



WINSTONE
AGGREGATES


Boffa Miskell



Part
B

Appendix B12.4.14

Transportation Assessment



HUNUA QUARRY DEVELOPMENT



Transportation
Assessment

26 March 2026

PROJECT Hunua Quarry Development – Hunua Quarry Development
REPORT TITLE Transportation Assessment
DOCUMENT REFERENCE J003408 489 Hunua Road, Hunua Traffic 260326
DATE 26 March 2026



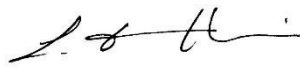
REPORT STATUS	PREPARED BY	REVIEWED BY	APPROVED BY
Final Report	Hunter Abernethy	Leo Hills	Leo Hills
			



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1 Introduction

Winstone Aggregates (“Winstone”), a division of Fletcher Concrete and Infrastructure Limited, has engaged Commute to assess the potential traffic effects of the proposed development of Hunua Quarry at 489 Hunua Road, Hunua, Auckland.

Winstone is seeking approval to the project under the Fast-Track Approvals Act 2024 (FTAA). The Hunua Quarry Development is a Listed Project in Schedule 2 of the FTAA, reflecting its regional and national significance. The proposal is to expand the existing quarry to increase annual quarry production to a peak of approximately 5.4 million tonnes of aggregate, and to enable the continued extraction of aggregate for a further 80 years (“**the Project**”) or also referred to as the “**quarry development area**”. Through this approval process, Winstone propose to update the consent conditions and quarry management plans applying to the site to incorporate the changes and enable greater operational efficiency.

This transport assessment addresses the following aspects with respect to the proposal:

- A review of the existing road environment near the quarry;
- An assessment of traffic generation and distribution on the road network;
- An assessment of the site access design;
- A discussion on the potential effects of the proposal on the surrounding road network.

These and other matters are addressed in detail in this report. By way of summary, it is considered that the proposal, as detailed in this report, will have minimal traffic effects on the function, capacity and safety of the surrounding transport network.

The author of this report, Hunter Stewart Abernethy is a graduate transport traffic and transport engineer at Commute Transportation Limited (Commute). Hunter has a Bachelor of Engineering with Honours (2025) from the University of Auckland and joined Commute in 2025 as a graduate traffic and transport engineer. Hunter has been involved in multiple other Fast Track Applications and engaged to advise on traffic and development issues covering safety, management and planning matters of many kinds.

The reviewer and approver of this report, Leo Donald Hills is a director at Commute Transportation Limited (Commute). Leo has a Master of Civil Engineering (2000), a Bachelor of Engineering with Honours (1996), both from the University of Auckland, is a Chartered Professional Engineer (CPEng), and a Chartered Member of Engineering New Zealand (CMEngNZ). Leo has over 29 years’ experience as a specialist traffic and transport engineer. During his time as a practicing traffic engineer, he has been engaged by local authorities and private companies/individuals to advise on traffic and development issues covering safety, management and planning matters of many kinds.

Although this is not a hearing before the Environment Court, we record that we have read and agree to comply with the Environment Court’s Code of Conduct for Expert Witnesses as specified in the Environment Court’s Practice Note 2023. We confirm that this report is within our area of expertise, except where we state that we rely upon the evidence or reports of other expert witnesses lodged forming part of the project’s application material. We have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

2 Existing Road Environment

2.1 Site Location

The subject site is located at 489 Hunua Road in Hunua, with frontage to Hunua Road and Middleton Road. The primary existing access to the site is via Hunua Road.

The Hunua Quarry is in South Auckland, approximately 5 kilometres (km) southeast of Papakura and 35 km southeast of the Auckland Central Business District (“CBD”). The Hunua Quarry has been operating on the site since the 1920’s and produces greywacke rock and supplies a significant part of the Auckland region’s aggregate requirements, primarily for use in civil infrastructure such as roading and concrete. The Quarry is recognised as one of Auckland’s three most strategically important sources of aggregate.

Currently, material is extracted from the Symonds Hill Pit and processed on-site, with material with no value (referred to as overburden) being deposited on-site in the overburden disposal area (OBDA) (the previous Hunua Pit).

To extend the site’s operational life, Winstone proposes a 50ha expansion and to deepen the existing Symonds Hill Pit to access additional high quality greywacke resource. Initial investigations confirm that the site contains a substantial greywacke resource, sufficient to meet projected demand for up to 80 years, given based on current rates of extraction and local known site constraints.

With reference to the Auckland Unitary Plan, the majority of the development site is zoned ‘Special Purpose - Quarry Zone’ with a portion being zoned Rural – Mixed Rural Zone. The location of the site and access in relation to the surrounding road environment is shown in Figure 1 and Figure 2.

Figure 1: Site Location within the wider Network

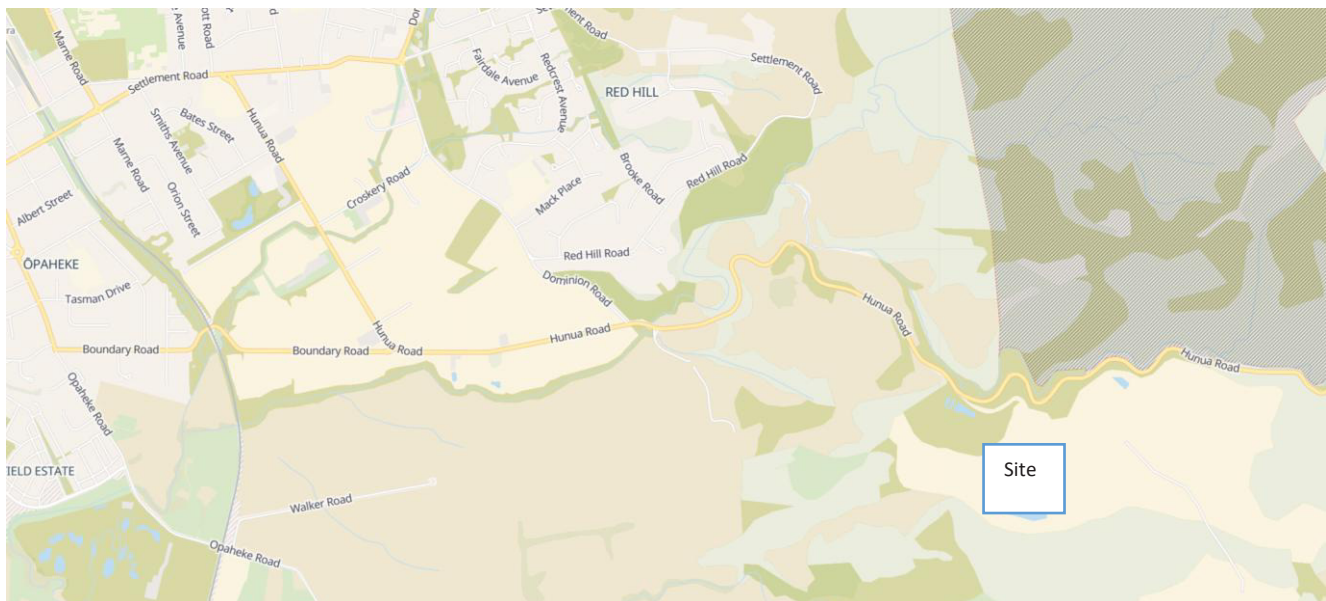


Figure 2: Existing Access



2.2 Road Network

2.2.1 General

The site has frontage to Hunua Road and it is proposed for the site to connect to the wider network via a single existing access onto Hunua Road. The surrounding road network is described in subsequent sections.

2.2.2 Hunua Road

The entire length of Hunua Road is not classified as an 'Arterial Road' within the Auckland Unitary Plan; only that section to the west of Dominion Road is classified as an 'Arterial Road', with this classification stopping near the rural-urban boundary.

Hunua Road is comprised of one vehicle lane in each direction, provides a road reserve of approximately 9m, including a sealed width of 7.5m and has a posted speed limit of 80km/hr adjacent to the site access. There are no footpaths or cycle provisions on Hunua Road.

Traffic data obtained from Auckland Transport¹ shows that Hunua Road (between Hunua Gorge Bridge (1st abutment) and the quarry entrance) carried 3,558 vehicles per day (vpd) in both directions (in February 2025). The morning peak hour volume was 344 vehicles per hour (vph) and the evening peak hour volume was 292

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¹ Auckland Transport Traffic Counts, March 2015, <https://at.govt.nz/about-us/reports-publications/traffic-counts/>

vph. A total of 21% of the traffic volume was recorded as heavy vehicles reflecting the importance of the road for freight

Photograph 1: Hunua Road Looking West



Photograph 2: Hunua Road looking East



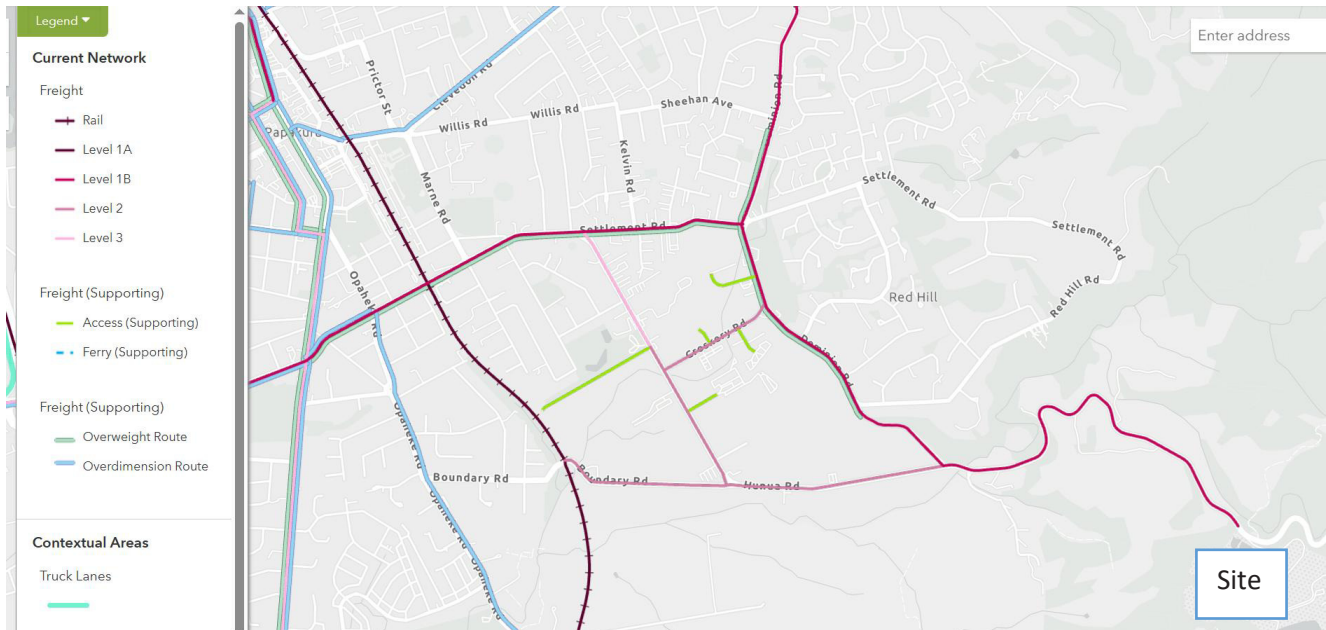
2.2.3 Freight Route

Hunua Road, (to the west of the site entrance) is part of the Auckland Strategic Freight Network. The classification for Hunua Road is 1B which is defined as follows:

“Roads of the highest strategic value to freight movement being Arterials where efficient freight movements must be actively supported to maintain Levels of Service, where competing modes and land uses require active management.”

This is shown in Figure 3 below.

Figure 3: Auckland Transport Freight routes



Of note Hunua Road through to Settlement Road as well as Settlement Road and Beach Road through to SH1 (southern motorway) is all classified as a Freight route (of varying classification). Dominion Road is also classified as a Freight Road (classification 1A). All these roads have been specifically designed and progressively upgraded to cater for large truck and trailers.

It is expected that the maintenance and upgrades is undertaken by Auckland Transport to ensure that the existing freight and arterial network is adequate for its intended use which is large truck and trailers.

2.3 Intersection traffic counts

Traffic count surveys at AM and PM peak commuter periods were undertaken on 16th December 2025 at the following intersections:

- Hunua Road / Settlement Road;
- Hunua Road / Dominion Road; and
- Hunua Road / Boundary Road.

The traffic counts revealed the following overall peak hour of the surrounding road network:

- AM peak hour – 7:15am to 8:15am; and
- PM peak hour – 4:15pm to 5:15pm.

Auckland Transport, through initial discussions has highlighted that the above traffic survey occurred when the nearby Edmund Hillary School was not operating. A revised traffic count survey of the critical Hunua Road / Settlement Road (intersection closest to the school) turning movements in the critical AM peak hour has been conducted on the 12th March 2026 during the AM peak hours of 7:00-9:00 am.

It is noted that the revised traffic count survey generally resulted in a similar number of turning vehicles at the Hunua Road / Settlement Road Intersection. The revised traffic survey revealed the AM peak hour was 7:30-8:30AM with 582 turning vehicles which is only three vehicles more than the existing survey peak hour (7:15-7:30AM) with 579 turning vehicles. An increase in turning traffic of three vehicles is considered to be well below the natural daily fluctuation of movements and therefore, the 16th December 2025 survey is considered appropriate for analysis purposes.

The results of both peak traffic surveys are included in **Appendix A**.

2.4 Public Transport

There are currently no public transport services that travel on Hunua Road or in close vicinity to the site. This is not unexpected given the rural location of the site.

Additionally, the proposed quarry development will not need access to public transport.

2.5 Walking and Cycling

There are no dedicated walking and cycling facilities on the section of Hunua Road that adjoins the site.

It is noted that a pedestrian footpath is provided on Hunua Road to the west of Dominion Road; however, due to the intended use of the site and rural catchment, the lack of walking and cycling provisions will have a negligible impact of travel habits.

2.6 Road Safety

An assessment of the surrounding area's safety record has been carried out using the Waka Kotahi CAS database, for the five-year period between 2021 and 2025 plus any crashes entered into the system for 2026. The search included all reported crashes on Hunua Road between the site and Dominion Road. A total of 15 crashes were reported within the search criteria as summarised below:

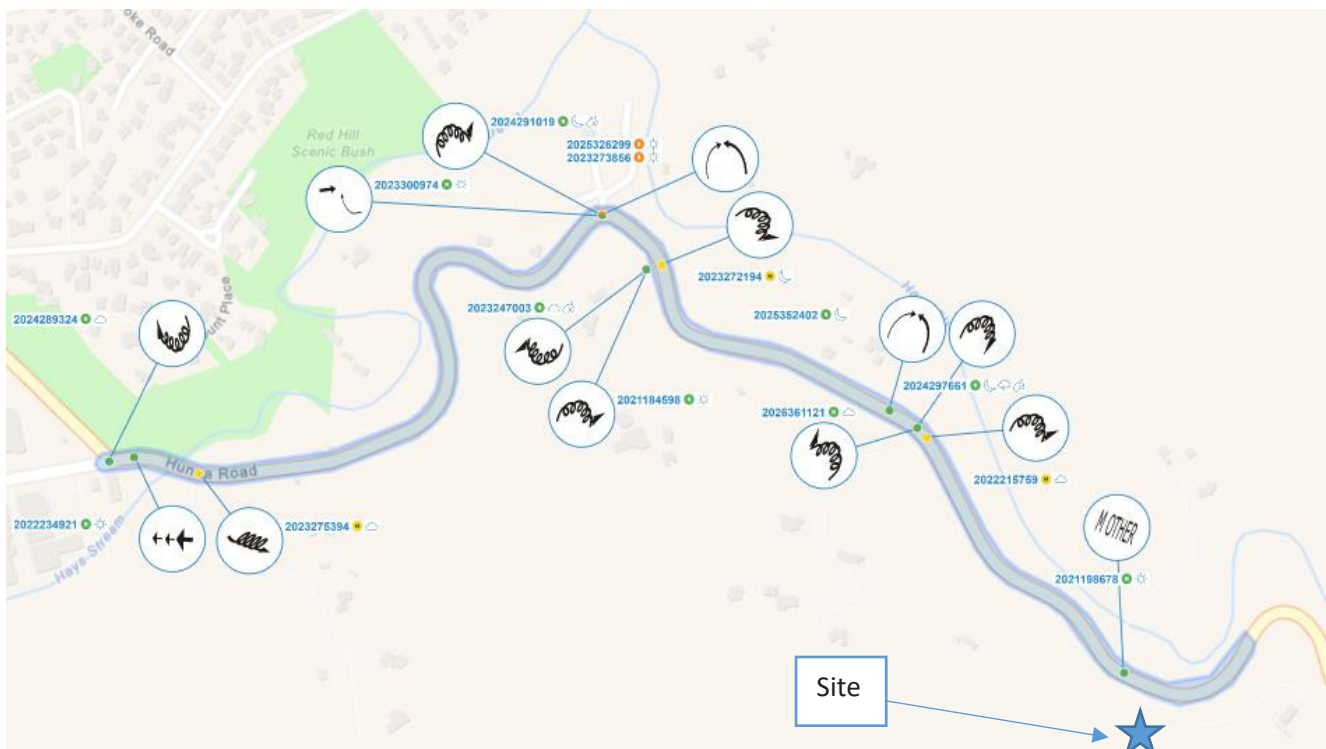
- A single non-injury collision due to vehicle reversing into a following vehicle while stationary waiting for a truck to turn left into a driveway;
- A single minor injury collision due to losing control and colliding with a telecom pole after encountering gravel on the road;
- Two non-injury collisions due to vehicle on Hunua Road failing to navigate a bend;
- A single non-injury collision due to vehicle crossing the centreline causing a head-on collision with an oncoming vehicle;
- A single non-injury collision due to a vehicle swerving and losing control due to an oncoming vehicle crossing the centre line;
- A single minor injury collision due to a vehicle swerving and losing control to avoid hitting a rabbit and colliding with a tree;
- A single non-injury collision due to a truck taking a 45km/h advisory bend too quickly and rolling over;
- A single serious injury collision due to a vehicle travelling westbound on Hunua Road taking a corner too wide and clipping the wheel of an oncoming trailer;
- A single serious injury collision due to a vehicle travelling eastbound crossing the centre line at a bend causing a head on collision with an oncoming vehicle;

- A single non-injury collision due to a vehicle heading towards Huana turning right into a residential driveway into the path of an oncoming vehicle;
- A single non-injury collision due to the driver of a vehicle heading eastbound on Hunua Road falling asleep and colliding with a chevron sign;
- A single minor injury collision due to a vehicle travelling eastbound on Hunua Road colliding with a telephone pole due to medical reasons;
- A single non-injury collision due to a truck making a last-minute turn causing a rear end collision from following trucks; and
- A single non-injury collision due to a vehicle travelling north on Hunua Road turning right onto Dominion Road before losing control and colliding with a grass bank.

The results do not highlight any significant safety concerns or trends relating to the Quarry entrance or quarry trucks. The collision diagram can be seen in Figure 4 below.

It is noted that on-site observations have shown that the existing quarry access design is deficient as per Austroads “*Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management*” relating to right turn entries and the number of quarry trucks to be accommodated. An assessment of the access against Austroads Guidelines is provided in Section 7.1.2.

Figure 4: CAS Collision Diagram



2.6.1 Truck Safety

A further CAS search of Hunua Road between the Quarry access and Settlement Road has been conducted only including crashes involving a truck for the five year period between 2021 and 2025 plus any crashes entered into the system for 2026. A total of 10 crashes were reported within the search criteria as summarised below:

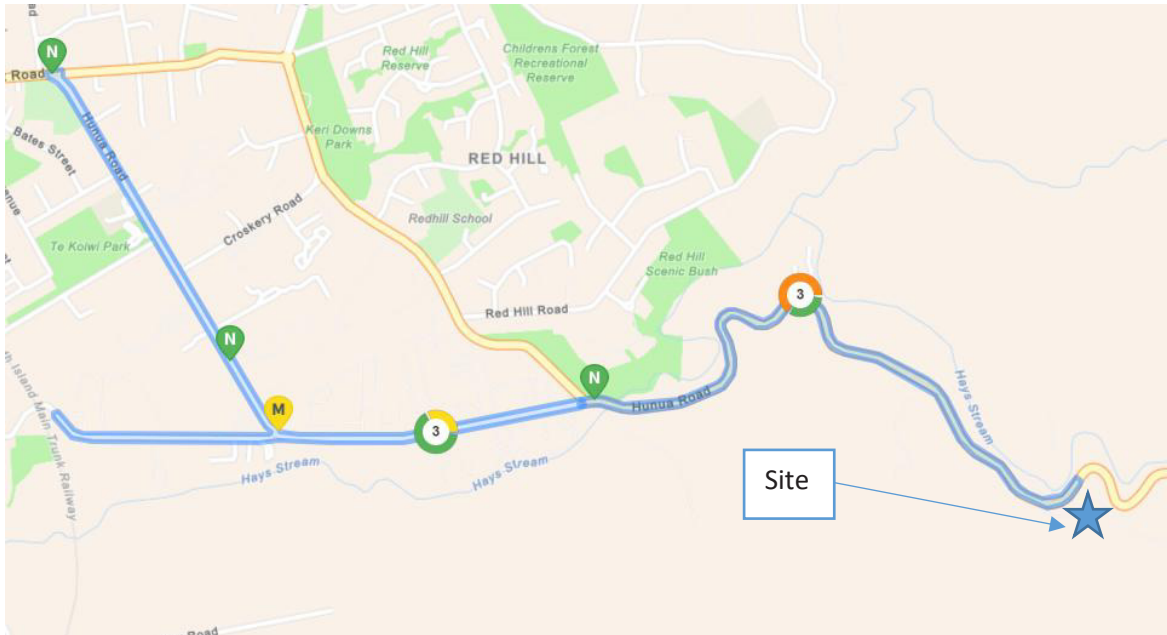
- A single non-injury collision due to a truck taking a 45km/h advisory bend too quickly and rolling over;
- A single serious injury collision due to a vehicle travelling westbound on Hunua Road taking a left bend corner too wide and clipping the wheel of an oncoming truck and trailer;
- A single serious injury collision due to a vehicle travelling eastbound crossing the centre line at a bend causing a head on collision with an oncoming vehicle;
- A single non-injury collision due to a quarry truck travelling west along Hunua Road approaching the Dominion Road intersection making a last minute turn resulting in following trucks causing a rear ending collision;
- A single non-injury collision due to a truck travelling east on Hunua Road colliding with parking vehicles;
- A single minor injury collision due to a truck travelling westbound on Hunua Road colliding with a stationary vehicle who was pulled over to the left hand side of the road, the truck driver claimed to have been falling asleep which caused the crash;
- A single non-injury collision due to Ute with overloaded trailer coming unhitched, crossing the centre line and colliding with an oncoming truck on Hunua Road;
- A single minor injury collision due to vehicle turning right from Boundary Road onto Hunua Road failing to give way to oncoming truck travelling north on Hunua Road;
- A single non-injury collision due to truck driver exiting driveway on Hunua Road between Settlement Road and Boundary Road failing to take the turn wide enough and colliding with a power pole; and
- A single non-injury collision due to vehicle heading east on Settlement Road failing asleep and crossing the centre line, an oncoming truck blocked the car from colliding with the footpath / pedestrians. Drugs were a suspected factor in this crash.

The results do not highlight any significant safety concerns / patterns regarding truck movements on Hunua Road between the quarry access and Settlement Road. The CAS search can be seen in Figure 5

Auckland Transport have highlighted concern with the two serious collisions on the same curve on Hunua Road, in this regard although we do not consider two crashes over a five year period a trend, additional rumble strips along the centreline of the corner could be included discourage drivers from crossing the centreline causing head on collisions².

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² NZTA Rumble Strips Information Sheet:
<https://www.nzta.govt.nz/assets/network/operating/safely/doc/rumble-strips-info-sheet.pdf>

Figure 5: Truck crashes CAS



3 Proposal

3.1 General

The Hunua Quarry development seeks to expand and deepen the existing Symonds Hill Pit, enabling sustainable extraction of additional greywacke resource, and the continuation of the quarrying within Winstone’s existing site for up to 80 years. The proposed development initially focuses on the southern and northwestern ends of the quarry complex. The new extraction footprint will initially expand the existing Symonds Hill Pit to the south and east, followed by areas to the north and west. These development works will occur entirely within Winstone-owned land and integrate with existing quarry infrastructure.

The proposal seeks to increase the annual quarry production of Winstone’s Hunua Quarry located at 489 Hunua Road, Hunua from 2,943,052 tonnes to a peak of approximately 5,400,000 tonnes of aggregate as well as to enable the extraction for up to 80 years.

Winstone has identified that it may seek consent later (approximately years 50-80) to drop the pit below RL50 once it has completed stage 8, subject to further investigations and the approval of any required regional consents. This will have the same footprint as the existing quarry pit but will go deeper. Provided the annual production does not increase above the 5,400,000 tonnes, quarrying below the RL50 level would not result in additional traffic effects above those assessed in this report.

The quarry will utilize the existing access from Hunua Road, although a right turning lane is proposed to improve the safe operation of the access for turning trucks and other road users. This also reflects the increase in truck volumes accessing the Site as production on the Site increases.

The quarry will operate as per the existing consented hours of:

- Monday to Friday 6:00am – 5:30pm
- Saturday 6:00 – 4:00pm

It is noted that part of a paper road in the northeast portion Site needs to be stopped (extension of Middleton Road). In this regard Winstone have previously stopped a portion of this paper road to support earlier pit development. However, it did not stop the remaining section. As this road has previously been stopped in the pit and it does not serve any property west of where it will stop (No 193 Middleton Road will become part of the pit), no adverse effects will occur.

4 Proposed Trip Generation

4.1 General

The existing quarry currently produces approximately 2,943,052 tonnes of aggregate annually; the proposal seeks to increase this production to a peak of approximately 5,400,000 tonnes of aggregate.

Based on site-observations all truck movements to and from the site will be via the Hunua Road / Dominion Road, Hunua Road / Boundary Road, and Settlement Road / Hunua Road intersections.

A summary and assessment of the existing and proposed truck movements and effects on the surrounding transport network can be found below.

It is noted that Hunua Road, west of the quarry access has in the past been significantly upgraded to cater for quarry trucks passing each other which has included significant widening of corners / shoulders. It is considered that the above previous upgrades are still appropriate to cater for the anticipated increase in quarry trucks.

As highlighted previously, the proposal will be using the existing freight and arterial network which is intended for large heavy vehicles and trucks.

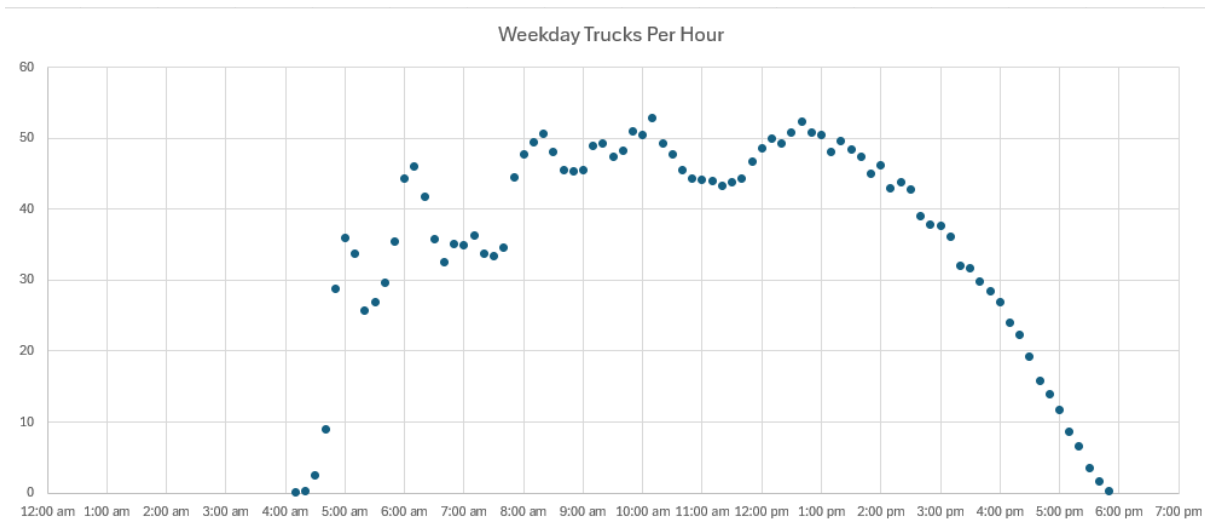
4.2 Existing Volumes

The average truck movements to and from the site over a period of 24 hours have been provided by Winstone.

The existing average daily truck trip data is summarised in the graph in

Figure 6 below.

Figure 6: Existing Average Weekday Truck Movements (per hour)



Data provided by Winstone in 2023 reveals that during the AM and PM peak hours, the quarry generated the following truck movements:

- AM peak hour – 76 truck movements; and
- PM peak hour – 64 truck movements.

4.3 Proposed Level of Traffic Generation

It is proposed to increase the annual quarry production from 2,943,052 tonnes to a peak of approximately 5,400,000 tonnes. Figure 7 shows the data provided by Winstone in regard to the increase in production and truck movements.

Figure 7: Increase in Quarry Production and Truck Movements

	Off season			On Season		Holidays		On Season					Off season	Total	2023 Actual	Splits	
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Theoretical			Actual	
	336,000	336,000	406,000	489,500	594,500	284,000	284,000	594,500	594,500	580,000	569,000	351,000	5,419,000	2,943,052			
Roading	250,000	250,000	300,000	350,000	450,000	200,000	200,000	450,000	450,000	450,000	450,000	250,000	4,050,000	2,148,808	75%	73%	
Building	50,000	50,000	70,000	80,000	80,000	50,000	50,000	80,000	80,000	75,000	70,000	60,000	795,000	679,777	15%	23%	
Seal Chip	6,000	6,000	6,000	12,000	12,000	6,000	6,000	12,000	12,000	12,000	6,000	6,000	102,000	30,184	2%	1%	
Sundry	5,000	5,000	5,000	7,500	7,500	3,000	3,000	7,500	7,500	3,000	3,000	5,000	62,000	34,465	1%	1%	
Unprocessed	25,000	25,000	25,000	40,000	45,000	25,000	25,000	45,000	45,000	40,000	40,000	30,000	410,000	49,818	8%	2%	
working days (inc. Sat)	27	26	26	26	25	25	24	23	26	22	26	25	301	301			
tonnes per truck	35	35	35	35	35	35	35	35	35	35	35	35	35	40			
av. daily truck movements	356	369	446	538	679	325	338	739	653	753	625	401	514	244			
trucks per minute (14-hour day)	0.42	0.44	0.53	0.64	0.81	0.39	0.40	0.88	0.78	0.90	0.74	0.48	0.61				

From the above data, it is estimated that the average daily truck movements increase by approximately 111% from the 2023 actual survey. Therefore, the existing truck movements during the AM and PM peak hours have been increased by 111% in order to estimate the peak hour truck movements in and out of the site post-increase. This increase results in the following truck movement volumes during the AM and PM peak hours:

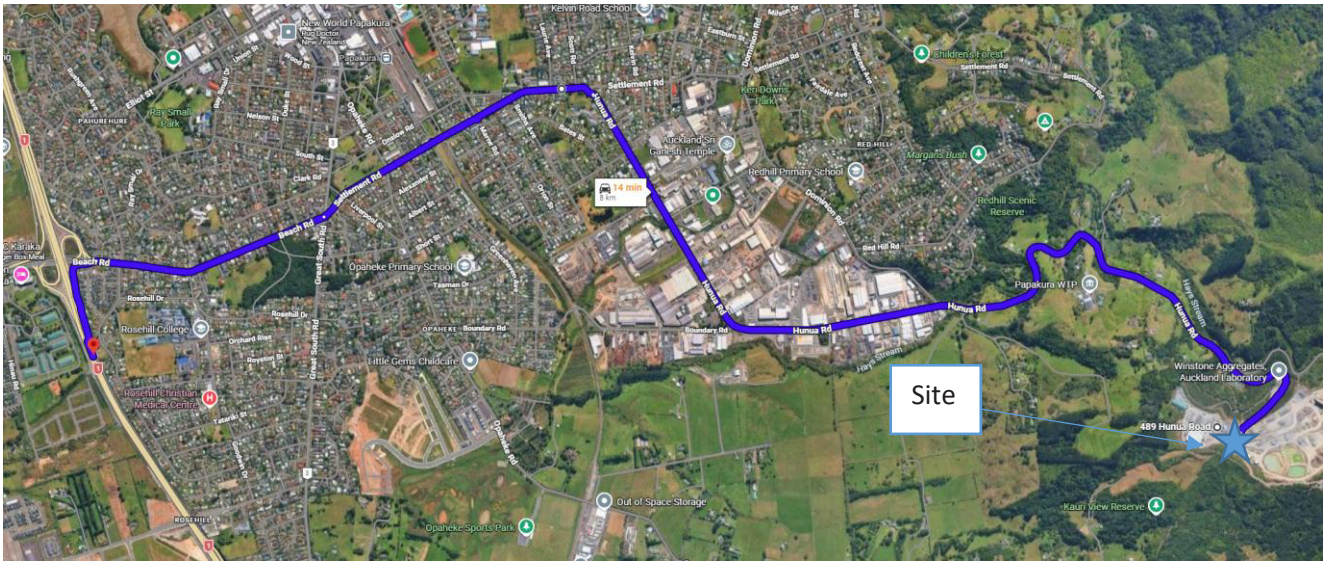
- AM peak hour – 161 truck movements (increase by ~86 from existing) corresponding to approximately 43 entry and 43 exit additional truck movements; and
- PM peak hour – 135 truck movements (increase by ~72 from existing) corresponding to approximately 36 entry and 36 exit additional truck movements.

Of note staff movements (non-truck) are expected to be generally unchanged (from that already surveyed) as while there would be about a 10% increase in staff, more automation would also be brought in over time so the numbers would be near static. Additionally, it is noted that truck movements are based on 35-35 tonne trucks which include a truck and trailer. There may be situations where single-unit trucks are used however this is expected to be minimal.

4.3.1 Wider Network Trip Distribution

Based on observations of the existing trucks during the traffic surveys, it has been assumed that all truck movements to and from the subject site are along Hunua Road through to Settlement Road (then generally linking to SH1 / southern motorway) as seen in Figure 8.

Figure 8: Trip distribution



Trip distribution diagrams (existing and proposed) can be seen in **Appendix B**.

5 Intersection Assessment

5.1 Assessment

Three key intersections have been assessed in relation to the increase in truck volumes being:

- Hunua Road / Settlement Road
- Hunua Road / Boundary Road; and
- Hunua Road / Dominion Road;

The location of these intersections in relation to the site is shown in Figure 7.

Figure 9: Site Location within the wider Network

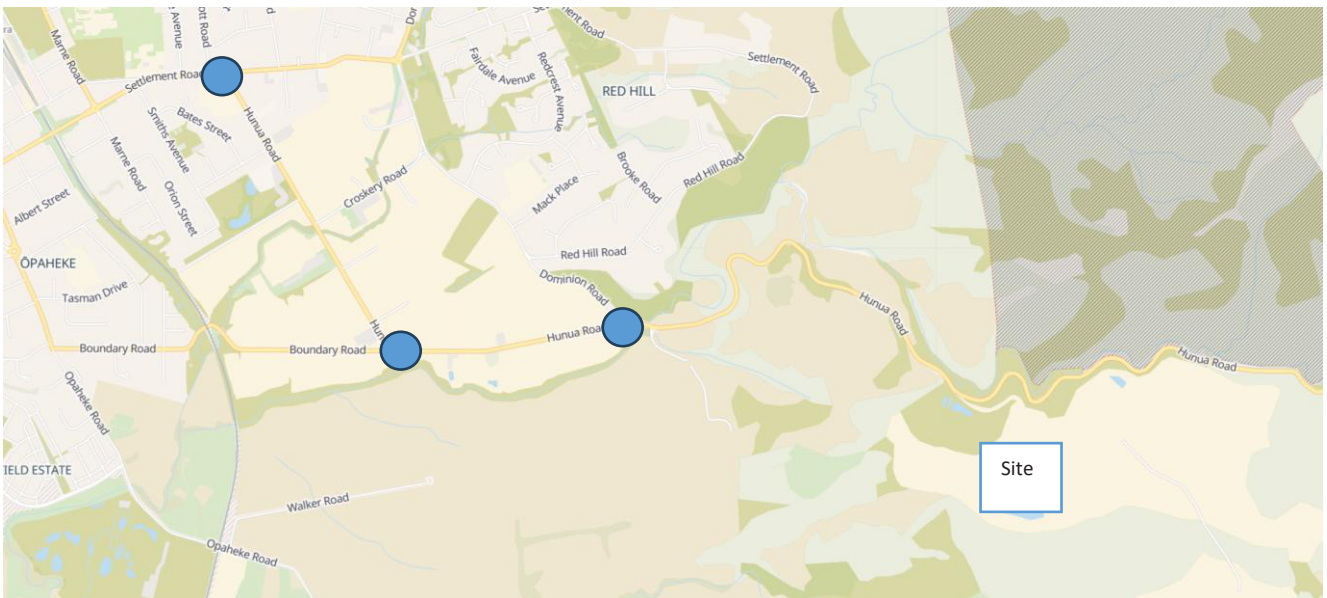


Table 1 below provides a summary of the SIDRA intersection modelling results of the above three intersections. Each intersection is assessed in greater detail in the following sections.

Table 1: SIDRA results summary

Intersection		Hunua Road / Settlement Road	Hunua Road / Dominion Road	Hunua Road / Boundary Road
Existing				
Average LOS	AM	LOS A/B	LOS A	LOS A
	PM	LOS A/B	LOS A	LOS A
Average Delay	AM	3.8 Seconds	2.1 Seconds	3.7 Seconds
	PM	3.1 Seconds	2.4 Seconds	3.9 Seconds
95% Back of Queue Length	AM	11.9m	2.4m	7.4m
	PM	8.2m	1.7m	5.1m
Proposed				
Average LOS	AM	LOS A/C	LOS A	LOS A
	PM	LOS A/B	LOS A	LOS A/B
Average Delay	AM	4.4 Seconds	1.7 Seconds	3.5 Seconds
	PM	3.5 Seconds	2.0Seconds	3.7 Seconds
95% Back of Queue Length	AM	18.6m	3.2m	8.4m
	PM	11.2m	2.0m	5.8m

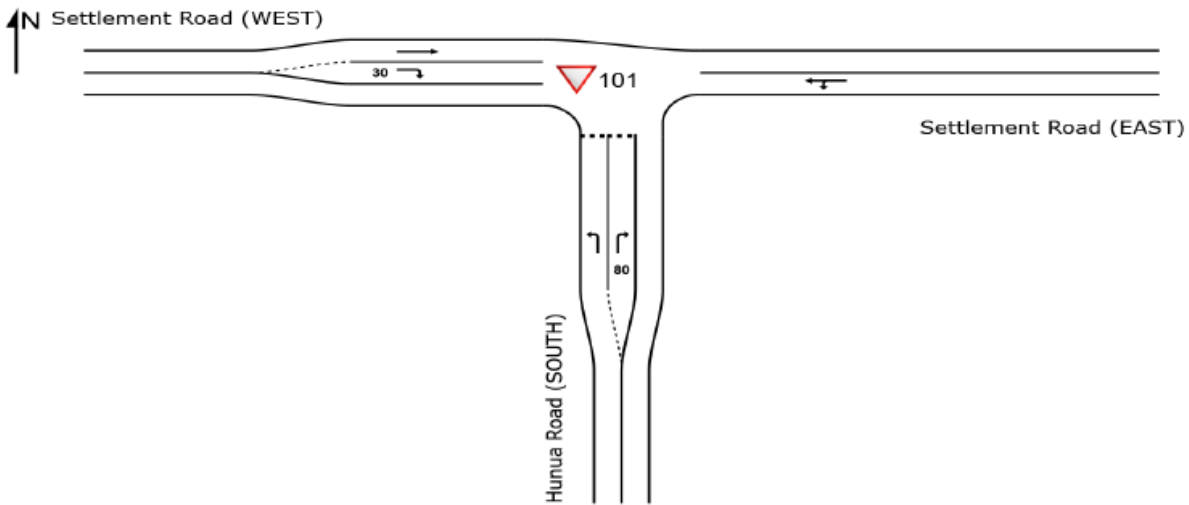
5.2 Modelling

5.2.1 Hunua Road / Settlement Road

Modelling of the Hunua Road / Settlement Road mentioned above has been conducted using the SIDRA modelling software. The full results for the above intersection during the AM and PM peak periods can be seen in **Appendix C**.

Figure 10 shows the intersection layout for the SIDRA assessment of the Hunua Road / Settlement Road intersection.

Figure 10: SIDRA Intersection Layout (Hunua Road / Settlement Road)



The Hunua Road / Settlement Road intersection operates at acceptable levels with additional capacity in both the existing and proposed scenarios.

As shown above, the intersection continues to operate at LOS A/B. Only one of the movements in the AM peak hour operates at LOS C, which is the right turn from Hunua Road onto Settlement Road. It is noted that the increase in average delay for this movement is approximately 1.2 seconds which is considered a minimal increase. Overall, the effects of the increase in truck volumes on the Hunua Road / Settlement Road intersection are considered negligible. As such, the intersection operation is acceptable.

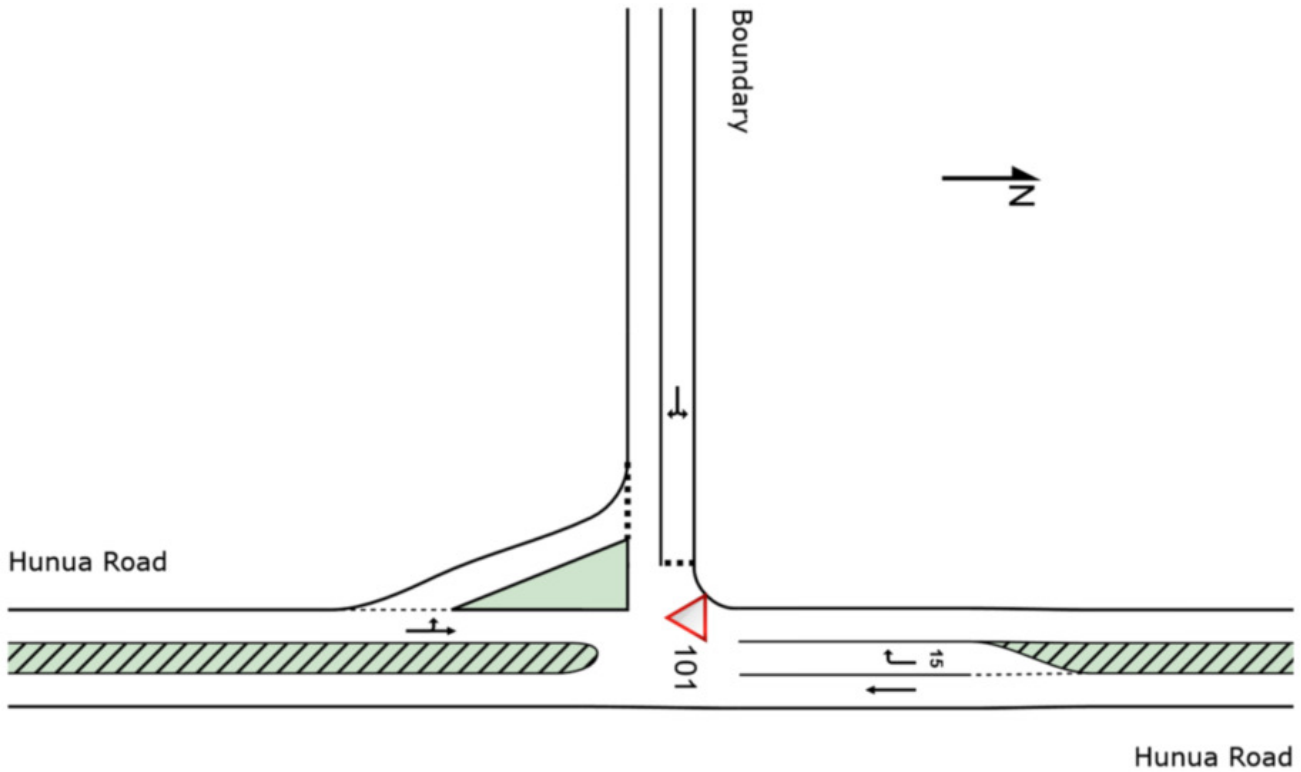
No upgrades or mitigation measures are deemed to be required at the Hunua Road / Settlement Road intersection, and it is anticipated that the intersection will acceptably manage the generated traffic from the proposal.

5.2.2 Hunua Road / Boundary Road

Modelling of the Hunua Road / Boundary Road mentioned above has been conducted using the SIDRA modelling software. The full results for the above intersection during the AM and PM peak periods can be seen in **Appendix C**.

Figure 9 shows the intersection layout for the SIDRA assessment of the Hunua Road / Boundary Road intersection.

Figure 11: SIDRA Intersection Layout (Hunua Road / Boundary Road)



The Hunua Road / Boundary Road intersection operates at acceptable levels with additional capacity in both the existing and proposed scenarios.

As shown above, the intersection continues to operate at LOS A/B with minimal delays and queuing across both existing and proposed scenarios and on all approaches.

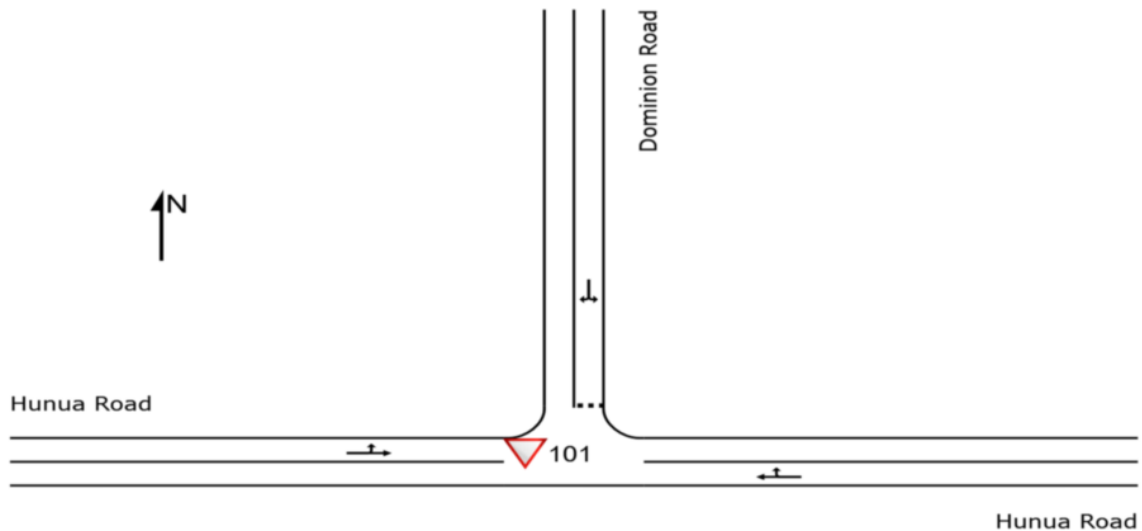
No upgrades or mitigation measures are deemed to be required at the Hunua Road / Boundary Road intersection, and it is anticipated that the intersection will acceptably manage the generated traffic from the proposal.

5.2.1 Hunua Road / Dominion Road

Modelling of the Hunua Road / Dominion Road mentioned above has been conducted using the SIDRA modelling software. The full results for the above intersection during the AM and PM peak periods can be seen in **Appendix C**.

Figure 10 shows the intersection layout for the SIDRA assessment of the Hunua Road / Dominion Road intersection.

Figure 12: SIDRA Intersection Layout (Hunua Road / Dominion Road)



The Hunua Road / Dominion Road intersection operates at acceptable levels with additional capacity in both the existing and proposed scenarios.

As shown above, the intersection continues to operate at LOS A/B with minimal delays and queuing across both existing and proposed scenarios on all approaches.

No upgrades or mitigation measures are deemed to be required at the Hunua Road / Dominion Road intersection, and it is anticipated that the intersection will acceptably manage the generated traffic from the proposal.

6 Midblock Capacity

The mid-block capacity of Hunua Road has been undertaken using industry standard procedures set-out in the AUSTRROADS guidance document “Guide to Traffic Management Part 3: Transport Studies and Analysis Methods (Edition 4.0, April 2020)”, (“AUSTRROADS Part 3”) and in particular, the procedures provided at Section 5.1.1 - Capacity. The primary approach and principle of this capacity analysis method is summarised below:

“The capacity of a single traffic lane will be affected by factors such as the pavement width and restricted lateral clearances, the presence of heavy vehicles and grades.”

The capacity of a significant length of a single traffic lane is calculated by using the following equation:

$$C=1800 F_W F_{HV}$$

Where:

- C = capacity in vehicles per hour under prevailing roadway and traffic conditions
- FW = adjustment factor for narrow lanes and lateral clearances (Table 5.1)
- FHV = adjustment factor for heavy vehicles (Table 5.2)

The following characterise the critical section of Hunua Road (between the site entrance and Dominion Road) and are relevant for the analysis:

- level gradient along the length of the route;

- equivalent 3.2m lanes;
- 1.0m lateral clearance on each side including sealed shoulder / swale drains on the outer edge of the road;
- 25% heavy traffic within the overall traffic stream along Hunua Road.

The above results in the following:

$C=1800 \times 0.80 \times 0.80 = 1,152$ vehicles per hour per lane.

On this basis, the full-width two-way traffic capacity for Hunua Road is calculated to be approximately 2,300 vehicles per hour.

As noted previously, traffic data obtained from Auckland Transport shows that Hunua Road (between Hunua Gorge Bridge and the quarry entrance) carried peak hour volume of 344 vehicles per hour in the morning peak and 292 vph in the evening peak hour volume.

As noted previously the truck volumes at the quarry are expected to change as follows:

- AM peak hour – 161 truck movements (increase by 85 from existing) corresponding to approximately 80 entry and 80 exit truck movements; and
- PM peak hour – 135 truck movements (increase by 71 from existing) corresponding to approximately 68 entry and 68 exit truck movements.

As such the proposed truck volumes at the quarry are expected to be as follows

- AM peak hour – currently 344 vph increasing to 429 vph; and
- PM peak hour – currently 292 vph increasing to 362 vph,

There will also be a general increase in background traffic on Hunua Road of 2-3% per annum however (based on the above analysis) the future Hunua Road in the rural section will be well below capacity.

7 Access

7.1 General

The existing primary site access into the quarry is shown in Photograph 3 and Photograph 4 below. The existing access allows for two-way truck movements.

Photograph 3: Existing Access – View 1



Photograph 4: Existing Access – View 2



7.1.1 Safe Intersection Sight Distance

Safe Intersection Sight Distance (SISD) is the minimum distance that should be provided on a major road at any intersection, for a driver on the major road to observe a vehicle moving into a collision position from the minor road and to decelerate to a stop before reaching the collision point.

Hunua Road has a posted speed limit of 60km/h in this location. Additionally, a speed survey was conducted at the site entrance which showed the 85th percentile speed was 56km/h for westbound vehicles and 53km/h for eastbound vehicles.

The Austroads: Guide to Road Design Part 4A Table 3.2 recommends for driveways on a 60 km/h carriageway that a safe sight distance of 123m be provided.

Equation 2 in Section 3.2.2 of the Austroads: Guide to Road Design Part 4A specifies SISD, Austroads recommends for driveways on a 56km/h carriageway that a safe sight distance of 112m be provided.

Sight distance in both directions from the existing site access can be seen in Photograph 5, Photograph 6, and Appendix D below, and the recommended sight distance of 112m is provided in both directions which is considered to be acceptable.

It is noted that as per Photograph 6, vegetation on the inside of the curve does not currently impact sight distances; however, it does have the potential to if not maintained. Maintenance of vegetation within the road reserve is not the responsibility of the applicant.

It is noted that the stone wall adjacent to the existing site access will be removed as part of the access upgrade which will also ensure sight lines are not impacted with the revised access layout.

Photograph 5: Site distance looking west



Photograph 6: Sight distance looking east



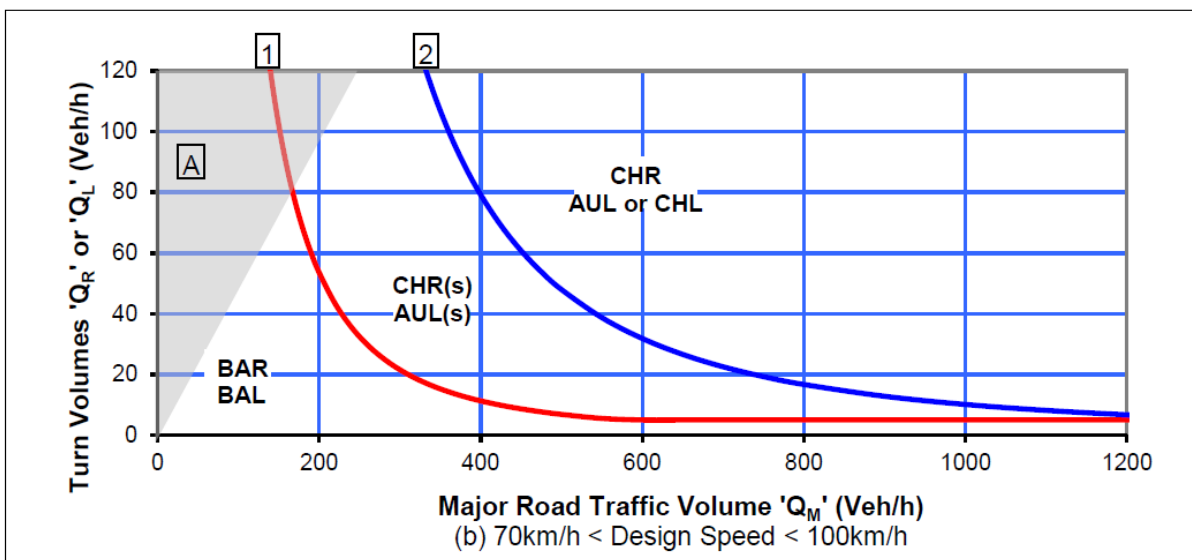
7.1.2 Access Design

NZTA’s updated Planning Policy Manual ‘Access onto the state highway from private property’ has been reviewed to inform the appropriate treatment for turning vehicles. Major road turning treatments include basic (BAR), auxiliary lane (AU) and channelised (CHR) layouts.

As outlined in Section 2.3 of this report, Hunua Road carried 3,558 vehicles per day (vpd) in both directions in February 2025. The morning peak hour volume was 344 vehicles per hour (vph) and the evening peak hour volume was 292 vph.

Given the high proportion of heavy vehicles, the access arrangement has been assessed against Austroads “Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management”. Figure 13 details the turning warrants, sourced from Figure 3.25 of the Austroads document for a speed environment corresponding to the posted speed limit on Hunua Road.

Figure 13: Recommended Turning Treatment for Hunua Road Design Speed

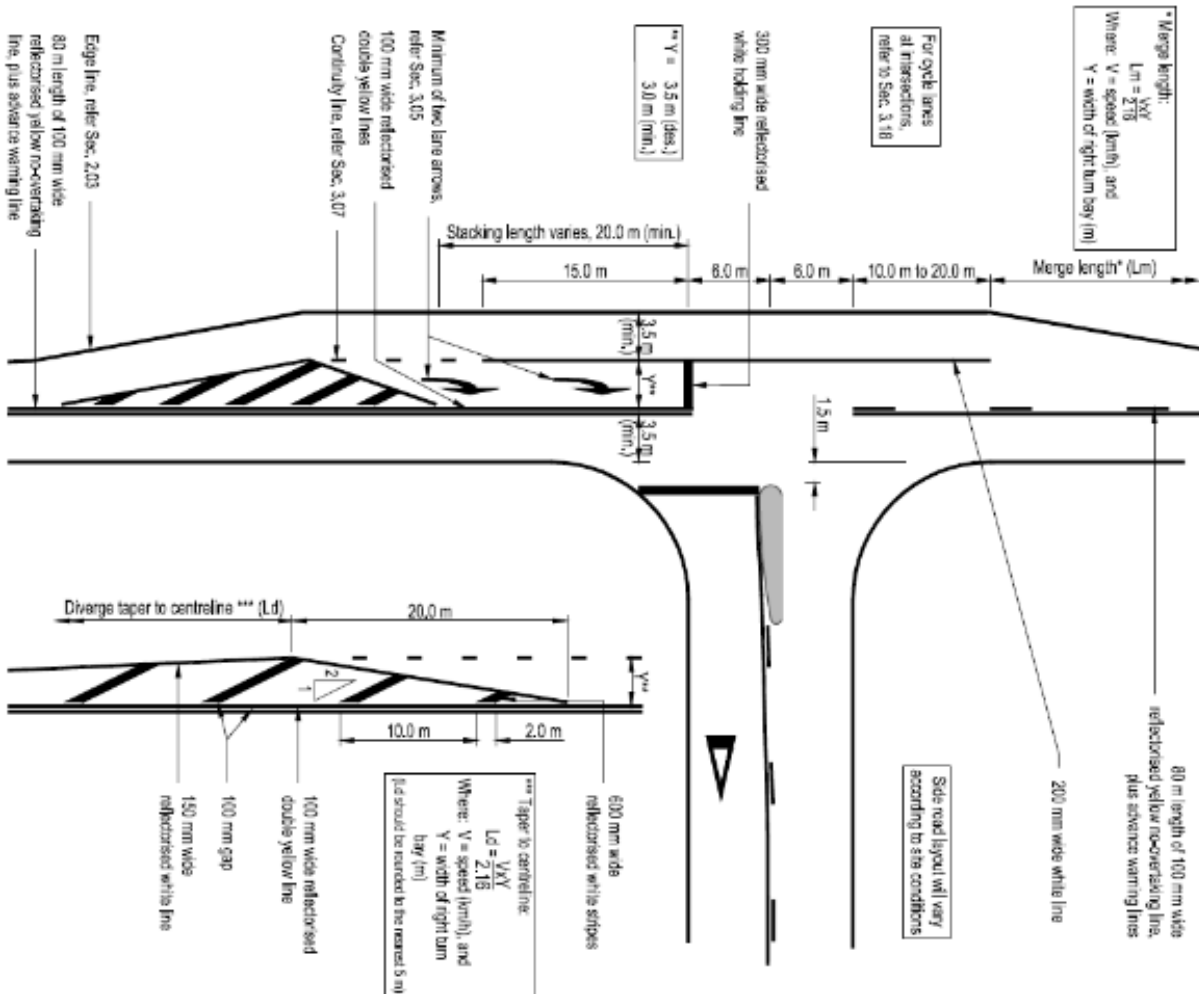


The analysis shows an auxiliary right turn short lane is required (AUL(s) in terms of Austroads. Given the majority of right turn movements are large truck and trailers it is considered that the full right turn bay is required. An example of this is shown in Figure 14.

Additionally, a draft right turn bay drawing has been prepared and can be seen in **Appendix D** demonstrating that there is adequate road reserve available for the widening required to accommodate the right turn bay.

It is considered that despite the proposed increase in truck volumes from the quarry site, the proposed right turn bay provision and revised access design will result in a net positive gain in terms of safety, when compared with the status quo. Additionally, minimal additional truck movements entering the site from the east (left turn) are anticipated.

Figure 14: Right Turn Bay



The concept of this is shown in Appendix D (together with tracking of a truck and trailer) and Figure 13 below which includes:

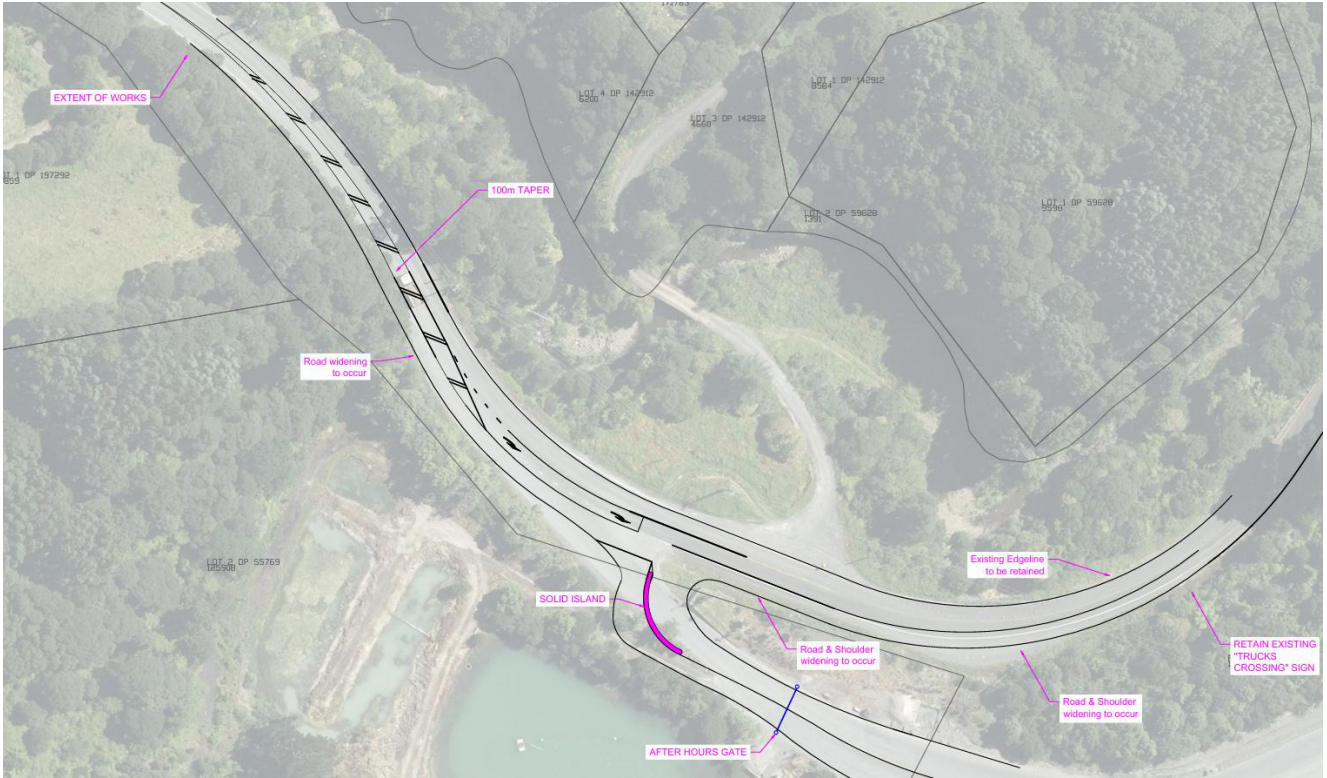
- Provision of a full right turn bay;
- “squaring” up the access to be 90 degrees with Hunua Road
- Provision of 40m stacking distance for the right turn bay (two trucks);
- Provision of a central solid splitter island at the entry to ensure trucks do not cut across the entry;
- Provision of sealed access for at least the first 50m into the site;
- Provision of an afterhours gate set back some 50m from the entrance. This allows for at least two truck and trailers to queue at the gate before queuing onto the road. In this regard the gate will operate in a similar way to existing and only closed for periods late at night and therefore little to no queuing is expected; and
- Retain existing “trucks crossing” signage.

Of note this upgrade will be subject to further detailed design at Engineering Approval stage.

It is recommended that the haul road has a minimum width of 7m on straight section with appropriate widening on corners.

Vehicle tracking of a 16m truck and trailer of the revised layout and proposed access layout design can be seen in **Appendix D**, it is noted that AT has highlighted potential level and gradient differences between the existing access and the main carriageway of Hunua Road; however, this is not a traffic engineering matter.

Figure 15: Right Turn Bay concept



8 Auckland Unitary Plan

In terms of Chapter H28 SP-QZ, mineral extraction activities are classed as a controlled activity and traffic and access are matters that the Council consider relevant assessment criteria H28.7.2.(1)(a) (i) & (ii). These criteria together with a comment on each are provided below.

- (i) *whether the expected traffic generated by the activity appropriately avoids, remedies or mitigates adverse effects on the safe and efficient functioning of the surrounding road network.*

Comment: The analysis of the local intersections of Hunua Road / Settlement Road Hunua Road / Boundary Road and Hunua Road / Dominion Road is discussed in Section 5 while an assessment of the midblock road capacity in Section 6. The results show that with the proposal there is minimal change in intersection operation and Hunua Road is well below theoretical capacity. No significant safety issues have been identified in the surrounding area with the widening that has already occurred and the proposal is not expected to have a significant effect on road safety in the surrounding area.

- (ii) *the extent to which entry and exit points to the site are designed to suitably accommodate all traffic movements, and in doing so, avoid, remedy or mitigate disruption to traffic flows on the adjoining road network.*

Comment: The analysis of the only access point for the quarry has identified the need for an upgrade as discussed in Section 7. This upgrade includes a full right turn bay and “squaring” up the intersection. As a result, despite the proposed increase in truck volumes from the quarry site, the proposed upgrade will result in a net positive gain in terms of safety, when compared with the status quo.

In terms of Chapter E27 “Transportation” the following rules are considered relevant.

Table 2: Unitary Plan E27

Rule	Requirement	Comment
E27.6.1(1). Trip generation	100 v/hr (any hour) traffic generation threshold before restricted discretionary consent is required.	Standard E27.6.1(1) does not apply where there are requirements to assess transport, traffic or trip-generation effects for the activity in the applicable zone rules or precinct rules for any controlled or restricted discretionary land use activities. As there is a requirement as per H28 noted above, no consent required . Regardless, as noted above a full assessment of the surrounding network has been undertaken which has shown there is minimal change in intersection operation and Hunua Road is well below theoretical capacity.
Table E27.6.2.3 Parking rates	No minimum or maximum parking requirements	Complies
Table E27.6.2.5 Required bicycle parking rates	No cycle parking requirements for Quarry	Complies
Table E27.6.2.7 Minimum loading space requirements	All other activities, except for activities within rural zones with less than 5,000sqm GFA no loading zone required.	Complies noting there is ample loading areas within the quarry site.
E27.6.4.1. Vehicle Access Restrictions	Access points on arterial roads, within 10m of another intersection, 30m of a rail crossing or within 2m of another access requires consent	Complies (no consent required)
Table E27.6.4.3.2 Vehicle crossing and vehicle access widths	Maximum width of 6m Provided that a maximum width of 9.0m is permitted where the crossing needs to accommodate the tracking path of large heavy vehicles	Does not comply. Crossing width is proposed to be 17m at the road boundary, however this has been specifically designed to accommodate a right turn bay with opposing truck and trailers and central island. The design and width is thus considered appropriate.
E27.6.4.4. Gradient of vehicle access	Maximum gradient of 1 in 8 for heavy vehicles and a platform must be provided which has a maximum gradient no steeper than 1 in 20 (5 per cent) and a minimum length of 6m for all non residential activities.	Can comply. Appendix D shows the layout which includes levels, indicating that there is a noticeable level difference between the revised access and the Hunua Road carriageway noted. AT has recommended additional investigation including a 3D design of the accessway area demonstrating that all areas used by turning and waiting trucks will have appropriate gradients that comply with Unitary Plan requirements which we agree with.

Overall, the proposal meets Unitary Plan requirements or has been specifically designed to cater for the Quarry operation (e.g. access width).

9 Conclusion

The proposal is to expand the existing Hunua Quarry located at 489 Hunua Road, Hunua. The proposal will increase annual quarry production and enable the extraction of aggregate for up to 80 years. The findings from our assessment can be summarised as follows:

- The proposal complies with Unitary Plan requirements and does not trigger an assessment against AUP provisions;
- Annual quarry production is proposed to increase from 2,943,052 tonnes to approximately 5,400,000 tonnes;
- It is estimated that the average daily truck movements increase by approximately 111% from current volumes;
- No significant safety issues have been identified in the surrounding area with the widening that has already occurred and the proposal is not expected to have a significant effect on road safety in the surrounding area;
- As assessed in Section 5, there is sufficient capacity to accommodate the proposed increase in truck volumes as part of the proposal. The Hunua Road / Settlement Road intersection (key intersection in the area) can accommodate the increased volumes, therefore considered acceptable from a transport perspective;
- It has been identified that with the heavy vehicles accommodated by the access; the existing access point requires an upgrade to include a full right turn bay; and
- The proposal meets Unitary Plan requirements or has been specifically designed to cater for the Quarry operation (eg access width).

Recommendations / Conditions:

- The Consent Holder must upgrade the site access on Hunua Road in general accordance with the drawings in the Transport Assessment, Appendix D (Plan J003408 Hunua Access Upgrade (Figure 1-5) dated 19 March 2026). The upgrade must include:
 - a) Provision of a full right-turn bay on Hunua Road for vehicles turning right into the site.
 - b) Formation of the access generally perpendicular (90°) to Hunua Road.
 - c) Provision of at least 40 m stacking length in the right-turn bay (two trucks).
 - d) Provision of a central solid splitter island at the site entry to ensure trucks do not cut across the entry.
 - e) Sealing of the first 50 m of the internal access from Hunua Road.
 - f) Installation of an after-hours gate at least 50 m inside the entrance so at least two truck-and-trailer units can queue on-site clear of Hunua Road.
 - g) Retention and maintenance of the existing “Trucks Crossing” warning signage.
- Further investigation of the revised accessway level and gradients against Unitary Plan requirements via a 3D design of the access.

Overall, there is no reason to preclude acceptance of the proposal as currently intended, subject to the recommendations made above. Accordingly, it is concluded that there are no traffic engineering or transportation planning reasons that would preclude approval of the proposal. The proposal, despite almost doubling production at the quarry, is considered to result in a net positive gain for the transport network due to the recommended right turn bay upgrades, and additionally the increase in truck volumes is not anticipated to adversely impact on the safe or operation of the wider transport network.

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Appendix A: Traffic Surveys

Figure 16: Existing AM traffic distribution 16th December Traffic Survey

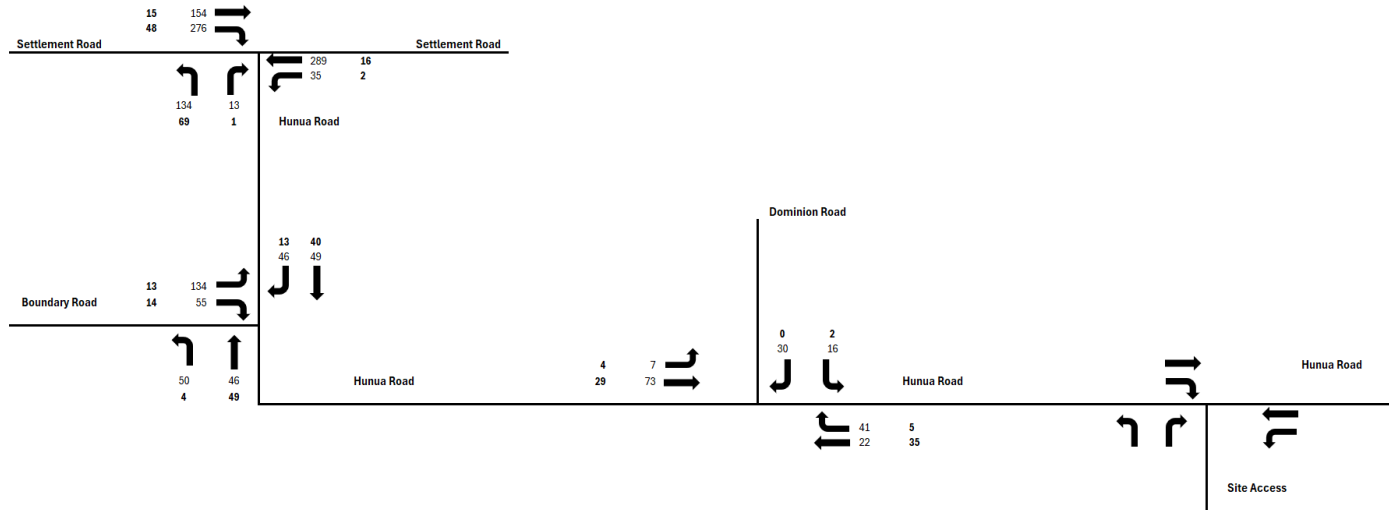


Figure 17: Existing PM Traffic Distribution 16th December Traffic Survey

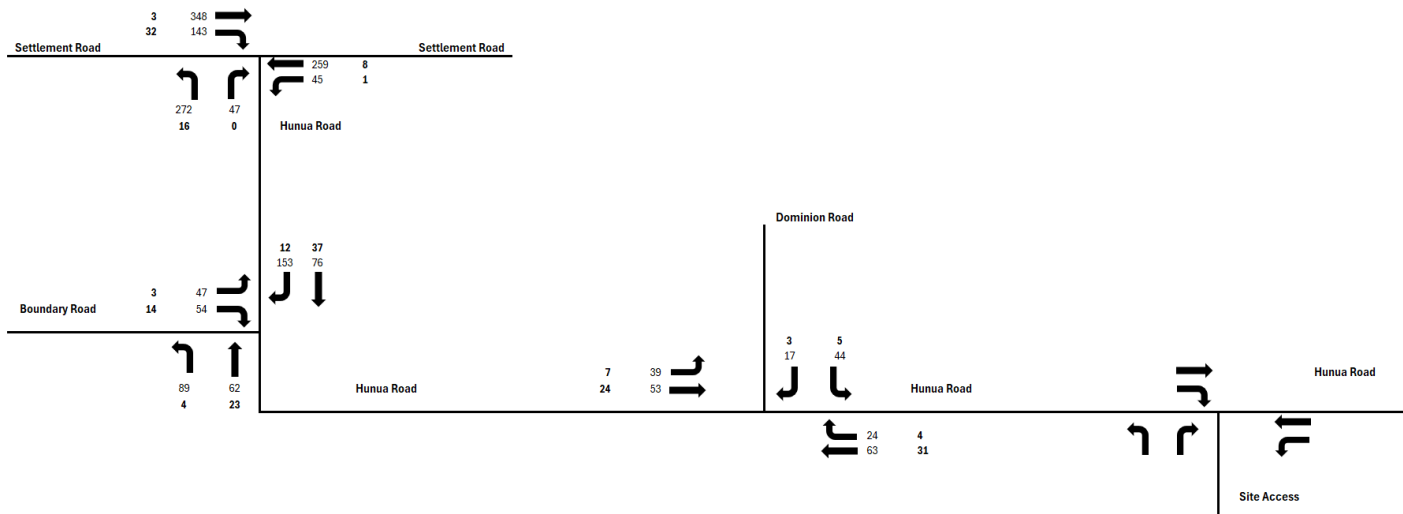
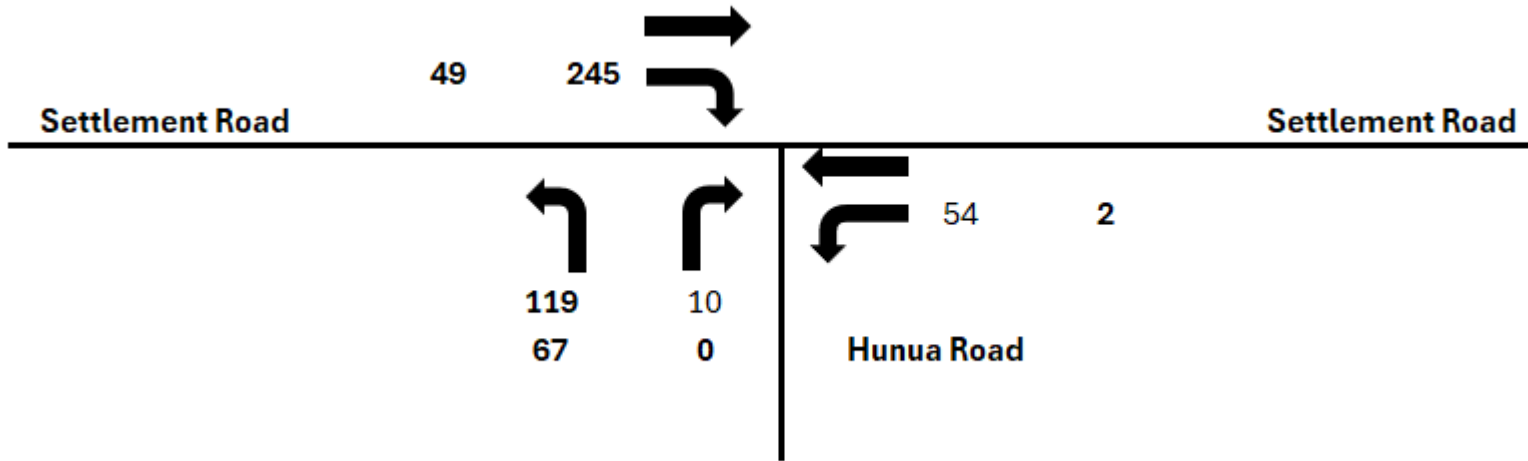


Figure 18: Existing AM Hunua Road / Settlement Road Intersection revised Survey 12th March 2026 turning movements only



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Appendix B: Traffic Generation

Figure 19: AM Generated Traffic Distribution

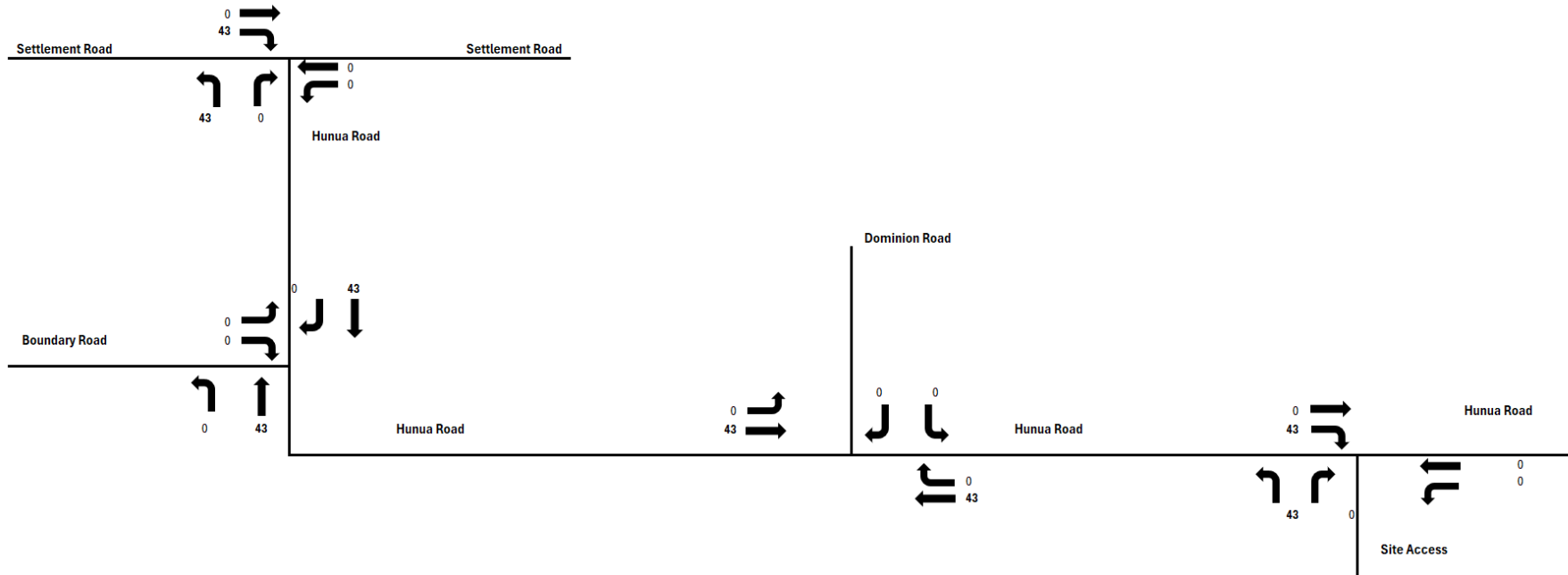


Figure 20: PM Generated Traffic Distribution

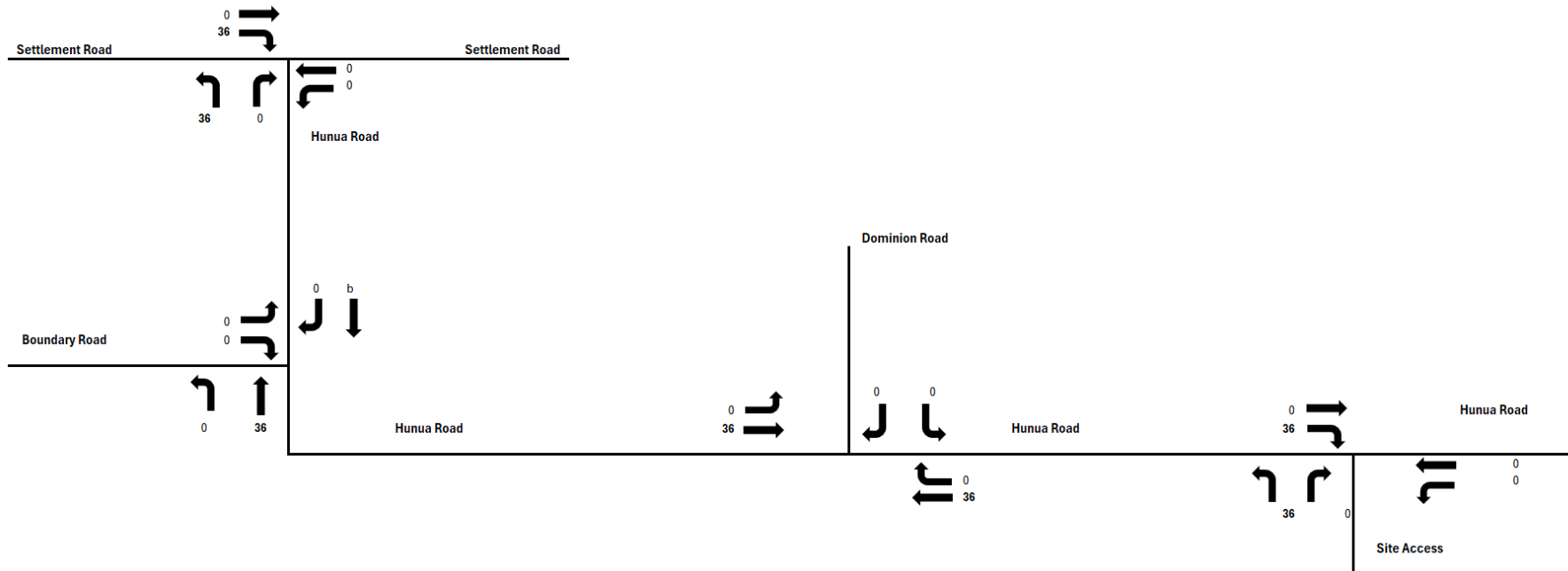


Figure 21: AM Proposed Traffic Distribution

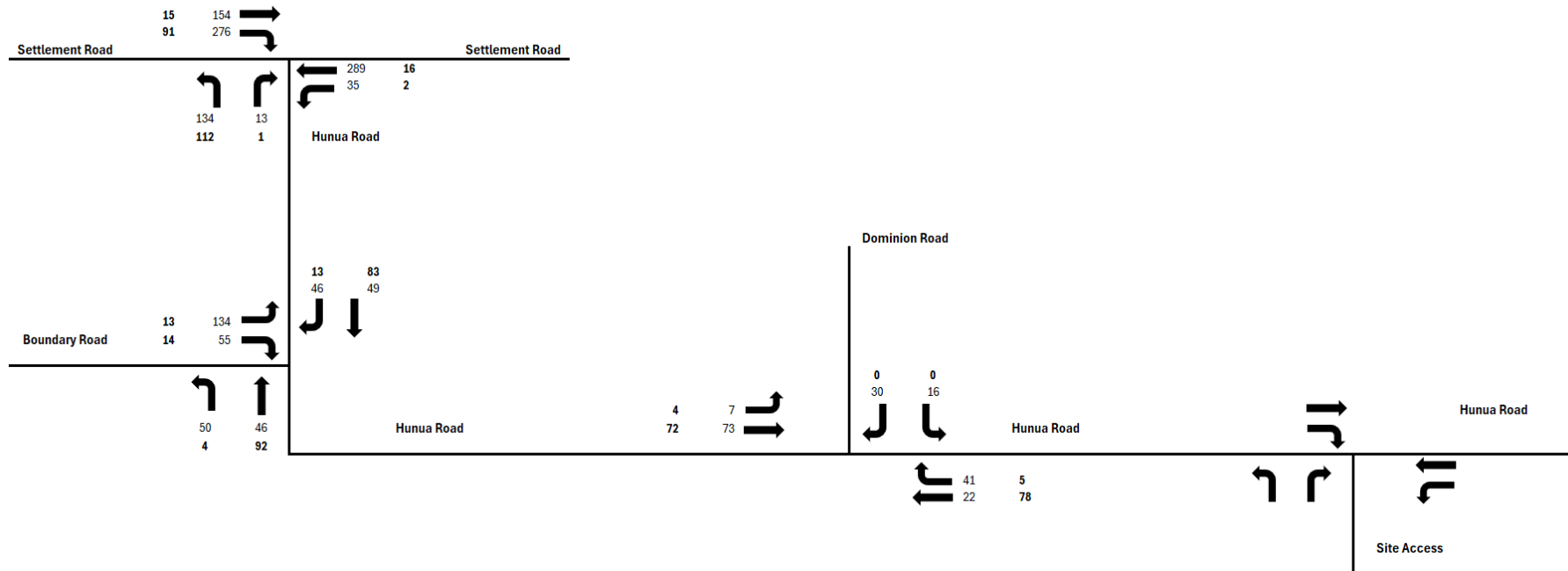
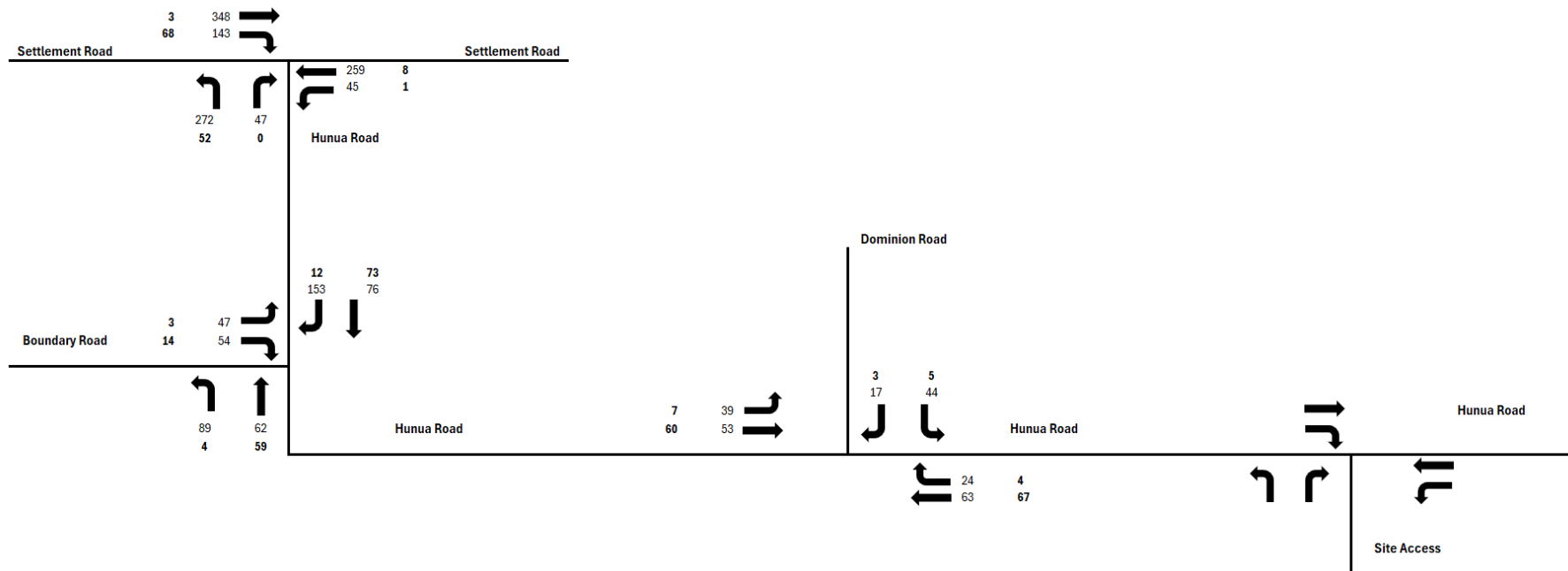


Figure 22: PM Proposed Traffic Distribution



Appendix C: Modelling Results

MOVEMENT SUMMARY

Site: 101 [AM Settlement / Hunua (Site Folder: Settlement / Hunua Existing)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hunua Road (SOUTH)															
1	L2	All MCs	214	34.0	214	34.0	0.222	6.8	LOS A	0.9	8.6	0.46	0.64	0.46	44.4
3	R2	All MCs	15	7.1	15	7.1	0.044	13.9	LOS B	0.1	1.1	0.71	0.87	0.71	40.9
Approach			228	32.3	228	32.3	0.222	7.3	LOS A	0.9	8.6	0.48	0.65	0.48	44.2
East: Settlement Road (EAST)															
4	L2	All MCs	39	5.4	39	5.4	0.192	4.7	LOS A	0.0	0.0	0.00	0.06	0.00	48.3
5	T1	All MCs	321	5.2	321	5.2	0.192	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	49.6
Approach			360	5.3	360	5.3	0.192	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.4
West: Settlement Road (WEST)															
11	T1	All MCs	178	8.9	178	8.9	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	All MCs	341	14.8	341	14.8	0.303	6.7	LOS A	1.5	11.9	0.52	0.66	0.52	44.5
Approach			519	12.8	519	12.8	0.303	4.4	NA	1.5	11.9	0.34	0.43	0.34	46.2
All Vehicles			1107	14.4	1107	14.4	0.303	3.8	NA	1.5	11.9	0.26	0.36	0.26	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 [PM Settlement / Hunua (Site Folder: Settlement / Hunua Existing)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Hunua Road (SOUTH)															
1	L2	All MCs	303	5.6	303	5.6	0.249	5.9	LOS A	1.1	8.2	0.41	0.60	0.41	44.9
3	R2	All MCs	49	0.0	49	0.0	0.127	12.8	LOS B	0.4	3.1	0.70	0.87	0.70	41.5
Approach			353	4.8	353	4.8	0.249	6.8	LOS A	1.1	8.2	0.45	0.64	0.45	44.4
East: Settlement Road (EAST)															
4	L2	All MCs	48	2.2	48	2.2	0.173	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.2
5	T1	All MCs	281	3.0	281	3.0	0.173	0.1	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach			329	2.9	329	2.9	0.173	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.3
West: Settlement Road (WEST)															
11	T1	All MCs	369	0.9	369	0.9	0.191	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	All MCs	184	18.3	184	18.3	0.160	6.3	LOS A	0.7	5.9	0.45	0.63	0.45	44.6
Approach			554	6.7	554	6.7	0.191	2.1	NA	0.7	5.9	0.15	0.21	0.15	48.0
All Vehicles			1236	5.1	1236	5.1	0.249	3.1	NA	1.1	8.2	0.20	0.30	0.20	47.3

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 [AM Settlement / Hunua (Site Folder: Settlement / Hunua Proposed)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h	%	veh/h	%				veh	m				
South: Hunua Road (SOUTH)															
1	L2	All MCs	259	45.5	259	45.5	0.288	7.3	LOS A	1.3	12.5	0.49	0.65	0.49	44.1
3	R2	All MCs	15	7.1	15	7.1	0.050	15.6	LOS C	0.2	1.2	0.74	0.89	0.74	40.1
Approach			274	43.5	274	43.5	0.288	7.8	LOS A	1.3	12.5	0.51	0.66	0.51	43.8
East: Settlement Road (EAST)															
4	L2	All MCs	39	5.4	39	5.4	0.192	4.7	LOS A	0.0	0.0	0.00	0.06	0.00	48.3
5	T1	All MCs	321	5.2	321	5.2	0.192	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	49.6
Approach			360	5.3	360	5.3	0.192	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.4
West: Settlement Road (WEST)															
11	T1	All MCs	178	8.9	178	8.9	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
12	R2	All MCs	386	24.8	386	24.8	0.368	7.5	LOS A	2.2	18.6	0.56	0.71	0.63	44.0
Approach			564	19.8	564	19.8	0.368	5.1	NA	2.2	18.6	0.38	0.49	0.43	45.7
All Vehicles			1198	20.8	1198	20.8	0.368	4.4	NA	2.2	18.6	0.30	0.40	0.32	46.3

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 [PM Settlement / Hunua (Site Folder: Settlement / Hunua Proposed)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Hunua Road (SOUTH)															
1	L2	All MCs	341	16.0	341	16.0	0.300	6.2	LOS A	1.4	11.2	0.44	0.61	0.44	44.7
3	R2	All MCs	49	0.0	49	0.0	0.137	13.7	LOS B	0.5	3.4	0.73	0.88	0.73	41.1
Approach			391	14.0	391	14.0	0.300	7.2	LOS A	1.4	11.2	0.48	0.64	0.48	44.2
East: Settlement Road (EAST)															
4	L2	All MCs	48	2.2	48	2.2	0.173	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.2
5	T1	All MCs	281	3.0	281	3.0	0.173	0.1	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach			329	2.9	329	2.9	0.173	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.3
West: Settlement Road (WEST)															
11	T1	All MCs	369	0.9	369	0.9	0.191	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
12	R2	All MCs	222	32.2	222	32.2	0.212	6.8	LOS A	1.0	8.9	0.48	0.64	0.48	44.3
Approach			592	12.6	592	12.6	0.212	2.6	NA	1.0	8.9	0.18	0.24	0.18	47.7
All Vehicles			1312	10.6	1312	10.6	0.300	3.5	NA	1.4	11.2	0.22	0.32	0.22	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: 101 [AM Dominion / Hunua (Site Folder: Dominion / Hunua Existing)]

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 HV]	Arrival Flows [Total HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh.]	Dist [m]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h %	veh/h %	v/c	sec							km/h
East: Hunua Road													
5	T1	All MCs	60 61.4	60 61.4	0.072	0.3	LOS A	0.3	2.4	0.20	0.30	0.20	47.6
6	R2	All MCs	48 10.9	48 10.9	0.072	5.1	LOS A	0.3	2.4	0.20	0.30	0.20	46.1
Approach			108 38.8	108 38.8	0.072	2.5	NA	0.3	2.4	0.20	0.30	0.20	46.9
North: Dominion Road													
7	L2	All MCs	19 11.1	19 11.1	0.044	5.1	LOS A	0.2	1.1	0.26	0.54	0.26	45.2
9	R2	All MCs	32 0.0	32 0.0	0.044	5.5	LOS A	0.2	1.1	0.26	0.54	0.26	45.2
Approach			51 4.2	51 4.2	0.044	5.3	LOS A	0.2	1.1	0.26	0.54	0.26	45.2
West: Hunua Road													
10	L2	All MCs	12 36.4	12 36.4	0.073	4.9	LOS A	0.0	0.0	0.00	0.05	0.00	47.9
11	T1	All MCs	107 28.4	107 28.4	0.073	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	49.7
Approach			119 29.2	119 29.2	0.073	0.5	NA	0.0	0.0	0.00	0.05	0.00	49.5
All Vehicles			278 28.4	278 28.4	0.073	2.1	NA	0.3	2.4	0.12	0.24	0.12	47.7

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 [PM Dominion / Hunua (Site Folder: Dominion / Hunua Existing)]

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 HV]	Arrival Flows [Total HV]	Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue [Veh.]	Dist [m]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			veh/h %	veh/h %	v/c	sec							km/h
East: Hunua Road													
5	T1	All MCs	99 33.0	99 33.0	0.081	0.2	LOS A	0.2	1.7	0.13	0.18	0.13	48.8
6	R2	All MCs	29 14.3	29 14.3	0.081	5.2	LOS A	0.2	1.7	0.13	0.18	0.13	47.2
Approach			128 28.7	128 28.7	0.081	1.3	NA	0.2	1.7	0.13	0.18	0.13	48.4
North: Dominion Road													
7	L2	All MCs	52 10.2	52 10.2	0.059	5.0	LOS A	0.2	1.7	0.22	0.52	0.22	45.3
9	R2	All MCs	21 15.0	21 15.0	0.059	5.9	LOS A	0.2	1.7	0.22	0.52	0.22	45.0
Approach			73 11.6	73 11.6	0.059	5.2	LOS A	0.2	1.7	0.22	0.52	0.22	45.2
West: Hunua Road													
10	L2	All MCs	48 15.2	48 15.2	0.079	4.7	LOS A	0.0	0.0	0.00	0.20	0.00	47.3
11	T1	All MCs	81 31.2	81 31.2	0.079	0.0	LOS A	0.0	0.0	0.00	0.20	0.00	48.7
Approach			129 25.2	129 25.2	0.079	1.8	NA	0.0	0.0	0.00	0.20	0.00	48.1
All Vehicles			331 23.6	331 23.6	0.081	2.4	NA	0.2	1.7	0.10	0.26	0.10	47.6

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 [AM Dominion / Hunua (Site Folder: Dominion / Hunua Proposed)]

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 HV] veh/h %	Arrival Flows [Total HV] veh/h %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h	
East: Hunua Road													
5	T1	All MCs	105 78.0	105 78.0	0.110	0.3	LOS A	0.3 3.2	0.19	0.26	0.19	47.6	
6	R2	All MCs	48 10.9	48 10.9	0.110	5.4	LOS A	0.3 3.2	0.19	0.26	0.19	46.1	
Approach			154 56.8	154 56.8	0.110	1.9	NA	0.3 3.2	0.19	0.26	0.19	47.1	
North: Dominion Road													
7	L2	All MCs	17 0.0	17 0.0	0.047	5.1	LOS A	0.2 1.1	0.34	0.58	0.34	45.2	
9	R2	All MCs	32 0.0	32 0.0	0.047	6.1	LOS A	0.2 1.1	0.34	0.58	0.34	45.0	
Approach			48 0.0	48 0.0	0.047	5.8	LOS A	0.2 1.1	0.34	0.58	0.34	45.1	
West: Hunua Road													
10	L2	All MCs	12 36.4	12 36.4	0.111	4.9	LOS A	0.0 0.0	0.00	0.04	0.00	47.9	
11	T1	All MCs	153 49.7	153 49.7	0.111	0.0	LOS A	0.0 0.0	0.00	0.04	0.00	49.7	
Approach			164 48.7	164 48.7	0.111	0.4	NA	0.0 0.0	0.00	0.04	0.00	49.5	
All Vehicles			366 45.7	366 45.7	0.111	1.7	NA	0.3 3.2	0.12	0.20	0.12	47.9	

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 [PM Dominion / Hunua (Site Folder: Dominion / Hunua Proposed)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
East: Hunua Road															
5	T1	All MCs	137	51.5	137	51.5	0.113	0.2	LOS A	0.2	2.0	0.12	0.16	0.12	48.8
6	R2	All MCs	29	14.3	29	14.3	0.113	5.5	LOS A	0.2	2.0	0.12	0.16	0.12	47.2
Approach			166	44.9	166	44.9	0.113	1.1	NA	0.2	2.0	0.12	0.16	0.12	48.5
North: Dominion Road															
7	L2	All MCs	52	10.2	52	10.2	0.064	5.2	LOS A	0.2	1.8	0.29	0.54	0.29	45.2
9	R2	All MCs	21	15.0	21	15.0	0.064	6.6	LOS A	0.2	1.8	0.29	0.54	0.29	44.9
Approach			73	11.6	73	11.6	0.064	5.6	LOS A	0.2	1.8	0.29	0.54	0.29	45.1
West: Hunua Road															
10	L2	All MCs	48	15.2	48	15.2	0.111	4.7	LOS A	0.0	0.0	0.00	0.16	0.00	47.3
11	T1	All MCs	119	53.1	119	53.1	0.111	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	48.7
Approach			167	42.1	167	42.1	0.111	1.4	NA	0.0	0.0	0.00	0.16	0.00	48.2
All Vehicles			406	37.8	406	37.8	0.113	2.0	NA	0.2	2.0	0.10	0.23	0.10	47.8

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 [AM Boundary / Hunua (Site Folder: Boundary / Hunua Existing)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hunua Road															
1	L2	All MCs	57	7.4	57	7.4	0.102	4.8	LOS A	0.3	2.7	0.11	0.20	0.11	47.1
2	T1	All MCs	100	51.6	100	51.6	0.102	0.1	LOS A	0.3	2.7	0.11	0.20	0.11	48.2
Approach			157	35.6	157	35.6	0.102	1.8	NA	0.3	2.7	0.11	0.20	0.11	47.8
North: Hunua Road															
8	T1	All MCs	94	44.9	94	44.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	All MCs	62	22.0	62	22.0	0.043	5.2	LOS A	0.2	1.6	0.25	0.53	0.25	44.9
Approach			156	35.8	156	35.8	0.062	2.1	NA	0.2	1.6	0.10	0.21	0.10	47.8
West: Boundary															
10	L2	All MCs	155	8.8	155	8.8	0.215	5.1	LOS A	1.0	7.4	0.33	0.54	0.33	45.1
12	R2	All MCs	73	20.3	73	20.3	0.215	8.0	LOS A	1.0	7.4	0.33	0.54	0.33	44.8
Approach			227	12.5	227	12.5	0.215	6.0	LOS A	1.0	7.4	0.33	0.54	0.33	45.0
All Vehicles			540	25.9	540	25.9	0.215	3.7	NA	1.0	7.4	0.20	0.35	0.20	46.6

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 [PM Boundary / Hunua (Site Folder: Boundary / Hunua Existing)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hunua Road															
1	L2	All MCs	98	4.3	98	4.3	0.123	5.2	LOS A	0.5	4.0	0.26	0.33	0.26	46.6
2	T1	All MCs	89	27.1	89	27.1	0.123	0.5	LOS A	0.5	4.0	0.26	0.33	0.26	47.6
Approach			187	15.2	187	15.2	0.123	2.9	NA	0.5	4.0	0.26	0.33	0.26	47.1
North: Hunua Road															
8	T1	All MCs	119	32.7	119	32.7	0.074	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	All MCs	174	7.3	174	7.3	0.110	5.0	LOS A	0.5	3.9	0.22	0.53	0.22	45.2
Approach			293	17.6	293	17.6	0.110	3.0	NA	0.5	3.9	0.13	0.31	0.13	47.0
West: Boundary															
10	L2	All MCs	53	6.0	53	6.0	0.160	5.0	LOS A	0.7	5.1	0.40	0.57	0.40	44.3
12	R2	All MCs	72	20.6	72	20.6	0.160	9.3	LOS A	0.7	5.1	0.40	0.57	0.40	44.0
Approach			124	14.4	124	14.4	0.160	7.5	LOS A	0.7	5.1	0.40	0.57	0.40	44.2
All Vehicles			604	16.2	604	16.2	0.160	3.9	NA	0.7	5.1	0.23	0.37	0.23	46.4

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 [AM Boundary / Hunua (Site Folder: Boundary / Hunua Proposed)]

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		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hunua Road															
1	L2	All MCs	57	7.4	57	7.4	0.138	4.8	LOS A	0.3	3.2	0.09	0.16	0.09	47.2
2	T1	All MCs	145	66.7	145	66.7	0.138	0.1	LOS A	0.3	3.2	0.09	0.16	0.09	48.2
Approach			202	50.0	202	50.0	0.138	1.4	NA	0.3	3.2	0.09	0.16	0.09	47.9
North: Hunua Road															
8	T1	All MCs	139	62.9	139	62.9	0.100	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	62	22.0	62	22.0	0.047	5.5	LOS A	0.2	1.7	0.32	0.55	0.32	44.8
Approach			201	50.3	201	50.3	0.100	1.7	NA	0.2	1.7	0.10	0.17	0.10	48.2
West: Boundary															
10	L2	All MCs	155	8.8	155	8.8	0.246	5.5	LOS A	1.1	8.4	0.43	0.59	0.43	44.6
12	R2	All MCs	73	20.3	73	20.3	0.246	9.9	LOS A	1.1	8.4	0.43	0.59	0.43	44.3
Approach			227	12.5	227	12.5	0.246	6.9	LOS A	1.1	8.4	0.43	0.59	0.43	44.5
All Vehicles			631	36.6	631	36.6	0.246	3.5	NA	1.1	8.4	0.22	0.32	0.22	46.7

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 [PM Boundary / Hunua (Site Folder: Boundary / Hunua Proposed)]

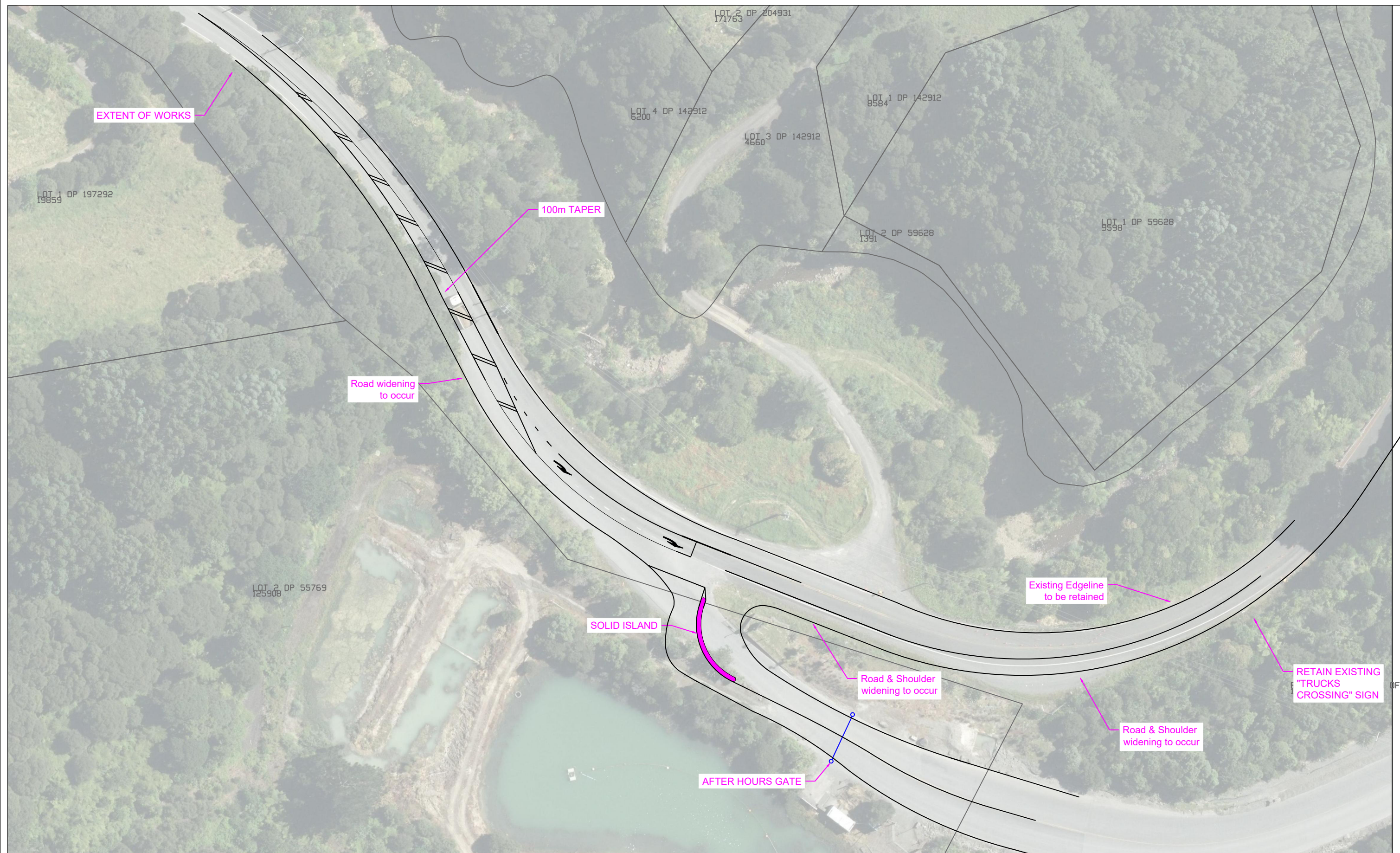
Output produced by SIDRA INTERSECTION Version: 9.1.6.228

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

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hunua Road															
1	L2	All MCs	98	4.3	98	4.3	0.151	5.2	LOS A	0.6	4.8	0.23	0.30	0.23	46.7
2	T1	All MCs	127	48.8	127	48.8	0.151	0.4	LOS A	0.6	4.8	0.23	0.30	0.23	47.6
Approach			225	29.4	225	29.4	0.151	2.5	NA	0.6	4.8	0.23	0.30	0.23	47.2
North: Hunua Road															
8	T1	All MCs	157	49.0	157	49.0	0.106	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	All MCs	174	7.3	174	7.3	0.116	5.2	LOS A	0.5	4.1	0.29	0.55	0.29	45.1
Approach			331	27.1	331	27.1	0.116	2.7	NA	0.5	4.1	0.15	0.29	0.15	47.2
West: Boundary															
10	L2	All MCs	53	6.0	53	6.0	0.186	5.2	LOS A	0.7	5.8	0.50	0.63	0.50	43.8
12	R2	All MCs	72	20.6	72	20.6	0.186	11.0	LOS B	0.7	5.8	0.50	0.63	0.50	43.5
Approach			124	14.4	124	14.4	0.186	8.6	LOS A	0.7	5.8	0.50	0.63	0.50	43.6
All Vehicles			680	25.5	680	25.5	0.186	3.7	NA	0.7	5.8	0.24	0.35	0.24	46.5

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.

Appendix D: Access upgrade



Revision notes:		
Rev:	Date:	Notes:

Drawn by:
HA
J003408

Project:
489 Hunua Road, Hunua, Auckland
Hunua Quarry Development

Date:
19 March 2026

Scale @ A3:
1:750

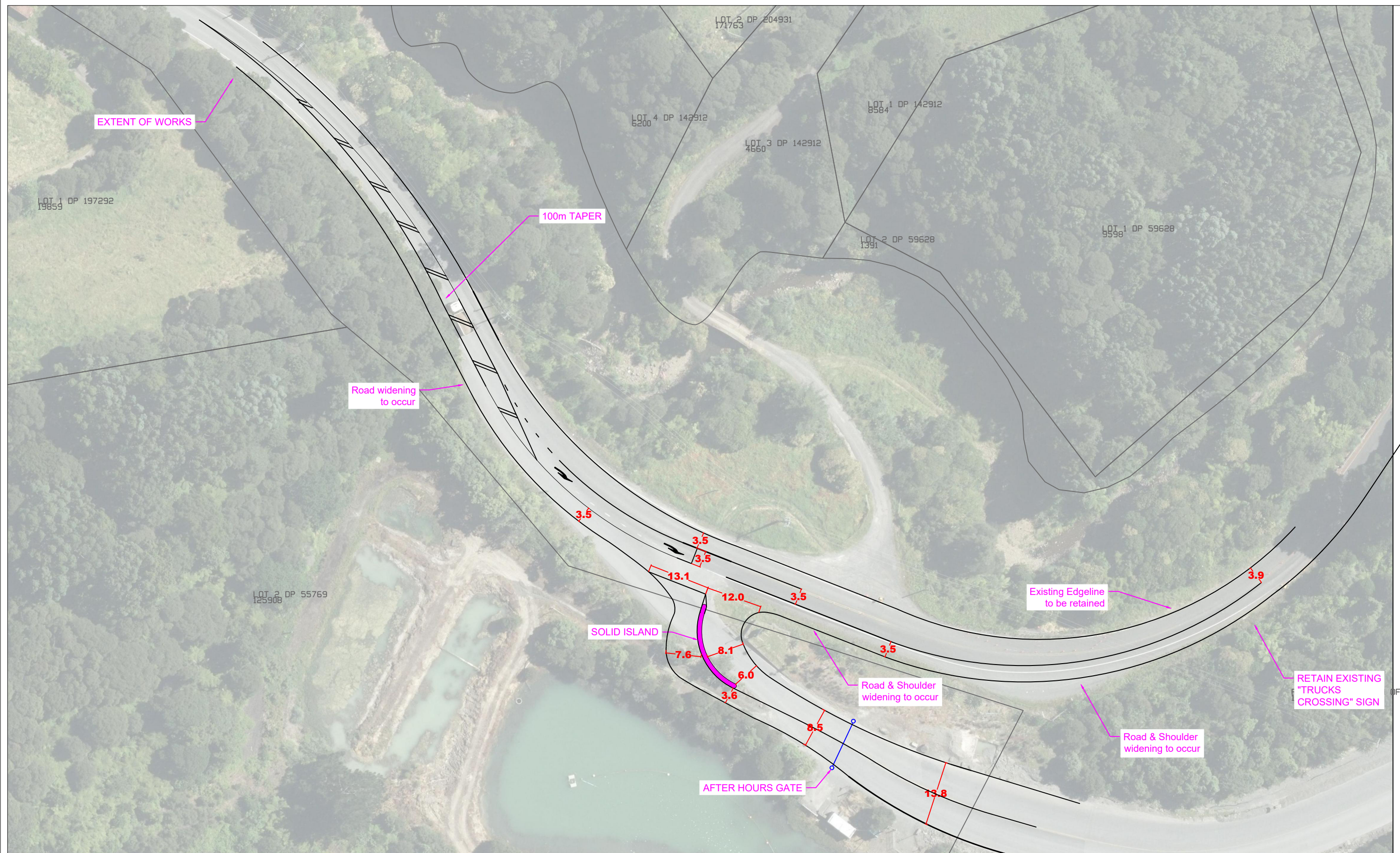
Revision:
A

Client:

Drawing Title:
Access Upgrade



Figure:
1



Revision notes:		
Rev:	Date:	Notes:

Drawn by:
HA
J003408

Project:
489 Hunua Road, Hunua, Auckland
Hunua Quarry Development

Date:
19 March 2026

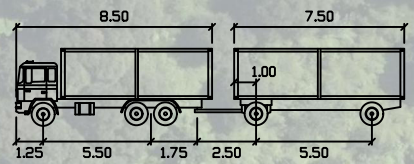
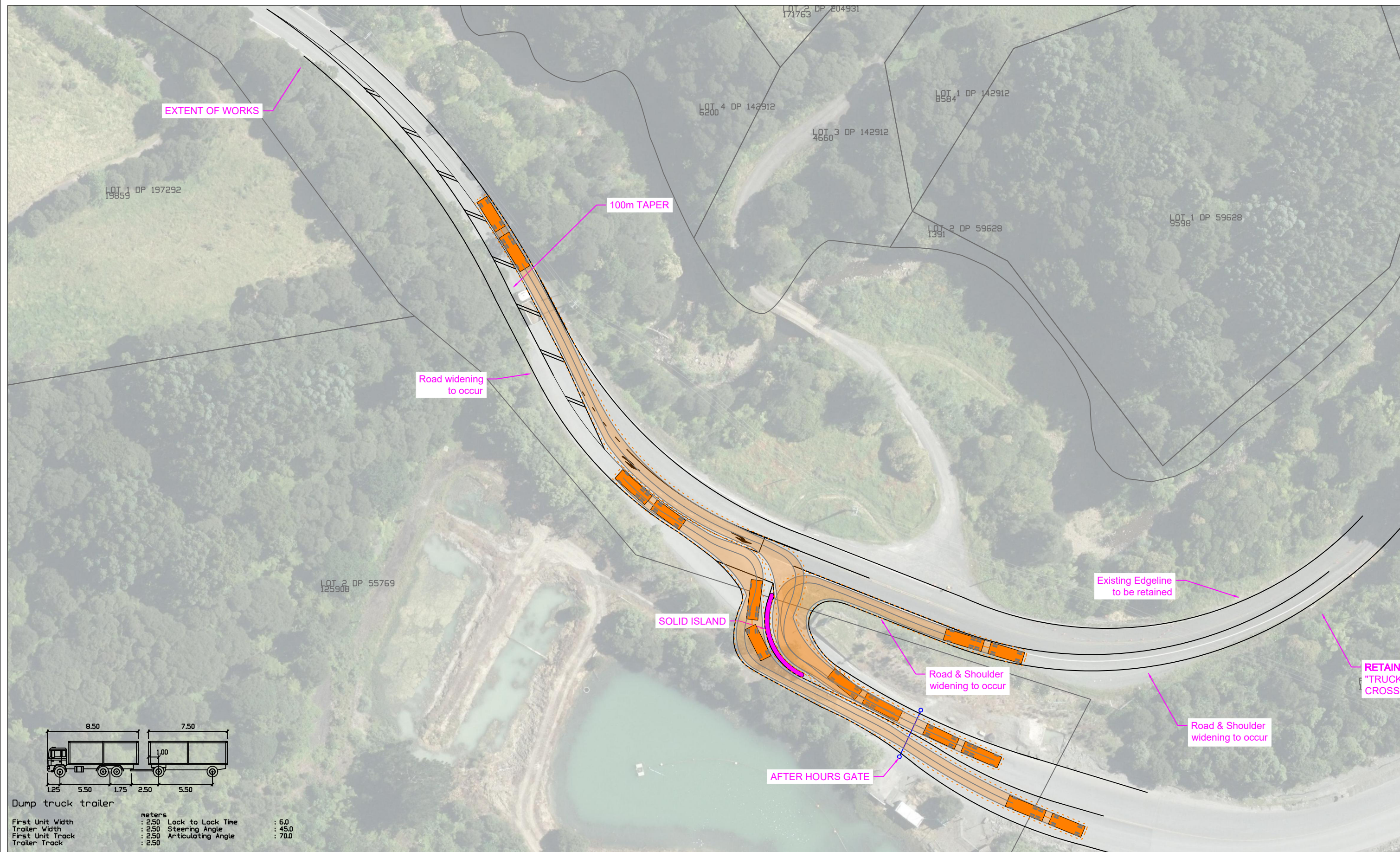
Scale @ A3:
1:750

Client:

Drawing Title:
Access Upgrade
Dimensions

Revision:
A





Dump truck trailer

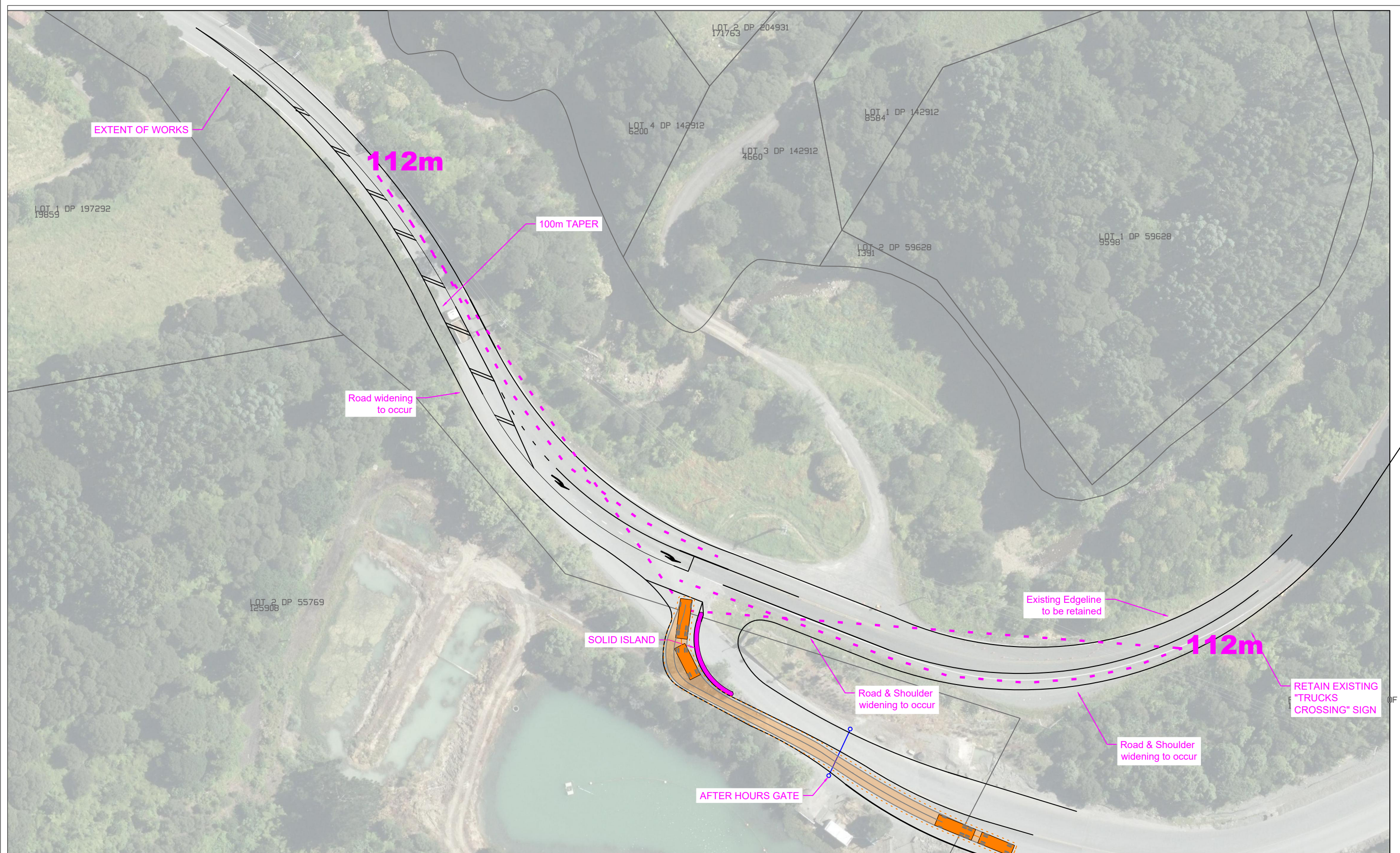
First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 45.0
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

Revision notes:		
Rev:	Date:	Notes:

Drawn by: HA J003408
Client:

Project: 489 Hunua Road, Hunua, Auckland Hunua Quarry Development
Drawing Title: Access Upgrade Truck and Trailer tracking

Date: 19 March 2026
Scale @ A3: 1:750
Revision: A



Revision notes:		
Rev:	Date:	Notes:

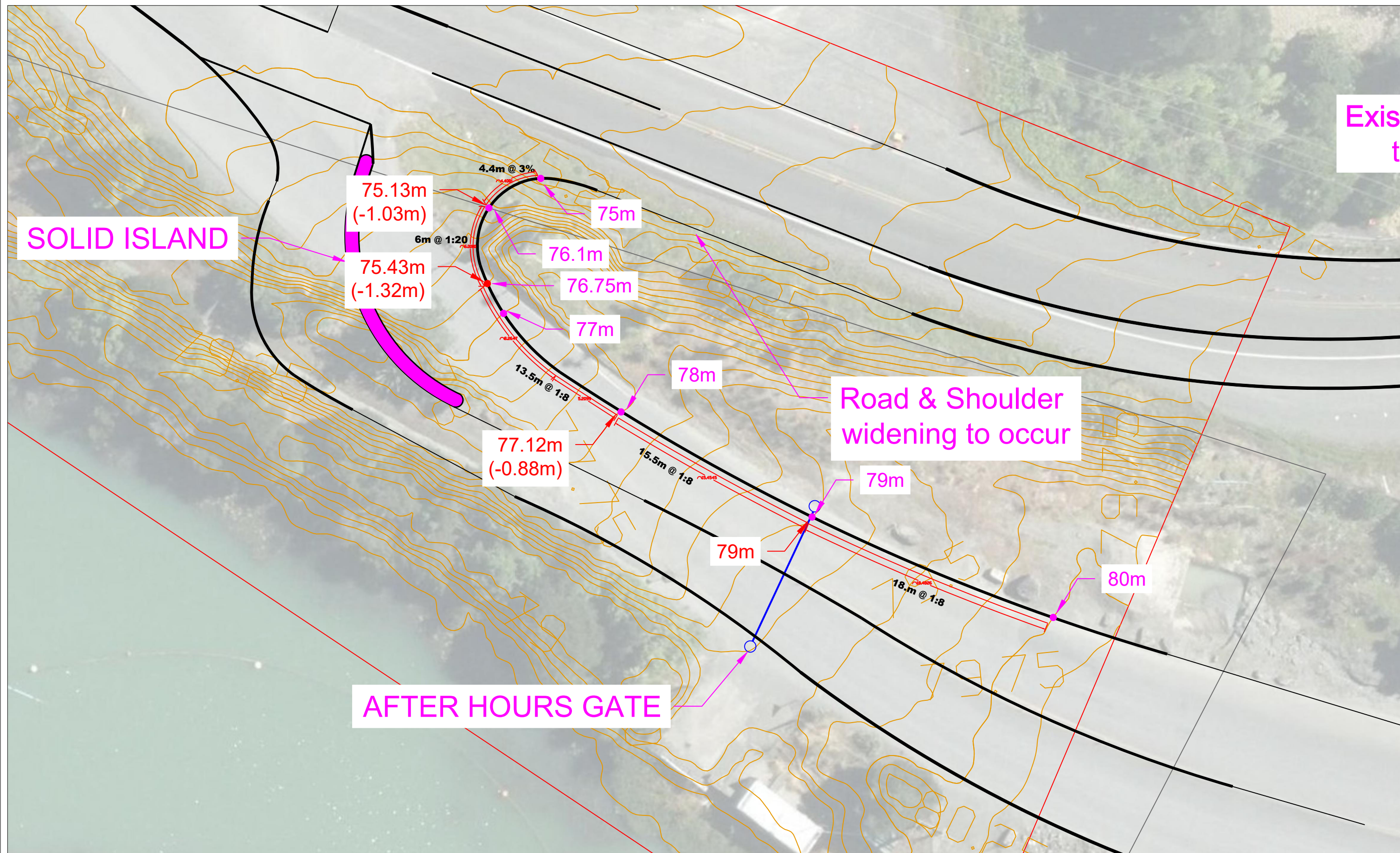
Drawn by: HA J003408
Client:

Project: 489 Hunua Road, Hunua, Auckland Hunua Quarry Development
Drawing Title: Access Upgrade Sight Distance Assessment

Date: 19 March 2026
Scale @ A3: 1:750
Revision: A



Figure:
4



SOLID ISLAND

Existing

Road & Shoulder widening to occur

AFTER HOURS GATE

75.13m
(-1.03m)

75.43m
(-1.32m)

77.12m
(-0.88m)

75m

76.1m

76.75m

77m

78m

79m

79m

80m

4.4m @ 3%

6m @ 1:20

13.5m @ 1:8

15.5m @ 1:8

18m @ 1:8

Revision notes:		
Rev:	Date:	Notes:

Drawn by: HA J003408	Client:
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Project: 489 Hunua Road, Hunua, Auckland Hunua Quarry Development	Drawing Title: Access Upgrade Level Analysis
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Date: 19 March 2026	Scale @ A3: 1:250
Revision: A	



Figure: 5