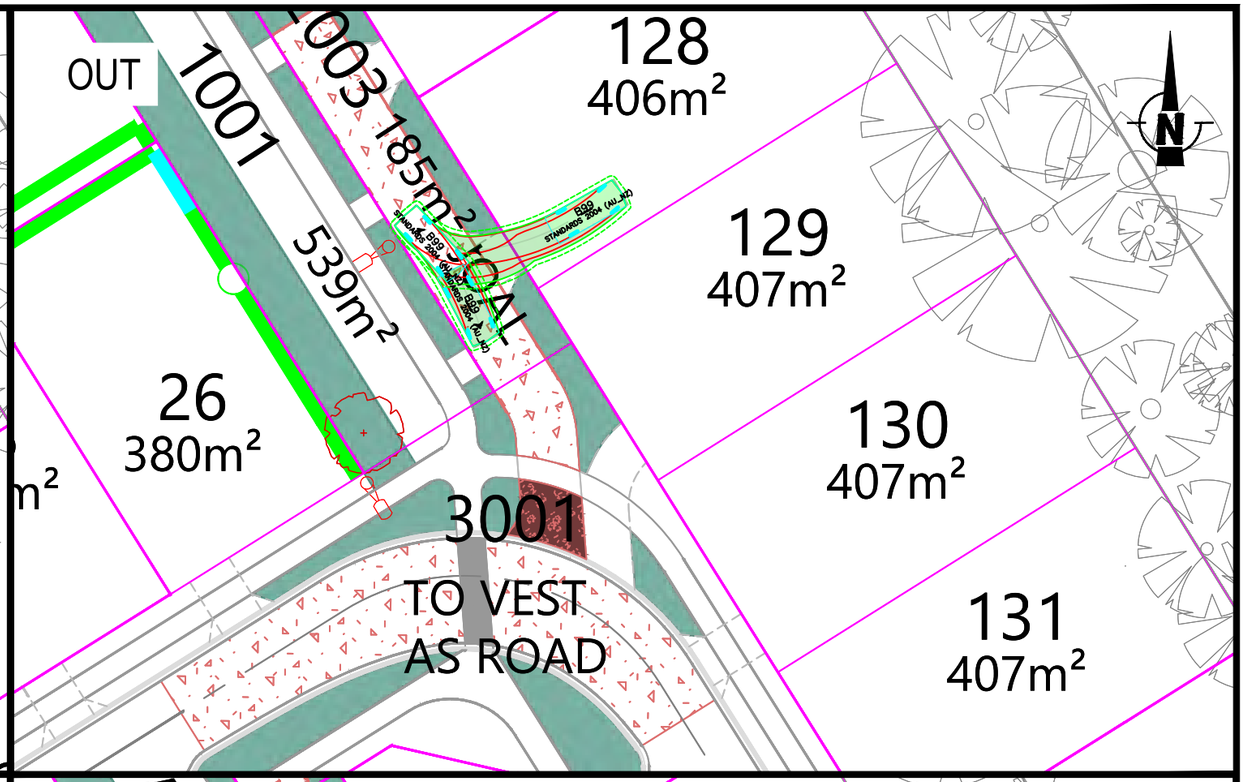

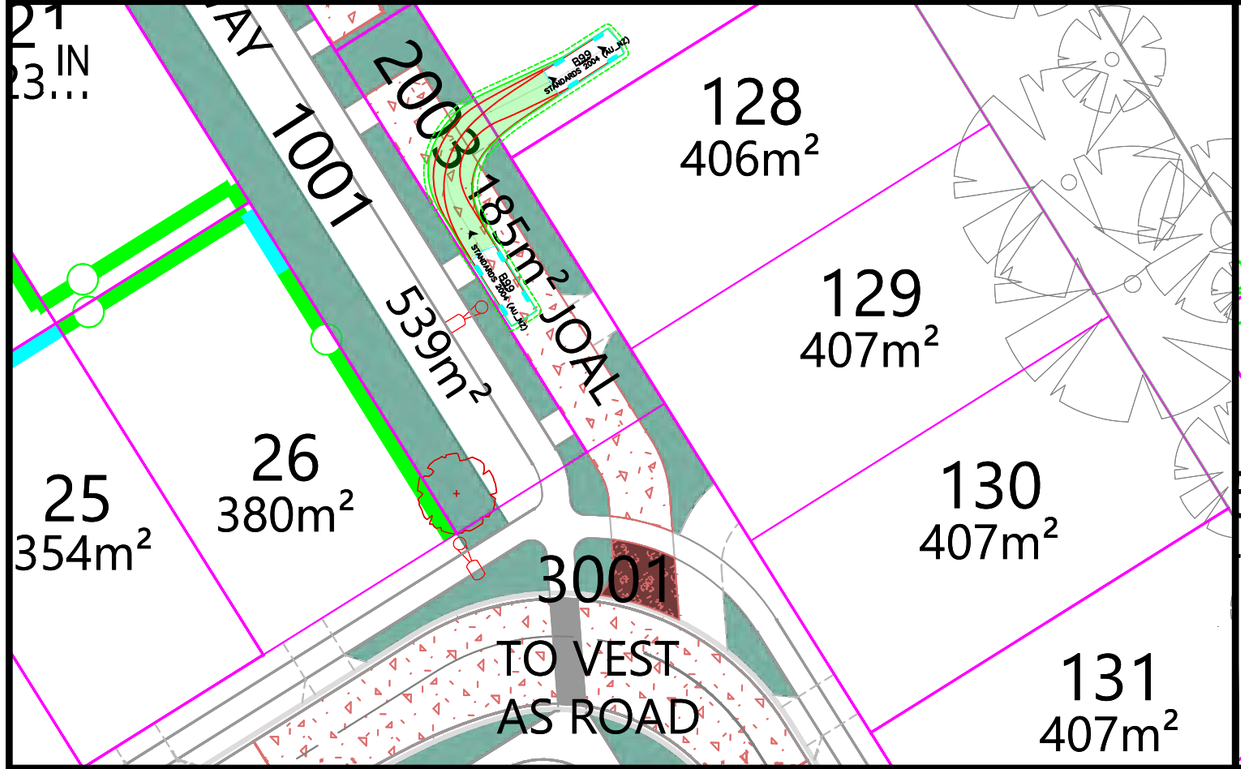

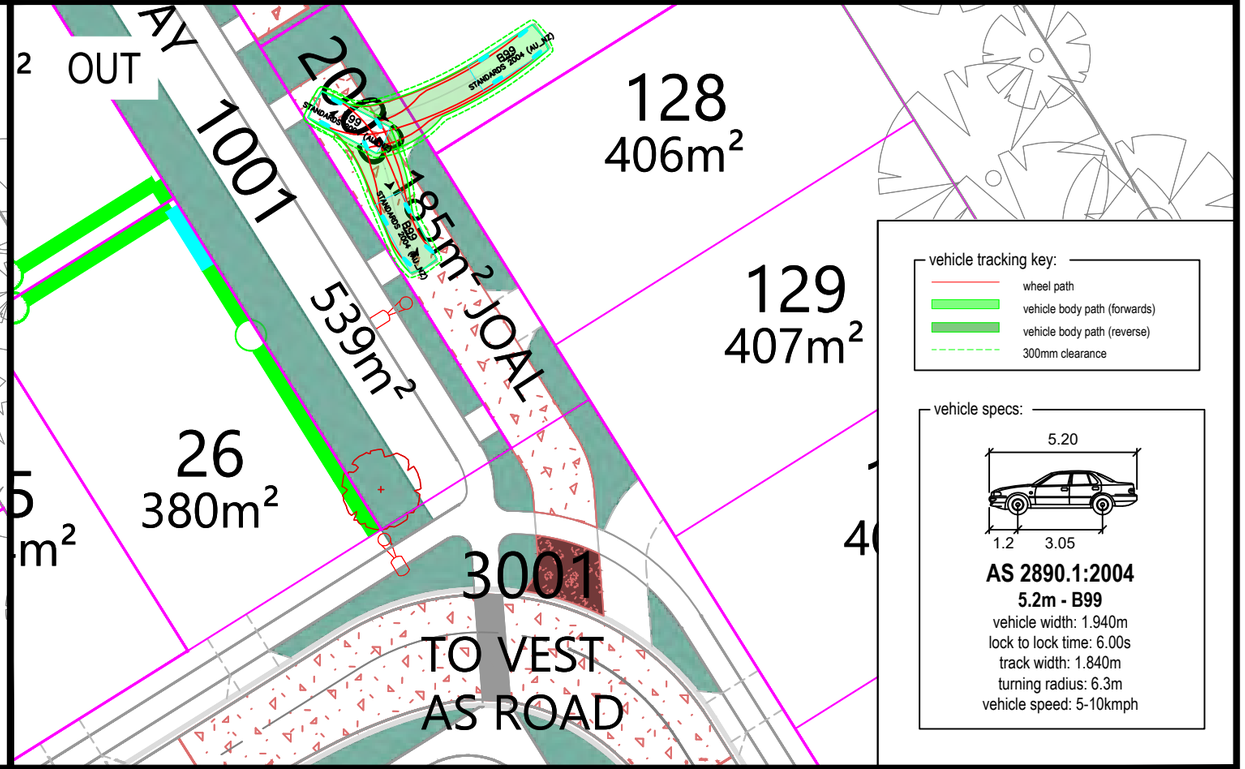

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 13 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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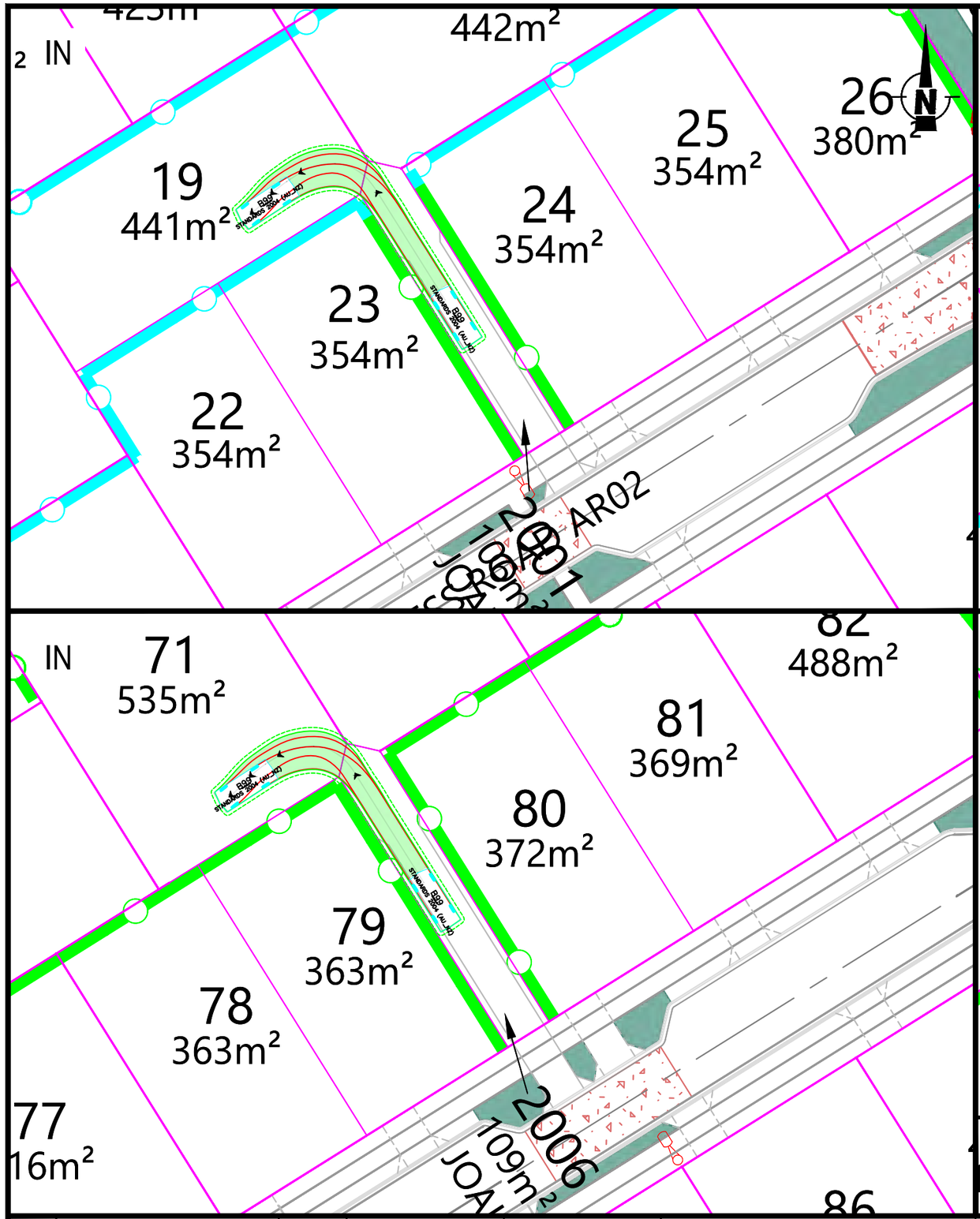

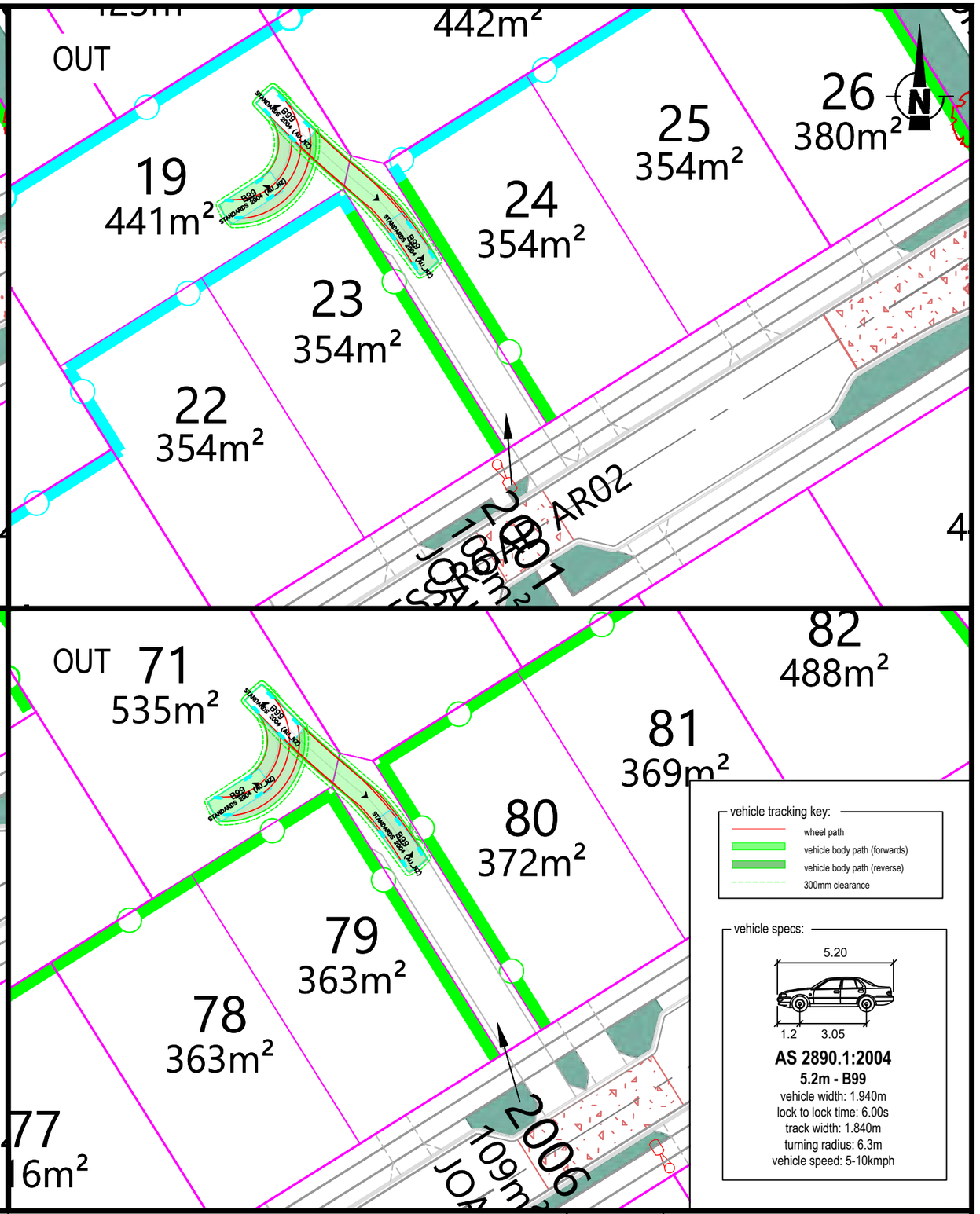

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 14 of 20
REV: A

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TRANSPORTATION SPECIALISTS
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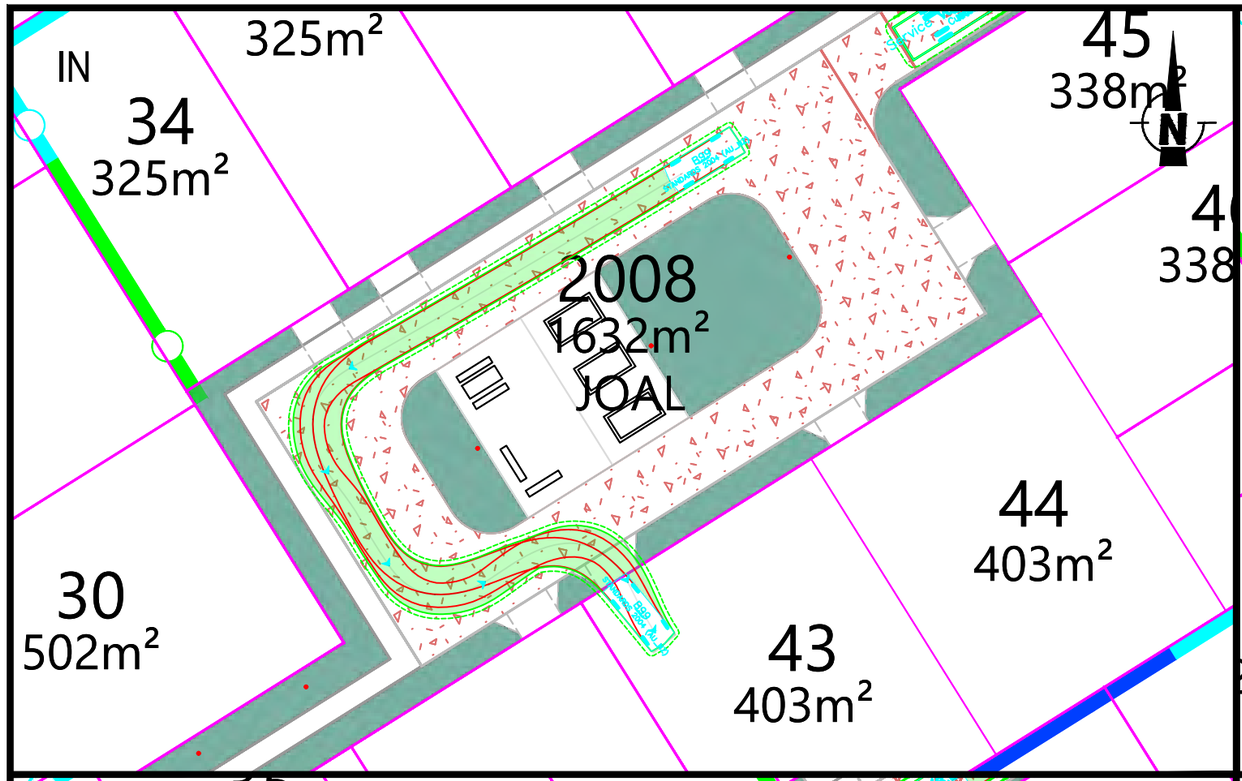

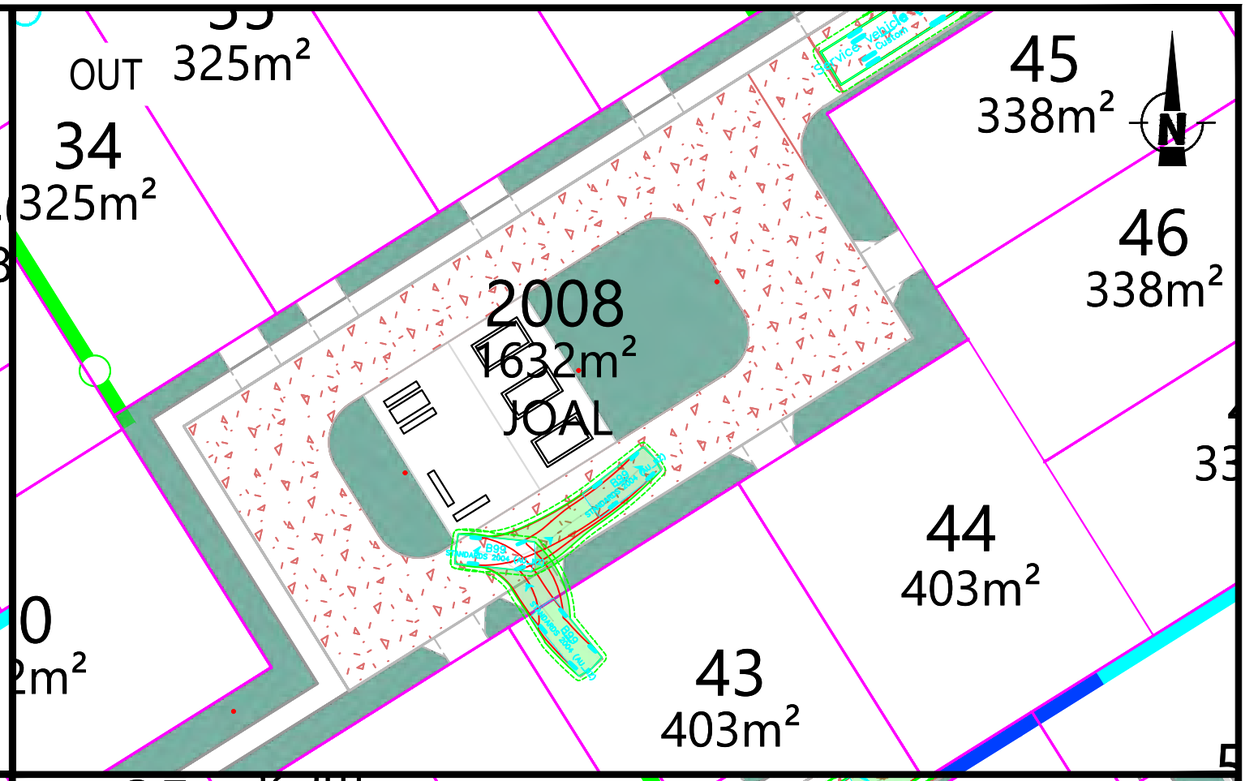

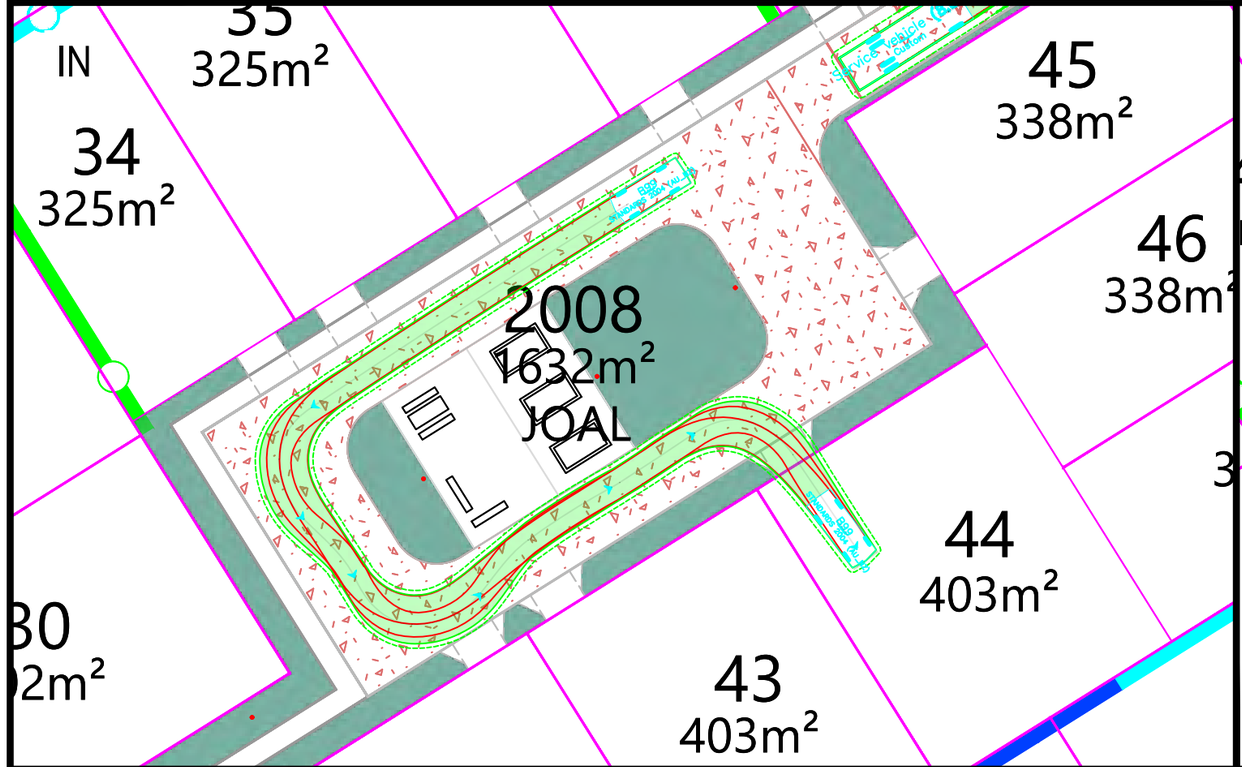

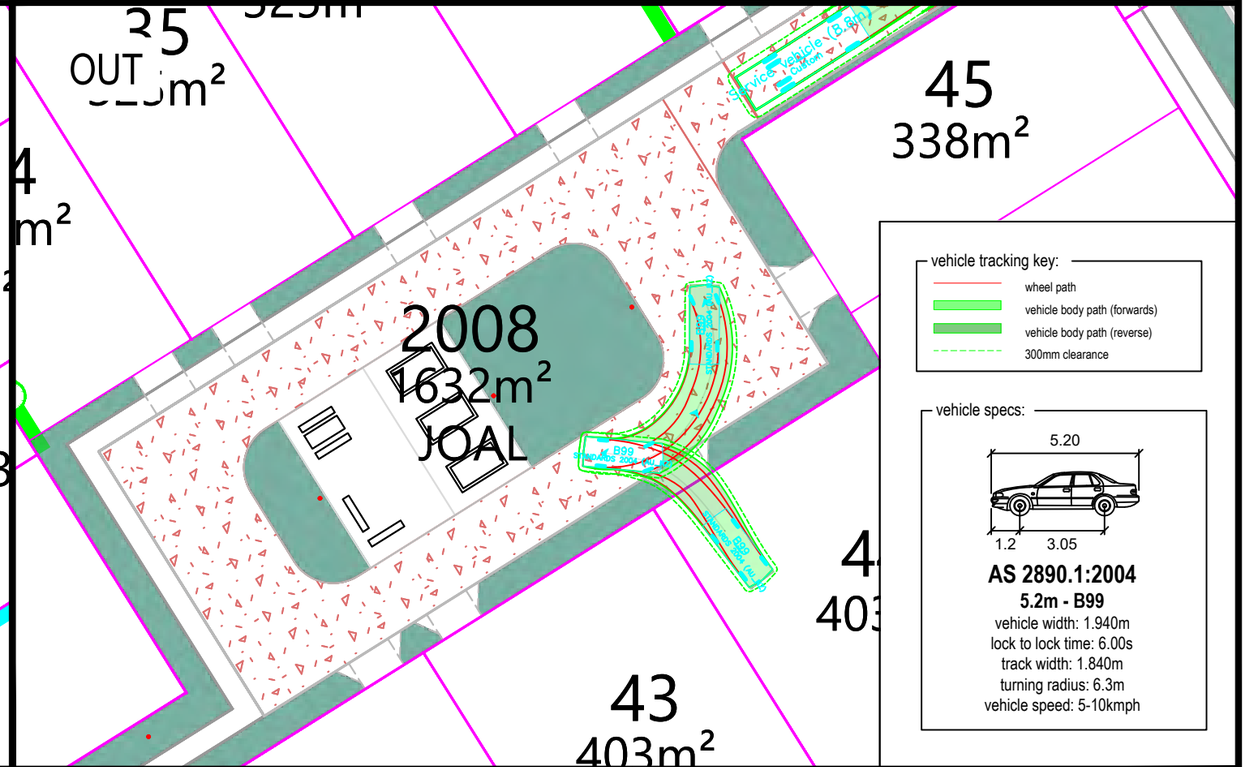

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 15 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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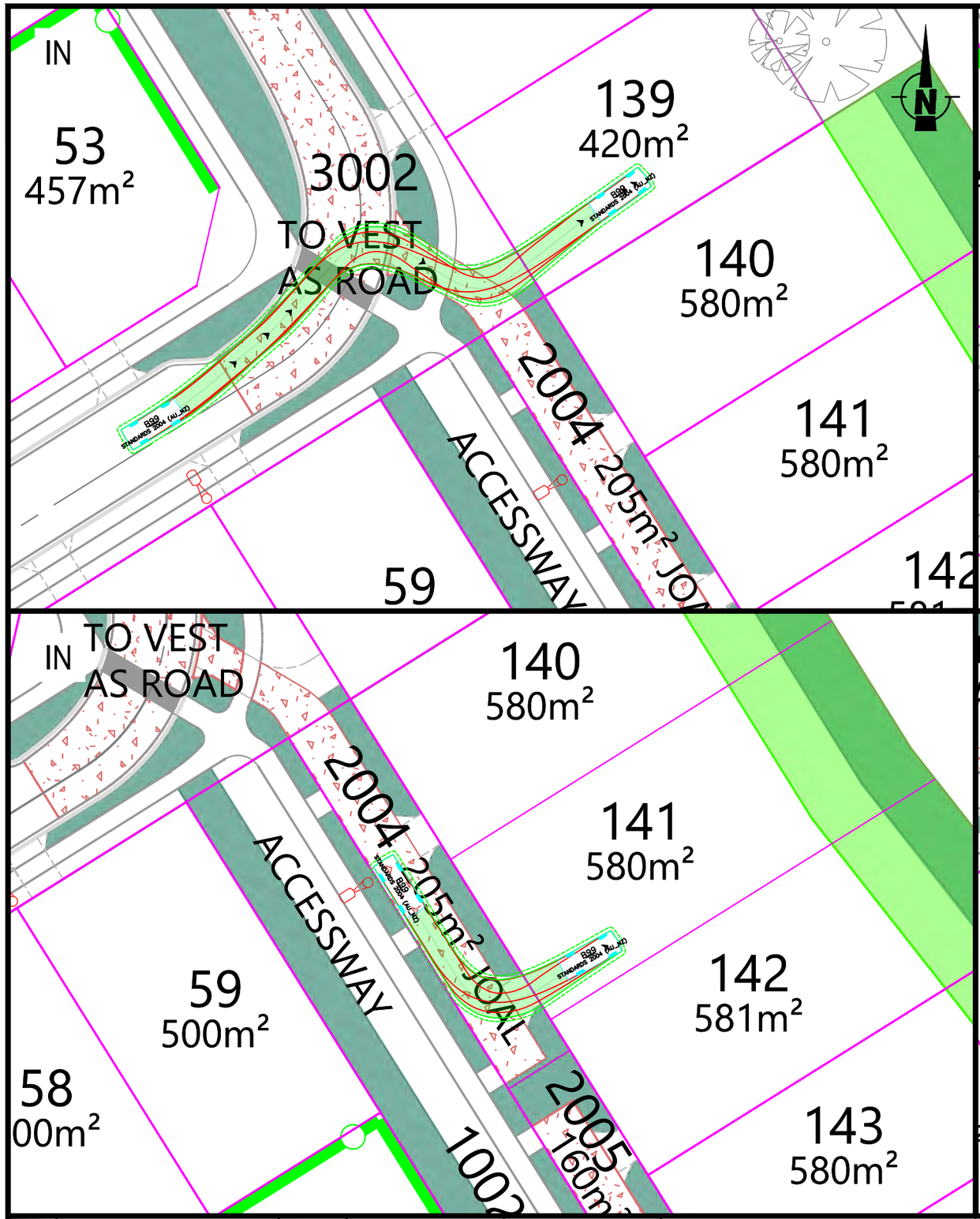

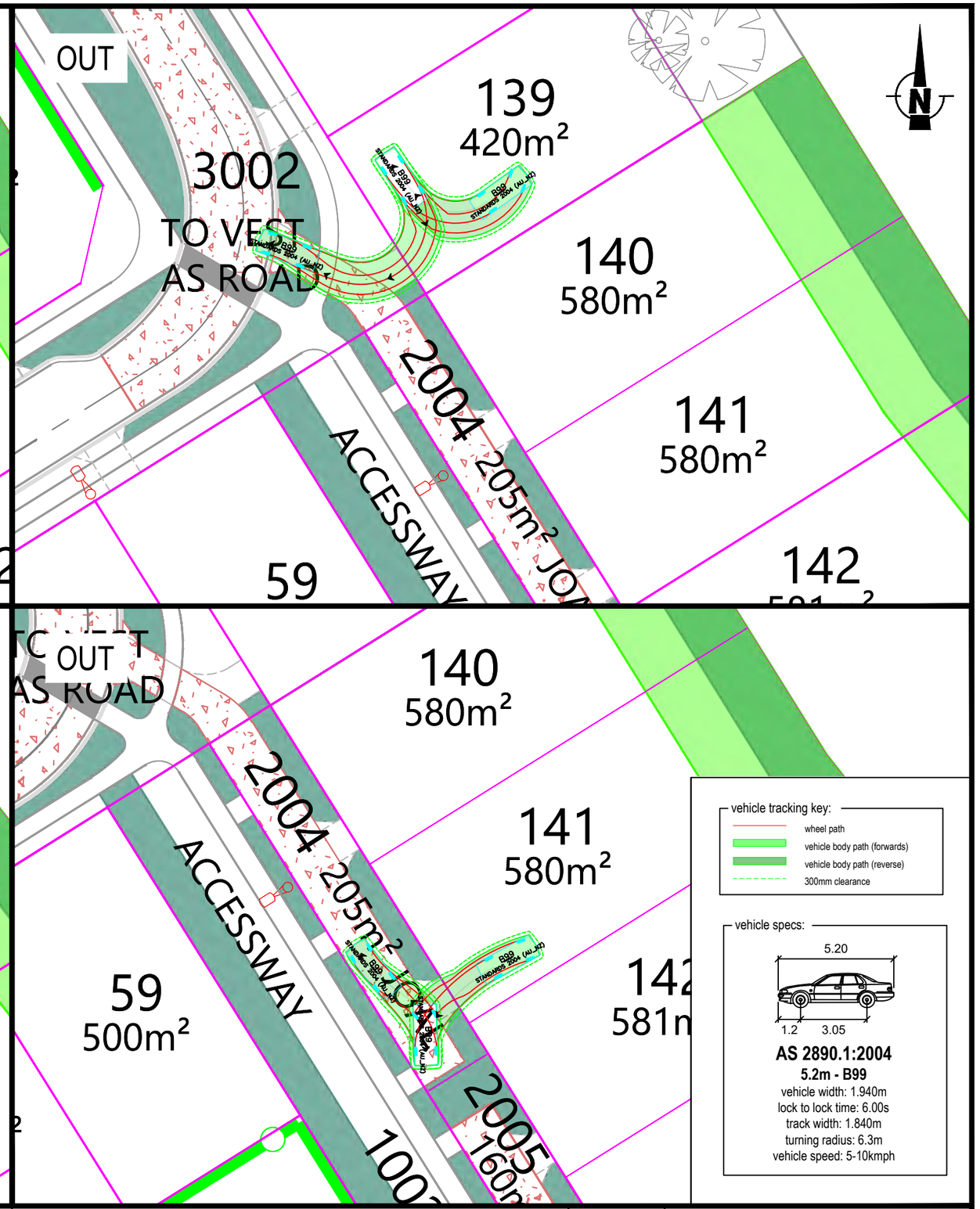

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 16 of 20

REV: A

flow
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IN

OUT

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:

AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 17 of 20

REV: A

flow
TRANSPORTATION SPECIALISTS
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p 09 970 3820 | f 09 970 3890 | www.flownz.com

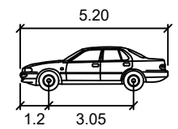
IN

OUT

111 315m²
113 325m²
115 325m²
103 351m²
104 351m²
117 365m²
118 326m²
106 391m²
105 391m²
JOAL 949m²

vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: JOAL ENTRY & EXIT LOTS
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 18 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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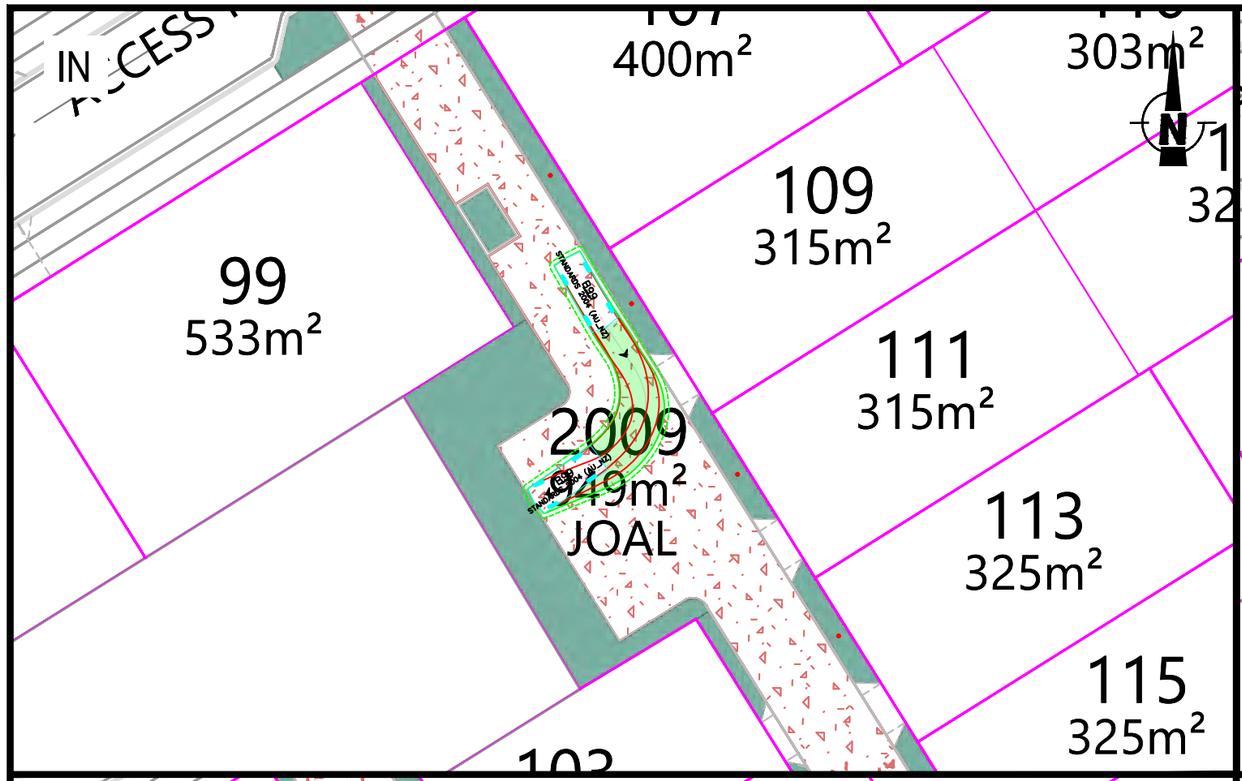

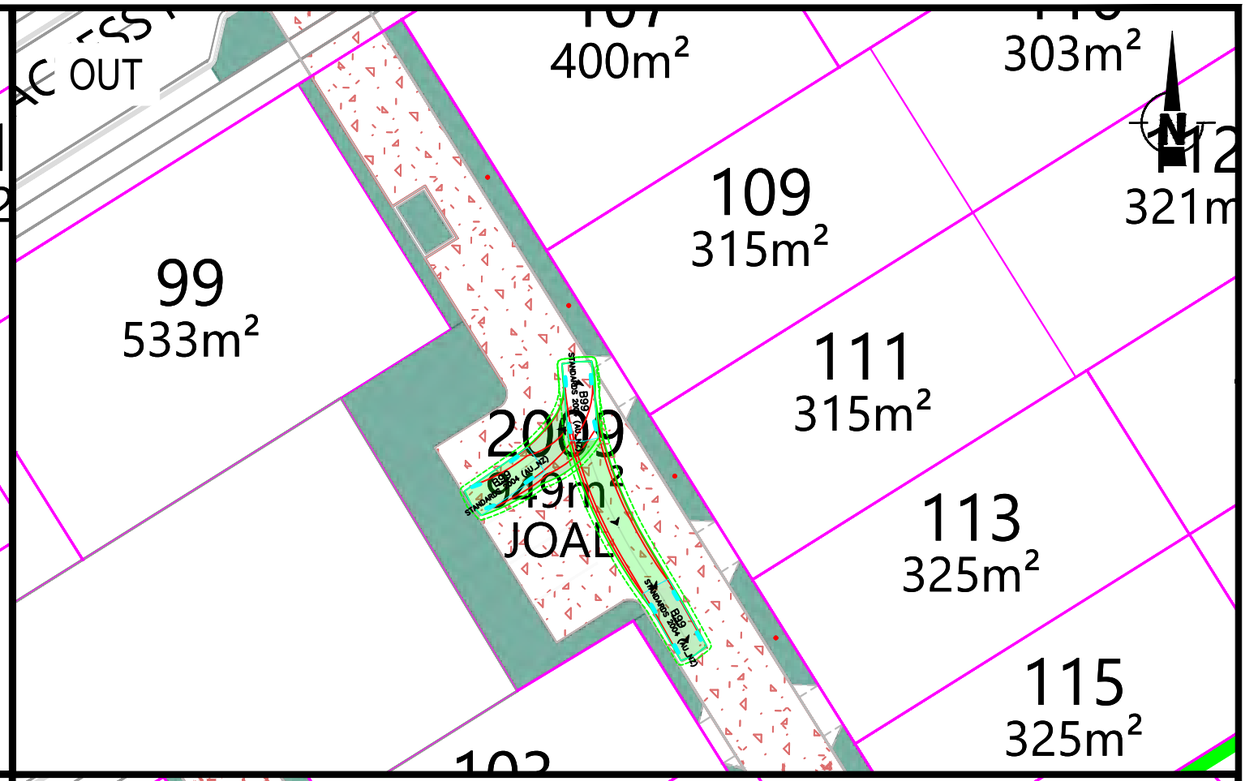

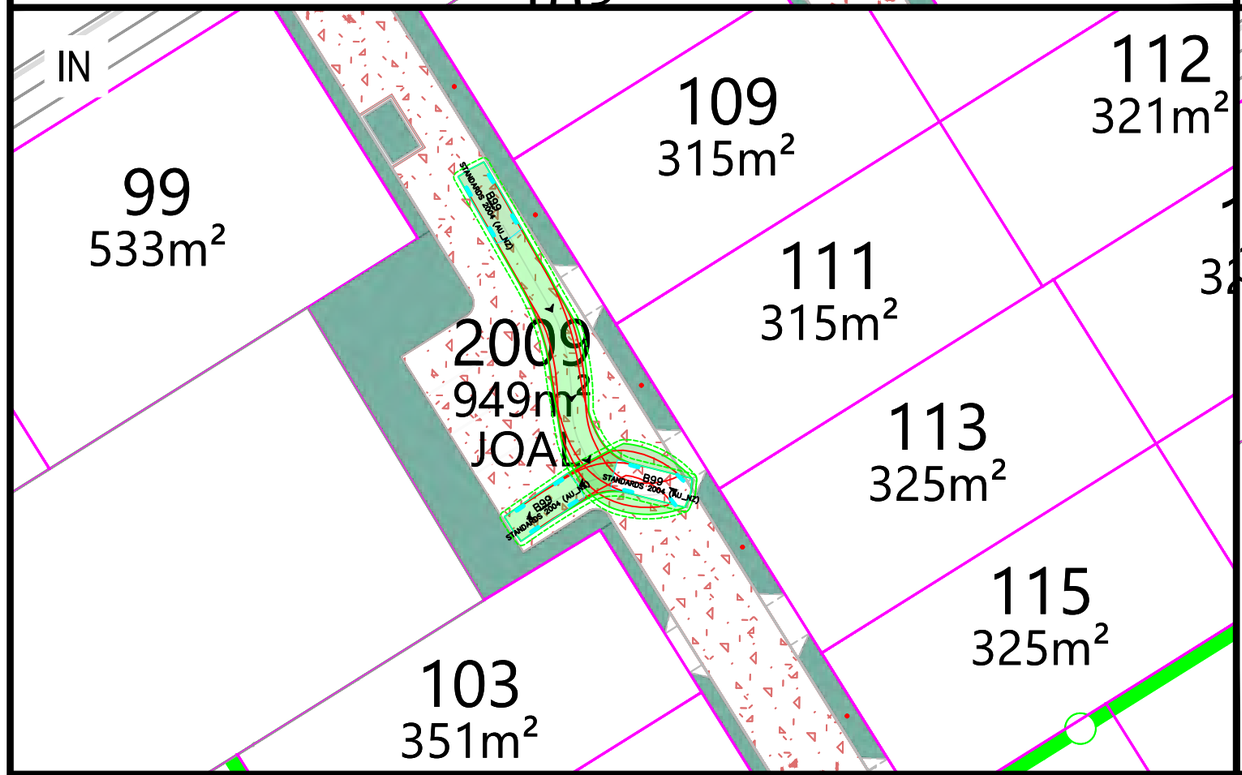

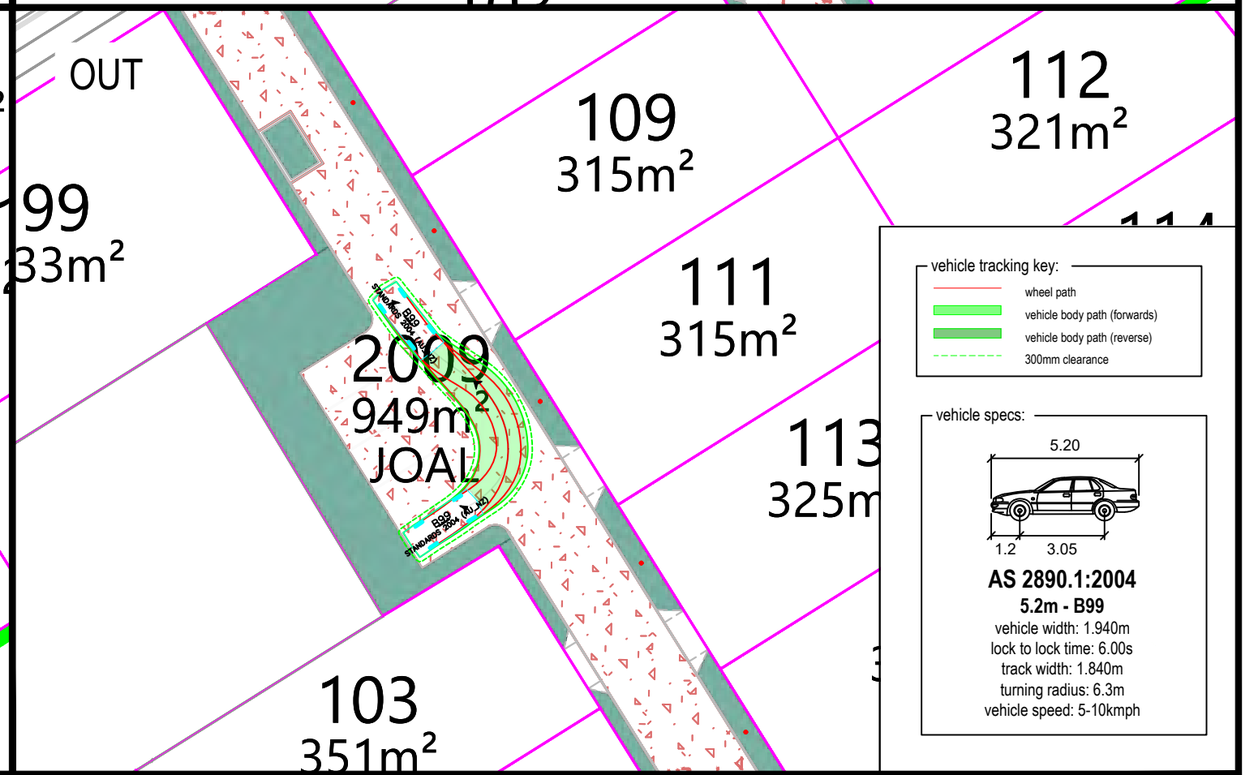

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: CAR PARK SPACES ENTRY & EXIT
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 19 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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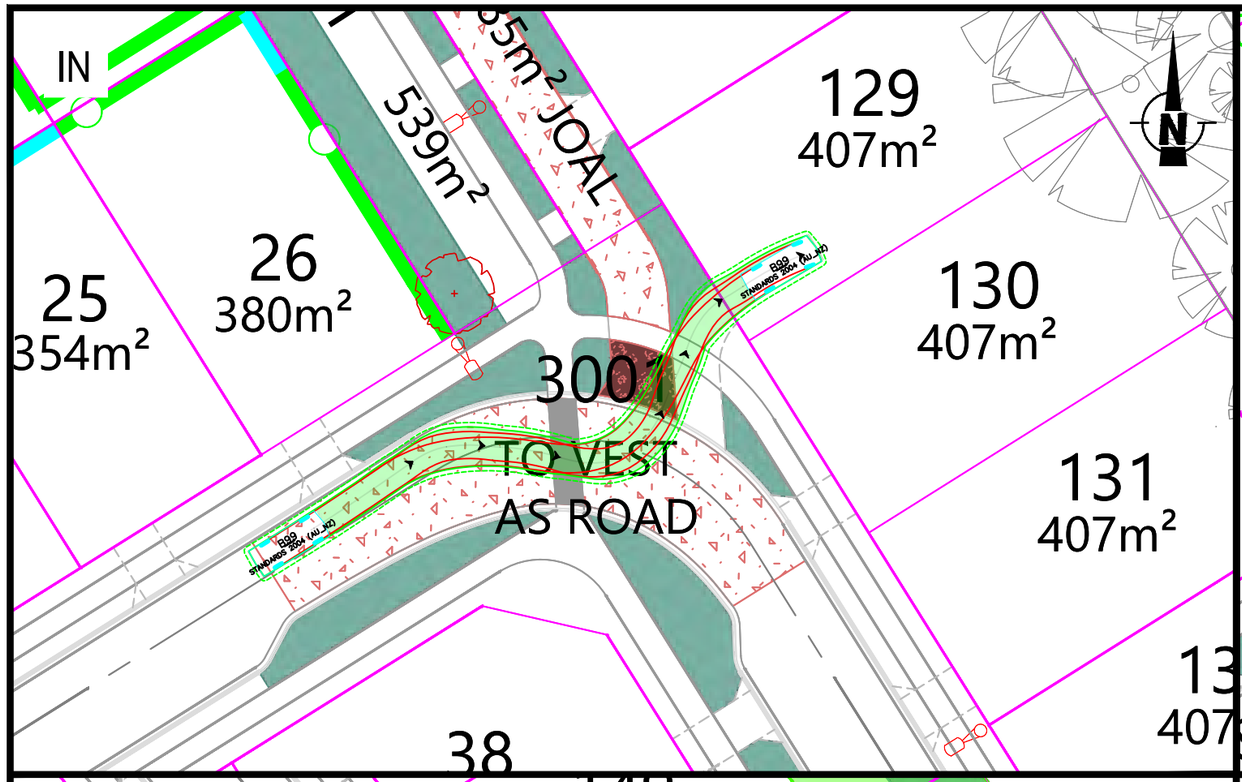
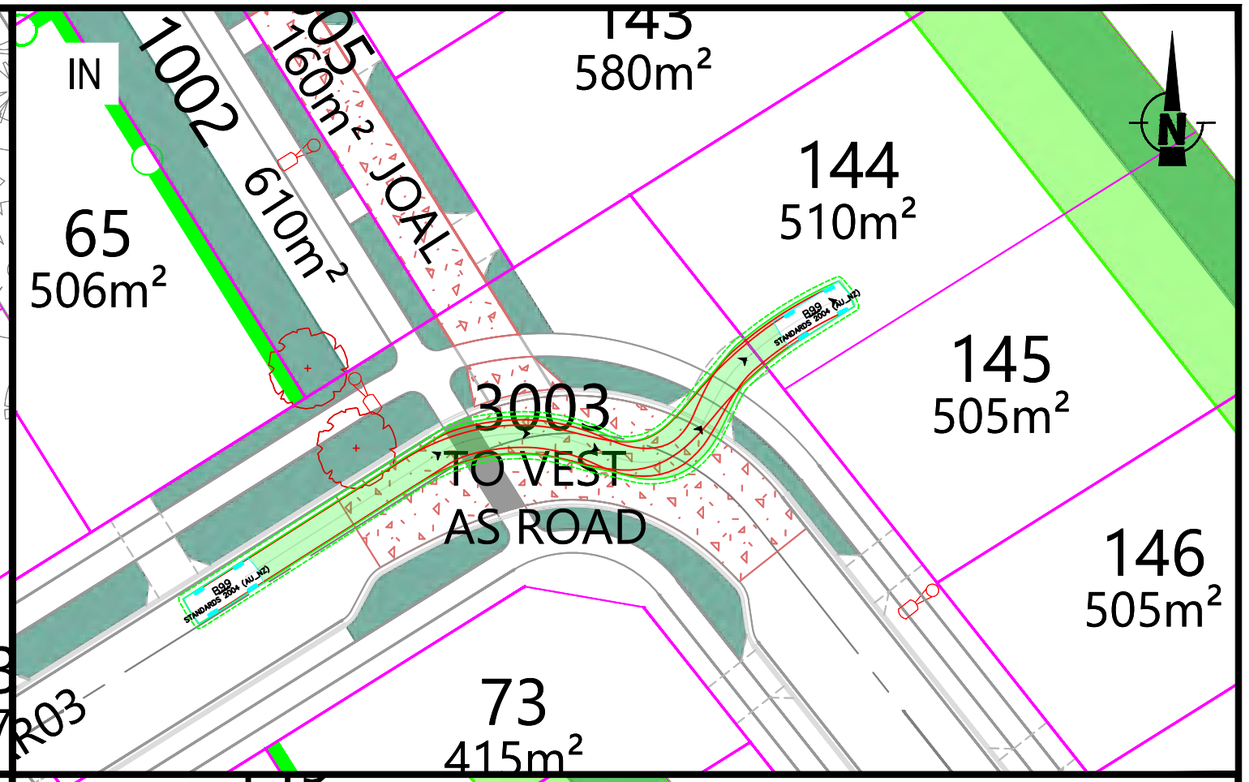
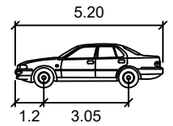




vehicle tracking key:
- wheel path
- vehicle body path (forwards)
- vehicle body path (reverse)
- 300mm clearance

vehicle specs:



AS 2890.1:2004
5.2m - B99
vehicle width: 1.940m
lock to lock time: 6.00s
track width: 1.840m
turning radius: 6.3m
vehicle speed: 5-10kmph

REV	AMENDMENT	DATE OF ISSUE
A	First Issue	01/07/2025

DESIGN: KC | DRAWN: KC
CHECKED: GVW | DATE: 01/07/2025
SCALE: 0 16m
1:400 @ A3

CLIENT: CDL LAND NEW ZEALAND LTD
PROJECT: ARATAKI ROAD FAST TRACK
LOCATION: ARATAKI ROAD, HAVELOCK NORTH

FOR RESOURCE CONSENT

SHEET TITLE: ANGLED VEHICLE CROSSING ENTRY
99th PERCENTILE CAR

DRAWING NUMBER: CDLL002-AT-DW01

SHEET: 20 of 20
REV: A

flow
TRANSPORTATION SPECIALISTS
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