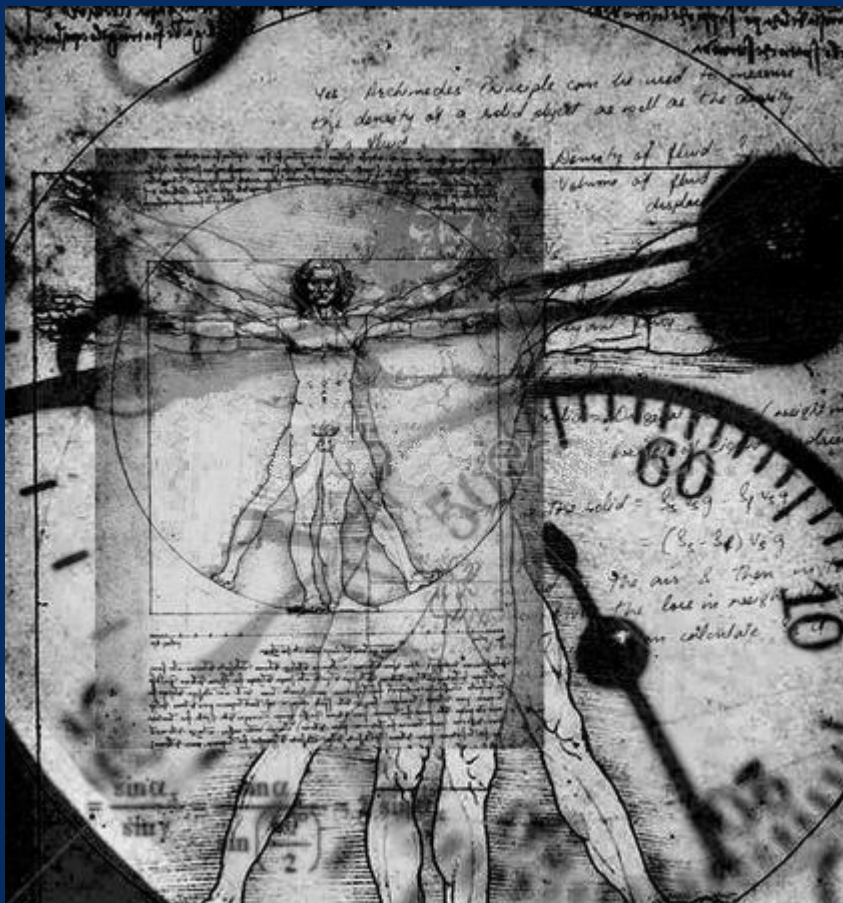




Subdivision for 2 lots – Traffic Report

34 White Swan Road, Mt Roskill, Auckland

16 December 2020



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34 White Swan Road, Mt Roskill, Auckland

1 SUMMARY

This report discusses the traffic-related aspects for the redevelopment of 34 White Swan Road comprising a revised application for a 2-lot residential development on Lot 1 DP 212178. This report is a response to the further information requested by Auckland Council to discuss the implications for the current level of development and determine the impact of the removal of car parking requirements in anticipation of the implementation of the National Policy Statement on Urban Development 2020 (NPS-UD).

The property is located within Mt Roskill that fronts via a shared private access way onto White Swan Road (Primary Arterial Road). White Swan Road is connected to the broader arterial road system; Blockhouse Bay Road in the southwest and Richardson Road in the northeast. The existing driveway is 3.2 m, with an exact width between boundaries of 3.63 m that is shared between existing vehicles and pedestrians.

The transport effects have been assessed against the Auckland Unitary Plan (AUP) requirements in Section E27 apart from the car parking requirements for proposed lot 2. An evaluation found that the reduced parking supply and access driveway meets the AUP requirements for vehicles and pedestrians. Traffic generated by the proposed development is the same as the existing situation and (1vph) is insignificant. A sensitivity test was carried out using the total development potential of all the current consented and unconsented properties that use the shared right-of-way access road from White Swan to the no.34 boundary. The total consented traffic is about eight vph, and most likely maximum traffic generation potential is estimated at 26 vph. Even at the maximum possible development potential of all the rear sites will have a less than minor impact on the traffic system.

The proposed development will have an insignificant effect on the current pedestrian access as traffic volumes is the same as before. The proposed site will provide a minimum 3.5 m access road that includes a 1.2 m pedestrian strip to share between pedestrians from lot 2 and the existing vehicles on Lot 1.

Based on a traffic engineering assessment, we recommend that the development proceed.

2 BACKGROUND INFORMATION

The property is located within Mt Roskill accessed via a shared private access way onto White Swan Road (Primary Arterial Road). White Swan Road is connected to the broader arterial road system; Blockhouse Bay Road in the southwest and Richardson Road in the northeast.

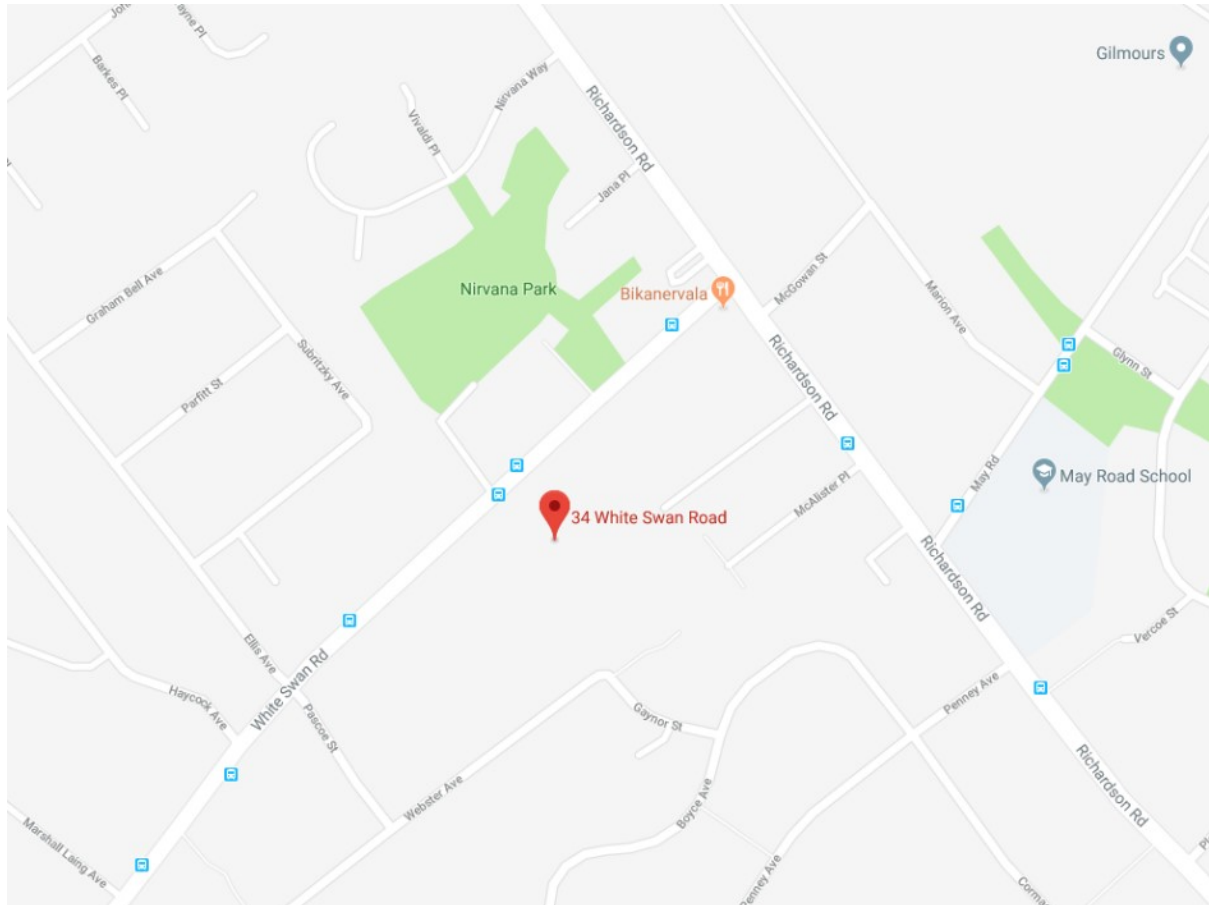


Figure 1: Site location

The proposal is located on a rear site, with a legal description of Lot 1 DP 212178 (Figure 2). It has an existing narrow driveway strip with reciprocal rights of access over neighbouring strips to provide access to White Swan Road. The shared private access way currently serves four existing residential lots. No. 34b has an existing consent to develop into four lots (4 total), and this proposal has an existing dwelling to be subdivided into an additional lot and a four residential unit conversion of the existing dwelling (5 total).

Accordingly, the combined total of established/consented units and this proposal **is eleven residential units** sharing the driveway. There are also unrealised future development opportunities on the remaining single dwelling lots at no. 34A and 36A, but no planned development of these lots are known at this time. However, we estimate that the total development potential is likely to be 26 residential lots/dwellings.

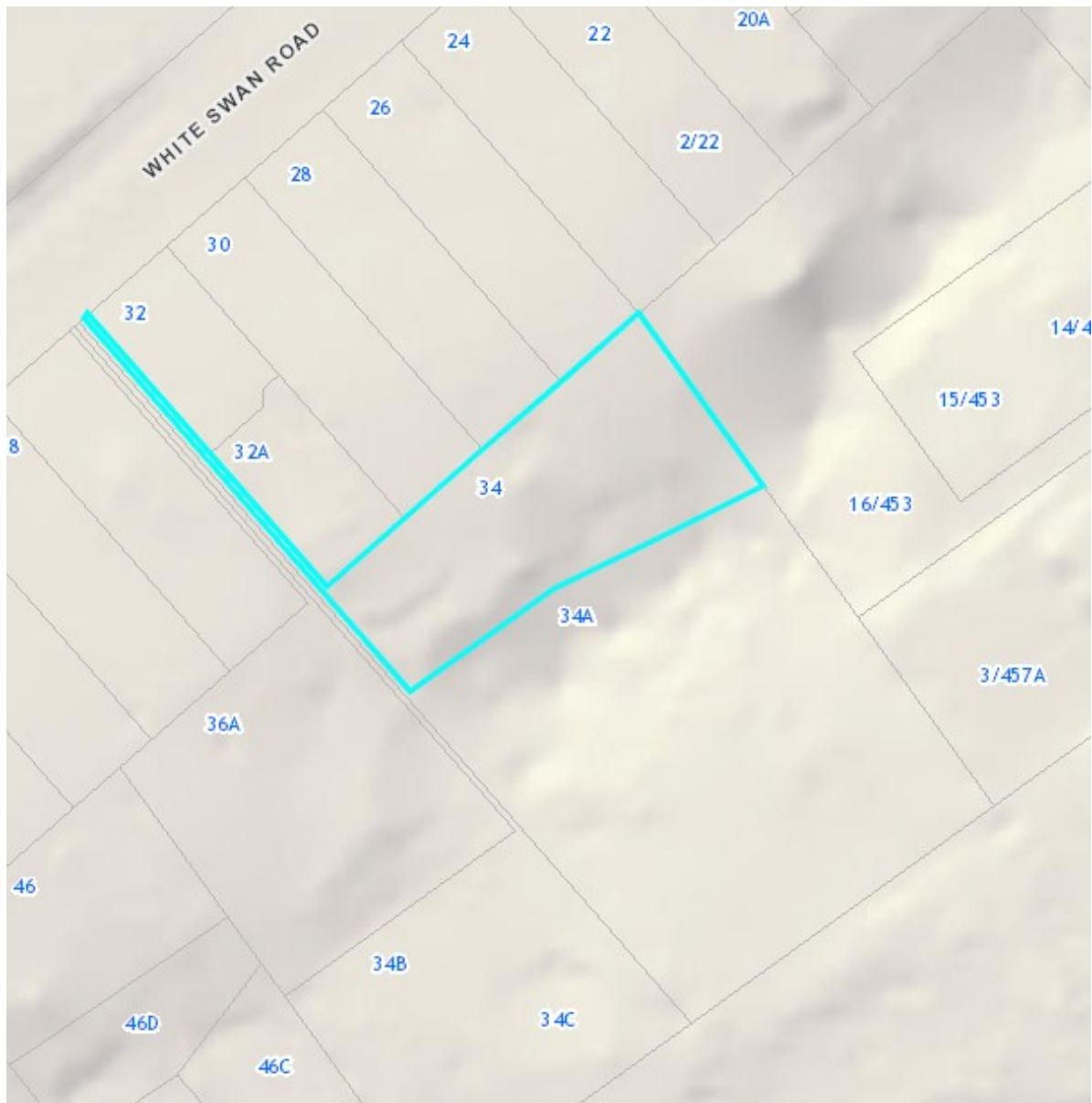


Figure 2: Property layout (Source: Auckland Council GIS – December 2018)

The surrounding roads are of a good standard with the adjoining network reasonably permeable with connections to other collector and arterial roads. Public transport services are within walking distance of the site; New Lynn Rail station is 4.4 km, 50 minutes' walk away or 12 minutes via bus route 68, and the surrounding pedestrian network has surfaced footpaths on both sides of White Swan Road.

The closest arterial-arterial intersection is 300 m to the northeast with Richardson Road and 260 m to Pascoe Road in the southwest. There are no formal pedestrian crossing facilities on White Swan Road. There is an on-road marked bus stop embayment adjacent to and opposite the existing shared access to the site.

The purpose of the Traffic Report is as a traffic effects assessment to an S92 request for further information due to an amended resource consent application to enable redevelopment of

the site with two residential units (total) and to satisfy the AUP requirements under the Resource Management Act (RMA).

The land is zoned as **mixed-housing suburban** within predominant residential zoning.

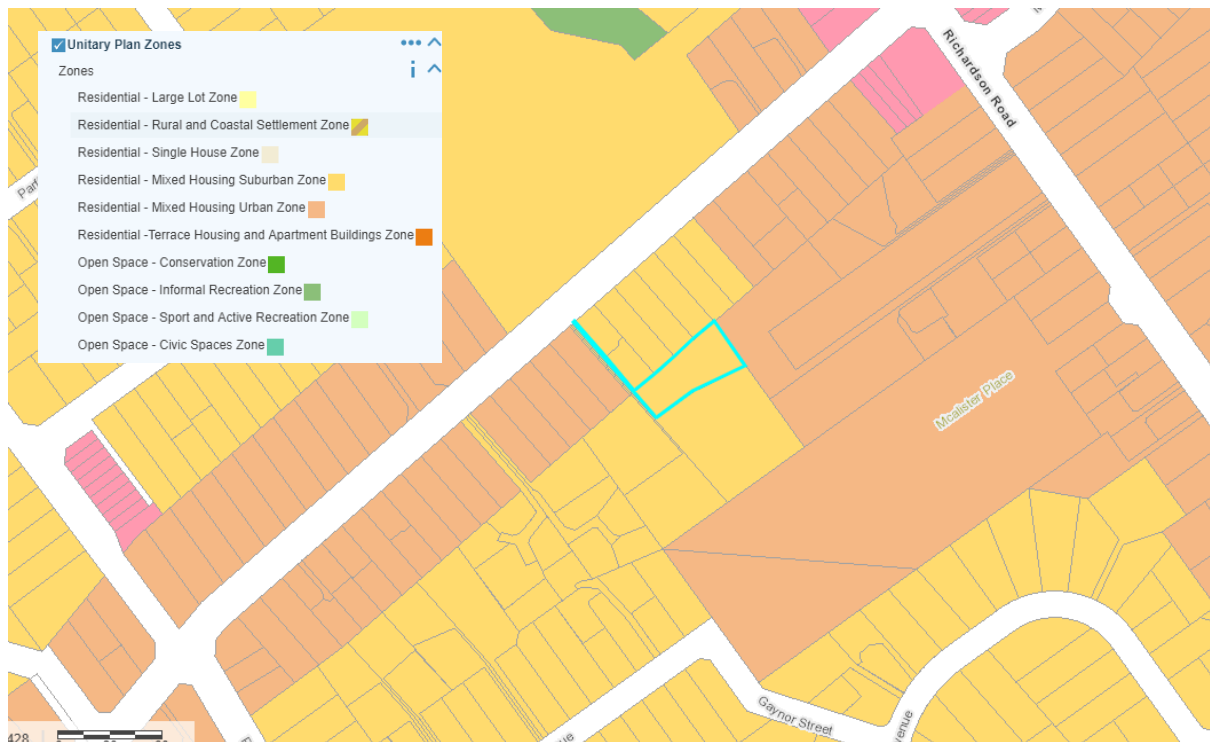


Figure 3: District Plan – Zoning (Source: Auckland Council GIS – December 2018)

Existing consents: The existing consents are described in the Assessment of Environmental Effects report prepared by CLC Consulting Group Ltd.

2.1 EXISTING TRAFFIC CONDITIONS

The estimated traffic volumes from the Auckland Transport counting programme are shown in Table 1. White Swan Road is a 2-way 2-lane road classified as a Primary Arterial Road (AUP) with an estimated medium-high 2-way volume (11,000 – 16,000 vph). The road widens near the signalised intersection at Richardson Road and has right turn slots at the Pascoe Road intersection. The road cross-section is approximate as follows (Figure 4):

- 1.5 m surfaced sidewalks
- 5.4 m lanes in both directions
- On-street parking is permissible

White Swan Road has a posted speed limit of 50 km/h with the highest 2-way flow ($\pm 1,600$) occurring around 5 PM on a weekday. Assuming a conservative 70:30 peak split the estimated peak flow in any one direction could be 1,120 vph. This is close to the mid-block capacity of a single lane with an estimated volume to capacity ratio of 80% ($1,120/1,400$).

Table 1: Auckland Traffic Count Programme 2012 - 2017

Start name	End name	Count date	Peak hour	Count duration	ADT	Peak traffic	% car	% heavy
WIDTH CHANGE (POWERPOLE LHS)	PASCOE ST	2018-07-30	1700	7D	15 823	1 579	97	3

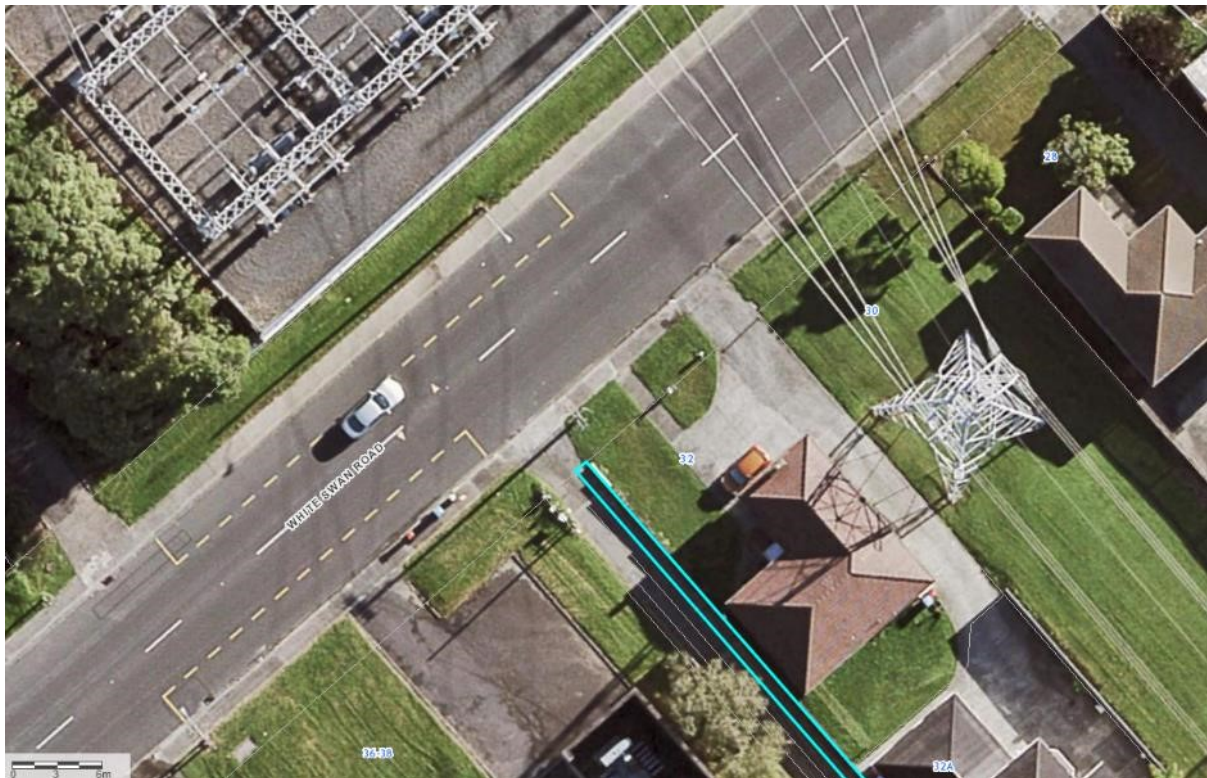


Figure 4: Typical road cross-section

2.2 PARKING

There is on-street parallel parking permissible along both sides of White Swan Road.

2.3 PEDESTRIAN NETWORK

There are well-formed pedestrian facilities on the surrounding roads with 1.5 m surfaced footpaths between the kerb and the boundary on both sides. The closest zebra crossing is 270 m northeast at the intersection with Richardson Road.

2.4 CYCLING

There are no formal cycle facilities marked on White Swan Road or the immediate surrounding roads.

2.5 PUBLIC TRANSPORT

The closest bus service operates along White Swan Road (Figure 5: Bus services) with a marked on-road bus stop on both sides opposite the vehicle crossing. The bus bays can accommodate two buses at the same time on the southern side and three buses on the northern side.



Figure 5: Bus services

New Lynn Rail station is 4.4 km, 50 minutes' walk away or 12 minutes via bus route 68. The CBD is accessible within an 18-minute bus journey.

2.6 CRASH HISTORY

An analysis of the NZTA Crash Analysis database for the period 2013 to 2018 revealed that there was a total of 8 crashes (Table 2), one minor, the rest non-injury. Most crashes (7) occurred when parking and one involved a pedestrian. Environmental factors only accounted for 3 (37%) crashes, and all were midblock crashes.

Table 2: Crash numbers

Year	Fatal	Serious	Minor	Non-injury
2013				1
2014			1	
2015				1
2016				1
2017				3
2018				1
			1 (13%)	7 (87%)

The analysis does not reveal any problem that would be exaggerated by the increase in demand because of the development. The crash analysis statistics are given in Appendix B.

3 THE EFFECT OF THE PROPOSAL

3.1 PROPOSAL DETAILS

A plan prepared by CLC Consulting Group of the future access layout is shown in Figure 6 and also attached in Appendix A. The development of 34 White Swan Road comprises the redevelopment of lot DP 212178 into two lots, the existing dwelling being converted into four apartment units (on Lot 2) and one new residential unit (on Lot 1).

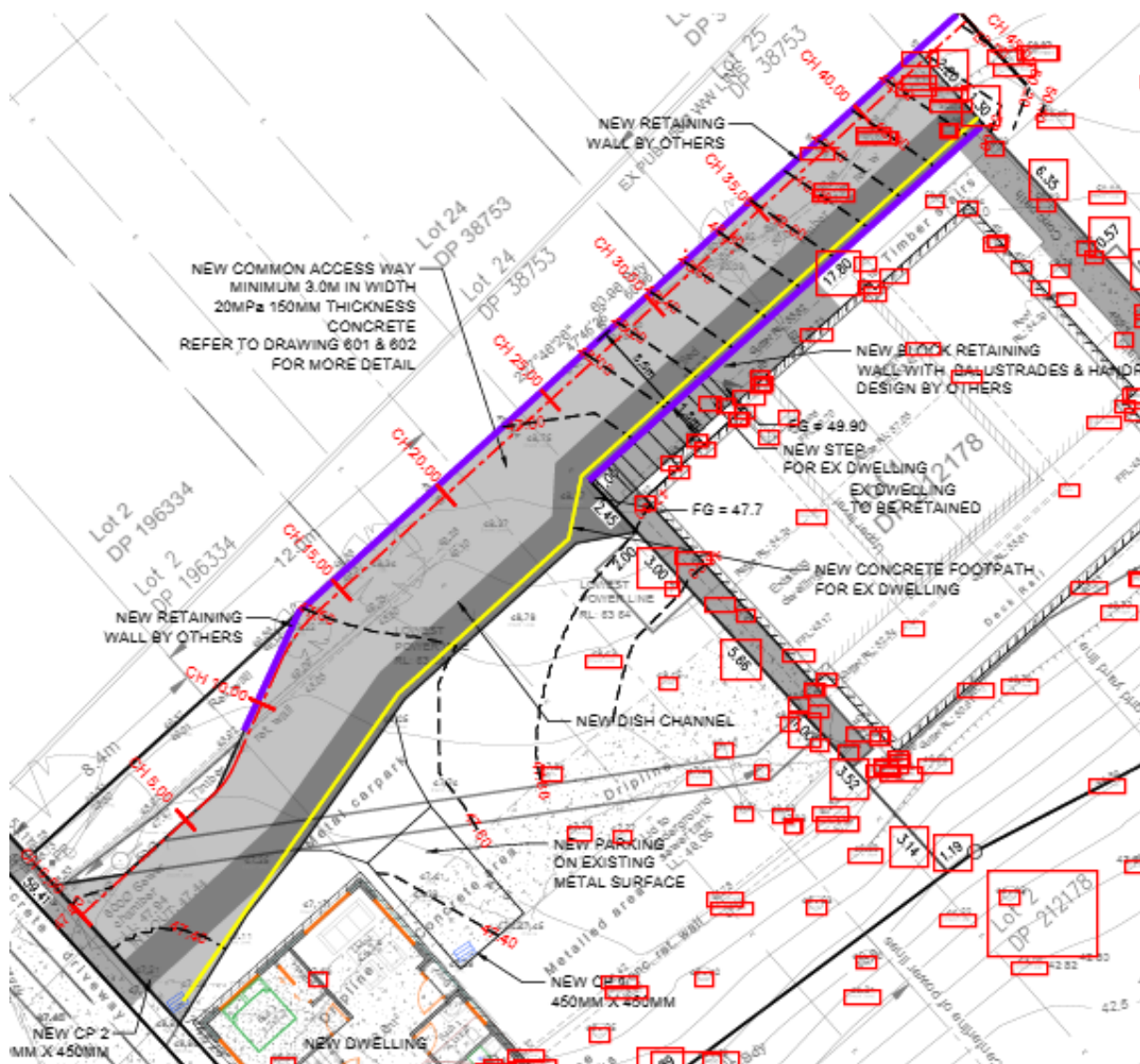


Figure 6: Proposed driveways for the 2-unit residential dwellings

3.2 TRAFFIC GENERATION - AUP- E27.6.1

The proposed five-unit development (i.e. four additional dwellings) does not exceed the development of thresholds (100 units) of section E27.6.1 (T1 or T2). Therefore, the proposal complies with this standard of the AUP.

However, as the shared access driveway to no.34 is a single driveway 3.2 wide and 57 m long to the property boundary, it marginally exceeds the AUP rule (50 m) that triggers the need for a passing bay. The section 127 application seeks to remove the requirement for installing a new passing bay, as no. 34B already has resource consent for a passing bay, that is yet to be constructed. Notably, this passing bay is only in favour of 34B, not any other property served by the driveway. This seems odd that Council accepted this mitigation package for the consented development at 34B.

The s127 application proposes to limit vehicles on the new subdivision by maintaining the status quo parking demand transferring it to the new dwelling and removing all parking for the existing converted dwelling. A queuing assessment was previously carried out at the intersection of White Swan Road and the driveway for the existing baseline conditions. As a sensitivity analysis comparison, we also undertook a queuing analysis for the maximum development potential of all rear properties that use the access driveway to examine the context of the current, proposed, and future impact.

We assessed the queuing and storage required on the access driveway and White Swan Road. The trip generation is based on the New Zealand Trip Database (NZTDB) Table C1 for inner-city, suburban land use. The 50% peak hour trip generation is 1.1, and 85% is 1.2 vph. To be conservative, we used the 85% trip generation value.

Table 3: Trip generation

Address/Site number	Existing trips (vph)	Current consented plus this proposal	Consented + this proposal Trips (vph)	Future possible development	Future Potential Trips (vph)
No. 34 (Applicant's site) 1 dwelling	1.2	1 large dwelling currently This project for one additional dwelling and the existing converted to 4 residential units (comprising 7 bedrooms)	1.2	Assuming the existing house with 4 residential units has one additional shared-vehicle trip with one exclusive vehicle trip from the new dwelling.	2.4
No 34A 1 dwelling	1.2	1 existing dwelling	1.2	Could be redeveloped with an approx. 10-unit yield)	12
No 34B 1 dwelling	1.2	1 existing dwelling but has RC for 4 dwellings	4.8	Has consent for 4 dwellings	4.8
No. 36A 1 dwelling	1.2	1 existing dwelling	1.2	Could be developed with 6 units	7.2
Total peak hour trips	4.8 (5)	7 dwellings	8.4 (8)	22 dwellings	26.4 (26)

Based on Table 3, we have evaluated and reported the queueing conditions at the driveway and White Swan Road using eight peak hour trips (See section 3.9).

3.3 PARKING SUPPLY - AUP E27.6.2

The parking supply compared with the AUP requirements are as shown in the tables below, with Table 4 summarising the requirements of section E27.6.2 however, as noted that the applicant is seeking consent in anticipation of the removal of minimum parking requirements as per National Policy Statement on Urban Development 2020 (NPS-UD).

Table 4: Parking requirement

Activity				Applies to zones and locations specified in Standard E27.6.2(5)	
				Minimum rate	Maximum rate
(T41)	Residential	Residential – Mixed Housing Suburban Zone	Dwellings - Studio	0.5 per dwelling (rounded down to the nearest whole number)	No maximum
(T42)			Dwellings - one-bedroom	0.5 per dwelling (rounded down to the nearest whole number)	No maximum
(T43)			Dwellings - two or more bedrooms	1 per dwelling	No maximum

Table 5 summarises the proposed parking supply

Table 5: Proposed parking supply

Proposed development	AUP Requirement	Proposed	Mitigation measures
3 x two bedrooms or more	1 per unit x 3 = 3	1 car space	Lot 2 is services via high PT proximity or if necessary on-street parking for the 4 units
2 x one bedroom units	0.5 per unit x 2 = 1		
TOTAL	4	1 on-site	3 on-street (if required)

The proposal does not comply with the current AUP parking requirements (before an amendment triggered by the 2020 NPS-UD), but can be mitigated as follows:

3.3.1 ON-SITE PARKING MITIGATION

The proximity and high frequency of public transport service on White Swan Road will serve to mitigate much of the previous need by residents for private vehicle travel. The closest bus stop is adjacent to the vehicle crossing and is within 75 m walking distance from the existing building. The general rule-of-thumb upper limit for walkability to a bus stop is 400 m, with this proposal requiring only a 75 m walk to the bus stop. Therefore, it can be assumed that the uptake will be useful for those residents that prefer public transport modes over private car-based travel modes (Figure 7):

The bus route is an essential connector route (Auckland Regional Public Transport Plan 2018 – 2028) with a weekday peak and interpeak service frequency of 10 minutes, and an evening and weekend service frequency of 20/30 minutes (Table 6).

Table 6: Public transport route service level (RPTP)

Bus services								
Route Descriptions	Network Status	Patronage expectation	Service Category	Year	Time (in minutes) between services			
					Mon-Fri Peak	Mon-Fri Interpeak	Mon-Fri Evening	Weekend Day/Evening
25B - Blockhouse Bay to City Centre via White Swan Rd Dominion Rd and University (Frequency based on Double Decker buses)	Non-discretionary (essential for network function)	High	Frequent	2018				
			Connector	2021				
			Peak	2028				
			School					
	Non-discretionary	High	Local					
			Connector (part of Frequent)	2018				
			Frequent	By 2021	10	10	20	20 / 30
				By 2028	10	10	12	12

White Swan Road can accommodate on-street parking northeast of the vehicle crossing or diagonally across the road on the north-west side in front of the bus stop opposite the electrical substation yard.

The vehicle crossing is close to the electrical substation yard, as shown in Figure 7. There is a 32 m length in front of the substation and 26 m in front of the electrical pylon corridor (marked in yellow shading) which is ample for nine cars without crowding the on-street parking in the front section at number 32, nor impeding the bus stop operations from the on-street bus bays.

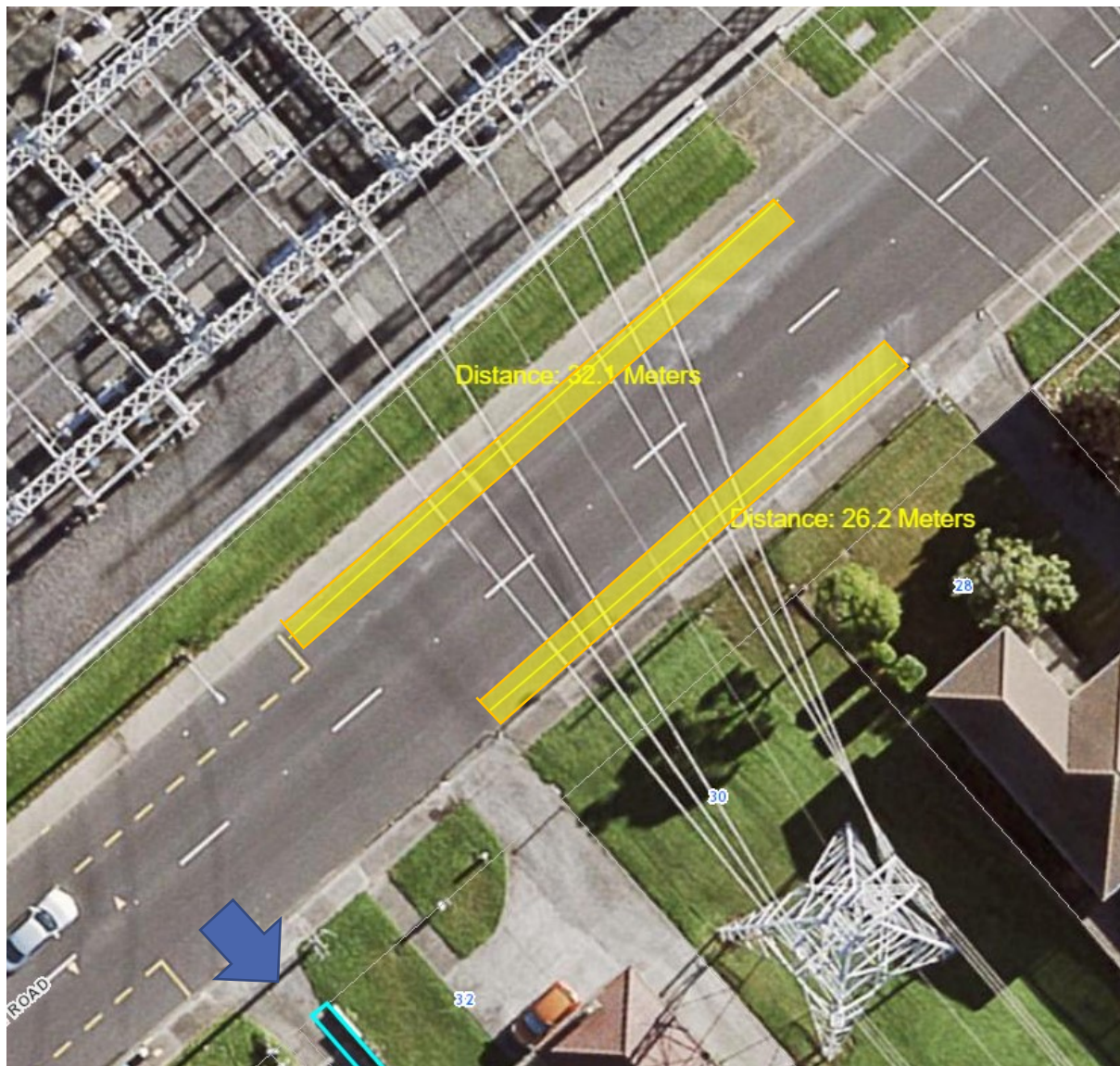


Figure 7: On-street parking capacity

3.3.2 MOBILITY SPACES - AUP E27.6.2 (10)

No disabled parks are proposed, nor required under the AUP.

The proposal complies with the AUP requirements.

3.3.3 BICYCLE PARKING RATES - AUP E27.6.2.5)

Table 7 outlines the AUP requirements.

Table 7: Bicycle parking requirements

Activity			Visitor (short-stay) Minimum rate	Secure (long-stay) Minimum rate
(T81)	Residential	Developments of 20 or more dwellings	1 per 20 dwellings	1 per dwelling without a dedicated garage

The proposal of five units does not exceed the AUP threshold. However, considering the intent not to supply on-site parking for the existing dwelling that will be divided into four apartments. As there will not be any garaging, those residents that prefer to use bicycles can store their bicycles indoors, or on the deck (each unit has its own).

The proposal complies with the AUP requirements.

3.4 DESIGN OF PARKING AND LOADING SPACES (AUP E27.6.3)

The proposal supplies one uncovered parking for Lot 1, the new dwelling, and no parking for the existing building. The existing dwelling will be divided into four dwelling units, being a mix of one-, two- and three-bedroom units with separate kitchen, lounge areas and private deck areas.

The two buildings (five dwellings) are accessed via a common surfaced driveway aisle off the shared access road from White Swan Road. The property common driveway aisle is tapered from 6.65 m at the property boundary to the narrowest portion of about 3.3 m wide in front of the new dwelling. It widens to 4.8 m allowing two- way flow and then tapers back to 3.5 m in front of the existing dwelling up to the end of the driveway.

There will be a 1.2 m wide pedestrian walkway marked on the concrete surface of the south-eastern side of the driveway aisle, leaving 2.3 m for an opposing vehicle to pass a pedestrian. A retaining wall will be built on the north-western edge of the common driveway.

The parking bay for Lot 2 is partially metal (gravel) and the existing concrete surface. The parking bay measures 3.0 x 5.2 m and meets the AUP requirements.

Table 8 summarises the parking bays details and the maximum gradient across these. The gradients are within the AUP (5%) maximum limit across parking bays and 8% across the manoeuvring areas.

Table 8: Proposed parking supply

Lot	Park space reference	Length	Width	Max. parking bay gradient
1	nil			
2	1	5 m	3.0 m	0.5%

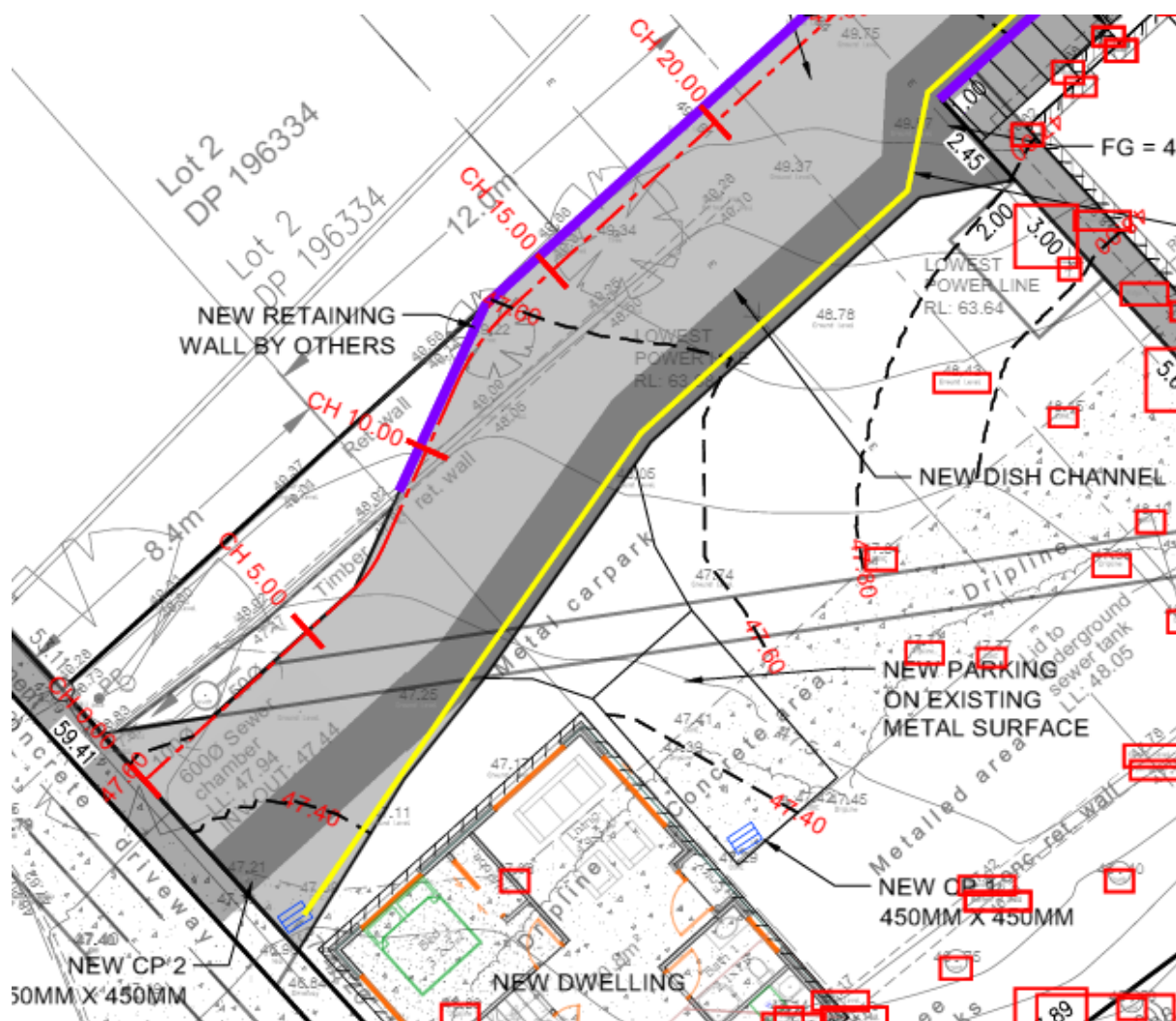


Figure 8: Proposed uncovered parking and manoeuvring layout

Table 9 shows the AUP requirements for parking, and the proposed uncovered space exceed the AUP requirements.

Table 9: AUP vehicle parking requirements

Car Parking Angle		The width of space (m)	Depth from the wall (m)	Depth from the kerb (m)	Manoeuvring Space(m)	Total (m)
(T117)	90 degrees (regular users)	2.4	5.0	4.0	7.1	12.1
(T118)		2.5			6.7	11.7
(T119)		2.6			6.3	11.3
(T120)		2.7			5.9	10.9

The car park will serve the new dwelling, and the driveway aisle will serve as access and temporary parking for occasional delivery and service vehicles. Vehicle turning circle templates have been superimposed on the driveway aisle: for the following vehicles:

- The B85 passenger car
- The B99 Passenger such as a larger utility vehicle
- A 6.4 m rigid body truck that is the equivalent size of a 12 m³ furniture moving truck that can be hired and used on a standard driver's licence
- An 8 m fixed chassis large delivery truck

Table 10 summarises the manoeuvring on-site together with the access for passenger cars, infrequent service delivery type vehicles. For a larger vehicle such as the very infrequent use of a 6.4 m 12 m³ delivery truck, it can enter forward and reverse out to the shared access way. For the rare case an 8 m fixed chassis delivery truck it would need to use the driveway at no. 36A. It is reasonable in these circumstances for the truck driver to seek permission from the neighbour for such a movement on the rare occasion that it might occur.

Table 10: Turning Circle Analysis Summary

	Appendix B drawing numbers	Direction			Wheel path over-track driveway	300 mm Envelope overhang
		From White Swan	No. 34	To White Swan		
85% Car	8.1	Forward	Forward in	-	No	Very minor at the car park
	Can enter and exit the car park at new dwelling in simple movements – minor full lock turns required					
	8.3	-	Forward out	Forward	No	No
	Can enter and exit the car park at new dwelling in simple movements— minor full lock turns required					
6.4 m Service/ Delivery (very infrequent)	8.4	Forward in	Forward in		No	Very minor in front of the new dwelling
	Can enter forward within driveway limits					
	8.5	-	Reverse out to shared access	Forward	No	Yes – very minor on retaining wall side
	Can reverse out within driveway limits					
99% Large utility vehicle (infrequent)	8.6	Forward	Forward in	-	No	No
	Can enter forward within driveway limits					
	8.7	-	Reverse out to shared access	Forward	No	No
	Can reverse out within driveway limits					
8 m Medium Truck (very rare)		Reverse in from White Swan	No access	-	No	No
	Trucks need to reverse into shared access road from White Swan and park temporarily in front of no.34 on the shared access way					
		-	No access	Forward out	No	No
	Trucks can exit onto White Swan in a forward direction					

Overall, the most regular vehicle, the B85 passenger car can manoeuvre as per the design. More infrequent and rarer medium body trucks that may be used for removals or construction can enter the property with additional manoeuvring. Alternatively, on those rare occasions, a medium-sized truck could reverse into the shared access road and

temporarily park in front of no 34's entrance. The delay to others can be minimised in conjunction with residents and advance notification, as is typically done elsewhere in other subdivisions/development with narrow private shared accessways.

No specific traffic signage is required for the driveway access on to the local road.

Overall, we do not foresee the current design proposals as problematic **as it complies with the AUP requirements for its most frequent user (the standard 85% motor vehicle).**

3.5 LOADING SPACES - AUP TABLE E27.6.2.7

There are no loading conditions specified for the operation of residential facilities; however, the common driveway aisle will act as temporary access and parking space for service vehicles.

The proposal complies the AUP requirements.

3.6 REVERSE MANOEUVRING – AUP E27.6.3.4.

The on-site layout will allow the passenger vehicles from the identified car park to turn around on the property or in the case of a visitor - the common driveway and exit in a forward direction along the shared access road to White Swan Road.

A larger service vehicle (6.4 m) can enter and exit in a forward direction off White Swan Road (except an 8m Medium Truck (rare), but will need to reverse into property number 34, and then reverse down the shared accessway to White Swan as shown in Appendix B.

The proposal complies with the AUP requirements.

3.7 FORMATION AND GRADIENT – AUP E27.6.3.6

The gradients from the access road edge into the property for the driveway and manoeuvring areas vary between 1:50 (2%) and 1:8 (12.5%). This is equal to the AUP maximum grade requirement for manoeuvring of 1:8 (12.5%).

The gradients across the parking space are less than the AUP requirement of 5%

The proposal complies with the AUP requirements.

3.8 VEHICLE ACCESS RESTRICTIONS – AUP E27.6.4.1

An existing vehicle crossing on White Swan Road (Primary Arterial) serves the four rear properties. The existing crossing formed width is 2.1 m at the boundary, and the driveway to the furthest rear property is 98 m in length. There are no existing passing bays.

It is separated from the adjacent property vehicle crossings by 10 m on either side of it.

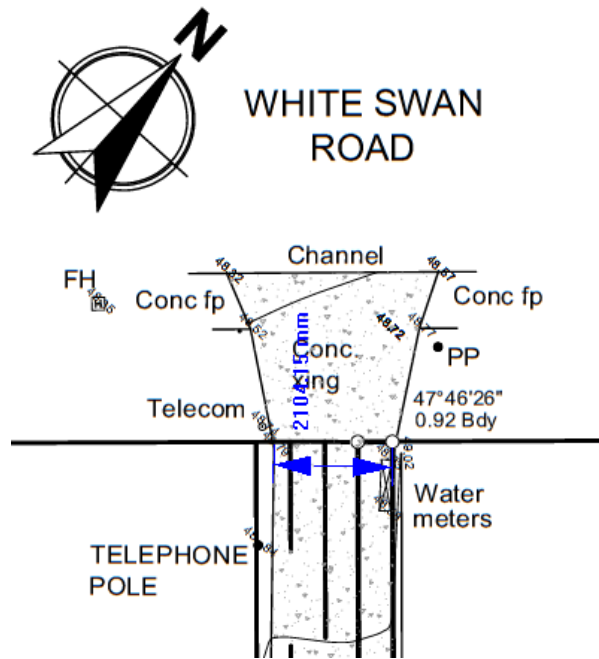


Figure 9: Existing vehicle crossing details

The approved resource consent for the development of 34B (**SUB60216616**) states the consented access serves 13 parking spaces and has a maximum vehicle crossing width of 3.66 m and the minimum formed access width 2.1 m. This is less than the minimum vehicle crossing width of 5.5 m, and minimum formed access width of 5.5 m specified under rule E27.6.4.3.2(T151). The previous consented proposal involves the construction or use of a vehicle crossing where Vehicle Access Restriction applies per standards in E27.6.4.1, and this is a restricted discretionary activity under rule E27.4.1 (A5):

- The proposed increase in residential activity is a change in activity on site, and the site has access to an arterial road (White Swan Road), and this, therefore, is considered to have a Vehicle access restriction as specified by standards E27.6.4.1 (2) and (3).

The site at number 34B has an approved resource consent with a passing bay provided 76 m away from the boundary of the subject site, where a minimum separation distance of 50 m is required between passing bays as specified under rule E27.6.4.3(1). The consented passing bay only increases the width of the access to 5.4 m over a 6 m length when a width of 5.5 m is required over a 7 m length as specified under rule E27.6.4.3(1). Also, as an easement, it is only in favour of No 34B, meaning that no other users of the access way have a legal right of use.

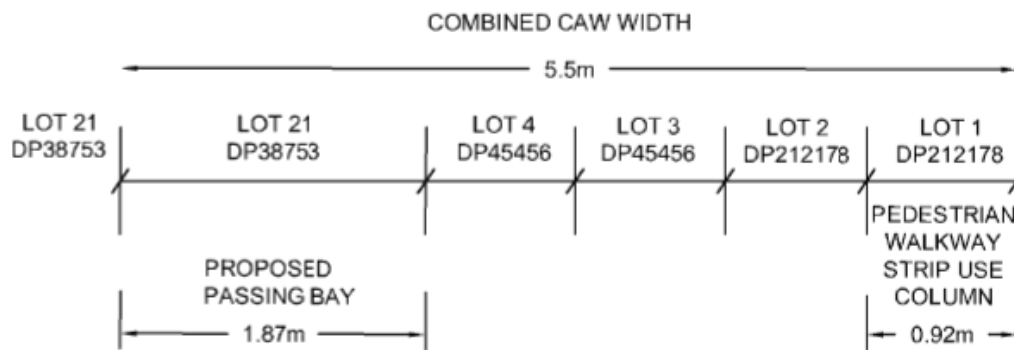


Figure 10: Shared accessway cross-section

Figure 10 shows the consented shared access way configuration with the consented passing bay for no.34B.

A 0.92 m pedestrian walkway is included in the existing 3.6 m width at the boundary, allowing one-way flow and for pedestrian movements.

For this proposal, the driveway crossing will remain as per existing.

Although the previously consented vehicle crossing width for number 34B is proposed to be increased from 2.1 m to 3.2 m at the property boundary with White Swan Road, only a single vehicle can still enter or exit at a given time.

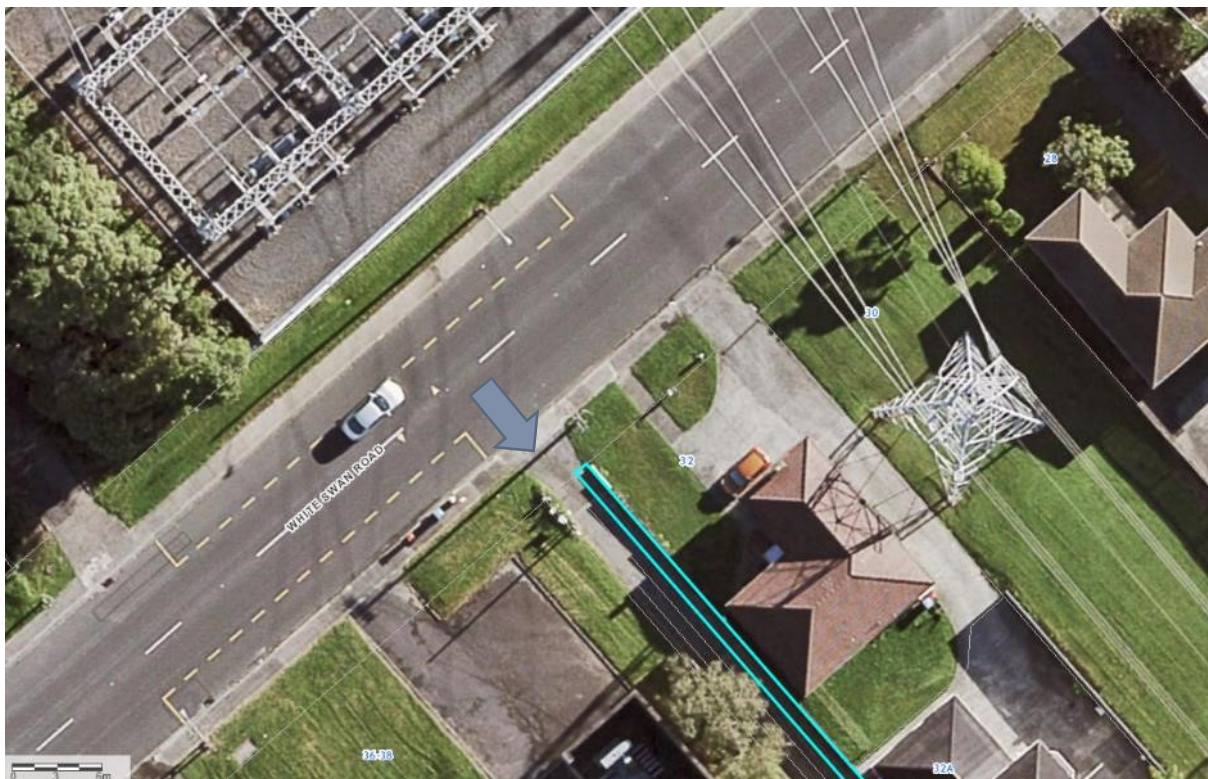


Figure 11: Existing vehicle crossing

This proposal for number 34 will increase the number of consented dwellings served by the shared accessway from 7 to 11 residential units.

As the previous consent (for 34B) required a pedestrian walkway and an additional passing bay to be installed on the shared accessway, this proposal seeks to remove the need for constructing a passing bay as it does not alter the current trip generation from no. 34.

AUP Table E27.6.4.3.2 specifies the minimum and maximum widths for the vehicle crossings (Table 11).

Table 11: AUP vehicle crossing requirements (Table E27.6.4.3.2 - PC14 amendment)

Location of the site frontage	Minimum width of the crossing at the site boundary	Maximum width of crossing at the site boundary	Minimum formed access width	
(T150)	3.0 m (one-way)	3.5 m (one-way)	Serves 3 - 9 or more car parking spaces	3.0 m (providing for one-way movements provided it is contained within a corridor clear of buildings or parts of a building with a minimum width of 3.5 m. The formed width is permitted to be narrowed to 2.75 m if there are clear sightlines along the entire access and passing bays at 50m intervals are provided. 1.0 m pedestrian access for rear sites which may be located within the formed driveway
Proposal	2.1 m	3.66 m	6 existing spaces	2.1 m
Compliance	Existing – no change proposed	yes	-	No – the proposal does not alter the total number of existing parking spaces

The 3.66 m width at the boundary and 2.1 m concrete formed width leaves approximately 0.7 m width on either side of the formed surface for pedestrians that traverse along the shared accessway to White Swan Road. Although this is not ideal, it has operated as such for many years, and there are clear sightlines for opposing vehicles and pedestrians to give way to each other.

This proposal does not alter the total number of parking spaces using the shared access way. Therefore, the existing crossing still complies with the AUP requirements and the need for constructing a passing bay for this proposal is premature as it has already been consented under the proposal for developing no. 34B.

3.9 VEHICLE QUEUING

The proposal (Appendix A) is to leave the shared accessway at its 2.1 m minimum at the boundary, to allow the existing one-way flow to continue over the vehicle crossing and into the accessway.

This proposal, combined with the previous consented proposal on 34B, could generate eight vph in the peak hour. White Swan Road is a two-lane two-way road with 5 m wide lanes, and it has a 3-bay bus stop opposite the one-way flow driveway. An entering right-turning vehicle could temporarily obstruct the northbound lane in the rare event that both a right-turner is waiting and a bus both occupy the northbound lane at the vehicle crossing.

Therefore, we have estimated the incidence and magnitude of a queue that may form on the northbound lane of White Swan Road using a critical gap of 15 s (@20 km/h) for vehicles turning from the driveway. The 15 s allows for an opposing vehicle that has already begun moving from the farthest point of the shared access way and that prevents a right-turning vehicle from White Swan to enter the driveway. We have also estimated the incidence of a queue on the shared access way waiting to turn into White Swan Road.

The absorption capacity and queue lengths were estimated by applying the Austroads (AGTM02-08) gap-acceptance model using the following assumptions (Table 12) to estimate the service rate required for queue estimation (M/M/1 negative exponential single-channel FIFO) (Appendix C).

Table 12: Queueing input data

Description	Detail	
White Swan Road directional split:	70:30 Northbound: southbound AM peak period of 1220:480 vph	
In/out distribution from vehicle crossing:	80:20 Outbound: inbound of 8 vph is split AM inbound is 1:1 and AM outbound 2:5 The values reverse for the PM.	
Mean arrival rate	Eight vph	
Opposing flow	1220 + 480 = 1600 vph from left and right on White Swan Road	
Mean service rate (absorption capacity) Austroads AGTM02-08	Exit from driveway = 184 vph > 7 vph estimated	Right turn into driveway = 542 vph > 7 vph estimated

The queuing analysis (99% confidence level) shows that the probability of vehicles being queued due to opposing traffic is shown in Table 13.

Table 13: Queueing probability

Vehicle being queued	Probability of vehicle in queued on White Swan Road	Probability of vehicle queued on the driveway/vehicle crossing
0 vehicle	98.7%	96.2%
1 vehicle	1.3%	3.7%
2 vehicles	0.1%	0.1%
Average delay (all vehicles)	< 0.5 s	< 1 s
The average delay (only those vehicles that will be queued)	< 7 s	< 20 s

The analysis shows the likelihood of a queue forming:

- On White Swan northbound and waiting to turn into the driveway, **is less than 1.5%** (1: 67) for a single-vehicle queue. The mean delay to only those that may be queued will be < 7s. (LoS A).
- On the driveway waiting to exit onto White Swan, is **less than a 4% chance** (1: 25) for a single-vehicle queue. The mean delay to only those that may be queued will be < 20 s.

The analysis confirms that the magnitude and incidence of not providing a passing bay are likely to result in less than a minor effect.

3.10 THE GRADIENT OF VEHICLE ACCESS – AUP E27.6.4.4

Property Driveway: The average gradient of the driveway aisle (Appendix A) from the common driveway into the property does not exceed 1:8 (12.5%). The maximum permitted under the AUP is 1:5 (20%).

The maximum gradient transition between adjoining gradients is 10.5% (sag). The maximum allowed under the AUP is 12.5% (summit) and 15% (sag).

Shared accessway: The shared accessway is to remain as per existing.

The proposal complies with the AUP.

4 ACCESS SAFETY

4.1 SHARED ACCESSWAY VISIBILITY WITH NUMBER 34:

As part to the previous consent granted for 34B mirrors will be installed on both sides of the shared accessway near the entrance to number 34. These mirrors are to improve visibility up and down the shared accessway for the driveway entrances at numbers 34 and 36A (Figure 12). This is a mitigation issue for the additional movements created by the development at 34B when that development occurs. There is no effective increase in movements from the

application site under the s127 proposal, and hence the current proposal does not generate a need for mirrors to be installed now.

4.2 VISIBILITY OF SHARED ACCESS WAY VEHICLE CROSSING WITH WHITE SWAN

The existing vehicle crossing is located at a suitable position on the road network, that provides clear sightlines exceeding stopping sight/distance thresholds. White Swan Road has a 50 km/h posted speed limit requiring a safe intersection sight distance (SISD) of 97 m (Austroads) between approaching vehicles and a vehicle exiting the development. The access driveway has a sight distance to the left and right, exceeding the minimum requirement.

The accessway has a low wall (<1.2 m) on the north-eastern side with no fence on the southwestern side, therefore providing ample sight visibility between exiting vehicles and pedestrians on the footpath located 2.8 m from the property boundary.

On this basis, the single parking bay to be provided on the site, the design and operation, and access provisions are all considered acceptable from a traffic engineering perspective.

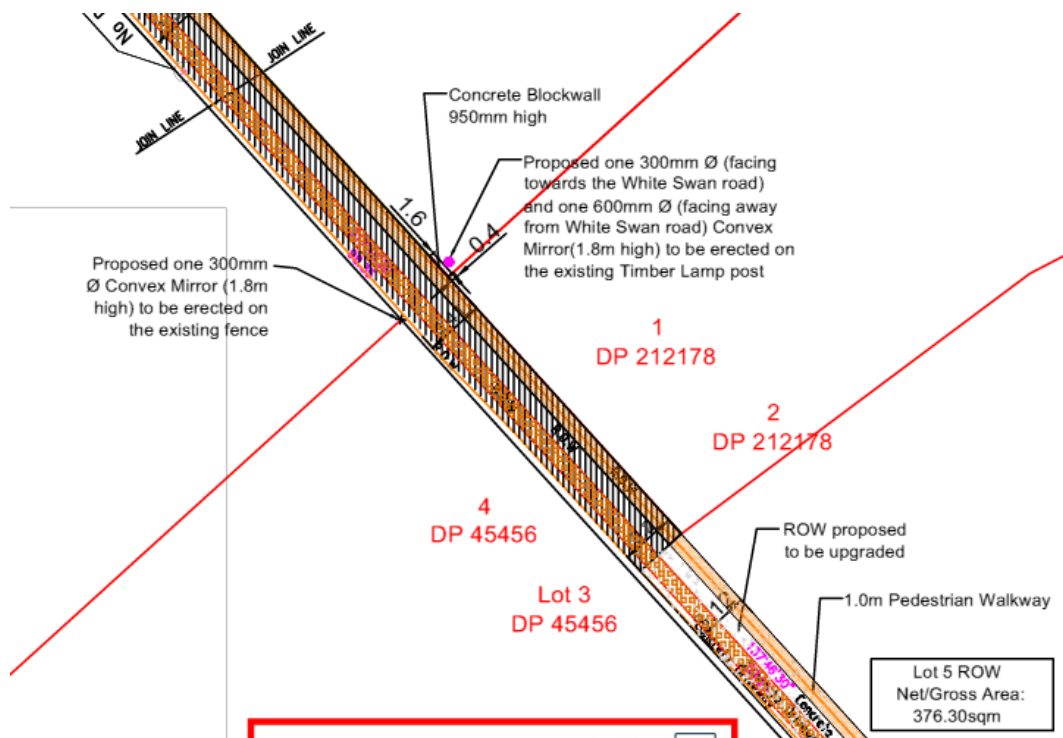


Figure 12: Location of sighting mirrors on JOAL



Figure 13: White Swan Road opposite no. 34 looking southwest

5 APPRAISAL OF TRANSPORTATION EFFECTS

Overall the proposed development traffic will have an insignificant adverse impact on the transport network functionality, as the total vehicle movements do not change from before. The extra four units will have no parking spaces on-site, thus encouraging residents to rely more on public transport.

The assessed shortfall in parking quantum is mitigated by the proximity of high-quality public transport and nearby bus stops on White Swan Road (in both directions) as well as the available on-street parking on White Swan Road, as follows:

- The location is like that of a transport-oriented design with close by and high-frequency public transport.
- Should residents own private vehicles, there is ample on-street parking opposite the electrical corridor and substation on White Swan Road opposite and adjacent to the vehicle crossing.
- The lack of on-site parking is in-line with the intent of the National Policy Statement on Urban Development 2020 (NPS-UD) to remove minimum parking requirements, especially in those developments that have good public transport alternatives.

The visibility on White Swan Road exceeds guidelines, and the current one-way flow shared access driveway has good visibility sightlines along its length.

The width between boundaries along the shared access way is adequate to accommodate pedestrians and vehicles. The new shared common driveway on no.34 will have a 1.2 m pedestrian walkway along the south-eastern edge of the surfaced driveway.

A turning circle analysis has demonstrated that the B85 vehicle could easily manoeuvre in and out of the site and exit in a forward direction onto White Swan. A similar analysis shows that irregular service and utility vehicles can also manoeuvre in and out of the site and exit forward onto White Swan.

The common driveway and parking bay comply with gradient thresholds, and the parking bay exceeds size requirements.

An assessment of queuing delay for the existing one-way shared access way demonstrated that the probability of both a vehicle wanting to exit to White Swan and one wanting to enter is less than 1.5% (1:67). In the event of a queued vehicle on White Swan, the delay to will be less than 7s per queued vehicle (LoS A).

The preceding six years analysis of the accident record confirms that the development is unlikely to affect traffic safety negatively.

It is our opinion that the supply of access, manoeuvring and parking on the property meet traffic engineering standards. It complies with all the applicable AUP requirements save for the current operative requirement of minimum parking supply. This requirement will become redundant once the National Policy Statement on Urban Development 2020 (NPSUD) is formalised in the AUP. The NPSUD removes the right for local authorities to specify minimum parking requirements.

An assessment of queueing on both the driveway and on White Swan Road is shown to have a negligible effect. Despite the shared accessway length from the kerb to boundary marginally exceeding the 50 m length requirement for a passing bay by 7 m, the queueing analysis finds that probability of two opposing vehicles creating a queue on White Swan is negligible (<1.3%).



6 CONCLUSION

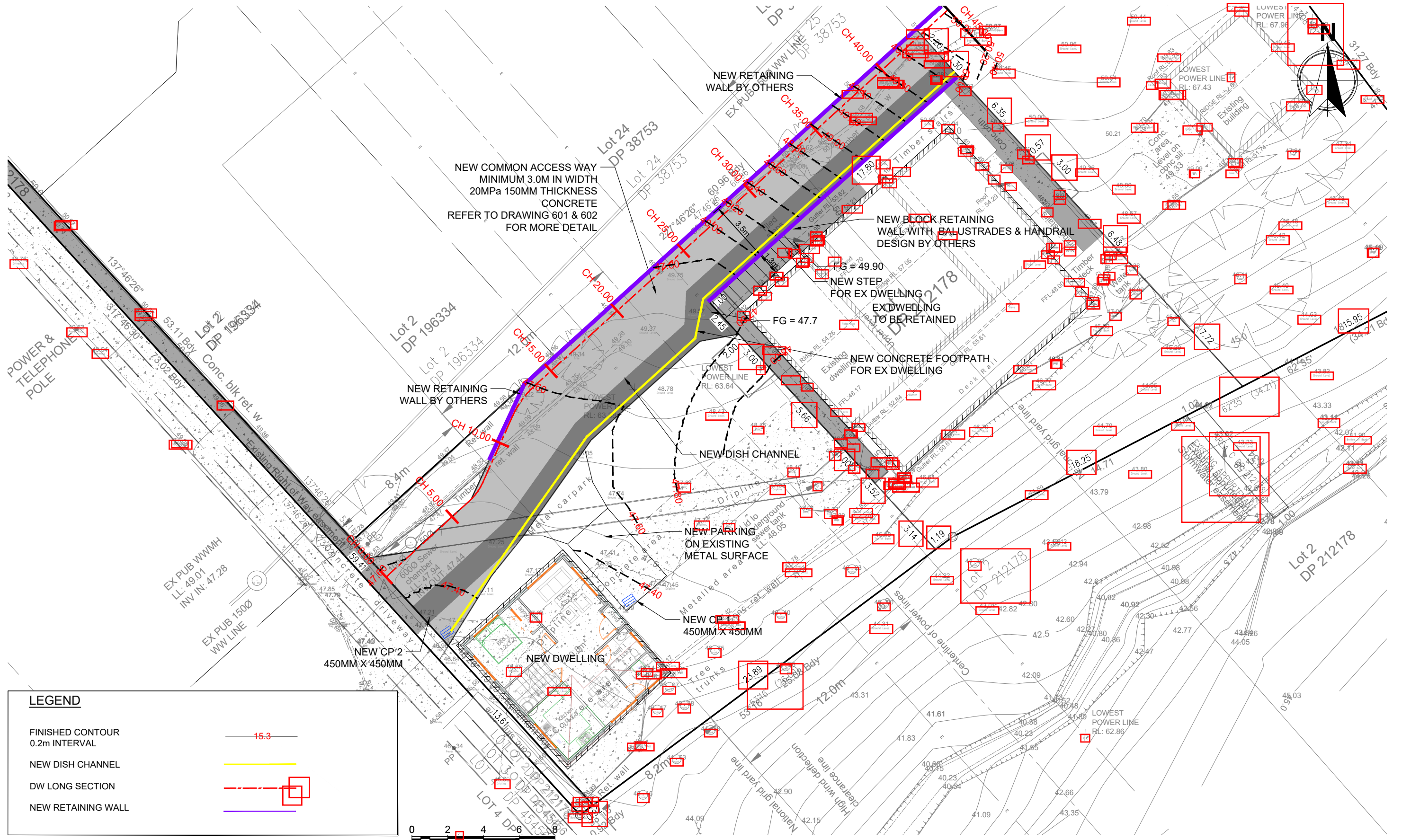
- The redevelopment of 34 White Swan Road from one existing to five residential units will have a less than minor effect on the transportation network;
- The surrounding transportation network is well developed, and the location of the access meets the AUP requirements;
- The assessment of parking demand reveals that the proposed parking supply meets the intention of the removal of minimum parking requirements as per the National Policy Statement on Urban Development 2020 (NPS-UD).
- The design and operation of the parking and driveway meet all the requirements in the AUP;
- The existing vehicle crossing visibility exceeds recommendations. The crash record does not reveal any shortcomings in the road design;
- The shared access way can operate adequately as a one-way facility without the need to add a passing bay;
- The queueing analysis confirms that the one-way system on the existing and unchanged shared access way, is improbable to impose any more than a minor effect on traffic flow on White Swan;
- There are no notable adverse effects anticipated and therefore, no mitigation measures required.

On this basis, it is believed that the proposal is acceptable from a traffic engineering perspective.



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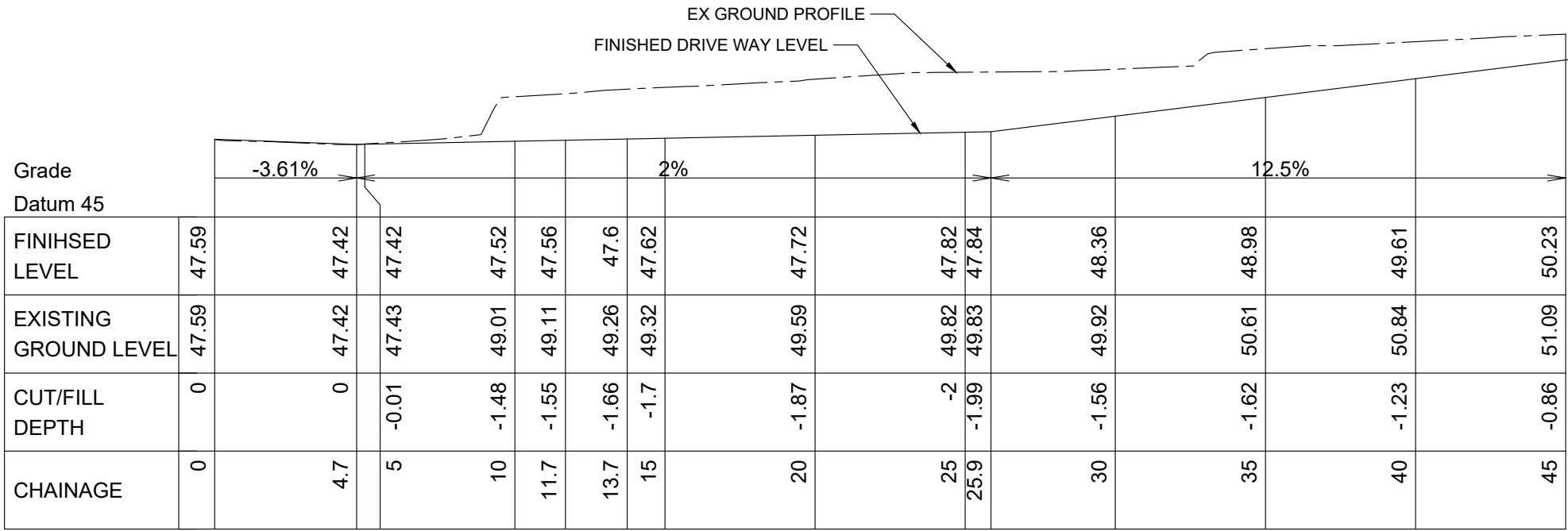
Revision Notes:		
Rev:	Date:	Notes:
A	07-09-2020	ISSUE FOR CONSENT - AY
B	11-12-2020	ISSUE FOR REPLY TO s92

Notes:

Client: JAYASHREE LIMITED		
Drawn By: AY 07-09-2020	Designed By: AY 07-09-2020	Checked By: RK 07-09-2020

Project: 34 WHITE SWAN ROAD HILLSBOROUGH
Drawing Title: PROPOSED COMMON ACCESS WAY SITE PLAN

Date: SEPTEMBER 2020
Scale @ A3: 1:200
20333-600-B



COMMON ACCESS WAY LONGSECTION

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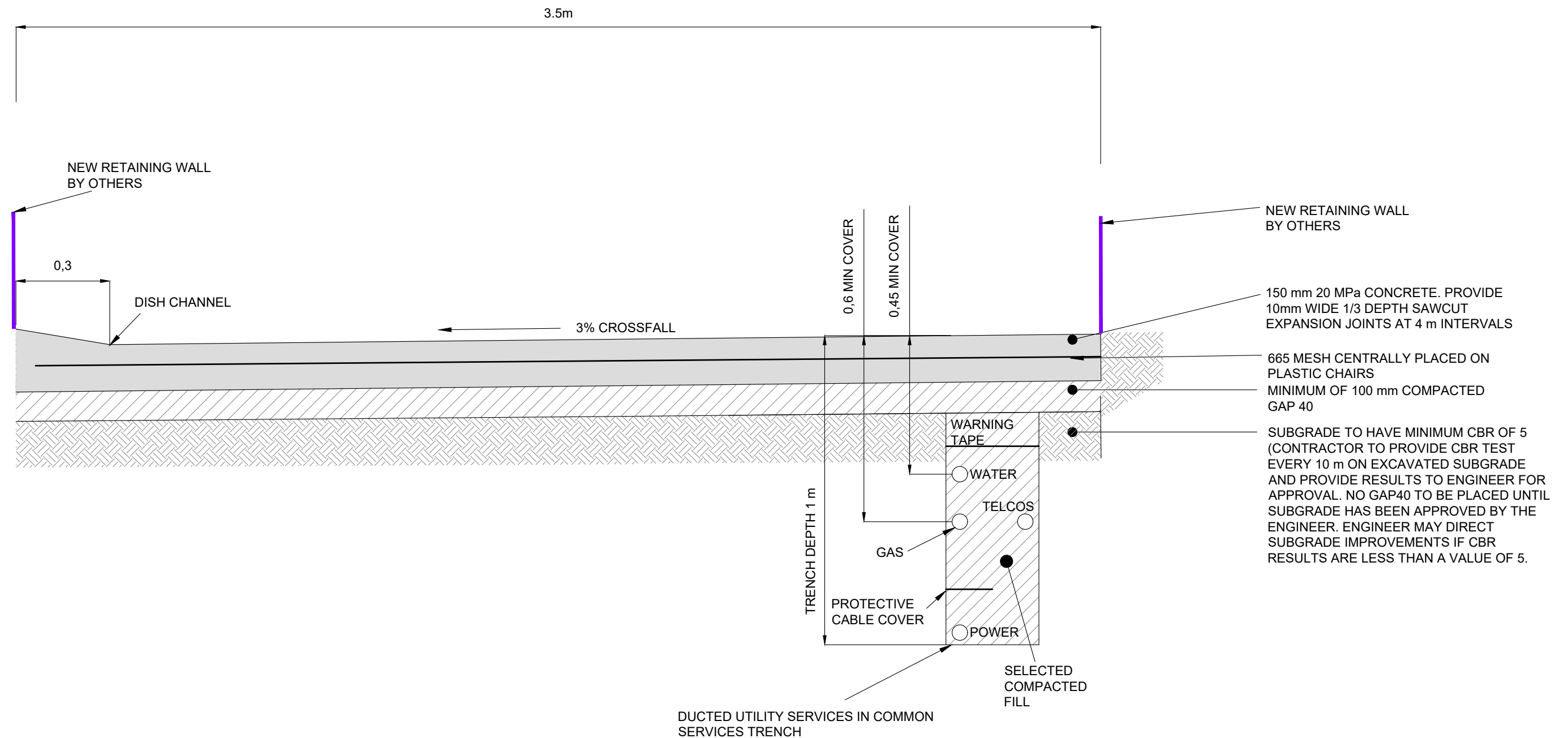
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Client: JAYASHREE LIMITED		
Drawn By: AY 07-09-2020	Designed By: AY 07-09-2020	Checked By: RK 07-09-2020

Project: 34 WHITE SWAN ROAD HILLSBOROUGH
Drawing Title: PROPOSED COMMON ACCESS LONGSECTION

Date: SEPTEMBER 2020
Scale @ A3: 1:200
20333-601-A



CROSS-SECTION OF NEW COMMON ACCESSWAY
NTS

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Revision Notes:

Rev:	Date:	Notes:
A	07-09-2020	ISSUE FOR CONSENT - AY

Notes:

Client:

JAYASHREE LIMITED

Drawn By:

AY
07-09-2020

Designed By:

AY
07-09-2020

Checked By:

RK
07-09-2020

Project:

**34 WHITE SWAN ROAD
HILLSBOROUGH**

Drawing Title:

**PROPOSED COMMON ACCESS
TYPICAL CROSS SECTION**

Date:

SEPTEMBER 2020

Scale @ A3:

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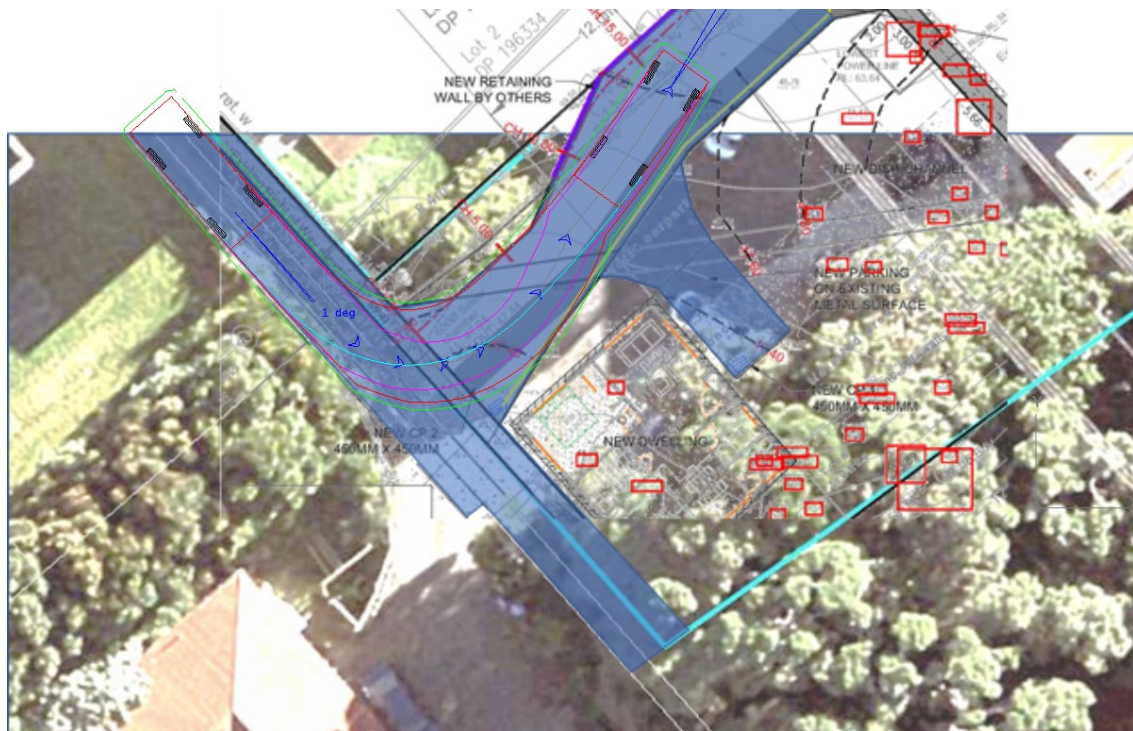
8.1 85% PASSENGER CAR – LOT 2 CAR PARK FORWARD IN



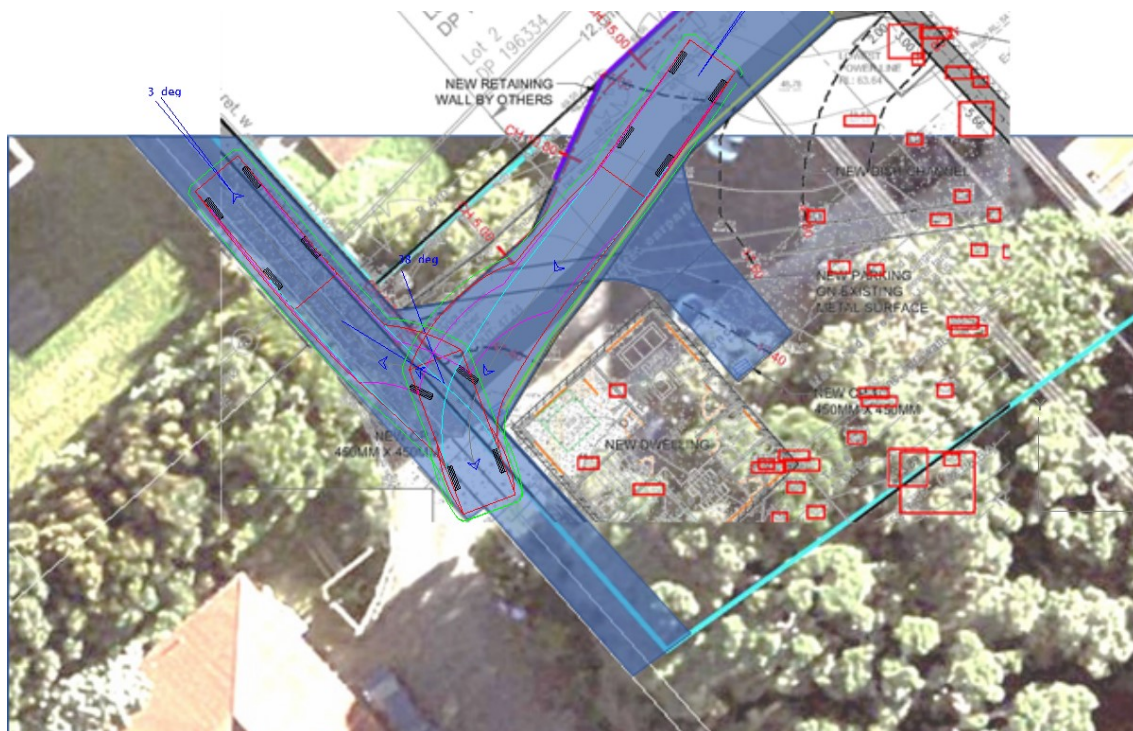
8.3 85% PASSENGER CAR – VISITOR/TAXI – PASSING BAY



8.4 LIGHT DELIVERY/SERVICE TRUCK (6.4 M) – FORWARD IN



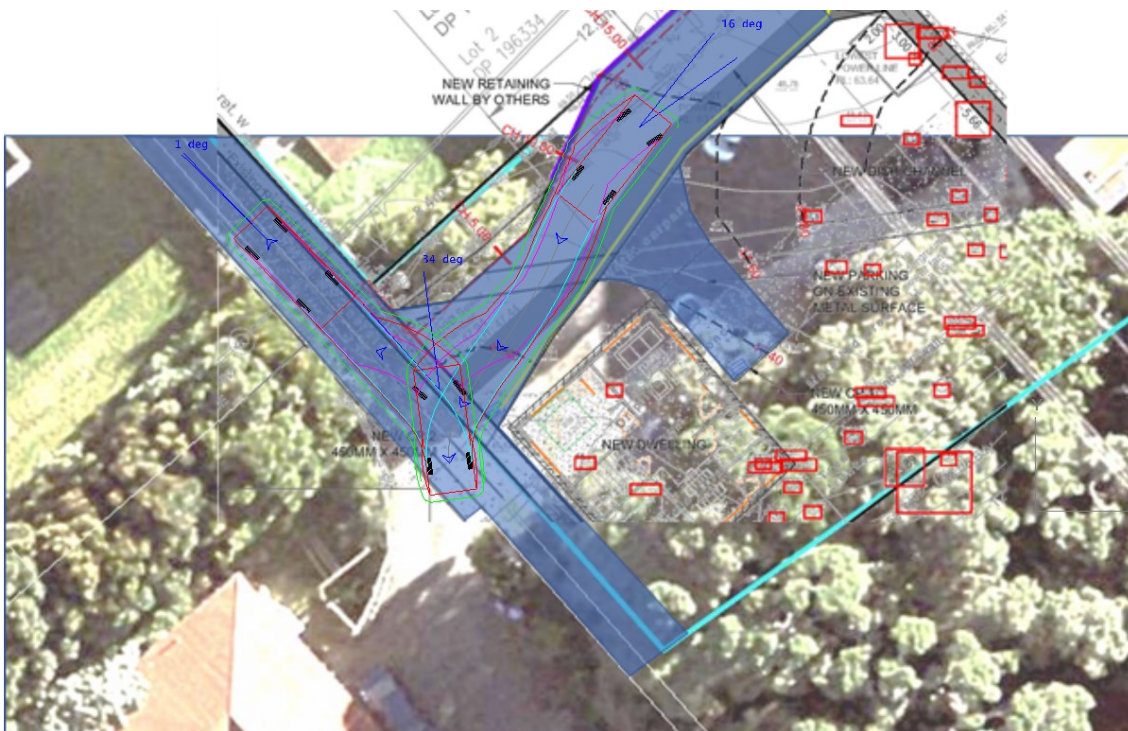
8.5 LIGHT DELIVERY/SERVICE TRUCK (6.4 M) – REVERSE OUT ONTO ACCESS WAY



8.6 99% PASSENGER CAR – SERVICE UTILITY VEHICLE – FORWARD IN



8.7 99% PASSENGER CAR – SERVICE UTILITY VEHICLE – REVERSE OUT



9 APPENDIX C: ABSORPTION CAPACITY AND QUEUING DELAY

Table 14: Absorption capacity assumptions

		From White Swan		From Driveway	
		Driveway	Straight and left in	Left turn	Right turn
Capacity (vph)		1791.3	966.2	859.8	463.7
Follow up Hw (s)	To	2.5	2.0	2.5	3.0
Min Hw Confl Flow (s)	Hm	1.5	1.5	1.5	1.5
Critical gap (s)	Tg (Ta)	15.0	4.0	5.0	5.0
Additional Follow Hw (s)	Tf (To)	2.0	2.0	3.0	3.0
Conflict Vol (vph)	V	7.0	1120.0	480.0	1141.0
Proportion of stream		0.006	0.993	0.296	0.703

Table 15: Absorption capacity turning from Vehicle Crossing

Austroads AGTM02 -08			Left turn	Right turn	Units	Table 5.3 equation
	Proportion delayed		49%	79%		(5.1)
	Average delay _ all		2.11	7.24	s	(5.2)
	Average delay only q		4.33	9.10	s	(5.3)
	Absorption Cap		869.4	230.3	vph	(5.4)
	Prac. Abs. Cap.	80%	695.5	184.2	vph	(5.5)
	Pr of gap Major Flow from Left			21%		(5.6a)
	Pr of gap Major Flow from Right		51%	51%		(5.6b)
	Pr both lanes			11%		(5.7)
Capacity	Combined cap. Other distribution	Ct =	294			(5.8)
	Combined theoretical absorption using neg exp headways		230			(5.9)
	Prac. Abs. Cap.	80%	184			INPUT to QUEUING

Table 16: Absorption capacity turning from White Swan

Austroads AGTM02 -08			Left turn	Right turn	Units	Table 5.3 equation
	Proportion delayed		3%	71%		(5.1)
	Average delay _ all		0.22	3.94	s	(5.2)
	Average delay only q		7.68	5.54	s	(5.3)
	Absorption Cap		1402.0	692.4	vph	(5.4)
	Prac. Abs. Cap.	80%	1121.6	553.9	vph	(5.5)
	Pr of gap Major Flow from Left			99%		(5.6a)
	Pr of gap Major Flow from Right		1%	29%		(5.6b)
	Pr both lanes			29%		(5.7)
Capacity	Combined cap. Other distribution	Ct =	697			(5.8)
	Combined theoretical absorption using neg exp headways		678			
	Prac. Abs. Cap.	80%	542			INPUT to QUEUING

