B

APPENDIX B

Integrated Transport Assessment

CKL

Planning | Surveying | Engineering | Environmental

B25065

Shaw's Quarries Limited

1466 Cambridge Road, Cambridge

Transportation Assessment Report

Document Control

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1 Introduction

CKL has been engaged by Shaw's Quarries Limited to assess the effects of a proposed sand quarry located at 1466 Cambridge Road, Cambridge (the site). The site is located across the District Council boundaries of both the Waikato District Council (Waikato DC) and Waipa District Council (Waipa DC) which bisects the site along the Banks Road corridor. The proposed site access is to be located on Cambridge Road, which falls within the Waipa DC. Accordingly, all access-related effects are assessed with respect to the Waipa DC, while all other district plan matters have been considered across both Waipa DC and Waikato DC.

The site is the current location of the Whakanui Stud and is largely un-developed rural pastureland / farmland. The Whakanui Stud is understood to cross six land parcels known as Lot 1 DP 572677, Lot 1 DPS 71331, Lot 3 DP 572677, Lot 1 DPS 15181 within Waipa DC and Lot 3 DP 571795 and Lot 4 DP 571795 within Waikato DC. Collectively the site is referred to as either 1466 Cambridge Road or 310 Hooker Road and has a total approximate area of 150ha.

The proposed sand quarry operation occupies approximately one third of the total site area of approximately 54.54ha. It is understood that pit sand will be extracted and processed and will be replaced with cleanfill imported to the site, with the intention to return the land to pastureland use following the completion of the quarrying activities.

This report addresses the transportation matters of the proposal and includes the following:

- Levels of vehicular traffic likely to be generated by the operation of the proposed sand quarry.
- Associated effects of the sand quarry on the performance and safety of the surrounding road network.
- Adequacy and function of the parking and access provisions.
- Consideration of the transportation related provisions (excluding access-related effects) within the Waikato District Plan – Operative in Part (WDPOiP)
- Consideration of the transportation related provisions within the Waipa DC District Plan. (Waipa DP)

These and other matters will be addressed in the detail of the report that follows. By way of summary, it can be concluded that there are no traffic or transportation reasons to preclude resource consent approval to operate the proposed sand quarry.

2 Existing Environment

2.1 Site Location

Figure 1 is an aerial photograph with the Whakanui Stud outlined in red with the quarry site outlined in yellow. The aerial image is sourced from GRIP.

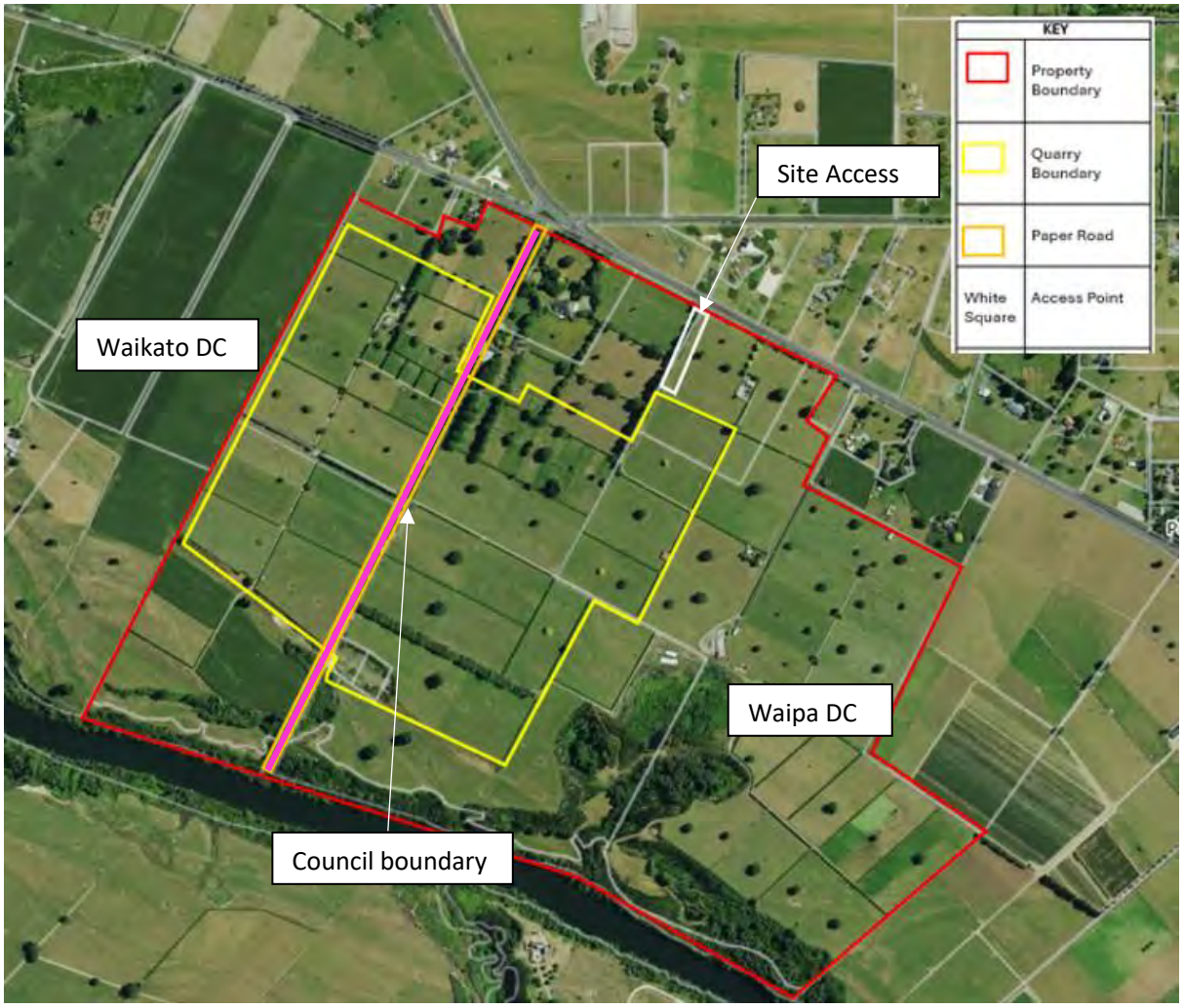


FIGURE 1: AERIAL PHOTOGRAPH OF SITE

The site is situated some 700m south of the Waikato Expressway, 2.8km northwest of the Velodrome and 5.7km northwest of the Cambridge town centre. The site is bounded to the south by the Waikato River and to its remaining boundaries primarily by rural pastureland and occasional residential dwellings. The site is included within the Rural zone within both the WDPOiP and the Waipa DP.

2.2 Road Network

Figure 2 portrays the site highlighted in red in the context of the wider road network.

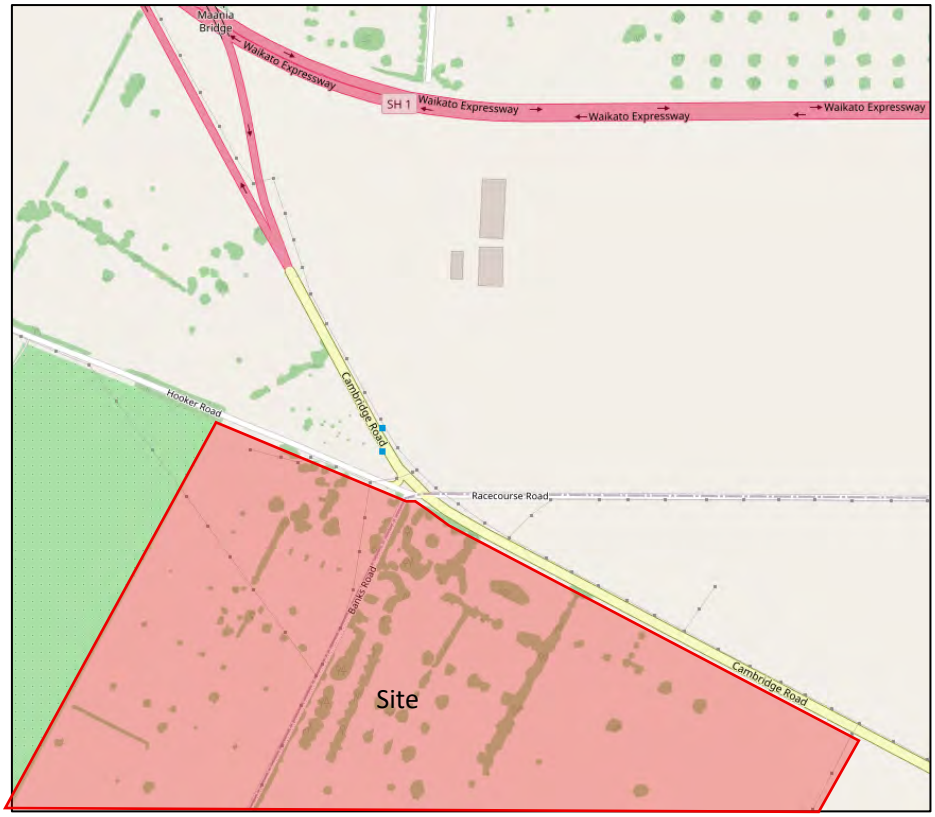


FIGURE 2: SURROUNDING ROAD NETWORK

The site has frontage to two formed roads, Cambridge Road and Hooker Road. It also has frontage to an unformed paper road, Banks Road.

2.2.1 Cambridge Road

Cambridge Road is classified within the Waipa DP as a major arterial route. The primary purpose of a major arterial road is the movement of people and goods as key strategic routes that provide inter-regional connections. The carriageway provides two-way, east / west movement with a single lane in each direction with sealed shoulders on both sides and has a posted speed limit of 100km/h. A typical cross-section of Cambridge Road is shown in Figure 3 below



FIGURE 3: TYPICAL CROSS-SECTION - CAMBRIDGE ROAD

2.2.2 Hooker Road

Hooker Road is classified as a local road in the WDPOiP and is considered a typical rural road with a 20m wide reserve and is located in a 100km/h speed environment. The carriageway measures approximately 6.8m and facilitates two-way traffic flow and is bound on either side by grass berms. There are no footpaths or designated cycle lanes. A typical cross-section is shown in Figure 4 below.



FIGURE 4: TYPICAL CROSS-SECTION OF HOOKER ROAD

2.2.3 Cambridge Road / Hooker Road Intersection

The intersection is a staggered give way control 'crossroad' style intersection with Cambridge Road and Racecourse Road. The Cambridge Road / Hooker Road intersection includes a right turn bay to facilitate movements into Hooker Road from Cambridge Road and is located on the outside of a horizontal curve. In addition to the right turn bay it is noted that a wide flush median extends to the east to facilitate right turn movements from Hooker Road.

It is noted that on the eastern aspect of the intersection, the dedicated cycle lane diverts immediately behind the intersection and raised, planted median. It is also noted that there is a bus stop located immediately west of the intersection.

An aerial image of the intersection is shown in Figure 5 below.

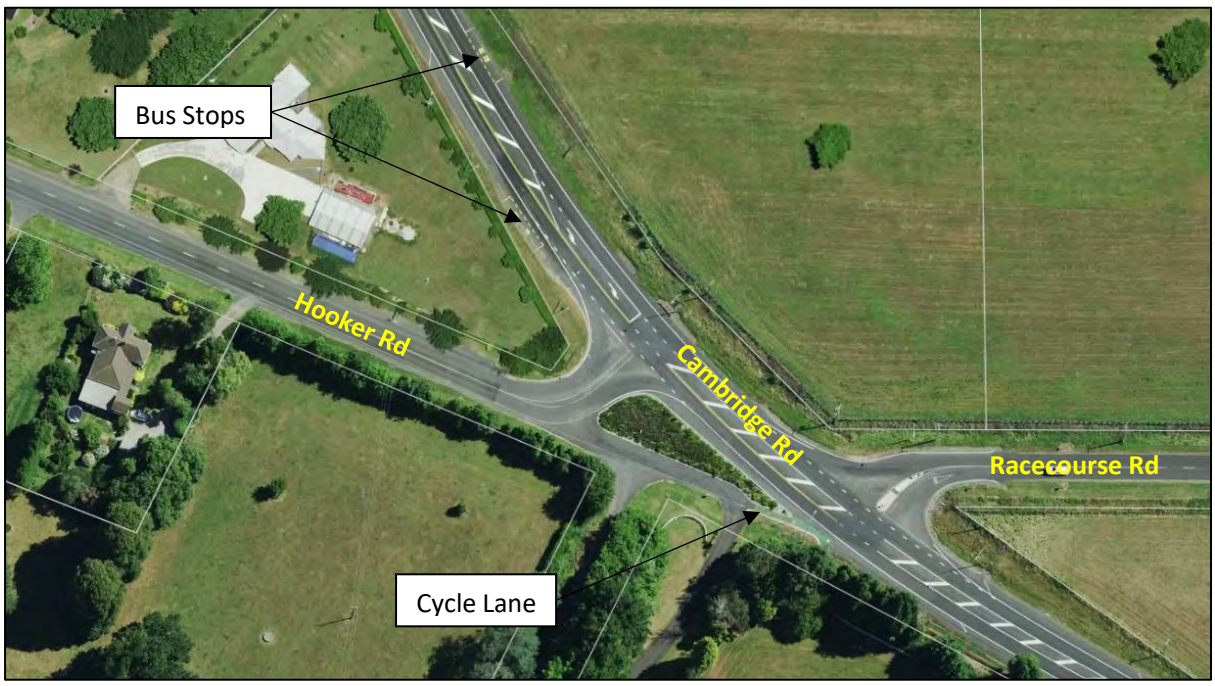


FIGURE 5: AERIAL PLAN VIEW OF CAMBRIDGE ROAD / HOOKER ROAD INTERSECTION

2.3 Public Transport

There is a pair of bus stops on Cambridge Road just north of Hooker Road. These stops are serviced by regional bus routes 20 and 32 as part of the Cambridge and Tokoroa Connector services respectively. Regular services are offered for Route 20 Cambridge seven days per week while Route 32 Tokoroa Connector operates Monday to Friday only.

2.4 Walking and Cycling

There are no footpaths in the immediate vicinity which is considered typical for a rural environment. As identified above, the dedicated northbound cycle lane on Cambridge Road terminates at the southern end of the Hooker Road / Cambridge Road intersection and a bypass is provided onto an access leg of Hooker Road.

It is noted that the Te Awa River Ride meets Hooker Road approximately 750m to the west of the site as shown on the Te Awa River Trail Ride Map excerpt shown in Figure 6 below with the trail shown yellow.

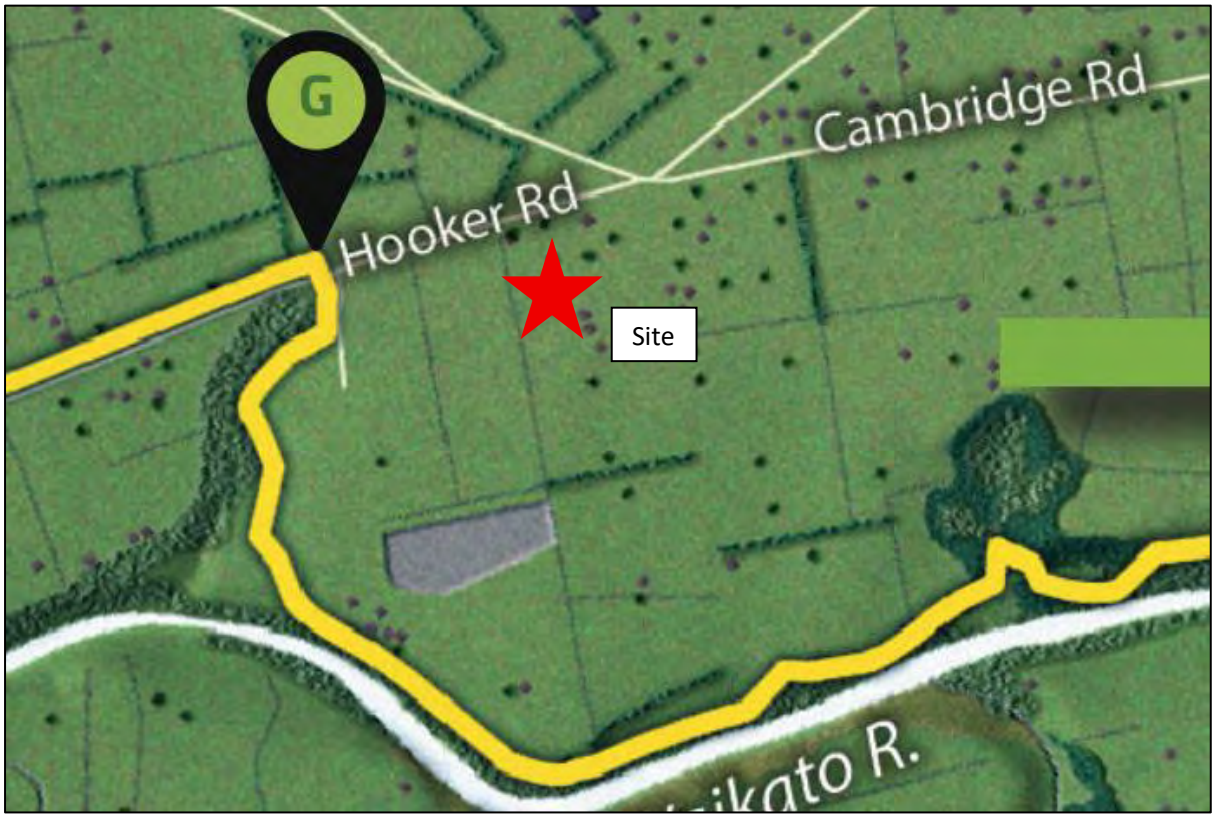


FIGURE 6: TE AWA RIVER RIDE TRAIL MAP EXCERPT

2.5 Traffic Volumes

Traffic volumes have been sourced from the Mobileroads website. Peak hour volumes are not available and have been calculated at 10% of the daily volumes.

TABLE 1: EXISTING TRAFFIC VOLUMES

Road	Location	Daily (vpd)	Calculated Peak (vph)
Hooker Road	Outside site	700	70
Cambridge Road	North of Hooker Road intersection	6,323	632
Cambridge Road	South of Hooker Road intersection	8,000	800
Banks Road	-	5	1

The typical carrying capacity of a single traffic lane is conservatively estimated at 1,200 vehicles per hour. As each road permits two-way traffic flow, it is assessed that the roads are operating within capacity.

2.6 Road Safety

A search was made of the NZ Transport Agency (NZTA) Crash Analysis System for all reported crashes that had occurred along the site frontage including the Cambridge Road/ Hooker Road intersection over the last five-year period between 2021 and 2025 and includes 2026 year to date. The search found that six crashes had been reported within the study area of which two resulted in serious injuries, one resulted in minor injuries. The other three were damage to property only. The reported crashes are shown in Figure 7 below.

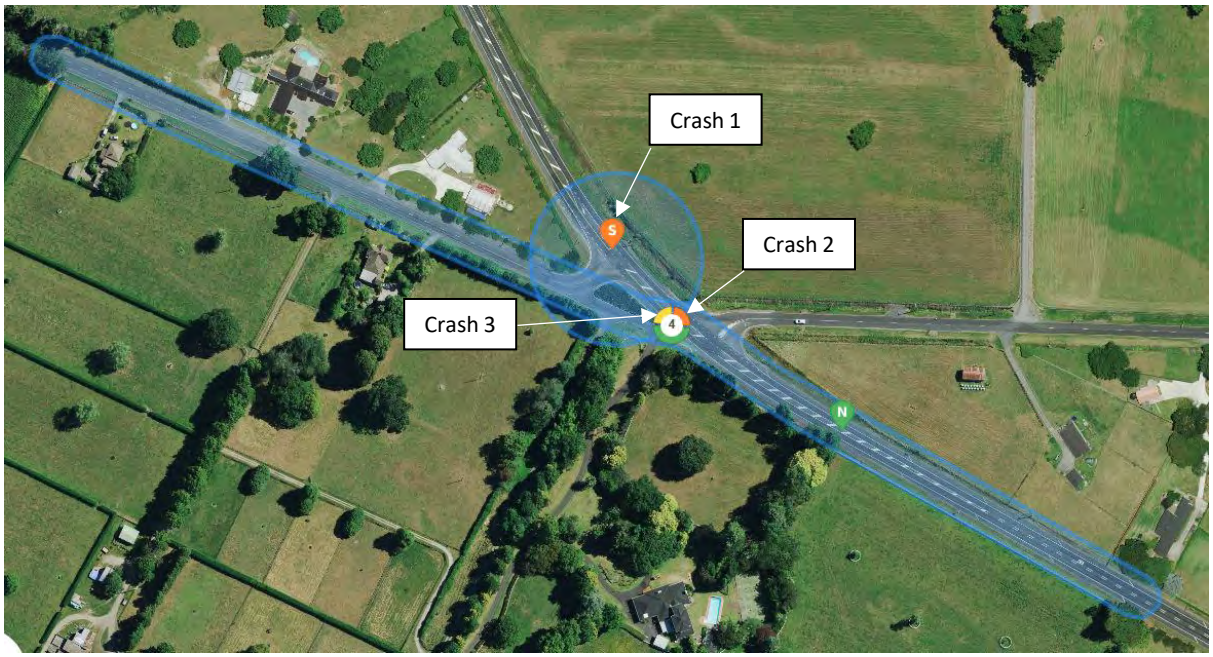


FIGURE 7: NZTA CRASH ANALYSIS 2020 - 2025

The three crashes that resulted in injuries are summarised below:

- Crash 1 (Serious Injury): Occurred when a cyclist turning right from Hooker Road failed to give way to a northbound vehicle on Cambridge Road. The crash occurred in overcast lighting conditions with no other road geometry or environmental factors listed.
- Crash 2 (Serious Injury): The crash report does not contain details of the crash. The crash diagram within the report appears to demonstrate a two vehicle, side impact crash on Hooker Road within 50m of the Cambridge Road / Hooker Road intersection. No environmental or road geometry factors have been identified as potential contributing factors to the crash.
- Crash 3 (Minor Injury): Occurred when an SUV turning right from Hooker Road onto Cambridge Road failed to give way to an oncoming northbound vehicle travelling toward the Waikato Expressway. The crash occurred in overcast lighting conditions with no other road geometry or environmental factors listed.

Two of the three non-injury crashes were the result of failure to give way at the intersections, one from Hooker Road and one from Racecourse Road. The third non-injury crash was a single vehicle incident due to an obstruction on the road. Overall, no crashes were reported that involved the subject site and no crashes involved any pedestrians. A common crash trend of failure to give way through the intersection has been identified. Such crash types are considered to be typical at intersections.

2.7 Committed Environmental Change

There are no known developments or roading upgrades that are committed that would have a noticeable impact on background traffic patterns in the vicinity of the site.

3 Proposal

It is proposed to establish a pit-sand quarry at 310 Hooker Road, Cambridge. As the sand is extracted, it is to be processed on-site, and the extraction area will be backfilled with cleanfill as part of the rehabilitation of the land in a manner that allows a return to rural uses.

It is anticipated that the proposed quarry will utilise approximately one third of the total site area, approximately 54.5Ha, of the total 150Ha. The anticipated quarry operation area is shown outlined in yellow in Figure 8 below.



FIGURE 8: APPROXIMATE QUARRY BOUNDARY

Quarry operations are expected to be six days per week and are likely to be between the hours of 7am and 6pm Monday to Friday with reduced operational hours on Saturdays as is typical of other similar operations. This equates to an approximate working week of 60 hours and a total of 303 working days per year not including statutory holidays.

The quarry is expected to have a total sand yield of 3,000,000m^3. Extraction rates will likely vary over time as demand for sand products changes. For the purposes of this assessment, a peak annual extraction rate of 600,000m^3 has been assessed.

As the site has road frontage to both Hooker Road (Waikato DC) and Cambridge Road (Waipa DC), a detailed access assessment has been completed in Section 5 below, to determine the most appropriate site access location.

4 Access Assessment

As the site has frontage to two road corridors, a multi-criteria analysis (MCA) has been conducted to determine the most suitable location for site access. This approach was discussed with both Waikato DC and Waipa DC and was agreed to be an appropriate approach to determine the preferred access location. This MCA is outlined below and included in Appendix A.

4.1 Multi Criteria Analysis

An assessment has been undertaken to determine the suitability of site access. This includes a comparative evaluation of two potential access arrangements, with consideration given to safety, compliance, operational performance, and constructability.

4.1.1 Assessed Access Locations

For the purposes of this assessment, two access locations have been assessed, one to Hooker Road, presented as Option A and the second access location on Cambridge Road is presented as Option B. The indicative access locations are shown in Figure 9 below.

- **Option A (Hooker Road)** is a standard vehicle crossing designed to accommodate tracking of large vehicles.
- **Option B (Cambridge Road)** is a full T-intersection with a right-turn pockets and diverge tapers designed for 110km design speed.



FIGURE 9: INDICATIVE ACCESS LOCATIONS

4.1.2 Assessment Methodology

The key element of the assessment was a multi-criteria analysis (MCA) that objectively compared the relative performance of the two access options against defined criteria covering compliance, safety, operations, constructability, approvals, and amenity factors. The MCA categories were assigned weightings to reflect the priorities of the assessment. Detailed MCA criterion / analysis is provided attached in Appendix A. It is noted that for the purposes off assessment, constructability was considered separately except for impact on general traffic as it is more relevant to the investor than to the road controlling authority.

For the safety assessment of the proposed new intersections, a Safe System-oriented intersection risk evaluation was undertaken. This approach considers core risk elements of exposure, likelihood and severity in line with Austroads' Safe System Assessment Framework. In this framework, exposure reflects traffic volumes, likelihood considers the probability of a crash given the exposure, and severity considers the expected outcome if a crash occurs, thereby aligning with Safe System principles for intersection safety evaluation. Indicative thresholds for ratings are provided in the guideline. Severity was based on the survivable speed charts for various types of impact.

For the existing Hooker Road / Cambridge Road intersection, the NZTA High-Risk Intersections Guide (HRIG) was used to calculate the current DSI risk based on the recorded crash history. The observed DSI equivalents were lower than what the standard prediction model would suggest for an average intersection of this type, indicating the site is performing better than average.

As a result, rather than relying solely on the raw model outputs (which would likely overestimate risk), a proportional adjustment factor was applied to the predicted future DSI values so they better reflected the observed performance of the intersection. The DSI calculations are also provided in the attachments. This approach was used to assess the comparative change in risk factors between additional turning movements at the intersection versus additional through movements at the intersection, relevant to Options A and B respectively.

4.1.3 Key Findings

Following analysis of both options, assessment indicates a minor overall preference towards the revised access location Option B, located on Cambridge Road. The overall scores are summarized in Table 2 below:

TABLE 2: ACCESS MCA SCORING

Access Option	MCA Score
Option A	148 / 220 (67%)
Option B	163 / 220 (74%)

Option A (Hooker Road access) aligns better with road hierarchy principles, as access is taken from a lower-classified road. However, it is located in close proximity to the Hooker Road / Cambridge Road intersection and increases traffic loading at that node. This results in greater turning complexity, higher interaction with active modes, and a marginally higher overall DSI risk compared with Option B.

Option B (Cambridge Road access) departs from strict hierarchy intent by introducing direct access to an arterial road. However, this option benefits from improved intersection spacing, stronger sight distance, reduced turning movements through the Hooker Road / Cambridge Road intersection, and more direct heavy vehicle routing. From a safety perspective, both the Safe System assessment and DSI analysis indicate a slightly lower overall collective risk relative to Option A.

4.1.4 Sensitivity Testing

Sensitivity testing was undertaken to check whether the MCA outcome was sensitive to the choice of weighting. The primary weighting set was intentionally safety-led, reflecting that intersection safety risk and crash harm outcomes were the key decision drivers for the assessment. A second weighting set was then tested with a stronger emphasis on compliance factors (road hierarchy and access spacing), reflecting a more policy-driven Road Controlling Authority perspective. The same scoring was retained for both tests, with only the weightings adjusted, to confirm whether the preferred option remained consistent under different but plausible weighting priorities. These findings are shown in Table 3 and Table 4 below.

TABLE 3: CRITERION WEIGHTING SUMMARY

Category	Original (Safety-led)	Compliance-Focused Sensitivity
Compliance	10	14
Safety	20	16
Operations	6	6
Constructability	3	3
Approvals	3	3
Amenity	2	2
Total	44	44

TABLE 4: MCA (SENSITIVITY TEST) SUMMARY SCORE

Access Option	MCA Score
Option A (Hooker Road)	145 / 220 (66%)
Option B (Cambridge Road)	159 / 220 (72%)

Option B achieves a higher overall weighted score across the MCA, including under the compliance-focused sensitivity weighting. While it departs from strict arterial access hierarchy principles, the safety and operational assessments consistently favour Option B, site access via Cambridge Road.

4.1.5 Discussion and Limitations

The multi-criteria assessment involves professional judgement in assigning weightings and individual criterion scores. The weightings were selected to reflect the relative importance of compliance, safety, operations and network effects from a transport planning perspective, and were developed by two experienced transportation engineers. Notwithstanding this, the process remains inherently subjective.

To address this, sensitivity testing was undertaken by applying an alternative, compliance-focused weighting set. While the overall margin between options changed slightly, the relative ranking of the options remained consistent. The overall preference is therefore not dependent on a single weighting assumption and is also supported by the DSI risk assessment.

Assessment of the proposed access Option B traffic effects, via Cambridge Road, has been undertaken against the relevant transportation requirements of the Waipa DP below.

5 Traffic Generation

5.1 Plant Machinery

It is expected that the plant required for the quarry operations such as excavators, bulldozers, watercarts etc will not be required to leave the site on a daily basis and as such will remain on-site throughout the project. For this reason, the Heavy Commercial Vehicle (HCV) movements associated with arrival and ultimate departure of this plant have been discounted from the operational trip generation. It is expected

that where required, the movement of quarry related plant to and from the site will be undertaken in conjunction with a suitable Construction Traffic Management Plan (CTMP).

5.2 Staff movements

Staff numbers are likely to be minimal, have been estimated to be 3 per day, and limited to equipment operators who will likely arrive to and depart from site outside quarry operational hours. Staff movements are therefore estimated to be up to 6 per day however are excluded from peak hour calculations as staff are likely to arrive on-site before and leave after other customers.

5.3 Sand Extraction

For the purposes of assessment, HCV movements are based on a 50/50 output split. Two types of vehicles are expected to transport material from the site, rigid trucks with a carrying capacity of 10m^3 and truck and trailers with a capacity of 29m^3. The volume of material exported is likely to be split 50/50 between these vehicle types.

Given the site's location across both Waikato DC and Waipa DC boundaries, the activity has also been assessed in accordance with the WDPOiP, while the effects on the surrounding road network have been assessed against the Waipa DP.

5.3.1 Average Sand Extraction

The quarry is expected to have a total sand yield of 3,000,000m^3. Over the lifetime of the quarry, assessed to be 25 years, this would equate to an average of 20 rigid truck loads and 7 truck and trailer loads per day, 27 in total. The 27 loads would result in 54 HCV movements as trucks would arrive empty to the site before departing with a load. This volume of traffic has been used in the Heavy Vehicle Impact Fee Calculations in section 5.6 of this report. This level of sand production equates to just over a third of peak movements as discussed below.

5.3.2 Peak Sand Extraction

Based on estimated peak annual extraction rates of 600,000m^3 and 303 working days per year, it is calculated that some 2,000m^3 of sand will be extracted per day. Based on the above rates, it is anticipated the site will generate a daily average across any one month of up to 100 trucks and 35 truck and trailers per day during peak demand times / seasons, allowing for flexibility in daily site production due to seasonal demand variation.

5.3.3 Waikato DC

Rule TRPT-R4 from the WDPOiP includes site trip generation thresholds based on the road frontage classification and the zoning of the site. Based on the General Rural Zone classification of the site, the threshold states that no more than 200 vehicle movements, measured as equivalent car movements (ECM), per day are permitted with up to 15% of these being heavy vehicle movements or approximately 30 movements per day. Truck movements are converted to ECM where one truck movement is equivalent to three car movements and one truck and trailer is equivalent to 5 car movements. Based on the 50/50 vehicle split with an average of 135 HCV movements expected per day as described above, this would equate to between 300 (truck only) and 175 (truck and trailer) ECM per day, exceeding the permitted 30 movement threshold.

The effect of this non-compliance exceeding the permitted number of ECMs to the existing road network requires an ITA to be submitted which this document satisfies.

5.3.4 Waipa DC

Trip generation for the development has been assessed against the Waipa DP Appendix T6 transportation provisions. The Waipa DP assesses traffic generation in terms of Car Equivalent Movements (CEMs) per day. Under the Waipa DP provisions, each heavy vehicle (gross vehicle mass exceeding 3.5 tonnes) movement, is treated as 10 car equivalents.

The activity of a sand quarry most closely aligns with the industrial activity classification under Appendix T6 of the Waipa DP although it is noted that there are no significant buildings, typically used to assess trip generation.

Based on the calculated peak daily average across any one month, of 135 HCV movements per day, and applying the relevant ECM conversion, this equates to approximately 1,350 ECMs per day.

5.4 Peak Demands

The quarry has a maximum theoretical capacity of one truck per minute. This represent the time it takes for a truck to enter the site, be filled and exit before the next truck can then be filled. This equates to a maximum theoretical output of 60 truck loads per hour or 660 truck loads per day.

At the maximum theoretical capacity, the quarry operations are such that only one truck can exit the site per minute. The staggering of vehicle departures reflects that a truck has to be filled and exit before the next truck can start to be filled.

Based on the calculated peak 135 HCV movements per day, network peak hour demands across the 11-hour work day are anticipated to be approximately 12 HCVs per hour, one fifth of the theoretical maximum capacity.

As there are no specific trip generation guidelines for a quarry activity within the district plan assessments, traffic demand has been considered using network capacity analysis. It is assessed that the road network can accommodate both the theoretical maximum and calculated peak hour HCV traffic demands for the proposed quarry from a capacity perspective. Stipulating a maximum number of trucks that can serve the proposed quarry is not considered necessary from a traffic and transportation perspective.

5.5 Trip Distribution

The location of other sand quarries in the ar4e ais shown in Figure 10. These are quarries that only provide sand i.e. mixed aggregate quarries or those accepting clean fill are not include.

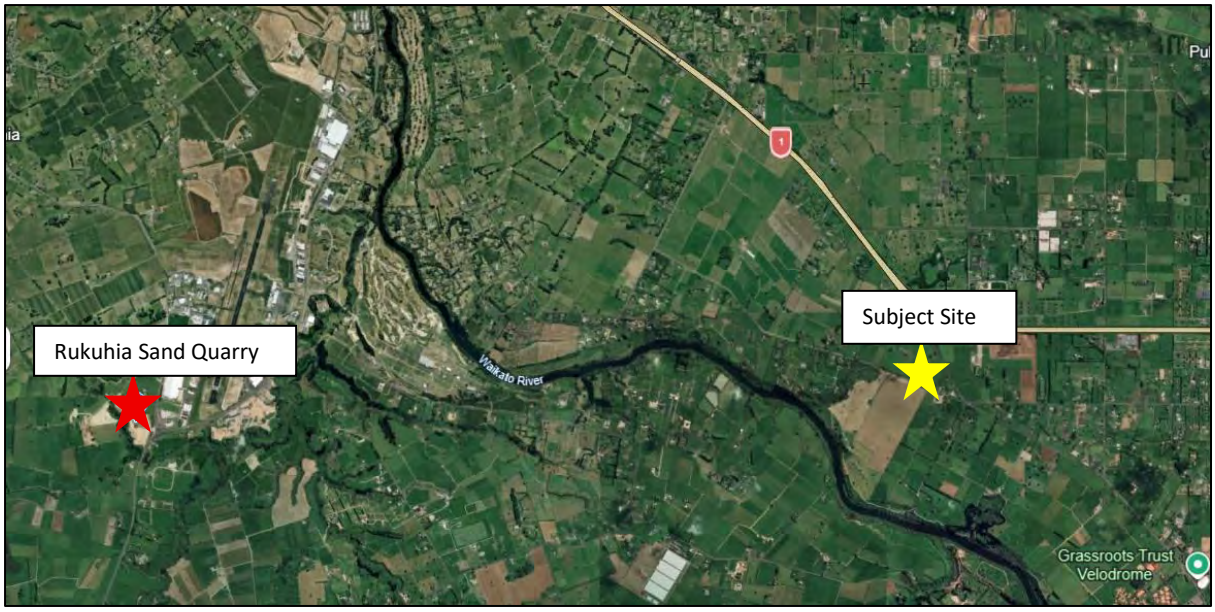


FIGURE 10: EXISTING NEARBY SAND QUARRY

The quarry is likely to service projects in all directions however given the relative locations of other quarries to the south and east of the site, it is anticipated that the majority of movements, some 75% will be to the north, west and southwest via SH1 with the remaining 25% heading east utilising local Waipa DC roads to the closest State Highway connection. These percentages are indicative to form the basis of distribution analysis and reflect the existing surrounding quarry locations as well as previous experience from other similar projects. No HCV movements are expected to be undertaken from the site along Hooker Road unless the final delivery site is bound by SH1, SH21 and the Waikato River. Table 5 summarises the expected distribution of trucks for the maximum theoretical output once the site is operational.

TABLE 5: TRUCK DISTRIBUTION SUMMARY

Direction	Expected Proportion	Theoretical Maximum Loads per hour
SH1 – North	75%	45
Peake Road (North or South)	15%	9
SH1B	5%	3
SH1 - South	5%	3
Total	**100%**	**60**

5.6 HVIF

The Heavy Vehicle Impact Fee (HVIF) is calculated based on the number of trucks generated by the proposed development over its lifetime and the length of roads travelled that are maintained by the local Council Road Controlling Authority (RCA). In this case, 440m of Cambridge Road to the north of Racecourse Road is within the Waikato District with the other roads being within the Waipa District. As calculated in section 5.3, the proposed quarry is expected to generate an average 54 truck movements per day over a 25-year lifetime.

Trucks heading to Peake Road are likely to be trucks that are servicing construction sites in the C1/C2/C3/C8/C9 growth cells, and may also be accessing Sh1B and Sh1 southbound. Consideration has also been given to alternative routes to reach SH1B and SH1, with the emphasis being on avoiding residential areas as much as possible as would most likely be the case. However, it is noted that the proposed quarry cannot enforce route choice on third party drivers. As such, two alternate route options have been considered in order to assess an appropriate HVIF. These are shown in Figure 11.

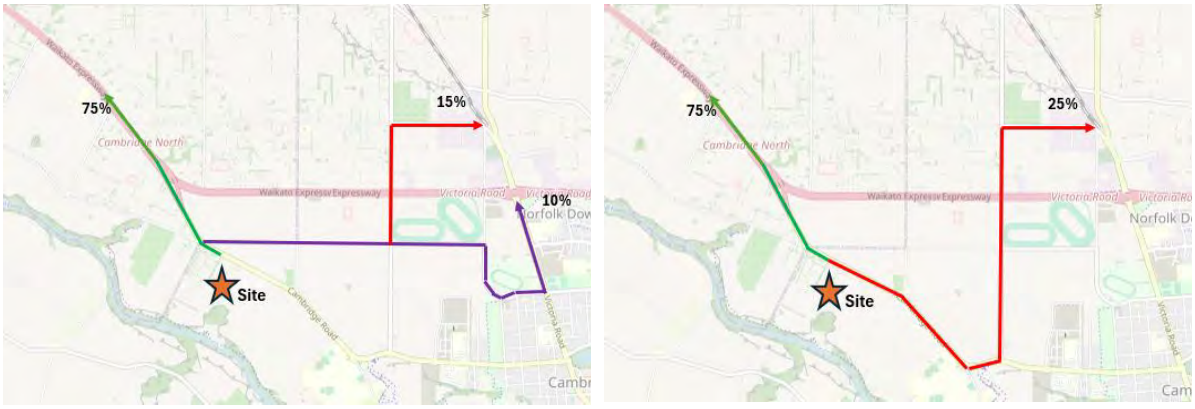


FIGURE 11: HVIF ROUTE ASSESSMENT

The full calculations of the HVIF are provided in Appendix B. It has been calculated that the average HVIF across the two route options would be a total of $114,938 of which $2,452 would be payable to Waikato DC and $112,486 would be payable to Waipa DC. This equates to a levy of $0.0385 per tonne of sand excavated from the site of which $0.001 would go to Waikato DC and $0.0375 to Waipa DC. This equates to $0.0005 per tonne of sand for Waikato DC and $0.0215 per tonne for Waipa DC.

It is also noted that if the quarry is exhausted in a shorter timeframe than 25 years, the number of trucks exporting material would still be the same, they would have just been generated within the shorter timeframe. As such, the different daily volumes between peak days and average days would not change the HVIF levies.

6 Access Effects

6.1 Location

As a result of the MCA described in section 4 above, the preferred access location is considered to be located on Cambridge Road.

Cambridge Road is the most direct route from the site to the wider road network including the state highway network and hence locating the access close to Cambridge Road reduces the amount of distance trucks would spend on the road network.

6.2 Separation

Section 16.4.2.5 of the Waipa DP specifies the minimum separation distances required between a vehicle entrance and an intersection or other vehicle entrance, based on sight distance categories K, M, and N shown in Figure 12 below.

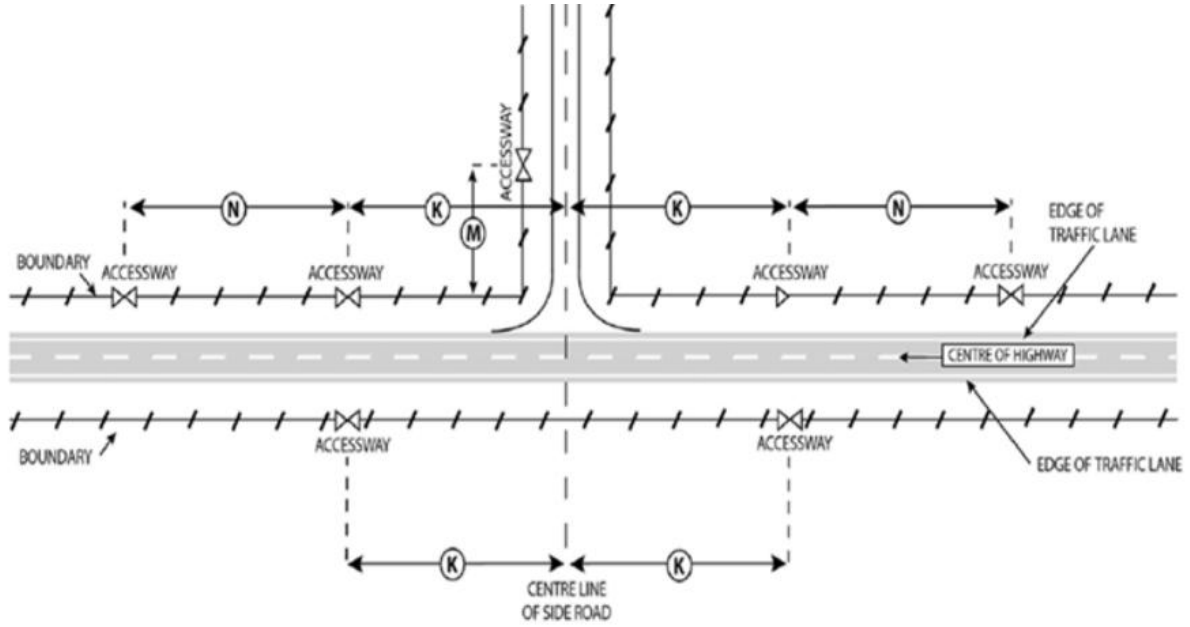


FIGURE 12: WAIPA DC SEPARATION CRITERIA

For a posted speed environment of 100 km/h, the Waipa DP requires minimum separation distances of 200 m for categories K and N, and 60 m for category M. There are no intersections within 200m of the proposed access however there is a residential access located approximately 117m to the southeast as shown in Figure 13 below.

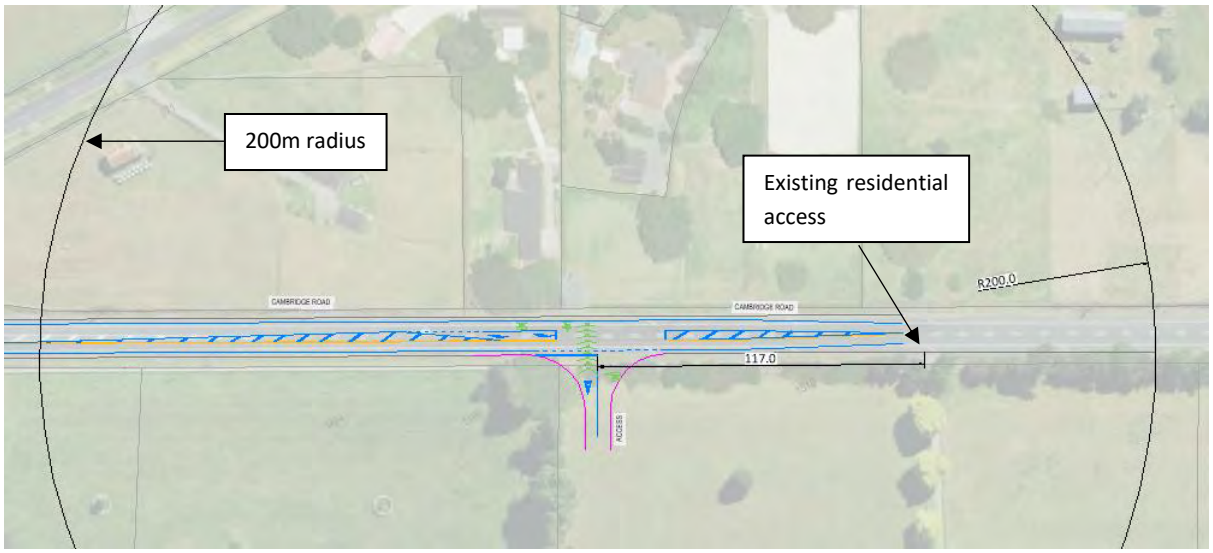


FIGURE 13: SEPARATION DISTANCE OF PROPOSED ACCESS

The proposed access is therefore non-compliant with the separation requirements between accesses however it is understood this existing residential access is to be closed and a new internal access provided to the proposed quarry access once operational. Thus, the non-compliance will be resolved.

6.3 Visibility

The Waipa DP does not specify visibility requirements for vehicle accesses. As such, visibility has been assessed in accordance with *RTS 6: Guidelines for Visibility at Driveways*.

Table 1 of RTS 6 indicates that for a high-volume arterial road with an operating speed of 110km/h, a minimum visibility distance of 290m is required in both directions from the access shown magenta in Figure 14 below. The proposed access is able to achieve this requirement.

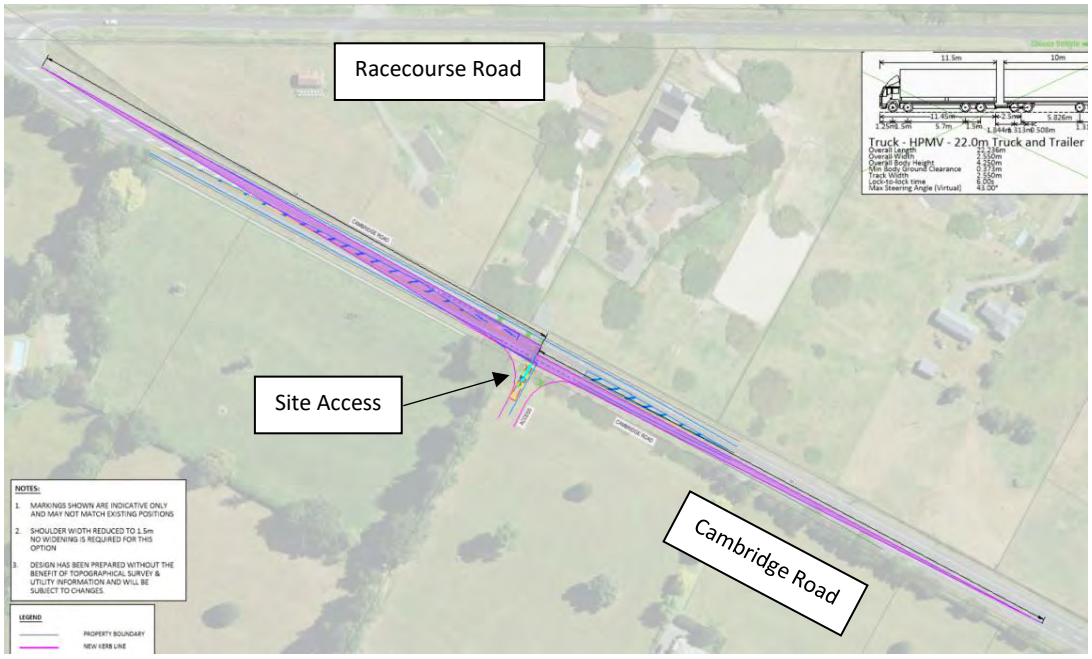


FIGURE 14: RTS 6 SIGHT DISTANCE (290M)

6.4 Right Turn Bay

Cambridge Road is classified as a major arterial route within the Waipa DP and has traffic volumes of approximately 8,000vpd and 800vph during network peak hour. Consideration of the potential right turn demands of the quarry and the requirement for provision of a right turn bay has therefore been undertaken to minimise the potential impact of right turning traffic associated with the quarry and maintaining safe and efficient road corridor operation.

As stated above, all quarry HCV traffic movements are anticipated to head north approximately 400m to Racecourse Road. Approximately 75% of HCVs will then continue north to the Waikato Expressway (WEx) with the remaining 25% heading east to Racecourse Road. As such, return movements to the quarry are expected to return via the same direction, from the north, requiring all 135 HCVs, approximately 12 HCVs per hour across the 11-hour working day, to undertake right turns into the site.

Austroads Guide to Traffic Management (AGTM) Part 3 Figure 3.25, shown in Figure 15 below, demonstrates the recommended movement thresholds for provision of a right turn bay.

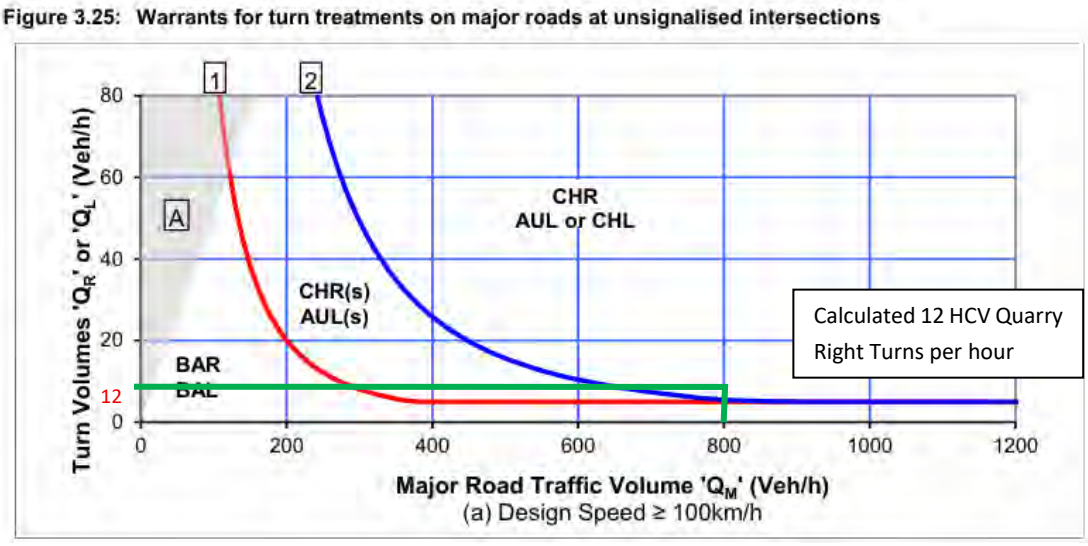


FIGURE 15: AGTM PART 3 FIGURE 3.25 RIGHT TURN BAY WARRANT

As shown in Figure 15 above, a right turn bay is considered appropriate based on the calculated right turn demands of the quarry for the existing road network.

6.5 Formation

Waipa DP does not contain guidance on vehicle crossing dimensions within rural zones therefore reference is made to the Regional Infrastructure Technical Specifications (RITS) manual. As stated within RITS, Section 3.3.19 '*vehicle crossing design must allow vehicles to safely enter and exit the property*'.

Due to the high comparative use of the proposed access by HCVs, a concept site access design has been completed including the provision of a right turn bay, compliant with the Traffic Control Devices Manual (TCDM) Part 4, to accommodate the anticipated right turn entry and left turn exit movements as shown in Figure 16 and Figure 17 below.

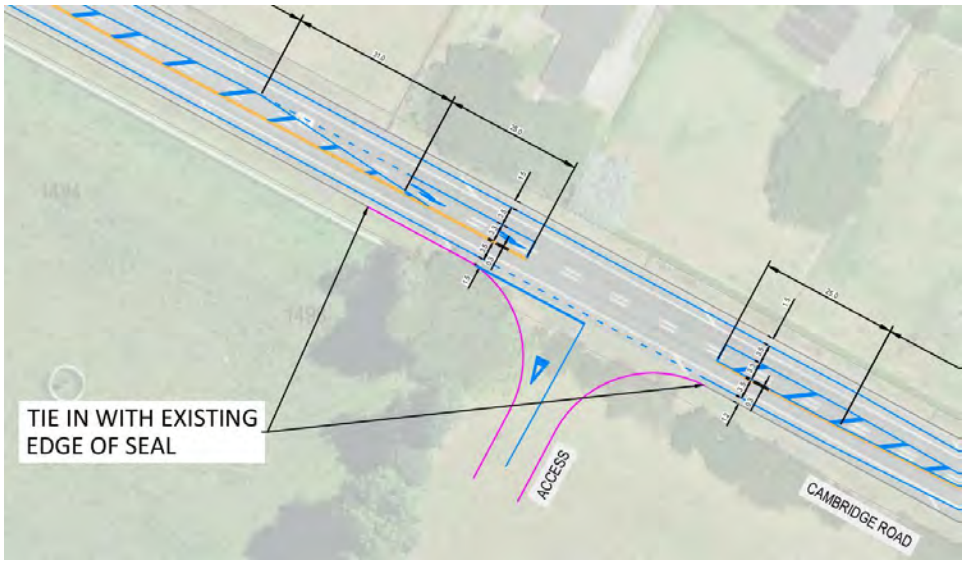


FIGURE 16: CONCEPT SITE ACCESS DESIGN TO CAMBRIDGE ROAD

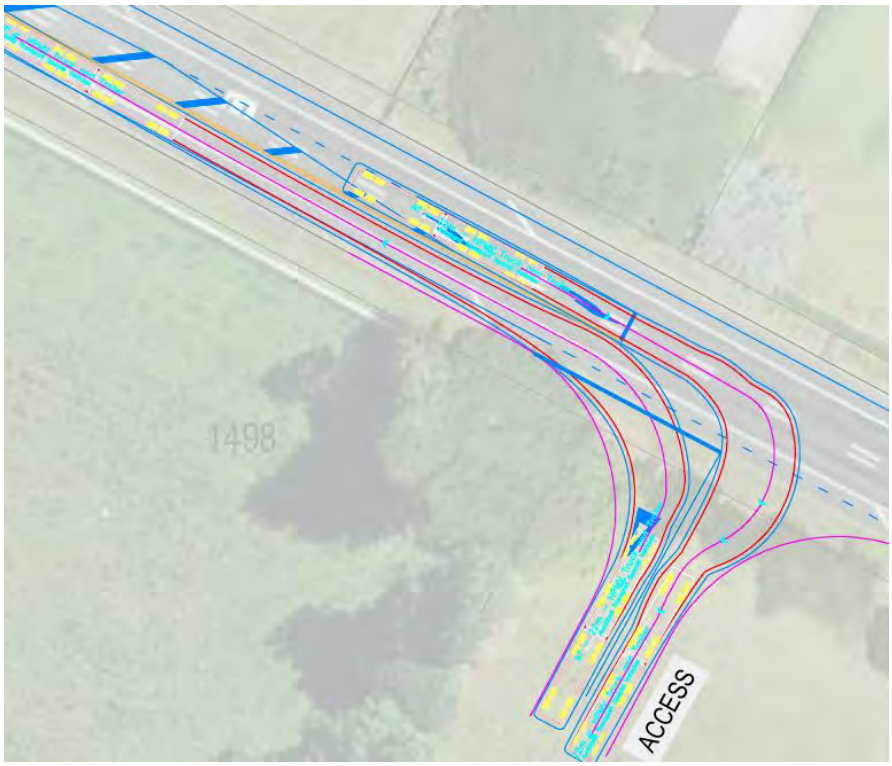


FIGURE 17: SITE ACCESS VEHICLE TRACKING - 22M TRUCK AND TRAILER

It is noted that the inclusion of the right turn bay does not require any additional road widening to accommodate the right turn bay however the existing 2.5m wide sealed shoulder is reduced to 1.5m along the right turn bay length. The concept site access and right turn bay design are also provided in Appendix C and is considered to closely align to the principles of both a RITS heavy commercial rural vehicle crossing and that of an NZTA Type E vehicle crossing.

7 Parking Effects

There are no minimum or maximum parking rates that apply to the site in either the WDPOiP or the Waipa DP. Demand for car parking is expected to be low, for staff only, and is also expected to be able to be accommodated within the site boundaries given its size. Should carparking be provided, given the nature of the activity, provision of sealed spaces using chipseal, asphalt or concrete is not considered appropriate or required and could instead utilise aggregate or compacted sand as suitable seal.

The nature of the activity renders any requirement for loading spaces obsolete as that is the primary nature of the activity, the loading of extracted sand and unloading of cleanfill. It is therefore considered that any loading requirements are able to be satisfied by default.

The WDPOiP requires cycle parking at a rate of 1 per 1000sqm of floor area. The proposal does not feature more than 500sqm of floor area, therefore, no cycle parking spaces are required.

Rule 16.4.2.21 of the Waipa DP states *'In areas other than the Rural Zone and Pedestrian Frontages, activities employing more than ten people must provide bicycle parking facilities at a rate of one bicycle park for every ten people employed'.* The site is in the rural zone and hence this requirement does not apply.

Overall, the parking provision is expected to be compliant with the various District Plans.

8 Statutory Assessment

8.1 Waikato District Plan Operative in Part

An assessment of the proposed development has been undertaken against the relevant transportation rules in section TRPT of the WDPOiP. All transportation rules, excluding those relating to access, have been assessed. This is provided in Table 6 below.

TABLE 6: WDPOIP ASSESSMENT

Rule	Requirement	Proposed	Compliance
TRPT-R2: On-site parking and loading			
1a(i)	The loading space requirements, manoeuvring and parking space dimensions in Table 6 – Required loading bays, and Table 9 – Car manoeuvring and parking space dimensions, noting: (1) When calculating the requirements for loading on the basis of the prescribed floor area, the area for parking, loading and manoeuvring shall be excluded; (2) If the calculation results in a fraction, then that figure shall be rounded to the nearest whole number; (3) 90 percentile car dimensions in Figure 9 – 90th Percentile car tracking curve minimum radius apply; (4) The requirements of Table 6 – Required loading bays do not apply to residential and rural activities; (5) Accessible parking	Proposed activity is a sand quarry where the main activity is loading and unloading of HCVs.	Compliance expected

	spaces must comply with the New Zealand Building Code D1/AS1 New Zealand Standard for Design for Access and Mobility – Buildings and Associated Facilities (NZS: 4121-2001) and Table 7 – Accessible parking spaces; and		
1a(ii)	On-site bicycle space requirements in Table 8 – Required bicycle spaces, except: (1) The requirements of Table 8 – Required bicycle spaces do not apply to residential and rural activities;	No cycle parking required	Complies
1a(iii)	Where parking is provided any on-site car parking spaces for non-residential activities within the GRZ – General residential zone and MRZ – Medium density residential zone must be set back at least 3m from the road boundary of the site and screened by planting or fencing from being viewed from the road;	Site not in these zones	N/A
1a(iv)	On-site car parking spaces (where provided) and loading bays comply with the requirements of Table 9 – Car manoeuvring and parking space dimensions and Figure 9 – 90th Percentile car tracking curve minimum radius and be located on the same site as the activity;	Car parking expected to be appropriately designed	Compliance expected
1a(v)	On-site car parking spaces and loading bays are to be sealed if five or more parking spaces are provided;	Less than 5 parking spaces proposed	N/A
1a(vi)	On-site car parking spaces and loading bays are to be permanently marked if five or more parking spaces are provided;	Less than 5 parking spaces proposed	N/A
1a(vii)	On-site car parking spaces and loading bays are not to be located on any shared access or residential living court;	No spaces expected in shared accesses or residential living areas	N/A
1a(viii)	Vehicles occupying any onsite car parking or loading spaces must have ready access to the road (or relevant access or right of way) at all times, without needing to move any other vehicle occupying other onsite car parking or loading spaces	All spaces expected to have access to the road	Compliance expected
1a(ix)	Loading bays are not required on sites with sole frontages to the following: (1) Main Street, Huntly; (2) Jesmond Street, Ngaruawahia; (3) Bow Street, Raglan (James Street to Cliff Street); (4) George Street, Tuakau (Gibson Road to Liverpool Street); (5) Great South Road, Pokeno (Selby Street to Market Street); or (6) Main Street, Te Kauwhata (Saleyard Road to Baird Avenue); and	Site does not front these roads	N/A
1a(x)	New on-site parking and loading bays shall not be located within an Identified Area, with the exception of a Significant Natural Area which is addressed in the ECO – Ecosystems and indigenous biodiversity chapter	No nearby identified areas	N/A
TRPT-R3: On-site manoeuvring and queuing			
1a(i)	On-site manoeuvring space shall be provided to ensure that no vehicle is required to reverse onto from or to a road except; (1) Rule TRPT-R3(1)(a)(i) does not apply to Local Roads within the GRZ – General residential zone, MRZ – Medium density residential zone, LLRZ – Large lot residential zone and SETZ – Settlement zone with a posted speed limit of less than 60 km/h	No reverse manoeuvres expected	Compliance expected
1a(ii)	A 90th percentile car, as defined in Figure 9 – 90th Percentile car tracking curve minimum radius, can enter and exit all parking spaces without making more than one reverse movement, excluding spaces required for a dwelling	Cars expected to track efficiently through the site given it can accommodate large trucks	Compliance expected

1a(iii)	On-site manoeuvring space for any heavy vehicle shall comply with the tracking curve (relevant for the type of activities to be carried out on the site and the largest combination standard configuration heavy vehicle permitted on the road(s) to which the site has frontage trucks to be used)	Heavy vehicles are expected to track through the site	Compliance expected
1a(iv)	On-site manoeuvring space shall be formed	Manoeuvring areas expected to be adequately formed	Compliance expected
1a(v)	On-site queuing space shall be provided in accordance with Table 10 – Queuing space for vehicles entering and exiting any on-site car parking, loading or manoeuvring space, where: (1) Length is measured from the road boundary where vehicles first enter the site; and (2) On-site queuing above must not encroach into the required on-site manoeuvring area	Queuing expected to be provided at compliant levels	Compliance expected
1a(vi)	On-site manoeuvring and queuing spaces are not required on sites with vehicle accesses/entrances to the following: (1) Main Street, Huntly; (2) Jesmond Street, Ngaruawahia; (3) Bow Street, Raglan (James Street to Cliff Street); (4) George Street, Tuakau (Gibson Road to Liverpool Street); (5) Great South Road, Pokeno (Selby Street to Market Street); (6) Main Street, Te Kauwhata (Saleyard Road to Baird Avenue)	Site does not front these roads	Complies
1a(vii)	New on-site manoeuvring shall not be located within an Identified Area, with the exception of a Significant Natural Area which is addressed in the ECO – Ecosystems and indigenous biodiversity chapter.	No nearby identified areas	Complies
TRPT-R4: Traffic Generation			
1a	Where any site gains access from an arterial or regional arterial (including state highway) road, there is a maximum of 50 Equivalent Car Movements (ECM) per day. Note: ECM – 1 car movement is equivalent to I car movement / 1 truck movement is equivalent to 3 car movements / 1 truck and trailer movement is equivalent to 5 car movements.	Site does not gain access from arterial roads.	N/A
1a(i)	Within the GRZ – General residential zone, MRZ – Medium density residential zone, or RLZ – Rural lifestyle zone there is a maximum of 100 vehicle movements per site per day, and no more than 15% of these vehicle movements are heavy vehicle movements	Site is not in these zones.	N/A
1a(ii)	Within the RPZ – Rangitahi Peninsula zone there is a maximum of 200 vehicle movements per site per day, and no more than 5% of these vehicle movements are heavy vehicle movements	Site is not in this zone.	N/A
1a(iii)	Within the BTZ – Business Tamahere zone, COMZ – Commercial zone, TCZ – Town centre zone or LCZ – Local centre zone there is a maximum of 300 vehicle movements per site per day, and no more than 15% of these vehicle movements are heavy vehicle movements	Site is not in this zone.	N/A
1a(iv)	Within the GRUZ – General rural zone: (1) There is maximum 200 vehicle movements per site per day and no more than 15% of these vehicle movements are heavy vehicle movements; (2) For activities directly associated with horticulture harvesting, a maximum of 300 vehicle movements per site per day for up to a month, once in a 12-month period and no more than 33% of these vehicle movements are heavy vehicle movements; or (3) Within the Agricultural Research Centres identified on the planning maps as a specific	Site is expected to exceed 15% HCV threshold Refer section 5	Non-compliance

	controls there is maximum 3000 vehicle movements per site per day		
1a(v)	Within the GIZ – General industrial zone and HIZ – Heavy industrial zone (excluding the Huntly Power Station and Huntly Quarry site): (1) Maximum 250 vehicle movements per site per day and no more than 15% of these vehicle movements are heavy vehicle movements	Site is not in this zone.	N/A
1a(vi)	From the Huntly Power Station site as shown as the HIZ – Heavy industrial zone on the planning maps: (1) All vehicle movements generated from all activities on the site combined (including those movements which were lawfully established prior to 5 December 2012), there is a maximum 750 vehicle movements per site per day; and (2) Maximum 300 of these vehicle movements are heavy vehicle movements	Site is not in this zone.	N/A
1a(vii)	From the Huntly Quarry site: (1) All vehicle movements generated from all activities on the site combined (excluding those movements which were lawfully established prior to 5 December 2012), there is maximum 350 vehicle movements per site per day; and (2) No more than 150 of these vehicle movements are heavy vehicle movements, increasing to 200 once the Huntly Bypass section of the Waikato Expressway is open for public use	Site is not in this zone.	N/A
1a(viii)	From the Pokeno Traffic Overlay the maximum number of vehicles per day must be no more than 1200 (including those that were previously established prior to January 2022) and no more than 420 of these movements can be heavy vehicles, provided that: (1) No more than 250 vehicle movements are generated from Record of Title 614850 (or any allotments subsequently created from that title) and of those 250 vehicle movements no more than 15% can be heavy vehicles; and (2) All vehicle movements must access to and from McDonald Road.	Site is not in this zone.	N/A
1a(ix)	Within PREC27 and PREC28 of the TKAZ – Te Kowhai airpark zone there is a maximum 250 vehicle movements per site per day and no more than 15% of these vehicle movements are heavy vehicle movements	Site is not in these zones.	N/A
1a(x)	Within PREC29 and PREC30 of the TKAZ – Te Kowhai airpark zone there is a maximum of 30 vehicle movements per site per day and no more than 4 of these vehicle movements are heavy vehicle movements except:	Site is not in these zones.	N/A
1a(xi)	Movement restrictions do not apply if the activity is an event or promotion (including temporary events) in PREC29 or a community facility in PREC29	Site is not in this zone.	N/A
1a(xii)	From the Horotiu Industrial Park does not exceed 15.4 trips/ha gross land area/peak hour	Site is not in this zone.	N/A
1a(xiii)	Within the KLZ – Kimihia Lakes zone there is a maximum of 850 vehicle movements per hour and no more than 15% of these vehicle movements are heavy vehicle movements	Site is not in this zone.	N/A
TRPT-R5: Operation, maintenance and minor upgrading of existing public roads, State Highways and associated road network activities			

1a(i)	The works occur within the road reserve or railway corridor	No works proposed	N/A
1a(ii)	Works within the road or railway corridor must be for the purpose of: (1) Maintaining or improving effectiveness or efficiency consistent with the function of the existing public road or railway corridor; or (2) Maintaining or improving safety for road users or adjacent properties	No works proposed	N/A
1a(iii)	Lighting shall be designed and located to comply with the Australia New Zealand Roading Lighting Standard 1158, (series) – Lighting for Roads and Public Spaces: 2005	No works proposed	N/A
1a(iv)	Any earthworks must comply with Rule AINF-R8	No works proposed	N/A
1a(v)	New trees must be planted at least 1.5m from underground services, or 1m with a root protection barrier approved by the relevant network utility operator.	No works proposed	N/A
TRPT-R6: New public roads, including where the road has been identified on the planning maps as an indicative road, and associated road network activities			
1a(i)	The public road is located within road or unformed road as shown on the planning maps	No new roads proposed or identified on the planning maps	N/A
1a(ii)	The public road is not located within an Identified Area	No new public roads proposed.	N/A
1a(iii)	The design requirements of Tables 12 or 13 based on their function within the Road Hierarchy as set out in Table 4 – Functions of roads within the Road Hierarchy, except: (1) Any National routes or Regional arterial roads shall be subject to Rule TRPT-R6(2); (2) The specified minimum Road/right of way reserve widths in Tables 12 or 13 do not include any additional width required for a turning head; (3) Any private access, right of way or access allotment over 70m in length must be constructed to be in accordance with the highest dimensions required for an access allotment in Tables 12 or 13; and (4) The requirements of Tables 12 or 13 shall not apply to taxiways within the TKAZ – Te Kowhai airpark zone	No new public roads proposed.	N/A
1a(iv)	Within road or unformed road located within the Tamahere RLZ – Rural lifestyle zone, all roads must:	No new public roads proposed.	N/A
1a(v)	Comply with the minimum widths specified in Figure 12; and	No new public roads proposed.	N/A
1a(vi)	Have swale drains on both sides of the carriageway capable of collecting all road runoff and overland flow towards the road or right of way from a 20% Annual Exceedance Probability event; and	No new public roads proposed.	N/A
1a(vii)	In areas of poorly-drained soils, either the stormwater is to be directed to areas with higher infiltration, or infiltration systems are to be constructed	No new public roads proposed.	N/A
1a(viii)	Within road or unformed road located within the RPZ – Rangitahi peninsula zone, the relevant access and road requirements of the Rangitahi Structure Plan take priority over the standards in Table 12 or 13 in the event of any conflict	No new public roads proposed.	N/A
1a(ix)	The road connection between Wayside Road and Travers Road comprising the extension of Bragato Way, Te Kauwhata	No new public roads proposed.	N/A

1a(x)	All roads and vehicle accesses shall be constructed in accordance with Table 12 and Figures 14, 15 and 16	No new public roads proposed.	N/A
1a(xi)	Stormwater collection must be through grassed swales prior to reaching reticulated systems	No new public roads proposed.	N/A
1a(xii)	Any earthworks must comply with Rule AINF-R8	No new public roads proposed.	N/A
1a(xiii)	New trees must be planted at least 1.5m from underground services, or 1m with a root protection barrier approved by the relevant network utility operator	Landscaping to be assessed by others.	N/A
TRPT-R8: Off-road pedestrian walkways and cycleways, being sections of the public walkway and cycleway network that are not located within the road network			
1a(i)	Have a minimum 2.0m width or 2.5m where alongside an arterial road or forming a shared path	No off-road footpaths or cycleways proposed.	N/A
1a(ii)	Are formed	No off-road footpaths or cycleways proposed.	N/A
1a(iii)	Any earthworks must comply with Rule AINF-R8	No off-road footpaths or cycleways proposed.	N/A
1a(iv)	Are not located within an Identified Area	Site is not in these areas.	N/A
TRPT-R9: Stock underpasses			
1a(i)	Any earthworks must comply with Rule AINF-R8	No stock underpasses proposed.	N/A
1a(ii)	Are not located within an Identified Area	Site is not in these areas.	N/A
TRPT-R10: Esplanade reserves and strips where a road is stopped			
1a	Where land comprising a stopped road or any part of a stopped road adjoins:	No esplanade reserves or stopped roads within the vicinity of the site.	N/A
1a(i)	The mark of mean high water springs of the sea	Site is not in these areas.	N/A
1a(ii)	The bank of any river with an average width of 3m or more	Site is not in these areas.	N/A
1a(iii)	The margin of any lake with an area of 8 hectares or more Section 345(3) of the Local Government Act 1974 and section 118 of the Public Works Act 1981 will apply only where the land comprising the stopped road or part of the stopped road is identified	Site is not in these areas.	N/A
1a(iv)	In APP7 – Esplanade priority areas	Site is not in these areas.	N/A
1a(v)	On the planning maps as requiring an esplanade reserve, esplanade strip or access strip to be set aside	Site is not in these areas.	N/A
TRPT-R11: Buildings and structures within a road/rail level crossing sight triangle			
All Zones	**(1) Activity status: RDIS** **Activity-specific standards:** Nil. **Council's discretion is restricted to the following matters:** (a) The extent to which the safety and efficiency of rail and road operations will be adversely affected. (b) The outcome of any consultation with KiwiRail; and (c) Any characteristics of the proposed use that will make compliance unnecessary.	No level crossings within the vicinity of the site.	N/A

The assessment has identified one rule where compliance is not achieved. This pertains to traffic generation whereby more than 15% of vehicles generated from the site being heavy vehicles. The increase in heavy vehicle movements is mitigated by inclusions of the HVIF as discussed in section 5.6 of this report.

8.2 Waipa District Plan

An assessment of the proposed development has been undertaken against the relevant transportation rules in Section 16 of the Waipa DP, including access-related aspects. This is provided in Table 7 below.

TABLE 7: WDP ASSESSMENT

Rule	Requirement	Proposed	Compliance
Road Hierarchy			
16.4.2.1	All structure plans, plan changes, developments, and subdivision must be consistent with the road hierarchy, as contained in Appendix T5.	No changes to road hierarchy are proposed.	N/A
16.4.2.2	To maintain the effectiveness of the road hierarchy, a road network must be designed so that a road connects to a road at the same level in the hierarchy, or directly above or below its place in the hierarchy	No road network additions are proposed	N/A
16.4.2.3	To maintain the effectiveness of the road hierarchy, when a site has two road frontages, vehicle access and egress must be from the lesser road type	Access proposed to road with higher status following MCA analysis as the safer option.	Non-compliance
Vehicular Access to Sites in All Zones			
16.4.2.4	Every site shall be provided with vehicle access to a formed road that is constructed to a permanent standard. The vehicle access shall be designed to accommodate the demands of all traffic from the activity on that site, taking into account the form and function of the road.	Site access is provided to a formed road.	Complies
Vehicle Entrance Separation from Intersections and Other Vehicle Entrances			
16.4.2.5	The minimum distance of a vehicle entrance (accessway) from an intersection or other entrance shall be as follows. Values K, M and N are 200m, 60m, and 200m respectively for the site as the frontage road speed limit is 100km/hr	No intersections within 200m however existing residential access located 117m to the southeast. Refer section 6 of this report	Non-compliance
Vehicle Entrance Separation from Railway Level Crossings			
16.4.2.6	New vehicle access ways shall be located a minimum of 30m from a railway level crossing.	No level crossings are near the site.	Complies
Minimum Sight Distance Requirements for a Railway Level Crossing			
16.4.2.7	Any buildings, structure or land use shall be located to comply with the minimum rail level crossing sightline requirements within Appendix T2.	No level crossings are near the site.	Complies
Vehicle Access to Compact Housing Development			
16.4.2.8	Compact housing development must only have one access point to a strategic road	No housing proposed	N/A
Vehicle Access to Sites in the Industrial Zone			
16.4.2.12	Where a site has a frontage greater than 50m to a road which is not a State Highway or a major arterial road, two vehicle crossings will be allowed from that road, subject to the requirements of Rule 16.4.2.5.	Only one vehicle crossing is proposed	Complies
Parking, Loading and Manoeuvring Area			

16.4.2.13	All activities that involve the erection, construction or substantial reconstruction, alteration or addition to a building on any site, or changes the use of any land or building, shall provide loading/unloading spaces for vehicles on the site as set out in Appendix T1. If parking is provided in the Residential Zone: (a) One of the car parks allocated to a single dwelling may be stacked (i.e. located in such a way that it cannot be accessed directly from the associated access or manoeuvring area) provided that the stacked car park does not: (i) Encroach on or interfere with any shared access on the site; or (ii) Encroach on any required building setback, side boundaries, or outdoor living area; or (iii) Compromise the ability for any vehicle to manoeuvre within the site	Refer to Section 7 of this report.	Can Comply
16.4.2.14	Vehicle parking (if provided), loading/unloading, and manoeuvring areas shall: (a) Not encroach on any setback, outdoor living area, or bicycle parking spaces; and loading/unloading areas and manoeuvring areas shall not encroach over vehicle parking spaces; and (b) Be designed, formed, and constructed to ensure that the surface of the required area provides a dust free environment; and (c) Provide for the safe and efficient disposal of surface stormwater clear of any adjoining access or road surface in a way that does not result in ponding or scouring; and (d) Be constructed to accommodate the anticipated use of the area by all traffic likely to access the site in the zone in which it is located, including construction traffic taking into account pavement, surfacing, demarcation of spaces, aisles and circulation roads; and (e) Be provided on the site on which the building, activity or proposal is located, except where the provisions of Rules 16.4.2.15 and 16.4.2.16 apply.	Refer to Section 7 of this report.	Can Comply
Exemption for On-Site Vehicle Manoeuvring Areas in the Residential Zone			
16.4.2.15	On front or corner sites in the Residential Zone, on-site vehicle manoeuvring areas may be exempt from Rule 16.4.2.14(e) and shall not be required where: (a) The site contains a single, primary dwelling; and (b) The garage doors, or vehicle entrance to the carport faces the road where the vehicle will access (refer to diagram following Rule 16.4.2.16); and (c) The distance between the garage door, or vehicle entrance to the carport and the road boundary on the site is no more than 12m (refer to diagram following Rule 16.4.2.16); and (d) The driveway does not encroach on any minimum outdoor living area as required under Rule 2.4.2.19 or road boundary setback other than at the vehicle entrance.	Exemptions not required	N/A
16.4.2.16	On sites in the Residential Zone with access to a right of way, manoeuvring may occur in the right of way and sites may be exempt from Rule 16.4.2.14(e) where: (a) The site contains a single, primary dwelling; and (b) The garage doors, or vehicle entrance to the carport face the right of way where the vehicle will access; and (c) The distance between the garage door, or vehicle entrance to the carport and the site boundary with the right of way is no more than 12m; and	Exemptions not required	N/A

	(d) The driveway does not encroach on any minimum outdoor living area as required under Rule 2.4.2.19; and (e) Rights over the right of way shall be apportioned so as to provide legal access to all sites for the purposes of vehicle manoeuvring; and (f) The right of way shall be of sufficient dimension to provide for a vehicle manoeuvring area of a standard adequate to accommodate a 99.8 percentile car, in order to ensure that all vehicles have the ability to access the adjoining road in a forward direction after no more than a three point turning manoeuvre on the site.		
16.4.2.17	The design and layout of sites shall ensure that access to each required loading and unloading space, or parking space if provided is directly from the required access or manoeuvring area.	Site not in residential zone	N/A
16.4.2.18	Vehicle manoeuvring areas loading and unloading spaces, and if provided, parking spaces, including those spaces located in a garage, shall be provided on a site, of a standard adequate to accommodate a 99.8 percentile car, or a 99 percentile truck, in order to ensure that all vehicles have the ability to access the adjoining road in a forward direction after no more than a three point turning manoeuvre on the site, except where Rule 16.4.2.16 applies.	Site not in residential zone	N/A
16.4.2.19	All car parks (if provided) shall be marked or delineated on site, except in the Residential Zone and in the St Peters School Zone.	Site not in residential zone	N/A
Car Park Landscaping and Lighting			
16.4.2.20	Other than in the St Peters School Zone, all car parks must: (a) Provide at least one tree planted for every 5 car parking spaces at a grade of no less than PB95. For the avoidance of doubt, PB95 is equivalent to a tree that is at least 1.5m tall at the time of planting; and (b) Ensure lighting is designed to avoid shading areas or isolating areas of public use.	Landscaping and lighting to be assessed by others	Can Comply
Provision of Bicycle Parking Facilities			
16.4.2.24	In areas other than the Rural Zone and Pedestrian Frontages, activities employing more than ten people must provide bicycle parking facilities at a rate of one bicycle park for every ten people employed	Site located in Rural zone	N/A
Provision of an Integrated Transportation Assessment			
16.4.2.25	A Simple or Broad Integrated Transport Assessment (ITA) shall be prepared for activities as required by this rule. A Simple ITA is required for a development generating more than 250 'car equivalents' onto a Local Road	This report is a Simple ITA.	Complies

The assessment has identified two areas of non-compliance, the first pertaining to the provision of access to the higher order road, Cambridge Road and the second pertaining to separation distance between accesses. The first non-compliance pertaining to access to the higher order road, Cambridge Road, is proposed following a detailed MCA analysis, agreed to by both Waikato DC and Waipa DC as an acceptable approach for access suitability, which has determined this location to be the most appropriate. The effect of this non-compliance is not expected to result in any material adverse transport effects.

The second non-compliance pertaining to separation distance relates to an existing residential vehicle crossing located some 117m southeast of the proposed quarry access. However, it is noted that the

existing residential crossing is to be closed upon the quarry access becoming operational, with the residential access being redirected through the quarry access, thus removing the non-compliance.

9 Conclusion

It is proposed to develop approximately one third of the existing 154ha land area of Whakanui Stud, into a 54Ha sand quarry operated by Shaws Quarries Ltd. The quarry is expected to have a total yield in the order of 3,000,000m^3 over its lifetime. For the purposes of this assessment, a peak annual extraction rate of 600,000m^3 has been assessed.

The quarry is expected to generate an average of 54 HCV movements per day over its lifetime with a peak of 135 HCVs per day based on an annual extraction rate of 600,00m^3. Due to the increased HCV movements to the road network, an HVIF has been calculated at a rate of $0.022 per tonne of sand excavated from the site of which $0.0005 would go to Waikato DC and $0.0215 to Waipa DC. The HVIF mitigates the effect of additional trucks on pavement structures.

It is proposed to establish a new vehicle access to Cambridge Road, a local road within the jurisdiction of Waipa DC. The new access has been designed to accommodate two-way simultaneous flow of trucks and incorporates a right turn bay to minimise network effects and promote continued safe operation. The location of the access has been selected to minimise time trucks spend on the roads while also ensuring that sufficient separation to other vehicle crossings, intersections and other utility infrastructure is achieved.

One non-compliance was identified within the transportation provisions of the WDPOiP relating to the proportion of heavy vehicles from the site exceeding 15% of total site movements. HCV movements within the jurisdiction of Waikato DC are expected to occur only within a 400m section of Cambridge Road north of Racecourse Road, immediately prior to SH1. No HCV movements are expected along Hooker Road unless the destination site is within the area bound by SH1, SH21 and the Waikato River. This is recommended to be managed by way of consent condition. It is also noted that the effects associated with heavy vehicle movements are mitigated through the inclusion of the Heavy Vehicle Impact Fee (HVIF).

Two non-compliances were identified within the transportation provisions of the Waipa DP relating to the provision of the access to the higher order road, that of Cambridge Road and separation distance between accesses. This access location has been chosen following a detailed MCA which has been agreed through both Waikato DC and Waipa DC as an appropriate methodology for ascertaining an appropriate access location. The MCA identified the proposed location on Cambridge Road as being the most appropriate of those assessed. It is considered unlikely that this non-compliance will result in any material adverse transport effects given the unobstructed sightlines and provision of a right turn bay.

The second Waipa DP non-compliance pertaining to separation distance relates to an existing residential vehicle crossing located some 117m southeast of the proposed quarry access. However, it is noted that the existing residential crossing is to be closed upon the quarry access becoming operational, with the residential access being redirected through the quarry access, thus removing the non-compliance.

As such, it is concluded that there are no traffic engineering or transport planning reasons to preclude approval of the proposed development.

CKL

Appendix A - Multi-Criterial Analysis

Planning | Surveying | Engineering | Environmental

Our Ref: B25065

26 February 2026

Madi Lawdry
Mitchell Daysh Ltd

Issued via: madison.lawry@mitchelldaysh.co.nz

Dear Madi

Transportation Assessment - 310 Hooker Road, Cambridge

We are pleased to provide the following transportation advice assessing the access effects of a proposed sand quarry located at 1466 Cambridge Road, Cambridge (the site). The site is located across the District Council boundaries of both the Waikato District Council (Waikato DC) and Waipa District Council (Waipa DC) which bisects the site along the Banks Road corridor.

The purpose of this assessment is to provide a comparison of two possible access arrangements into the site:

- Option 1 – off Hooker as per ITA
- Option 2 – off Cambridge Road as an alternative

Location and Form of Access

For the purposes of this assessment, the access location on Hooker Road is presented as Option A and the access location on Cambridge Road is presented as Option B. The indicative access locations are shown in Figure 1 overleaf.



Figure 1: Assessed Access Locations

- **Option A (Hooker Road)** is a standard vehicle crossing designed to accommodate tracking of large vehicles.
- **Option B (Cambridge Road)** is a full T-intersection with a right-turn pockets and diverge tapers designed for 110km design speed.

Assessment Methodology

The key element of the assessment was a multi-criteria analysis (MCA) that objectively compared the relative performance of the two access options against defined criteria covering compliance, safety, operations, constructability, approvals, and amenity factors. The MCA categories were assigned weightings to reflect the priorities of the assessment. Detailed MCA criterion / analysis is provided attached. It is noted that for the purposes off assessment, constructability was considered separately except for impact on general traffic as it is more relevant to the investor than to the road controlling authority.

For the safety assessment of the proposed new intersections, a Safe System-oriented intersection risk evaluation was undertaken. This approach considers core risk elements of exposure, likelihood and severity in line with Austroads' Safe System Assessment Framework[1]. In this framework, exposure reflects traffic volumes, likelihood considers the probability of a crash given the exposure, and severity considers the expected outcome if a crash occurs, thereby aligning with Safe System principles for intersection safety evaluation. Indicative thresholds for ratings are provided in the guideline. Severity was based on the survivable speed charts for various types of impact.

For the existing Hooker Road / Cambridge Road intersection, the NZTA High-Risk Intersections Guide (HRIG) [2] was used to calculate the current DSI risk based on the recorded crash history. The observed DSI equivalents were lower than what the standard prediction model would suggest for an average intersection of this type, indicating the site is performing better than average.

[1] Research Report AP-R509-16
[2] https://www.nzta.govt.nz/resources/high-risk-intersections-guide

Constructability	3	3
Approvals	3	3
Amenity	2	2
Total	44	44

Table 3: MCA (Sensitivity Test) Summary Score

Access Option	MCA Score
Option A	145 / 220 (66%)
Option B	159 / 220 (72%)

Option B achieves a higher overall weighted score across the MCA, including under the compliance-focused sensitivity weighting. While it departs from strict arterial access hierarchy principles, the safety and operational assessments consistently favour Option B.

Discussion and Limitations

The multi-criteria assessment involves professional judgement in assigning weightings and individual criterion scores. The weightings were selected to reflect the relative importance of compliance, safety, operations and network effects from a transport planning perspective, and were developed by two experienced transportation engineers. Notwithstanding this, the process remains inherently subjective.

To address this, sensitivity testing was undertaken by applying an alternative, compliance-focused weighting set. While the overall margin between options changed slightly, the relative ranking of the options remained consistent. The overall preference is therefore not dependent on a single weighting assumption and is also supported by the DSI risk assessment.

Yours sincerely



Jan Franta
Principal Transportation Engineer

CKL Planning | Surveying | Engineering | Environmental

Attached:

- Multi-Criterial Analysis
- Crash Estimation (Product of Flow) using NZTA HRIG

As a result, rather than relying solely on the raw model outputs (which would likely overestimate risk), a proportional adjustment factor was applied to the predicted future DSI values so they better reflected the observed performance of the intersection. The DSi calculations are also provided in the attachments. This approach was used to assess the comparative change in risk factors between additional turning movements at the intersection versus additional through movements at the intersection, relevant to Options A and B respectively.

Key Findings

Following analysis of both options, assessment indicates a minor overall preference towards the revised access location Option B, located on Cambridge Road. The overall scores are summarized in Table 1 below:

Table 1: MCA Summary Score

Access Option	MCA Score
Option A	148 / 220 (67%)
Option B	163 / 220 (74%)

Option A (Hooker Road access) aligns better with road hierarchy principles, as access is taken from a lower-classified road. However, it is located in close proximity to the Hooker Road / Cambridge Road intersection and increases traffic loading at that node. This results in greater turning complexity, higher interaction with active modes, and a marginally higher overall DSI risk compared with Option B.

Option B (Cambridge Road access) departs from strict hierarchy intent by introducing direct access to an arterial road. However, this option benefits from improved intersection spacing, stronger sight distance, reduced turning movements through the Hooker Road / Cambridge Road intersection, and more direct heavy vehicle routing. From a safety perspective, both the Safe System assessment and DSI analysis indicate a slightly lower overall collective risk relative to Option A.

Sensitivity Testing

Sensitivity testing was undertaken to check whether the MCA outcome was sensitive to the choice of weighting. The primary weighting set was intentionally safety-led, reflecting that intersection safety risk and crash harm outcomes were the key decision drivers for the assessment. A second weighting set was then tested with a stronger emphasis on compliance factors (road hierarchy and access spacing), reflecting a more policy-driven Road Controlling Authority perspective. The same scoring was retained for both tests, with only the weightings adjusted, to confirm whether the preferred option remained consistent under different but plausible weighting priorities.

Table 2: Criterion Weighting Summary

Category	Original (Safety-led)	Compliance-Focused Sensitivity
Compliance	10	14
Safety	20	16
Operations	6	6

Category	Criterion	Weight	Option A Score (Hooker Rd)	Weighted Score A	Option A Commentary	Option B Score (Cambridge Rd)	Weighted Score B	Option B Commentary	Note
Compliance	Road hierarchy / lesser road access	**4**	5	20	Complies with lower classified road access intent; Hooker is local road and preferred frontage access.	2	8	Cambridge Road is major arterial; direct access conflicts with hierarchy intent (Waipa DC rule 16.4.3.2)	
Compliance	Intersection separation / spacing	**4**	2	8	~70m to Cambridge intersection; less than 100m (Waikato TRPT Table 1)	4	16	~300m to Racecourse Rd (>200m in Waipa DC rule 16.4.2.5)	
Compliance	Adjacent access separation	**2**	2	4	Adjacent access 60m W (<100m)	3	6	Adjacent access 120m E (<200m), n/a (W)	
Safety	Visibility / Sight Distance	**5**	4	20	Hooker Rd: visibility east ~80m to Cambridge intersection; west >300m; relies on reduced operating speeds near intersection (SISD W = 285m, SISD E = 51.5 for 30km/h calculated using AT PN09 centripetal force formula)	5	25	Cambridge Rd: straight/wide section with good sight distance both ways. SISD = 285m, achievable: 380m(L), 500+m(R)	
Safety	Safe Systems Intersection Rating for new intersection / access	**5**	5	25	Exposure: 1 Likelihood: 2 Severity: 3 Total: 6/48	3	15	Exposure: 3 Likelihood: 1 Severity: 4 Total: 12/48	only considers new intersection, not effects on existing Hooker / Cambridge
Safety	Impact on Death & Serious Injuries risk at Hooker / Cambridge due to increased traffic	**5**	3	15	DSi 0.57(1.51)	4	20	DSi 0.54(1.43)	Using NZTA - high risk intersection rating methodology assessment, refer to attached DSi calculations
Safety	Turning movement complexity	**2**	2	4	A series of turns on arrival with tight tracking at Hooker Rd bellmouth	5	10	Direct access avoids Hooker/Cambridge intersection turns, designed to specific vehicle needs	
Safety	Active mode / PT interaction	**3**	2	6	Bus stops and cycle lane diversion/termination at Hooker/Cambridge intersection increase exposure.	4	12	Further away from bus/cycle conflict node	
Operations	Intersection performance / delay	**4**	4	16	No issues at site access (Hooker Rd), existing intersection of Hooker and Cambridge also has spare capacity	4	16	Does not load Hooker Rd, sufficient capacity on Cambridge	
Operations	HCV routing efficiency	**1**	3	3	Marginally shorter on and off- site towards predominant direction, but more start/stops	4	4	More direct route off-site, only one intersection	Assumed 75% West, 25% East split
Operations	Oversize plant access	**1**	3	3	Potential limitation due to reverse curves and narrow road	5	5	easy access as intersection can be designed accordingly	
Constructability	Extent of works and disruption to traffic during construction	**3**	4	12	Simple vehicle access Minor (stop-go affecting 700 vpd)	2	6	Priority T with a right-turn bay, extent of works over ~320m Moderate (multiple stages affecting 8,000 vpd)	Both works short term, line marking adjustment can probably be done overnight
Approvals	Council approval complexity	**3**	2	6	Hooker within Waikato DC, but Cambridge / Hooker on the border -> need to coordinate 2 councils	4	12	Dealing with Waipa DC only	the site spans Waikato/Waipa jurisdictions increasing coordination needs. Based on Client's information, not my experience
Amenity	Residential / sensitive receptor effects	**2**	3	6	4 dwellings within 100m of access; nearby driveway and constraints noted in ITA	4	8	4 dwellings within 100m, no driveway access	
TOTAL				**148**			**163**		

Constructability	Type of access intersection	**3**	4	12	Simple vehicle access	2	6	Priority T with a right-turn bay	

Constructability	Extent of works	**5**	4	20	Localised works over ~40m + tie in	2	10	~320m of road marking adjustment, est. 50m toe-in wide road works at interface	
Constructability	Need for road widening	**3**	5	15	Not required	4	12	Presumably not required (seal width ~12.8m, required 12.5m)	coarse measurement of aerial, TBC
Constructability	Disruption to traffic during construction	**3**	4	12	Minor (stop-go affecting 700 vpd)	2	6	Moderate (multiple stages affecting 8,000 vpd)	both works short term, line marking adjustment can probably be done overnight
Constructability	Utilities / physical constraints	**2**	3	6	Transformers, power poles, trees	2	4	Trees	
Constructability	Cost	**3**	5	15	Low	3	9	Moderate	
Total				**80**			**47**		

Scenario 1 - Access on Hooker Road, loading Hooker / Cambridge intersection

Hooker / Cambridge intersection			**Product of Flow**	**est average DSi (Fig A5-11)**
Existing Conditions	Cambridge Road AADT avg	7161.5		
	Hooker Road AADT (current)	700	479	1.42
	Hooker Road AADT (with dev)	835	514	1.51
	Factor			**1.06**
Crash History (2020-25)	Total reported crashes	6	over 5 yrs	
	Fatal & Serious	0	crashes	
	Injury crashes	3	crashes	
	Property damage only	3	crashes	
	DSI equivalents (existing)	0.54		
	DSi equivalents (with dev)	0.57	Since observed DSi are less than predicted, we use observed	

Scenario 2 - New Intersection on Cambridge Rd, additional flows on Cambridge

Existing Hooker / Cambridge intersection			**Product of Flow**	**est average DSi (Fig A5-11)**
Existing Conditions	Cambridge Road AADT (current)	7161.5	479	1.42
	Cambridge Road AADT (with dev)	7261.5	481	1.43
	Hooker Road AADT	700		
	Factor			**1.00**
Crash History (2020-25)	Total reported crashes	6	over 5 yrs	
	Fatal & Serious	0	crashes	
	Injury crashes	3	crashes	
	Property damage only	3	crashes	
	DSI equivalents (existing)	0.54		
	DSi equivalents (with dev)	0.54	Since observed DSi are less than predicted, we use observed	

Conclusions:

	Sum of DSi for Hooker/Cambridhge and New Access intersections	
Approach	Scenario 1 (New Access off Hooker)	Scenario 2 (New Access off Cambridge)
DSi eq. for existing & pro-rated	0.57	0.54
DSi calculated	1.51	1.43

ISO 9001 certified
Equal Assurance

Appendix B – Heavy Vehicle Impact Fee

Pavement Levy Calculation - Route 2

54 Total Daily Heavy Vehicle Movements (IN+OUT)

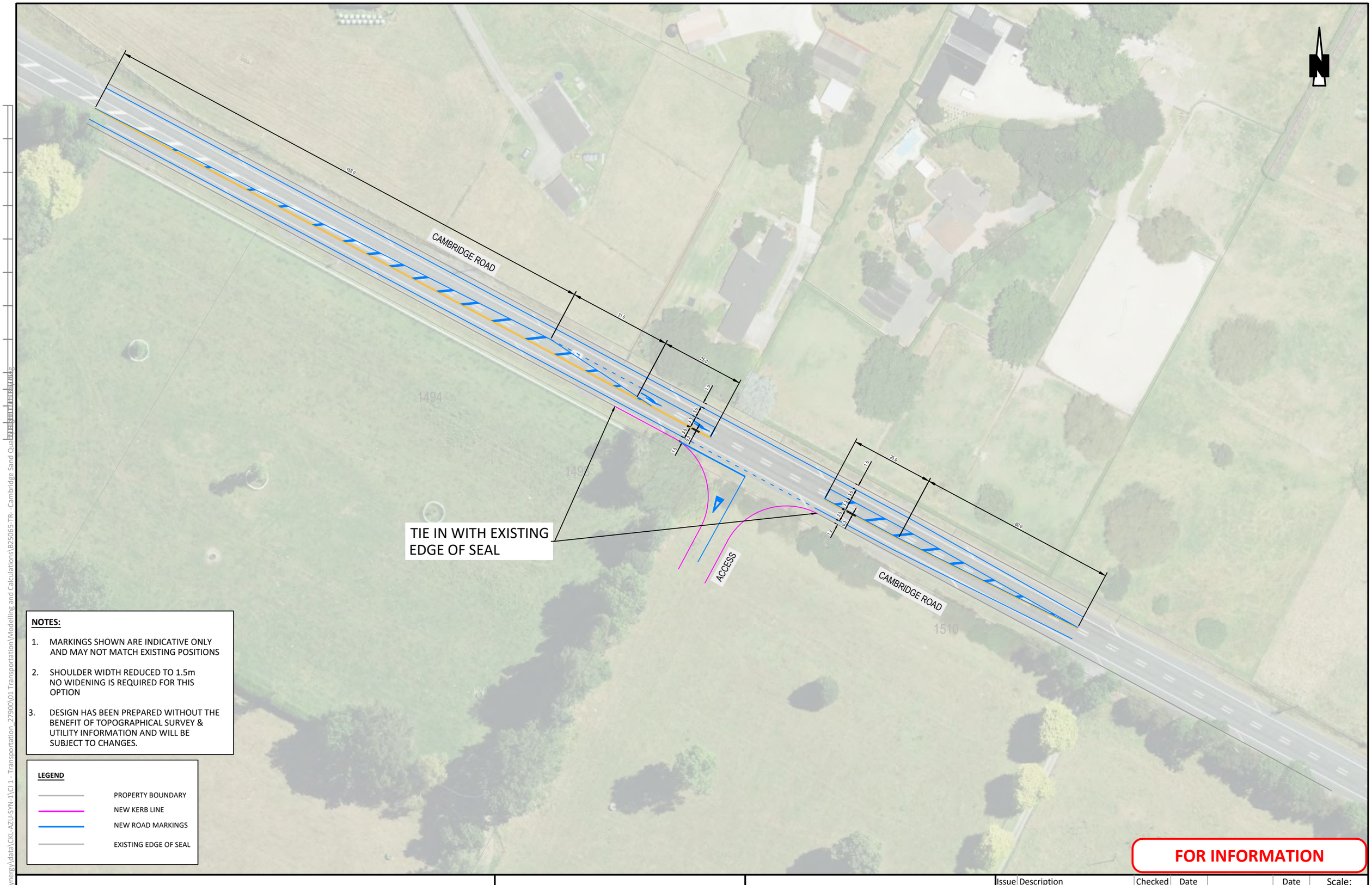
	Existing Traffic		Existing Traffic									Proposed Traffic										$450,000		
Road Section	Current Volume (vpd)	% HCV	Base HCV HCV/day	Length (km)	Direction Factor	Life (yrs)	HVs lane HCV/lane/yr	ESAs/HVAG	NHVAG	ESA/veh	DESA	HCV/day	%Using Route	HCV/day	Direction Factor	Duration (Years)	HVs lane HCV/lane/yr	ESA/HVAG	NHVAG	ESA/veh	DESA	Cost/km	Waikato Financial Cont.	Waipa Financial Cont.
Cambridge Road North	6,145	11%	686	0.44	0.5	40	125,268	0.6	2.4	1.4	7,215,445	54	0%	0	0.5	25	0	1	3.00	3.00	0	$198,000	$0	
Cambridge Road	8,085	7%	580	0.33	0.5	40	105,798	0.6	2.4	1.4	6,093,984	54	75%	41	1.5	25	15,552	2	3.00	6.00	2,304,806	$148,500		$40,752
Camnbridge Road South	9,477	7%	682	2.76	0.5	40	124,528	0.6	2.4	1.4	7,172,800	54	25%	14	1.5	25	5,184	2	3.00	6.00	768,269	$1,242,000		$120,159
Racecourse Road East	2,716	8%	230	1.27	0.5	40	41,930	0.6	2.4	1.4	2,415,188	54	0%	0	0.5	25	0	1	3.00	3.00	0	$571,500		$0
Abergeldie Road	1,516	8%	114	0.83	0.5	40	20,750	0.6	2.4	1.4	1,195,211	54	0%	0	0.5	25	0	1	3.00	3.00	0	$373,500		$0
Taylor Street	1,531	14%	214	0.63	0.5	40	39,117	0.6	2.4	1.4	2,253,151	54	0%	0	0.5	25	0	1	3.00	3.00	0	$283,500		$0
Victoria Road	14,552	8%	1,091	1.3	0.5	40	199,175	0.6	2.4	1.4	11,472,451	54	0%	0	0.5	25	0	1	3.00	3.00	0	$585,000		$0
Peake Road South	1,184	17%	199	1.5	0.5	40	36,301	0.6	2.4	1.4	2,090,963	54	25%	14	0.5	25	1,728	1	3.00	3.00	128,045	$675,000		$38,950
Peake Road North	1,867	15%	271	1.64	0.5	40	49,405	0.6	2.4	1.4	2,845,756	54	25%	14	0.5	25	1,728	1	3.00	3.00	128,045	$738,000		$31,777
Hautapu Road	3,840	36%	1,363	1.5	0.5	40	248,784	0.6	2.4	1.4	14,329,958	54	25%	14	0.5	25	1,728	1	3.00	3.00	128,045	$675,000		$5,978
																							$0	**$237,615**
																						FAR	51%	51%
																						WDC share (49%	$0	$116,431
																								Combined Total
																						Levy per cube	$0.000	$0.039	**$0.039**
																						Levy per tonne	$0.000	$0.022	**$0.022**
																							$0	$121,184	**$121,184**

Pavement Levy Calculation - Route 1

54 Total Daily Heavy Vehicle Movements (IN+OUT)

	Existing Traffic		Existing Traffic									Proposed Traffic										$450,000		
Road Section	Current Volume (vpd)	% HCV	Base HCV HCV/day	Length (km)	Direction Factor	Life (yrs)	HVs lane HCV/lane/yr	ESAs/HVAG	NHVAG	ESA/veh	DESA	HCV/day	%Using Route	HCV/day	Direction Factor	Duration (Years)	HVs lane HCV/lane/yr	ESA/HVAG	NHVAG	ESA/veh	DESA	Cost/km	Waikato Financial Cont.	Waipa Financial Cont.
Cambridge Road North	6,145	11%	686	0.44	0.5	40	125,268	0.6	2.4	1.4	7,215,445	54	75%	41	0.5	25	5,184	1	3.00	3.00	384,134	$198,000	$10,008	
Cambridge Road	8,085	7%	580	0.33	0.5	40	105,798	0.6	2.4	1.4	6,093,984	54	100%	54	1.5	25	20,736	2	3.00	6.00	3,073,075	$148,500		$49,782
Racecourse Road West	1,409	9%	133	2.54	0.5	40	24,324	0.6	2.4	1.4	1,401,085	54	25%	14	0.5	25	1,728	1	3.00	3.00	128,045	$1,143,000		$95,711
Racecourse Road East	2,716	8%	230	1.27	0.5	40	41,930	0.6	2.4	1.4	2,415,188	54	10%	5	0.5	25	691	1	3.00	3.00	51,218	$571,500		$11,868
Abergeldie Road	1,516	8%	114	0.83	0.5	40	20,750	0.6	2.4	1.4	1,195,211	54	10%	5	0.5	25	691	1	3.00	3.00	51,218	$373,500		$15,348
Taylor Street	1,531	14%	214	0.63	0.5	40	39,117	0.6	2.4	1.4	2,253,151	54	10%	5	0.5	25	691	1	3.00	3.00	51,218	$283,500		$6,301
Victoria Road	14,552	8%	1,091	1.3	0.5	40	199,175	0.6	2.4	1.4	11,472,451	54	10%	5	0.5	25	691	1	3.00	3.00	51,218	$585,000		$2,600
Peake Road	1,161	7%	82	0.7	0.5	40	15,041	0.6	2.4	1.4	866,338	54	15%	8	0.5	25	1,037	1	3.00	3.00	76,827	$315,000		$25,659
Peake Road North	1,867	15%	271	0.9	0.5	40	49,405	0.6	2.4	1.4	2,845,756	54	15%	8	0.5	25	1,037	1	3.00	3.00	76,827	$405,000		$10,646
Hautapu Road	3,840	36%	1,363	1.5	0.5	40	248,784	0.6	2.4	1.4	14,329,958	54	15%	8	0.5	25	1,037	1	3.00	3.00	76,827	$675,000		$3,600
																							$10,008	**$221,515**
																						FAR	51%	51%
																						WDC share (49	$4,904	$108,542
																								Combined Total
																						Levy per cube	$0.002	$0.036	**$0.038**
																						Levy per tonn	$0.001	$0.021	**$0.021**
																							$5,104	$112,973	**$118,077**

Appendix C - Concept Vehicle Crossing Design



NOTES:

1. MARKINGS SHOWN ARE INDICATIVE ONLY AND MAY NOT MATCH EXISTING POSITIONS
2. SHOULDER WIDTH REDUCED TO 1.5m NO WIDENING IS REQUIRED FOR THIS OPTION
3. DESIGN HAS BEEN PREPARED WITHOUT THE BENEFIT OF TOPOGRAPHICAL SURVEY & UTILITY INFORMATION AND WILL BE SUBJECT TO CHANGES.

LEGEND

- PROPERTY BOUNDARY
- NEW KERB LINE
- NEW ROAD MARKINGS
- EXISTING EDGE OF SEAL

FOR INFORMATION

CKL
Planning | Surveying | Engineering | Environmental

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CONCEPT DESIGN
SHAW'S QUARRIES LIMITED
1466 CAMBRIDGE ROAD

RIGHT TURN BAY + ACCESS LAYOUT PLAN SHEET 1 OF 2

Issue	Description	Checked	Date
1	CONCEPT DESIGN	JF	01.04.26

		Date
Designed:	AD	01.04.26
Drawn:	AD	01.04.26
Checked:	JF	01.04.26

Scale: **1:1000** (A3 Original)

Job No: **B25065** Dwg No: **1000** Rev: **1**

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CAMBRIDGE ROAD

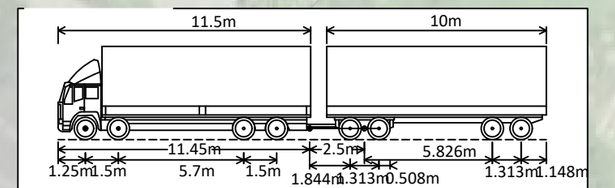
ACCESS

CAMBRIDGE ROAD

1494

1498

1510



Truck - HPMV - 22.0m Truck and Trailer

Overall Length	22.236m
Overall Width	2.550m
Overall Body Height	4.250m
Min Body Ground Clearance	0.373m
Track Width	2.550m
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	43.00°

NOTES:

1. MARKINGS SHOWN ARE INDICATIVE ONLY AND MAY NOT MATCH EXISTING POSITIONS
2. SHOULDER WIDTH REDUCED TO 1.5m NO WIDENING IS REQUIRED FOR THIS OPTION
3. DESIGN HAS BEEN PREPARED WITHOUT THE BENEFIT OF TOPOGRAPHICAL SURVEY & UTILITY INFORMATION AND WILL BE SUBJECT TO CHANGES.

LEGEND

- PROPERTY BOUNDARY
- NEW KERB LINE
- NEW ROAD MARKINGS
- EXISTING EDGE OF SEAL

FOR INFORMATION

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CONCEPT DESIGN
SHAW'S QUARRIES LIMITED
1466 CAMBRIDGE ROAD

RIGHT TURN BAY + ACCESS
VEHICLE TRACKING
SHEET 2 OF 2

Issue	Description	Checked	Date
1	VEHILCE TRACKING	JF	01.04.26

		Date
Designed:	AD	01.04.26
Drawn:	AD	01.04.26
Checked:	JF	01.04.26

Scale: **1:500** (A3 Original)

Job No: **B25065** Dwg No: **1001** Rev: **1**

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