asongroup

Transport Assessment

24-28 Glen Innes Road & 1-7 Chester Street, Inverell

Development Application
22/10/2021

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APPENDICES

Glossary

Acronym	Description
CC	Construction Certificate
Council	Inverell Shire Council
DA	Development Application
DCP	Development Control Plan
DPIE	Department of Planning, Industry and Environment
GFA	Gross Floor Area
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
MRV	Medium Rigid Vehicle (as defined by AS2890.2:2018)
NHVR	National Heavy Vehicle Regulator
OC	Occupation Certificate
RMS Guide	Transport for NSW (formerly Roads and Traffic Authority), Guide to Traffic Generating Developments, 2002
SRV	Small Rigid Vehicle (as defined by AS2890.2:2018)
TDT 2013/04a	TfNSW Technical Direction, Guide to Traffic Generating Developments – Updated traffic surveys, August 2013
TfNSW	Transport for New South Wales
TA	Transport Assessment
TIS	Transport Impact Statement
veh/hr	Vehicle movements per hour (1 vehicle in & out = 2 movements)

1 Introduction

1.1 Overview

Ason Group has been engaged by Newton Denny Chapelle (NDC) on behalf of North Coast Petroleum (NCP) to prepare a Transport Assessment (TA) supporting a Development Application (DA) located at 24-28 Glen Innes Road & 1-7 Chester Street, Inverell (the Site).

Since the Site is located within the Inverell Shire Council (the Council) Local Government Area (LGA), the Site is subject to that Council's planning controls.

Table 1 provides a legal breakdown description of the Site.

TABLE 1 LEGAL DESCRIPTION OF THE LAND

Land Use	DP Number	Lot Number	Currently Zoned[1] as
Existing service station	DP322074	1 & 2	B1 - Neighbourhood Centre
	DP666824	1	
	DP334109	1	
Proposed expansion	DP326225	1 & 2	R1 – General Residential
	DP360441	3D	

Note: 1) Under Inverell Local Environmental Plan 2012 (Inverell LEP 2012).

1.2 Planning Proposal

By the way of background, Ason Group prepared a Transport Assessment to accompany a Gateway Planning Proposal (*AG ref: P1599r01v1*) for the Site in May 2021. The Planning Proposal was prepared to enable the redevelopment of the service station including the operation of a Specialised Retail Premises and Rural Supplies from the Site. The key elements of the Planning Proposal included:

- Rezone DP326225 Lot 1 & 2 and DP360441 Lot 3D (approx. 2,580 m^2) to *B1 - Neighbourhood Centre* as they are currently zoned as *R1 – General Residential* under Inverell LEP 2012.
- Amend Schedule 1 Additional Permitted uses of the Inverell LEP 2012 to permit Specialised Retail Premises.

Having regard for the above, NSW Department, Planning, Industry and Environment (DPIE) granted initial Gateway approval with conditions on 16 August 2021. An alteration to the Gateway Determination was issued on 27 August 2021 (*Department Ref: PP-2021-3868*)[2].

As it relates to this report, this DA TA builds on the findings of the previous Planning Proposal report and provides an assessment of the detailed aspects to the Site with regard for the proposed redevelopment and expansion of the existing service station.

[2] https://www.planningportal.nsw.gov.au/ppr/pre-exhibition/ilep-2012-amend-no-5-planning-proposal-24-28-glen-innes-road-and-1-7-chester-street-inverell

1.3 Overview of the Proposal

As noted, this DA relates to the proposed redevelopment and expansion of the existing service station. In summary, the Proposal seeks to realise this by providing the following:

- Alter the existing service station and amalgamate the adjacent lots as an expansion of the existing service station, as shown in **Figure 1**.
- Provide 1 vehicular access crossover and 1 exit crossover to/from Chester Street,
- **Figure 2** provides an overview of the Site plan. Overall, the Site would provide for the development of:
  - A total built up Gross Floor Area (GFA) of 808 m^2 including:
    - A Service Station shop of 282 m^2 GFA
    - A Display Area of 94 m^2 GFA
    - A rural Supply Shed of 432 m^2 GFA, which is expected to stock packaged livestock food, bird seed, dog food, unpackaged hay, etc.
- A total of 14 refuelling positions, comprising:
  - 12 refuelling positions for light vehicles, and
  - 2 refuelling positions for heavy vehicles
- An emergency access crossover along Chester Lane,
- Associated car parking facility including 9 car parking spaces plus one Air and Water refuelling space,
- A dedicated loading bay for the proposed convenience store, and
- A Keep Clear manoeuvring area for ancillary loading / unloading facilities on-site.

Figure 1: Site Location

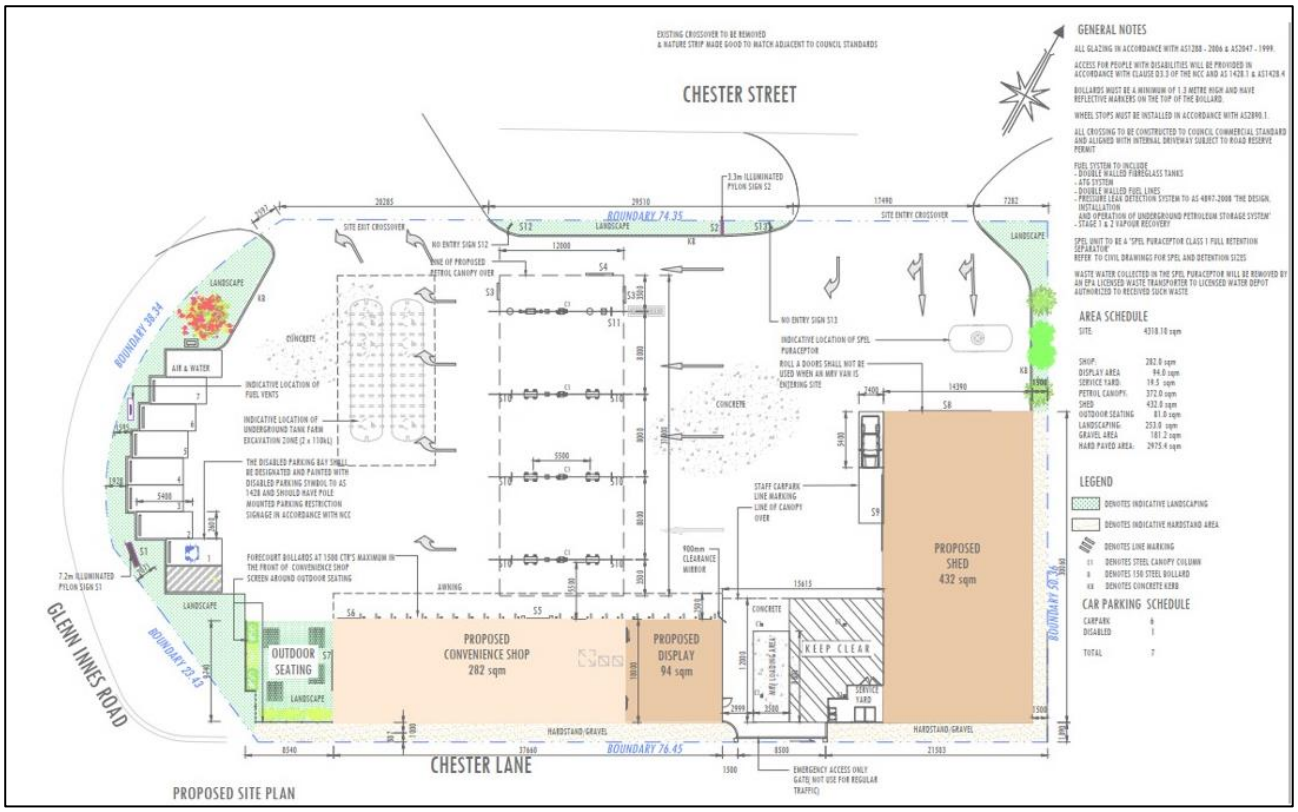


Figure 2: Proposed Site Plan

1.3.1 Ancillary Developments

Figure 2 highlights that the Proposal provides a Display Area and Supply Shed which are considered Ancillary Developments to the Service Station.

As shown in **Figure 3**, the proposed shed allows for vehicle access via a drive-through facility from the northern end of the shed. The drive-thru facility in the shed provides two lanes for drive-thru loading activity space. Additionally, the Display Area is another Ancillary Development to the Service Station where visitors would go to as part of their trip should they choose to.

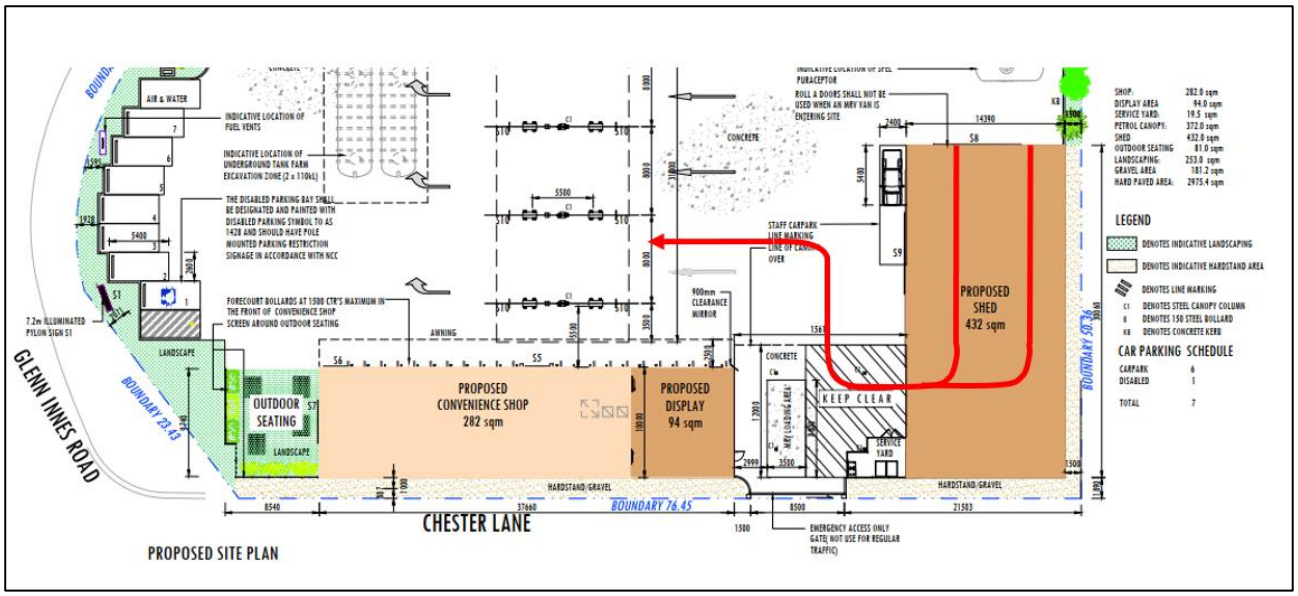


Figure 3: Ancillary Land Uses

1.4 Study Objectives

The objective of this study is to assess the impacts of the proposed service station expansion, from a Traffic and Transport perspective.

Therefore, this TA provides an assessment of the relevant access, traffic and parking characteristics of the Proposal, and the potential impacts of the Proposal on the surrounding road network and parking environment. In this regard, this has included detailed assessments of the following:

- Existing Site and local road network conditions, including the vehicular trip generation and distribution of the existing service station,
- Parking requirements in accordance with the Council controls and the proposed parking provision,
- The peak period vehicular trip generation and distribution of the Site further to the Proposal, and the potential impact of those trips on the key intersection, and
- Detailed review of the proposed site plan design including swept path analysis for different design vehicles.

1.5 Reference Documents

In preparing this TA, reference has been made to the following key planning documents:

- Inverell Local Environmental Plan 2012 (ILEP 2012); and
- Inverell Development Control Plan 2013 (IDCP 2013).

This TA also references general access, traffic and parking guidelines, including:

- Roads and Maritime Services, Guide to Traffic Generating Developments (RMS Guide);
- Roads and Maritime Services, Guide to Traffic Generating Developments – Updated Traffic Surveys TDT 2013/04a (RMS Guide Update);

- National Code of Australia (NCA), Disability (Access to Premises – Buildings) Standards (2010) ;
- Australian Standard AS 2890.1:2004 Parking Facilities – Off-Street Car Parking (AS 2890.1:2004);
- Australian Standard AS 2890.2:2018 Parking Facilities – Off-Street Commercial Vehicle Facilities (AS 2890.2:2018); and
- Australian Standard AS 2890.6:2009 Parking Facilities – Off-Street Parking for People with a Disability (AS 2890.6:2009).

Given Ason Group prepared the TA supporting the Planning Proposal, this document is also referenced below:

- Ason Group, P1599r01v1 PP_TA_24-28 Glen Innes Road & 1-7 Chester Street, Inverell (P1599r01v1).

1.6 Council Consultation

In the preparation of the Planning Proposal TA (*AG ref: P1599r01v1*), Ason Group had the opportunity to discuss the current and future operation of the Glen Innes Road (Gwydir Highway) in the vicinity of the Site with comments received from the Inverell Shire Council on 27 April 2021.

Ason Group acknowledges the insights and local contextual information provided by the Council in regard to the local and sub-regional traffic and transport operations for the existing and future conditions. It is considered that these insights remain relevant to the DA stage of the project and have therefore been relied upon in the preparation of this DA TA. In summary, the outcome of the Council meeting is briefly provided as follows:

- Council was in principle supportive of the proposed vehicular access strategy;
- The Project Team accepted the Chester Lane access point for emergency purposes only; and
- Council suggested that the concurrence with TfNSW would be required as part of a detailed design stage.

It is our understanding that the assessing authorities have since reviewed our Planning Proposal traffic report and as such, the traffic modelling of the proposed roundabout intersection (at Glen Innes Road / Chester Street) has already been reviewed. Accordingly, the scope for this TA mainly revolves around a detailed review of a parking demand vs. supply assessment and internal service station design aspects.

1.7 Report Structure

This TA is structured as follows:

- **Section 2** describes the existing Site and the existing local road network conditions;
- **Section 3** describes the future context (without the Proposal) of the surrounding local road network;
- **Section 4** outlines the parking requirements applicable to the Proposal and parking provision;
- **Section 5** assesses the potential traffic impacts of the Proposal;
- **Section 6** provides design advice commentaries; and
- **Section 7** provides a summary of the key TA conclusions.

2 Existing Conditions

2.1 Site Location

The Site is located at 24-28 Glen Innes Road & 1-7 Chester Street, Inverell. As shown in **Figure 1**, it is bordered by the existing residential dwellings to the north, Glen Innes Road (Gwydir Highway) to the south, Chester Lane to the east, and Chester Street to the west.

The Site has an area of some 4,728m^2 and has previously been zoned as *B1 - Neighbourhood Centre* and *R1 – General Residential* under Inverell LEP 2012.

Notwithstanding, as per the approved Gateway determination, approximately 2,580 m^2 of *R1 - General Residential* zone is to be re-zoned to *B1 - Neighbourhood Centre* zone.

2.2 Existing Site Characteristics

As mentioned in **Section 1.1**, the Site is currently occupied by a service station with a total GFA of approximately of 244 m^2 (Liberty service station known as the Junction Service Station) and 3 residential lots to the north of the service station. All these Lots are to be amalgamated prior to delivery of the new redevelopment for the expansion of the existing site.

2.3 Existing Site Access

The existing service station currently has 4 vehicular access crossovers:

- 2 access points at Glen Innes Road, and
- 2 access points at Chester Street.

All accesses allow full movements (in / out) of the existing service station.

Additionally, all residential lots within the Site have direct access at the crossovers via Chester Street.

2.4 Existing Traffic Generation

2.4.1 Traffic Surveys

In order to determine the baseline traffic generation of the Site, Ason Group has obtained the traffic survey data at the surrounding key intersections and all site accesses of the existing service station from Council.

The survey data was collected on Thursday, 27 July 2016 and Saturday, 29 July 2017, noting that Thursdays and Saturdays represent the days of peak site traffic generation. The received survey data is provided in **Appendix A**.

With reference to the traffic surveys, the vehicular traffic generation of the existing service station is summarised in **Table 2.**

TABLE 2 EXISTING SITE TRIP GENERATION – SERVICE STATION[1]

Trip Generation	AM Peak (08:15 – 09:15)	PM Peak (15:30 – 16:30)	Saturday (11:00 – 12:00)
Inbound	39 (22)	58 (2)	62 (1)
Outbound	33 (22)	58 (2)	55 (1)
Total	72 (44)	116 (4)	117 (2)

Note: 1) Heavy vehicle trip generation are provided in brackets. It was manually counted on-site from 15 Dec 2020 to 18 Dec 2020 and from 11 Jan 2021 to 17 Jan 2021.

Having regard for the above, the detailed traffic generation at each site access is presented in **Figure 4.**

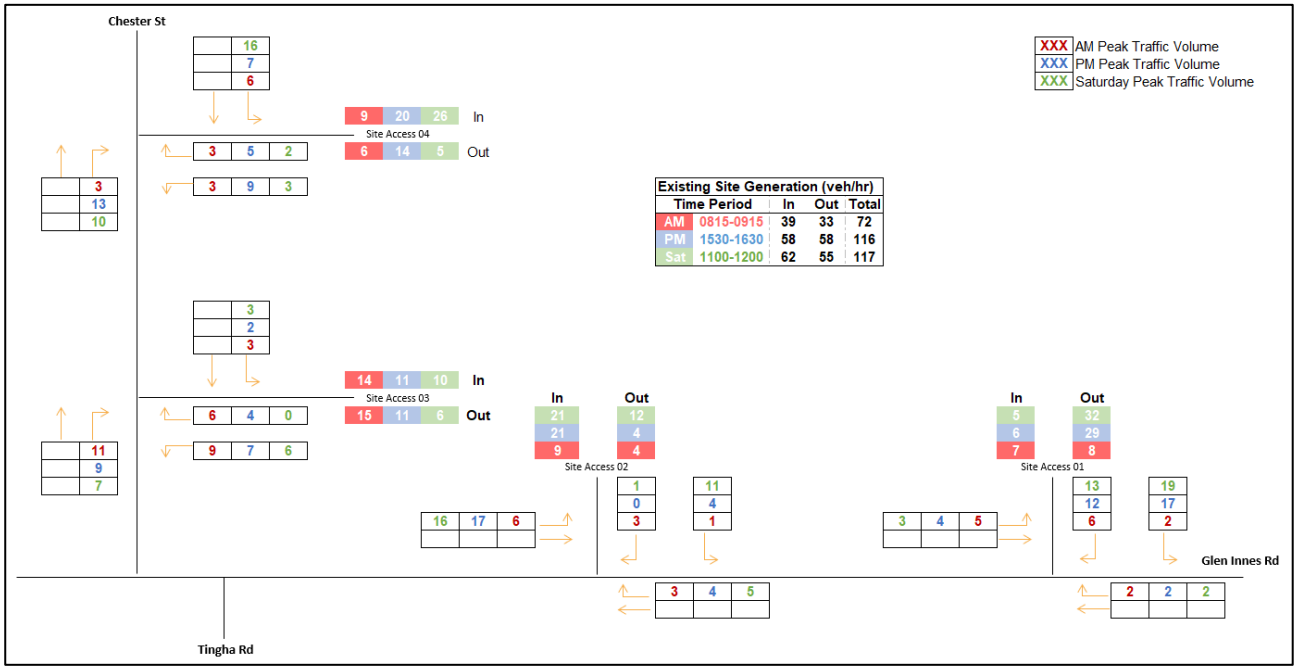


Figure 4: Existing Site Traffic Generation - Service Station

Additionally, the trip generation of the existing residential lots within the Site is estimated based on the following traffic generation rates outlined in *RMS Guide to Traffic Generating Developments – Updated Traffic Surveys 2013* (RMS TDT 2013/04a):

- Low density residential dwellings (regional areas):
  - Morning Peak hour: 0.71 vehicle trips per dwelling
  - Evening Peak hour: 0.78 vehicle trips per dwelling

Accordingly, the existing residential lots within the Site is estimated to generate approximately 2-3 vehicle trips per hour during both morning and evening peaks.

2.5 Key Roads

With reference to **Figure 5**, the key roads that may be influenced by the Proposal include:

- **Glen Innes Road (Gwydir Highway)** – an arterial road that runs to the south of the Site. It provides connection between Warialda to the west and Glen Innes to the east.

  In the vicinity of the Site, Glen Innes Road generally provides 2 lanes for two-way traffic (1 lane at each direction), with additional through movement and turning infrastructure at key intersections, specifically at Tingha Road. In the vicinity of the Site, Glen Innes Road has a posted speed limit of 50km/hr.

- **Chester Street** – a local road providing access for the existing service station and some residential lots, which runs to the west of the Site. Chester Street provides undivided 2 lanes for two-way traffic (1 lane at each direction).

  Chester Lane – a local road providing access to some residential lots, which runs to the east of the Site. Chester lane provides 1 lane for two-way traffic and has a posted speed limit of 50km/h.

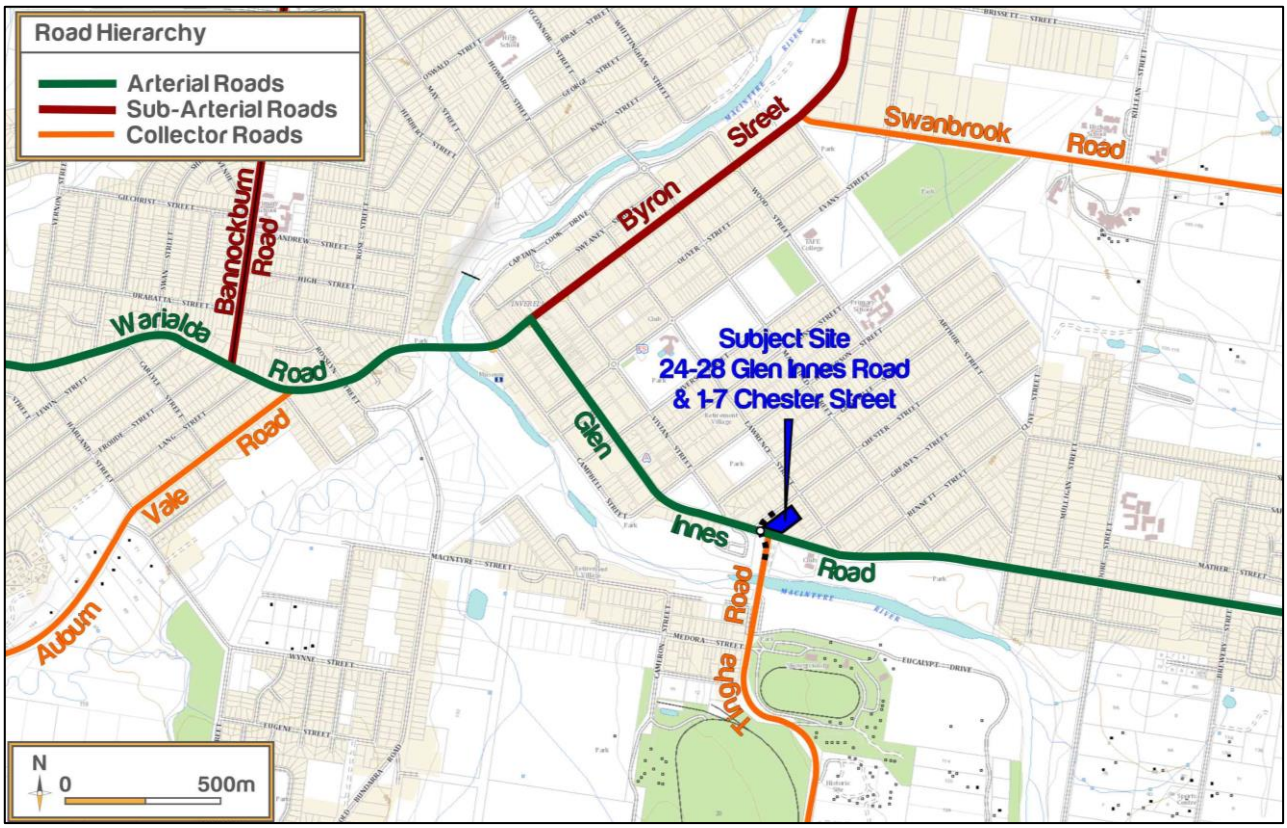


Figure 5: Road Hierarchy

2.6 Heavy Vehicle Travel Routes

The *TfNSW Restricted Access Vehicle* (RAV) Map indicates that the Tingha Road and Glen Innes Road (Gwydir Highway) is approved for up to 25/26m B-double Routes and Chester Street is an approved route with travel conditions. Refer to **Figure 6.**

Figure 6: 25/26m B-double Routes

Source: Transport for NSW, NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map

However, it is noted that the largest vehicles accessing the Site will be 20.0m Articulated Vehicles.

2.7 Key Intersection

The intersection of Glen Innes Road (Gwydir) / Tingha Road / Chester Street is currently a staggered T-intersection. As mentioned in **Section 2.4**, traffic surveys were undertaken at the key intersections as detailed above in July 2017.

With reference to the traffic surveys, the baseline traffic generation of the existing service station as well as the road network abutting the Site is presented in **Figure 7.**

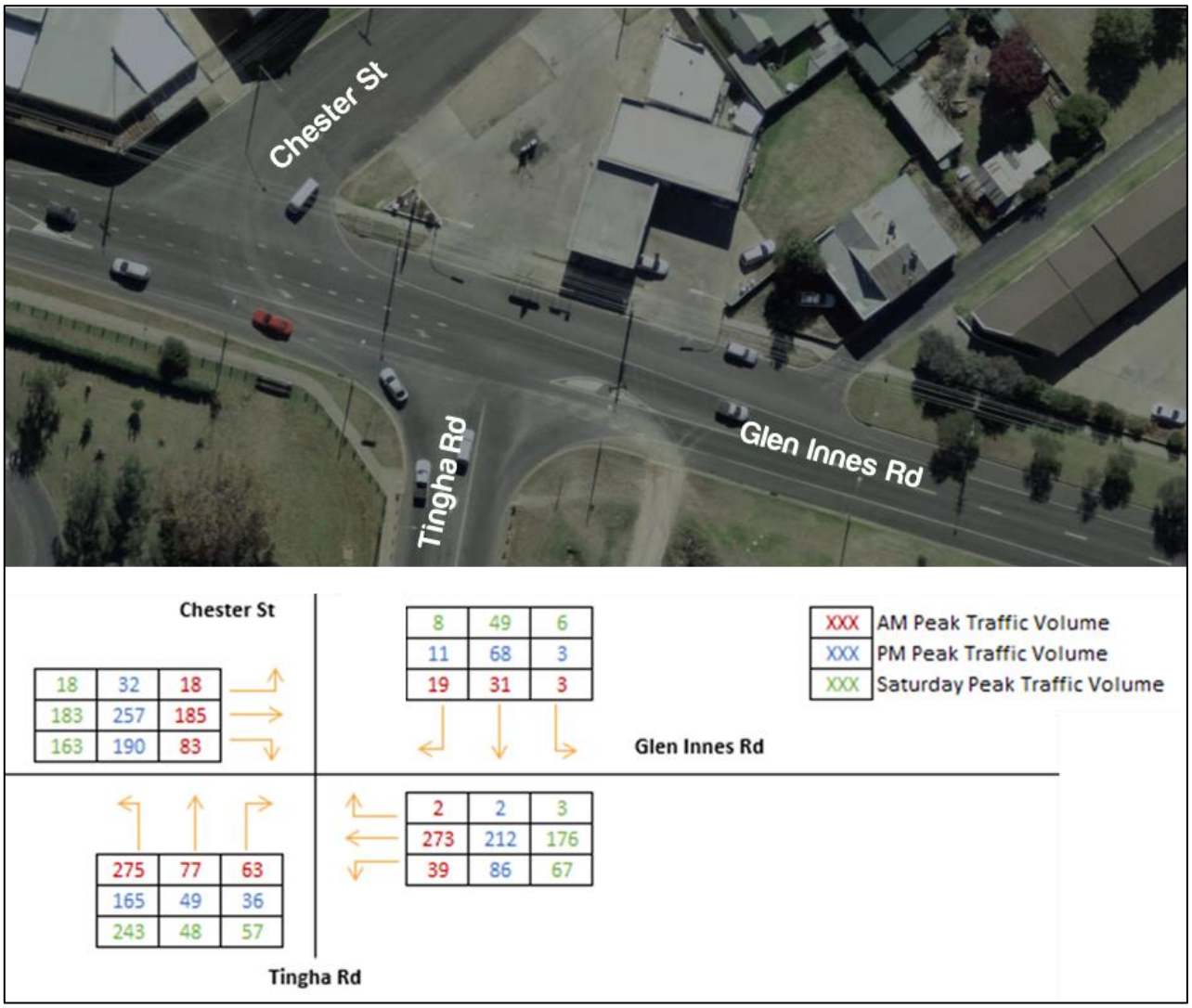


Figure 7: Baseline Traffic Volume (Year 2017) - Tingha Rd x Glen Innes Rd x Chester St

It is noted that a commitment has been made by the Australian Government to upgrade the above intersection to a roundabout to improve safety and efficiency at this junction. This upgrade will be further discussed in **Section 3.1**.

2.8 Public & Active Transport

2.8.1 Public Transport

Transport for NSW guidelines state that bus services influence the travel mode choices of sites within 400 metres (approximately 5 minutes) of a bus stop.

With reference to **Figure 9**, the Site has limited access to public transport. There is only 1 bus stop at Mansfield Street that is located within the 400 metres radius of the Site. This bus stop is serviced by the following bus routes, shown overleaf.

TABLE 3 BUS SERVICE – BUS STOP: MANSFIELD ST AT GREAVES ST, INVERELL

Bus Route	Description	Frequency
Route 471	Inverell CBD to Ross Hill & Southside	Weekdays: 16:49
Route 472	Inverell CBD to Belgravia	Monday / Wednesday / Friday: 09:50 / 12:28 Tuesday / Thursday: 09:50

2.8.2 Active Transport

With reference to **Figure 8** and **Figure 9**, the Site is currently served by shared walking / cycling paths along Glen Innes Road and Tingha Road.

Figure 8: Off-Road Shared Path on Glen Innes Road

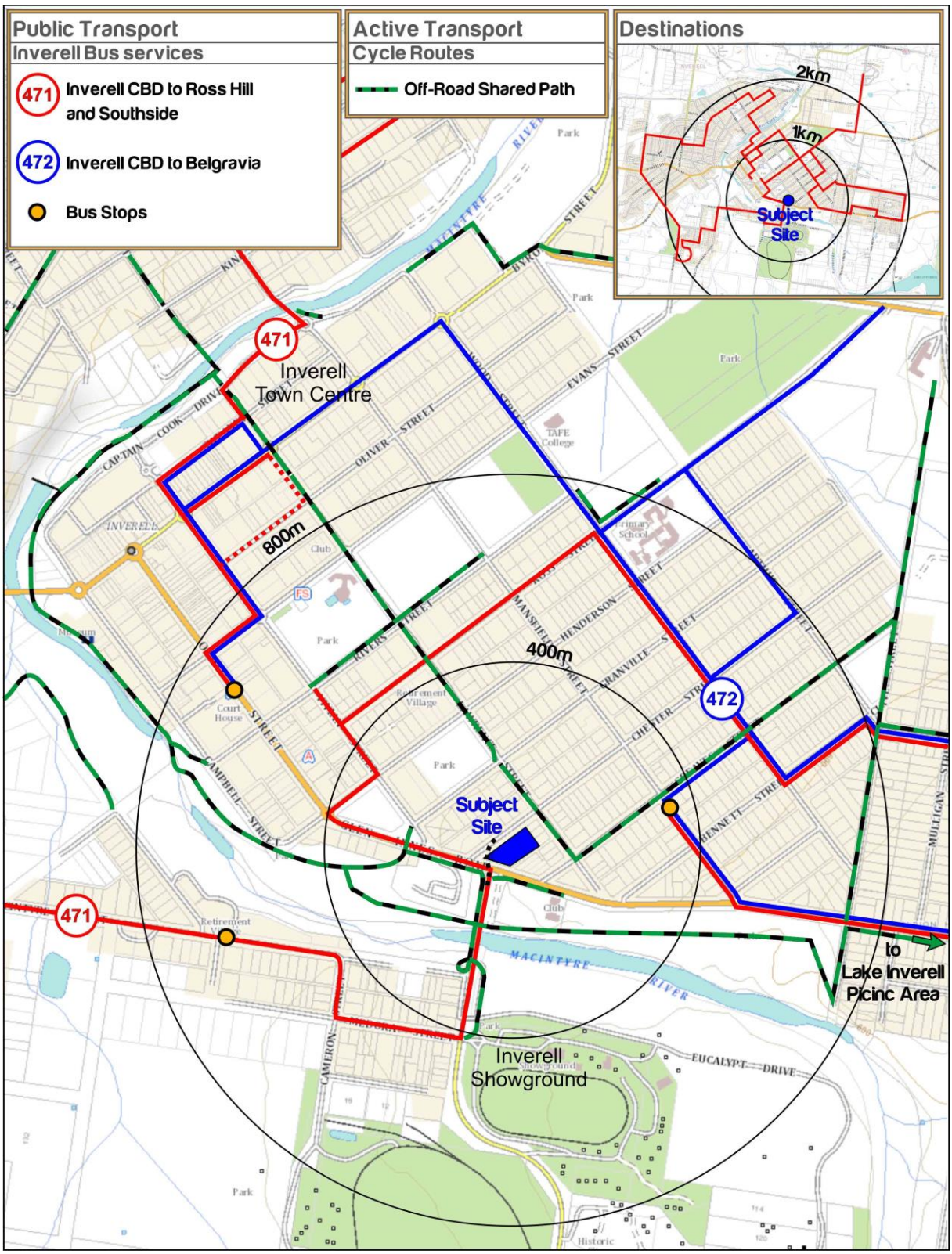


Figure 9: Public Transport Services & Cycling Routes

3 Future Conditions (Without the Proposal)

3.1 Tingha Road and Glen Innes Road Intersection Upgrade

As mentioned in **Section 2.6**, commitment has been made by the Australian Government to upgrade the intersection of Glen Innes Road (Gwydir Highway) / Tingha Road / Chester Street to a roundabout to improve safety and efficiency at this junction.[3]

This upgrade is currently in the Planning stage and the construction is expected to commence in early 2022 and be completed by late 2022. At the time of preparing this TA, Ason Group has been advised by the Council that the preferred upgrade design of the new roundabout is a one-lane roundabout with a dedicated left turn short lane from Tingha Road. An indicative upgrade plan is presented in **Figure 10.**

Figure 10: Preferred Roundabout Upgrade at Tingha Rd x Glen Innes Rd x Chester St (indicative)

Additionally, as a result of this upgrade:

- Right in and out movements of Chester Lane to / from Glen Innes Road are expected to be restricted by the proposed raised median on Glen Innes Road.
- The future southernmost access to the Site on Chester Street might need to be restricted to left-in / left-out due to the proposed raised median on Chester Street near Glen Innes Road.
  - *NOTE: This proposal seeks to restrict this access point to LEFT OUT ONLY which has been discussed with Council as part of the Planning Proposal stage meeting.*

[3] Tingha - Bundarra Road and Gwydir Highway Intersection

3.2 Future Intersection Performance (Without the Proposal)

3.2.1 Future Traffic Volume at Key Intersection

As discussed earlier, traffic survey data has been obtained for the key intersection of Glen Innes Road (Gwydir Highway) / Tingha Road / Chester Street and the existing service station. By excluding the existing traffic generation of the Site from the surveyed traffic volume at the key intersection, **Figure 11** provides the net existing traffic volume at the intersection.

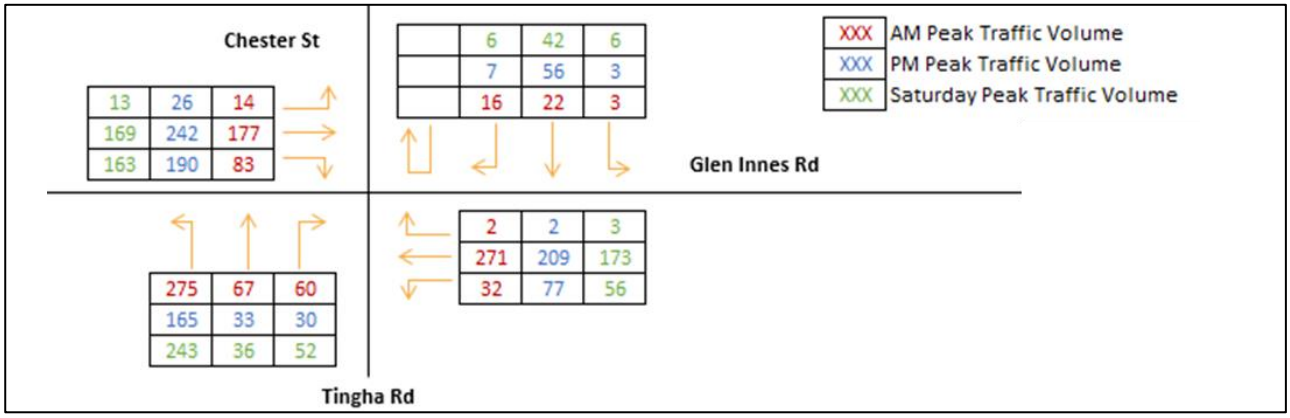


Figure 11: Baseline Traffic Volume (Year 2017) – Without Traffic Generation of the Site

The roundabout upgrade at the intersection of Glen Innes Road (Gwydir Highway) / Tingha Road / Chester Street is expected to be finished by late 2022. Therefore, future intersection performance has been assessed for the Baseline Year (Year 2022) and 10 years after the Baseline Year (Year 2032).

An annual compound growth rate of 2.5% per annum has been adopted based on Council's advice.

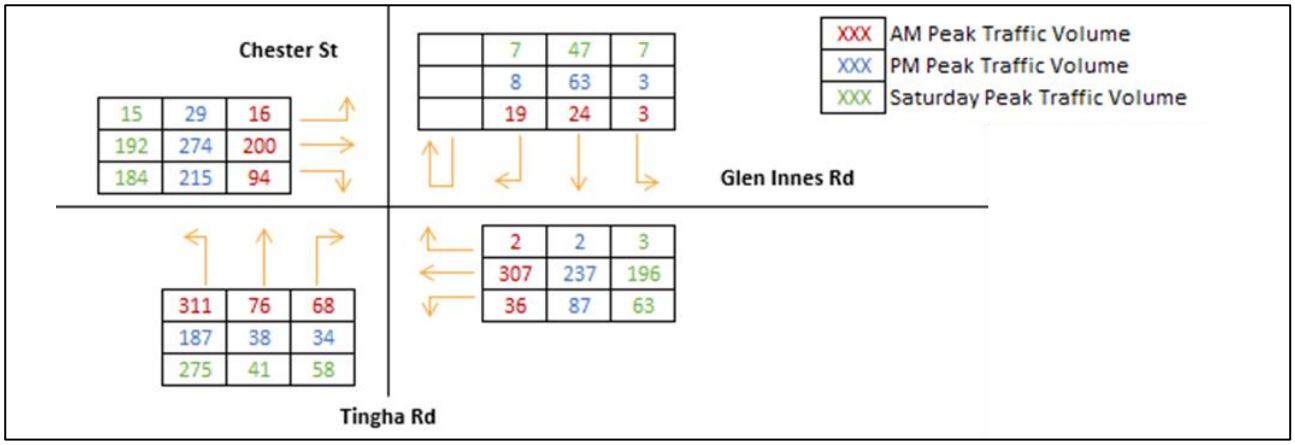


Figure 12: Future Traffic Volume (Year 2022) – Without the Proposal

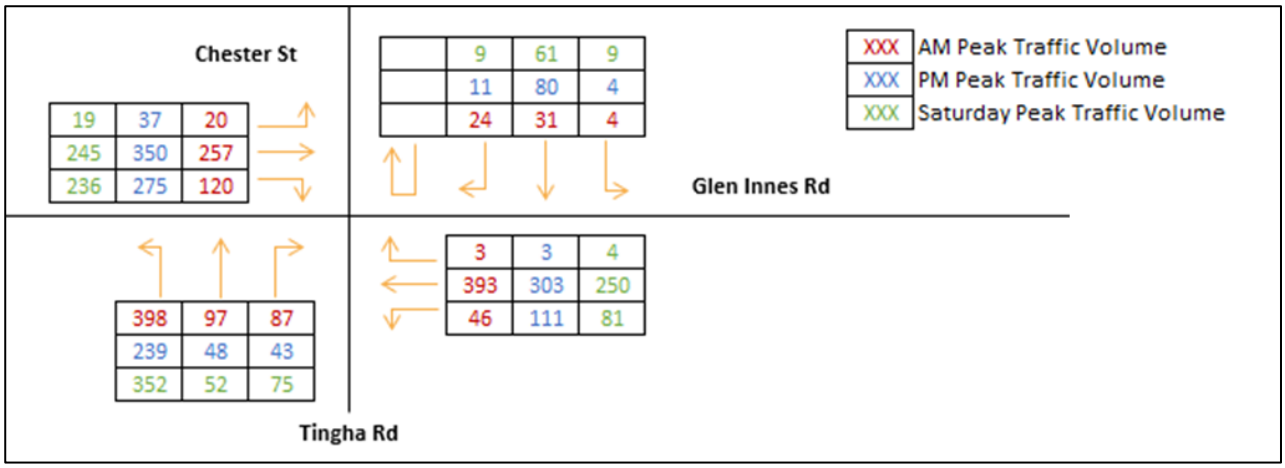


Figure 13: Future Traffic Volume (Year 2032) – Without the Proposal

3.2.2 SIDRA Intersection Layout

Having regard to the future roundabout upgrade – as discussed in Section 3.1 – the SIDRA layout for the future intersection of Glen Innes Road (Gwydir Highway) / Tingha Road / Chester Street is shown in **Figure 14.**

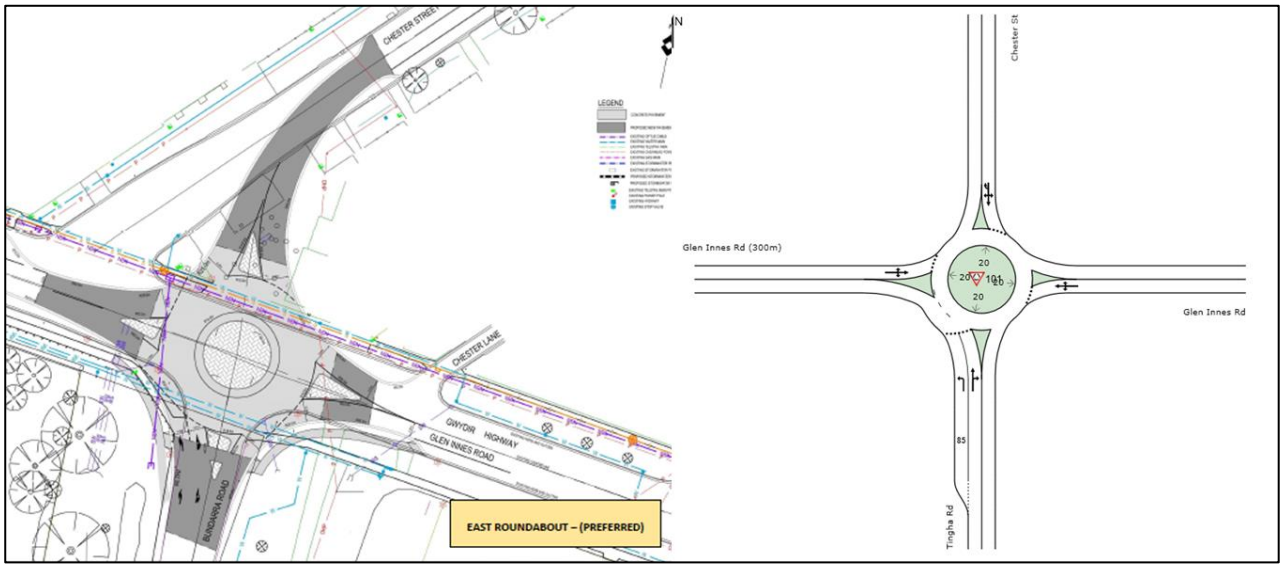


Figure 14: SIDRA Modelling Layout

3.2.3 SIDRA Modelling Results

The performance of the key intersection in future 'Baseline' (Year 2022) and future 'Base Case' (Year 2032) has been analysed using the RMS approved SIDRA modelling software. SIDRA modelling outputs a range of performance measures, in particular:

- ***Degree of Saturation (DOS)*** – The DOS is defined as the ratio of demand (arrival) flow to capacity. The DOS is used to measure the performance of intersections where a value of 1.0 represents an intersection at theoretical capacity, above 1.0 represent over-saturated conditions (demand flows exceed capacity) and

degrees of saturation below 1.0 represent under-saturated conditions (demand flows are below capacity). As the performance of an intersection approaches DOS of 1.0, queue lengths and delays increase rapidly. It is usual to attempt to keep DOS to less than 0.9, with satisfactory intersection operation generally achieved with a DOS below 0.8.

- ***Average Vehicle Delay (AVD)*** – Delay represents the difference between interrupted and uninterrupted travel times through an intersection and is measured in seconds per vehicle. Delays include queued vehicles accelerating and decelerating from/to the intersection stop lines, as well as general delays to all vehicles travelling through the intersection. The AVD (or average delay per vehicle in seconds) for intersections also provides a measure of the operational performance of an intersection and is used to determine an intersection's Level of Service (see below). For signalised intersections, the AVD reported relates to the average of all vehicle movements through the intersection. For priority (Give Way, Stop & Roundabout controlled) intersections, the AVD reported is that for the movement with the highest AVD.
- ***Level of Service (LOS)*** – This is a comparative measure that provides an indication of the operating performance, based on AVD. For signalised and roundabout intersections, LOS is based on the average delay to all vehicles, while at priority-controlled intersections LOS is based on the worst approach delay.

Table 4 outlines the relevant performance criteria in accordance with the RMS Guide.

TABLE 4 INTERSECTION ASSESSMENT CRITERIA

Level of Service	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

Having regard to the above, a summary of the modelling results is provided in the table below.

TABLE 5 MODELLING RESULTS – GLEN INNES ROAD / TINGHA ROAD / CHESTER STREET

Peak Period	Future Baseline (Year 2022)			Future Base Case (Year 2032)		
	Max. DoS	Max. Delay (sec)	LoS	Max. DoS	Max. Delay (sec)	LoS
AM Peak	0.29	11.2	A	0.39	12.0	A
PM Peak	0.39	10.4	A	0.51	11.5	A
Saturday	0.31	10.2	A	0.41	11.1	A

With reference to **Table 5**:

- The proposed roundabout intersection of Glen Innes Road / Tingha Road / Chester Street is expected to operate at a satisfactory LoS A during all peak periods in both future 'Baseline' (Year 2022) and future 'Base Case' (Year 2032).
- Under future 'Base Case', the maximum queue on Chester St is expected to occur during the evening peak, which is approximately 6 metres.

Accordingly, the proposed roundabout intersection CAN accommodate the regional background traffic growth by the design year of 2032 with best LoS A and spare capacity without impacting the proposed site access crossovers along Chester Street.

The additional impact over and above the background growth and as a result of the Proposal is further discussed in relevant sections of this report.

4 Parking & Servicing Requirements

4.1 Car Parking Requirement

4.1.1 Inverell DCP 2013

Clause 5.3 of the *Inverell Development Control Plan 2013* (IDCP) provides the following parking rates that are considered applicable for the Proposal:

Service Station:

- *4 spaces per work bay, plus*
- *5 spaces per 100 m^2 of GFA for convenience stores, plus*
- *15 spaces per 100 m^2 of GFA or 1 space per 3 seats for restaurant, whichever is greater.*

NOTE: THE PROPOSAL WILL NOT PROVIDE WORK BAYS OR A RESTUARANT. HENCE THE SECOND RATE IS TECHNICALLY APPLICABLE ONLY.

Retail Premises:

- *Shops where the total GFA is less than 4,000 m^2 – 1 space per 25 m^2 of GFA*
- *Shops where the total GFA is greater than 4,000 m^2 – 1 space per 40 m^2 of GFA*

NOTE: BASED ON ADVICE PROVIDED BY NDC, THE PROPOSED DISPLAY AND SHED FACILITIES ARE ANCILARY TO THE OPERATION OF THE SERVICE STATION. ACCORDINGLY, THESE USES ARE UNLIKELY TO GENERATE INDEPENDENT TRIPS. AS SUCH, THEIR ASSOCIATED COMMUTERS ARE MAINLY CONSIDERED ONLY FOR CROSS-TRADE PURPOSES THAT HAVE VISITED THE SERVICE STATION.

It is worth noting here that Clause 1.10 of the IDCP outlines that variations to the requirements may be considered by Council. In this regard, Clause 1.10 states the following:

"Variations to the acceptable solutions in the IDCP may be considered by Council. Requests for variations are to be made in writing and are to be supported by sufficient information to justify the variation. Variations to acceptable solutions will only be permitted where Council is satisfied that the variation will meet the intent and outcomes of the IDCP. Significant variations from the acceptable solutions may require determination at a Committee or Council meeting."

4.2 Car Parking Assessment

Accordingly, the required car parking spaces for each component of the proposed development are presented in **Table 6**.

TABLE 6 CAR PARKING REQUIREMENT FOR SITE – REALISTIC ASSESSMENT

Land Use	Yield (GFA - m^2)	Assumptions	Car Parking Rates Adopted	Parking Required	Onsite Parking Supply
Convenience Store	282	As discussed above. The proposal will not include work bays or restaurant.	5 spaces / 100 m^2 GFA	14	**23[1]**
Shed	432	The use of the proposed shed is ancillary to the service station.	Nil spaces	0	
Display	94	The use of the proposed display is ancillary to the service station.	Nil spaces	0	
Total				**14**	

NOTE: This includes 14 spaces at the bowsers and 9 on-site car parking spaces. This provision excludes the Air and Water space.

Strict application of the IDCP parking rates to the proposed development results in the requirement of 14 car parking spaces. In response, the proposal provides for:

- 14 refuelling positions at the bowsers (12 for cars and 2 for trucks) with significant extra queuing capacity, and
- 9 on-site car parking spaces (plus an additional Air and Water space).

In this regard, the proposed convenience store, outdoor seating area, shed and display facilities are not inherently trip generators and are generally ancillary to the service station traffic generation. This means that drivers to the service station would visit the ancillary services and only use the outdoor seating area as a supplementary part of their visit when filling up.

Notwithstanding, the convenience store has been assessed with reference to the parking rate outlined in the IDCP for Service Stations where application of the rate resulted in 14 spaces. It is considered that the parking demand associated with the convenience store is deemed to be readily satisfied with the refuelling positions which can cater for a maximum of 14 vehicles comfortably (with additional queuing capacity also being provided on Site).

Finally – as mentioned in **Section 1.3.1**, the proposed shed will provide 2 independent drive through lane within the building and as such, ANY ancillary trips to this facility will be accommodated via the drive through lanes with no actual demand for on-site car parking.

Accordingly, realistically speaking, the proposed parking provision of the Site is considered to be superior to the parking requirements of the proposed service station.

4.2.1 Worst Case Assessment

For conservativeness, the worst-case assessment has been undertaken where the **display area** has been assessed as an independent retail store with the assumption of infrequent occurrences where the display area

would be the main purpose of the trip. As such, application of 1 space per 25m^2 GFA results in a requirement of 4 car parking spaces on-site which can be accommodated by the proposed 9 on-site car parking spaces.

4.3 Additional Parking Considerations

4.3.1 Accessible Parking

While Inverell DCP 2013 does not provide any specific requirements in regard to the provision of accessible parking, the Disability (Access to Premises – Buildings) Standards 2010 from the National Code of Australia (NCA) provide the following standard accessible parking rate for retail developments:

- *Up to 1000 car parking spaces: 1 space for every 50 car parking spaces or part thereof (rounded up).*

Based on the requirement above, 1 accessible parking space is required for the DA.

In response to this requirement, the Proposal provides 1 accessible parking space which meets the requirement.

4.3.2 Bicycle Parking

While Inverell DCP 2013 does not provide any specific requirements in regard to the provision of bicycle parking, the *Planning Guidelines for Walking and Cycling December 2004*, NSW Department of Infrastructure, Planning and Natural Resources, Road and Traffic Authority provide the following bicycle rates for service station and retail shops:

- *Staff Bicycle Parking Requirement:* *3-5% of staff number*
- *Visitor Bicycle Parking Requirement:* *5-10% of staff number*

Assuming that maximum of 1-2 staff members are required for the operation of the service station 1 staff bicycle parking space and 1 visitor bicycle parking spaces are recommended for best practice.

The current plan does not indicate provision bicycle parking spaces, but the abovementioned spaces are recommended and can be accommodated in the Proposal. Having said that, the need for bicycle parking (if deemed necessary by the Council) can readily be provided in response to a suitable condition of consent.

4.3.3 Servicing Vehicle Parking

While Inverell DCP 2013 does not provide any specific requirements in regard to the provision of service / loading bays, the RMS Guide provides the following:

Shops:

- *< 2,000m2 GFA:* *1 space per 400 m^2 of GFA*
- *> 2,000m2 GFA:* *5 + 1 space per 1,000 m^2 of GFA over 2,000 m^2*

Provision must be made on-site at a convenient location for the type of delivery service vehicles appropriate to the Proposal. Furthermore, all service areas are expected to be designed to in accordance with AS 2890.2:2018.

Based on RMS Guide requirements above, the Shed GFA of 432 m^2 is proposed, hence 1 space for service vehicle parking are required.

In response to this requirement, the Proposal provides 1 servicing vehicle space for the convenience store and display area which meets the requirement. All loading / unloading activities associated with the proposed shed will be accommodated within the proposed building.

5 Traffic Assessment

5.1 Traffic Generation

As mentioned in **Section 1.2**, the Proposal aims to redevelop and expand the existing service station including provision of rural supply shed providing an additional 432 m^2 of GFA.

Further, as detailed in **Section 4.1.1**, the rural supply shed is recognised as an ancillary land use to the Service Station whereby vehicle trips to the shed are typically captured as part of the Service Station trips.

Nonetheless, to account any additional traffic generated by these additional area as well as the potential increase of passing trade and the increase in background traffic along surrounding road network, an annual compound growth rate of 2.5% per annum has been adopted for the site traffic generation under the future 'Project Case' assessment.

As such, the traffic analysis detailed in this TA are considered **conservative**.

TABLE 7 FUTURE 'PROJECT CASE' SITE TRIP GENERATION – YEAR 2032

Trip Generation	AM Peak (08:15 – 09:15)	PM Peak (15:30 – 16:30)	Saturday (11:00 – 12:00)
Inbound	54	80	85
Outbound	45	80	76
Total	**99**	**160**	**161**

5.2 Traffic Distribution & Assignment

As discussed in **Section 3.1**, the new roundabout upgrade would potentially result in restricted left-in / left-out accesses of:

- Chester Lane to / from Glen Innes Road
- The Site to / from Chester Street

Additionally, Ason Group has been advised that the Site is expected to provide two access points at Chester Street, including:

- An entry only access near the northern boundary of the Site
- A left-out only access near the Glen Innes Road intersection

Consultation with the Council regarding above access strategy has been undertaken on 27 April 2021, and as suggested by the Council, the access at Chester Lane will be restricted for emergency access only.

An indicative future access plan is provided in **Figure 15**.

Figure 15: Indicative Future Access Plan

With reference to sections above, the peak hour traffic generation of the Site has been assigned to the key intersection for the future 'Project Case' (Year 2032), as shown in the figure below.

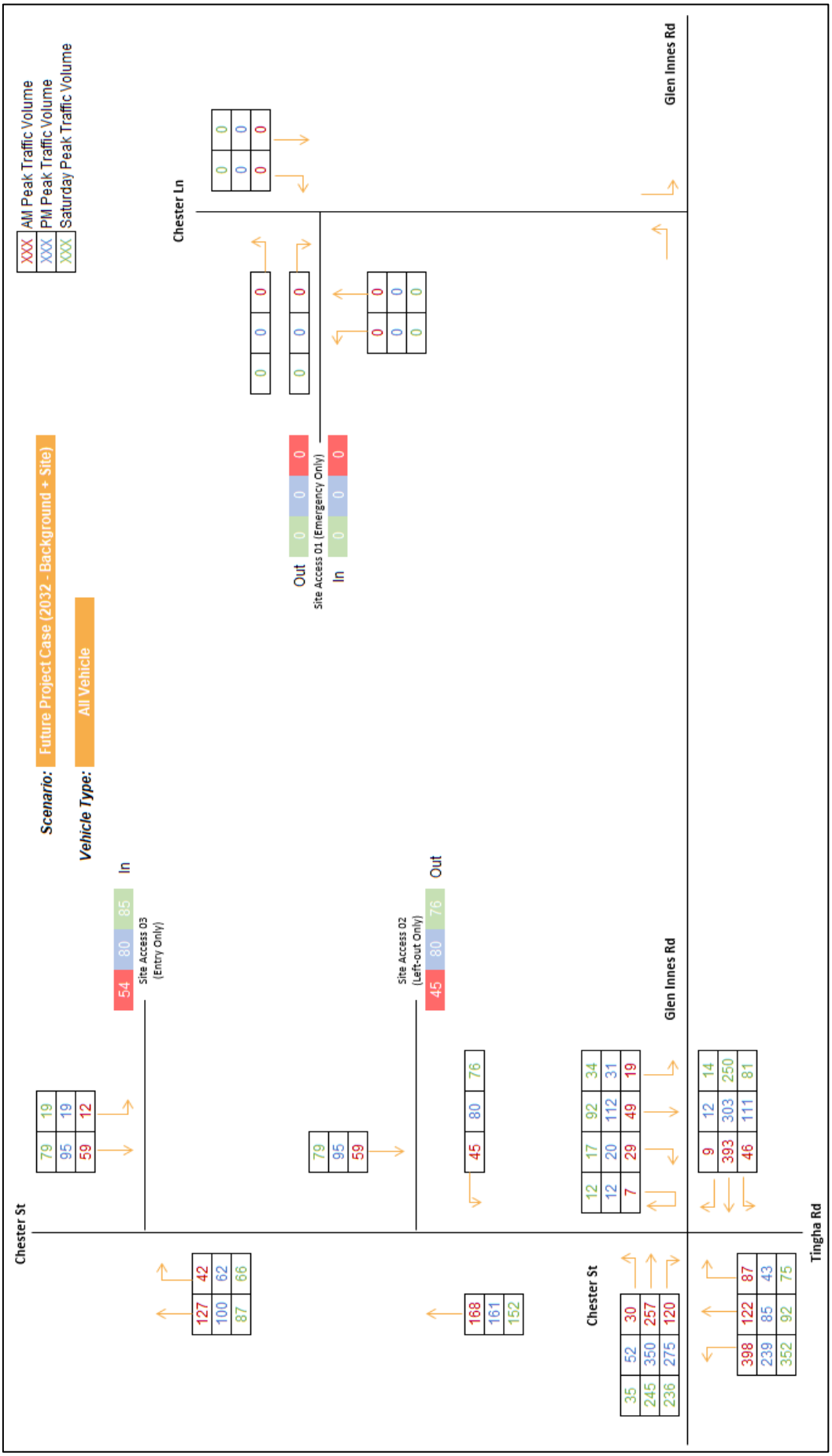


Figure 16: Future Traffic Generation of the Proposal (Year 2032)

5.3 Traffic Impacts

The operation of the key intersection in the Year 2032 further to the Proposal has again been assessed using the SIDRA model. The results of the analysis are provided in **Table 8**.

TABLE 8 MODELLING RESULTS COMPARISON – GLEN INNES ROAD / TINGHA ROAD / CHESTER STREET

Peak Period	Future Base Case (Year 2032 - without Proposal)			Future Project Case (Year 2032 - with Proposal)		
	Max. DoS	Max. Delay (sec)	LoS	Max. DoS	Max. Delay (sec)	LoS
AM Peak	0.39	12.0	A	0.41	16.0	B
PM Peak	0.51	11.5	A	0.56	15.7	B
Saturday	0.41	11.1	A	0.45	14.2	A

With reference to the table above:

- The Proposal has no material impact on the performance of the Glen Innes Road / Tingha Road / Chester Street intersection;
- The intersection of Glen Innes Road / Tingha Road / Chester Street is expected to still perform at a satisfactory LoS (LoS B or better) during all peak periods with the Proposal;
- Negligible increases in delays, ranging in the order of 3.1 seconds to 4 seconds; and
- Queue back from the roundabout to the LEFT OUT (exit crossover) on Chester Street is ONLY 10 meters. This access point is located some 20 meters from the roundabout and as such the queue back from the roundabout would not impact this access point.

6 Design Commentary

6.1 Relevant Design Standards

The following relevant Australian Standards are considered applicable to the Proposal:

- AS2890.1:2004 for car parking areas;
- AS2890.2:2018 for commercial vehicle loading areas; and
- AS 2890.6:2009 for accessible parking spaces

Having regard for the above, the design of the site access, car parks, internal circulation have been assessed to provide compliance with these Standards.

Detailed swept paths analysis and associated Design Advice commentary has been provided in **Appendix A**.

6.2 Design Vehicles

As mentioned in **Section 2.6**, the Site currently provides access to heavy vehicles up to 20.0m Articulated Vehicles (AVs) for fuel delivery and it would still be the case in the future.

Therefore, a 20.0m AV has been adopted as the largest and most relevant 'design vehicle' for this assessment. The 20.0m AV will be able to enter / exit from the proposed access driveways as well as manoeuvring into the heavy vehicle bowsers, located within the Site.

B99 vehicles have also been adopted as a 'design vehicle' for the general light vehicle (car) accessing the Site for refuelling purposes at each of the individual light vehicle fuel bowsers.

Medium Rigid Vehicle (MRV) has been adopted as the 'design vehicle' to assess for the loading and unloading at the proposed shed and display areas (as advised by NDC).

Detailed swept paths analysis and associated design advice commentary has been undertaken as part of this TA and provided in **Appendix A**.

6.3 Access Design

6.3.1 Light Vehicle Circulation

With reference to **Figure 17**, the fuel bowser filling points are shown with the B99 swept paths demonstrating the servicing circulation to this key area of the Site.

These vehicles enter the Site via the Chester Street northern access before filling up at the light vehicle fuel bowsers. Once the car is filled up, the vehicles then proceed to turn right onto the Chester Street left-out access.

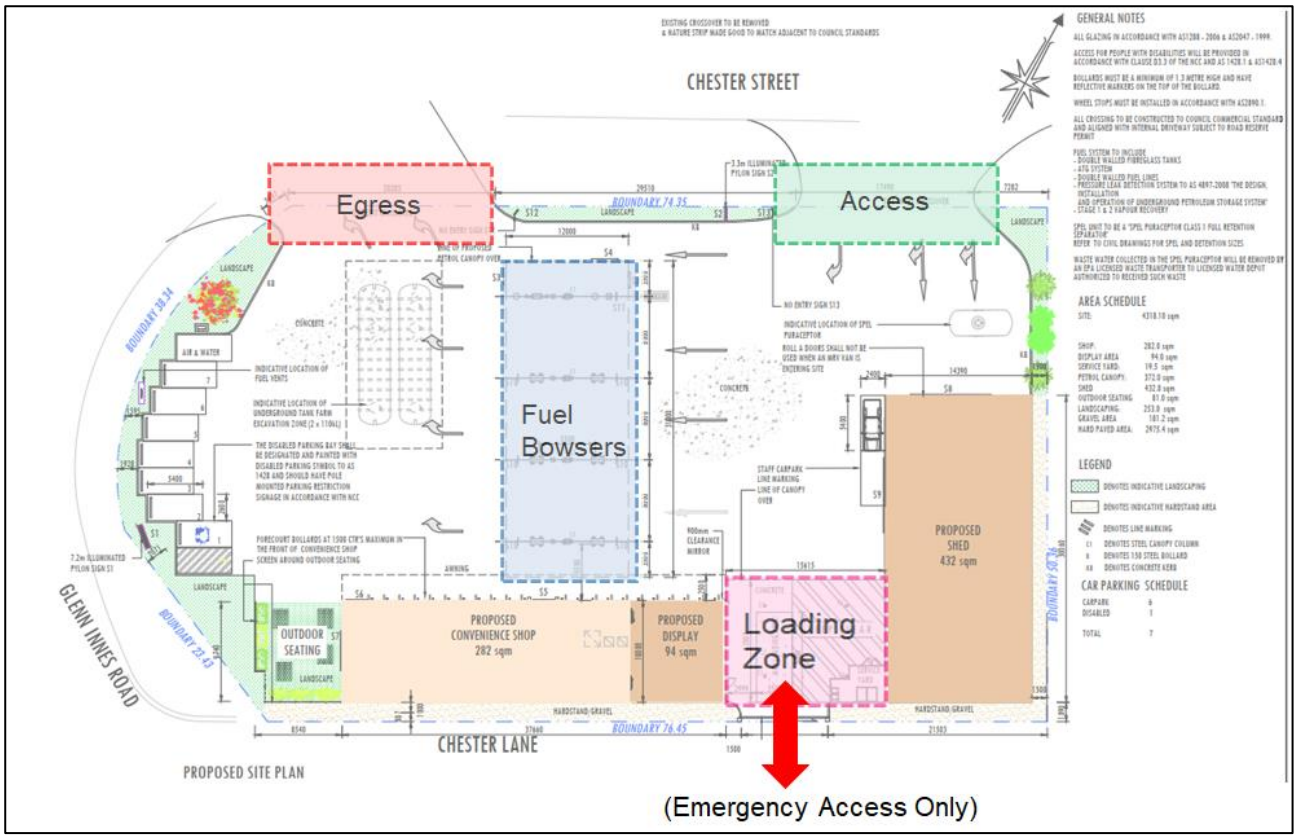


Figure 17: Key Servicing Areas on Site

Additionally, light vehicles are intended to access the supply shed as a drive-thru facility. In this regard, the access is provided to the northern end of the shed via Roller Shutter Doors (RSDs).

6.3.2 Medium Rigid Vehicle Circulation

The proposed supply shed is designed and intended to provide access to an 8.8m Medium Rigid Vehicle (MRV). In this regard, the access for MRVs is provided from the western side of the supply shed with the provision of a Loading Zone as shown in **Figure 17**.

6.3.3 Heavy Vehicle Circulation

With reference to **Figure 18**, all heavy vehicles are expected to enter the Site via the Chester Street northern access and exit the Site via the left-out access to Chester Street followed by the future roundabout of Chester Street and Glen Innes Road.

Figure 18: Indicative Heavy Vehicle Internal Circulation and Access

6.3.4 Egress Location

Additionally, the SIDRA modelling results indicate that – with the Proposal – the maximum queue on Chester Street is expected to occur during the evening peak, which is approximately 10 metres.

On this basis, it is evident that the left-out exit at Chester Street is located at a distance greater than some 10 metres away from the future roundabout of Chester Street and Glen Innes Road.

6.4 Traffic Management Plan

While the traffic impacts of the development is likely to be negligible, measures to minimise and manage on-site circulation would be conditioned after the DA stage. The measures and fundamentals would include the following:

- Traffic control to manage and regulate the traffic movements into and out of the site particularly for large fuel deliveries;
- Disruption to road users would be kept to a minimum by scheduling intensive fuel delivery activities outside of road network peak hours, and
- Trucks servicing dwell times at the refuelling positions would be minimised to reduce chances of queue back on-site.

7 Summary & Conclusions

7.1 Key Findings

Ason Group has been engaged by Newton Denny Chapelle (NDC) on behalf of North Coast Petroleum (NCP) to prepare a Transport Assessment (TA) supporting a Development Application (DA) located at 24-28 Glen Innes Road & 1-7 Chester Street, Inverell (the Site).

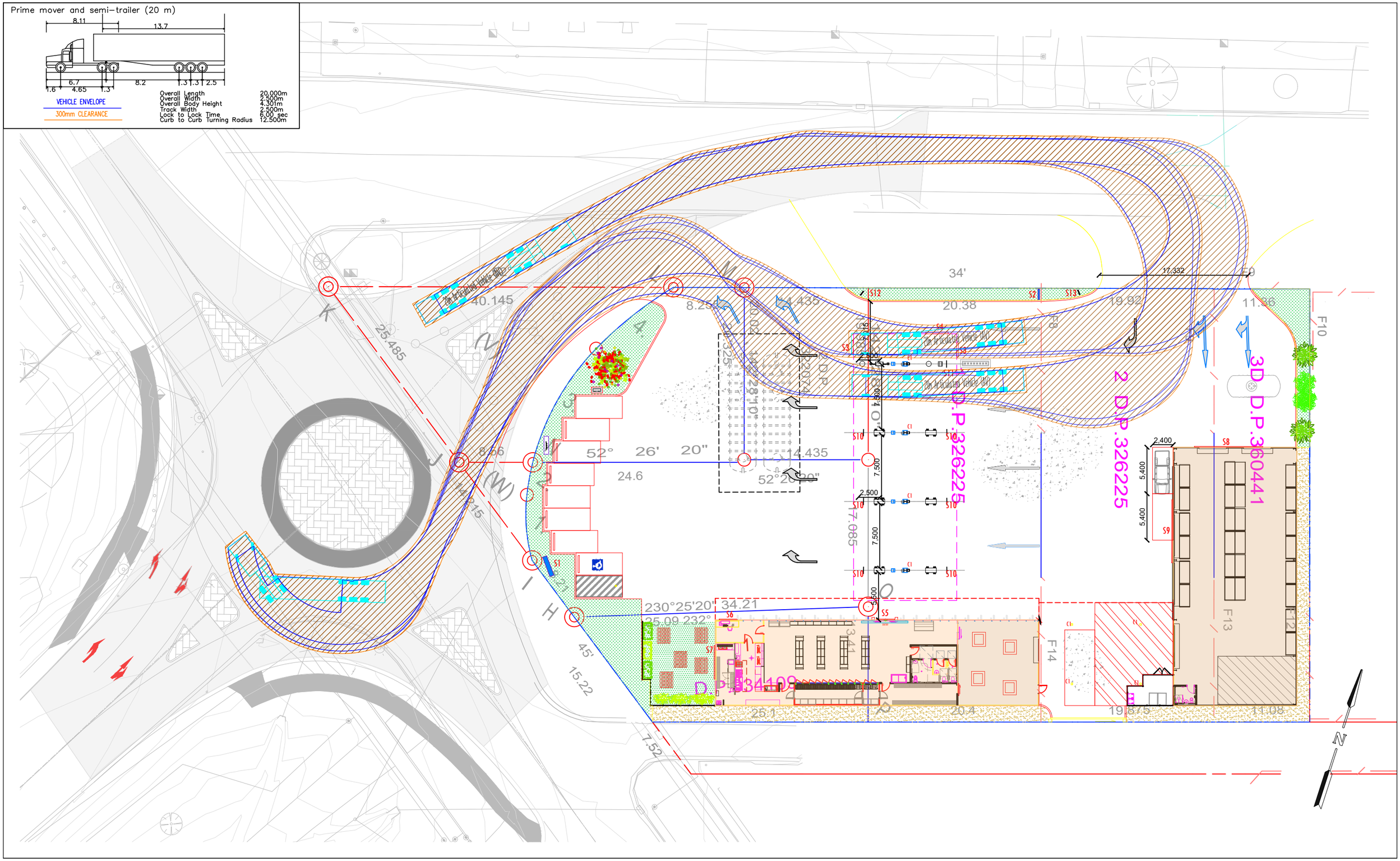
To summarise, the key findings of this assessment are:

- The proposed site plan suggests that overall, the Site would provide for the development of:
  - A total built up Gross Floor Area (GFA) of 808 m^2 including:
    - A service station shop of 282 m^2 GFA;
    - A display area of 94 m^2 GFA; and
    - A rural supply shop / shed of 432 m^2 GFA, which is expected to stock packaged livestock food, bird seed, dog food, unpackaged hay, etc.
- A total of 14 petrol pumps, comprising:
  - 12 petrol pumps for light vehicles, and
  - 2 petrol pumps for heavy vehicles.
- A commitment has been made by Australian Government to upgrade the intersection of Glen Innes Road (Gwydir Highway) / Tingha Road / Chester Street to a roundabout to improve safety and efficiency at this junction. This upgrade is currently in Planning stage and the construction is expected to commence in early 2022 and be completed by late 2022.
- SIDRA modelling has been undertaken to confirm that the future new roundabout would operate at a satisfactory LoS A and B during all peak periods with the Proposal in the future 'Project Case' (Year 2032) scenario.
- To account for traffic generated by the additional GFA from retail area and potential increase of passing trade and as well as the increase on traffic along surrounding road network, an annual compound growth rate of 2.5% per annum has been adopted for the site traffic generation under the future 'Project Case' assessment. Therefore, the traffic analysis contained in this TA is based on a conservative assessment.
- Having regard to the above, the car parking spaces required as per Inverell DCP based on the proposed GFA are as follows:
  - 14 spaces for the Convenience Store;
  - 0 spaces for the Shed; and
  - 0 (4 for worst-case assessment) spaces for the Display Area.
- In response, the proposal provides for more than 23 on-site spaces to accommodate cars and trucks, indicating a surplus of car parking spaces, irrespective of the assessment case.
- The Proposal will also provide an emergency only access on Chester Lane.
- All heavy vehicles (up to 20.0m AVs) are expected to enter the Site via the northern access from Chester Street, and exit the Site via the left-out access to the future roundabout of Chester Street and Glen Innes Road.

7.2 Conclusion

On the basis of the above, the DA is supportable on Traffic Engineering and Transport Planning grounds and will not result in any adverse impacts on the surrounding road network or the availability of parking.

Appendix A. Design Commentary and Swept Path Diagrams



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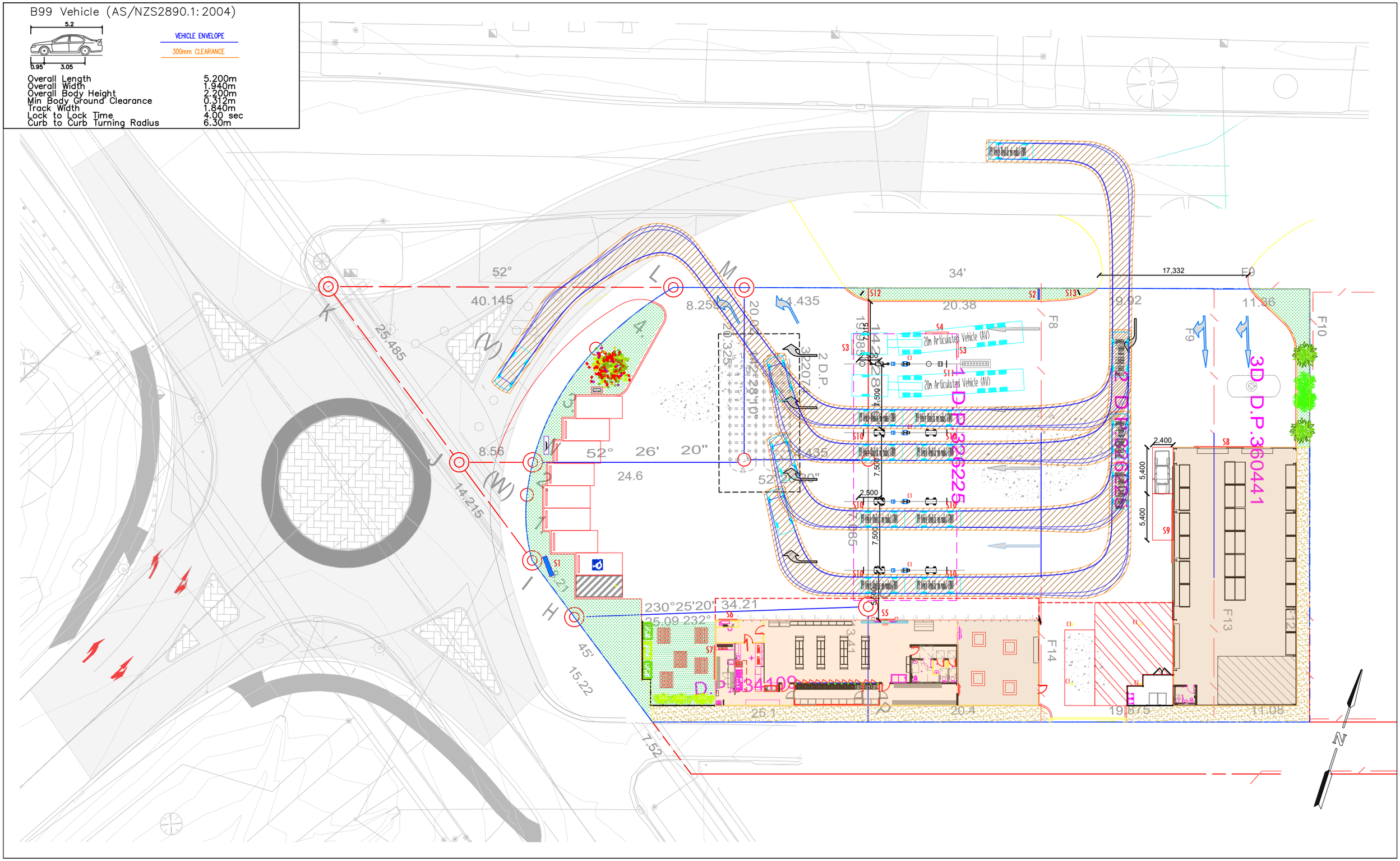
B99 Vehicle (AS/NZS2890.1: 2004)

VEHICLE ENVELOPE

300mm CLEARANCE

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m



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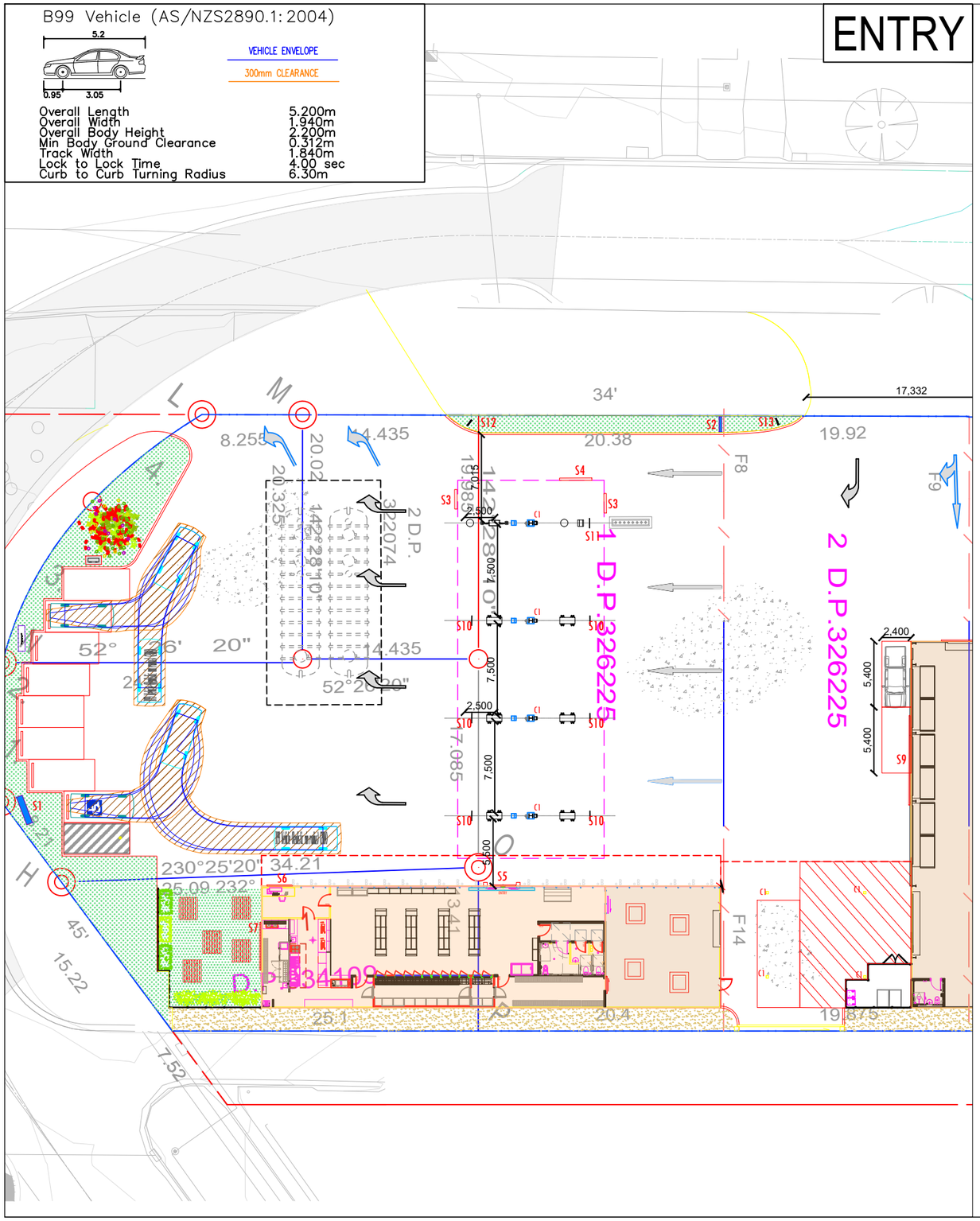

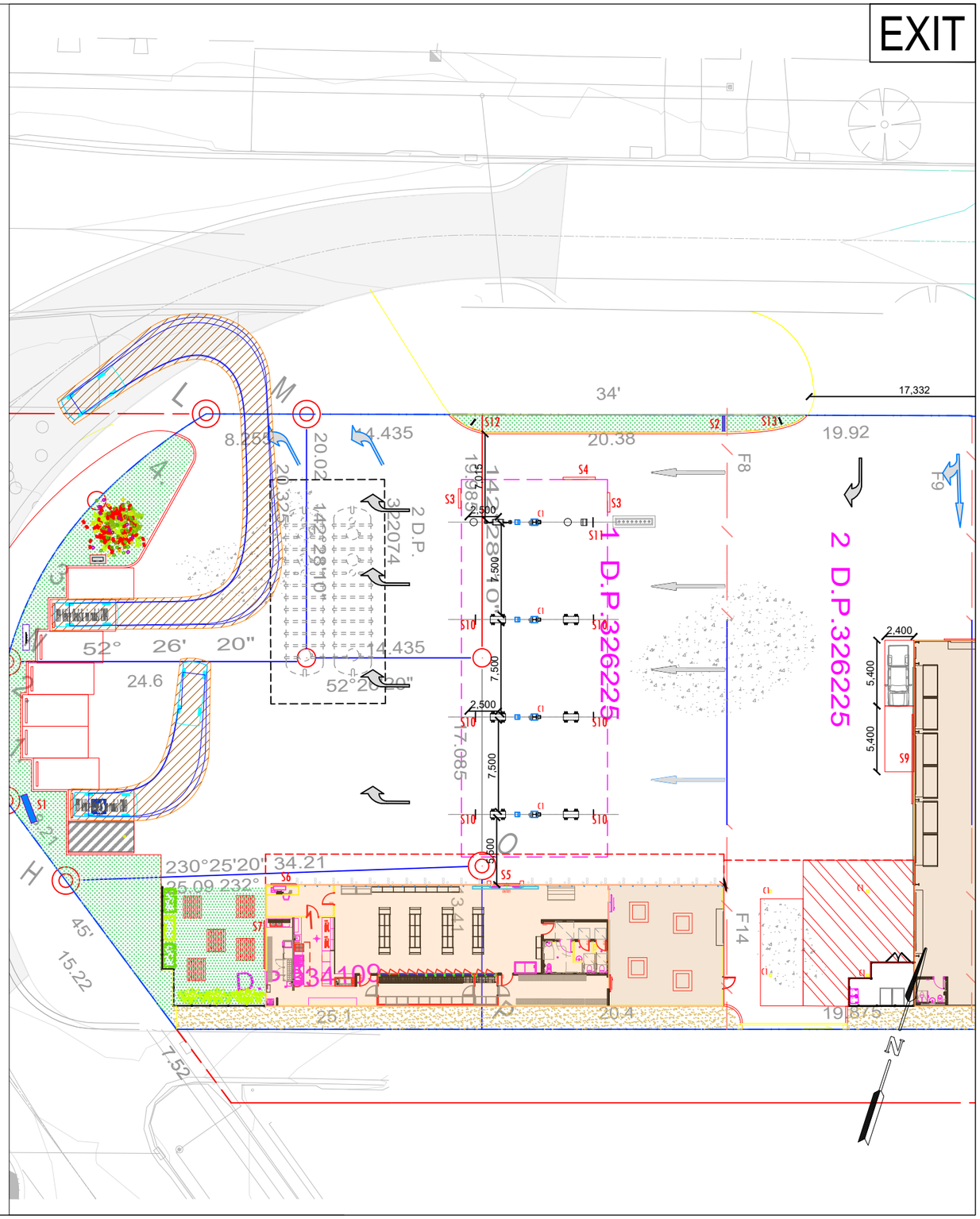

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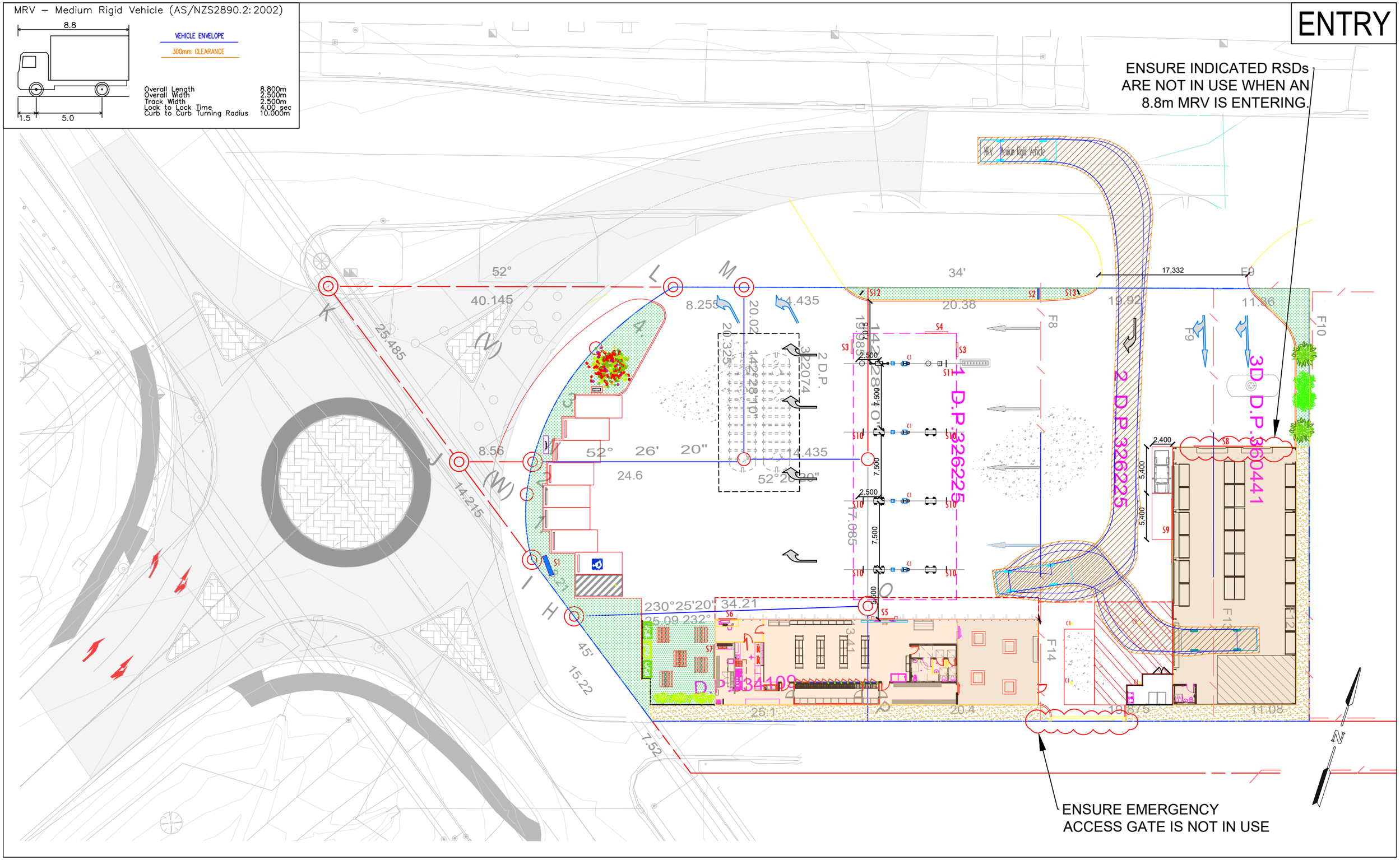

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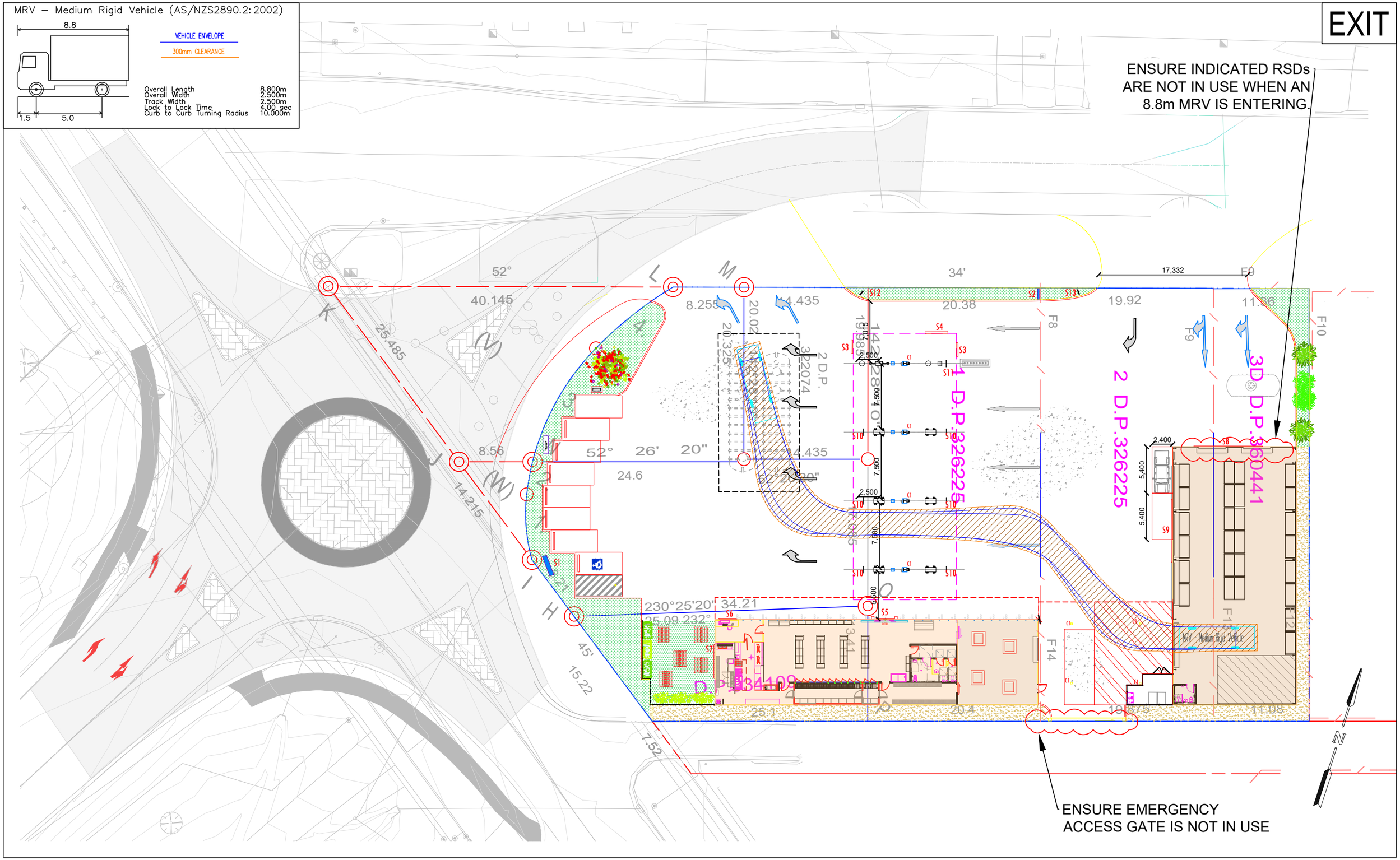

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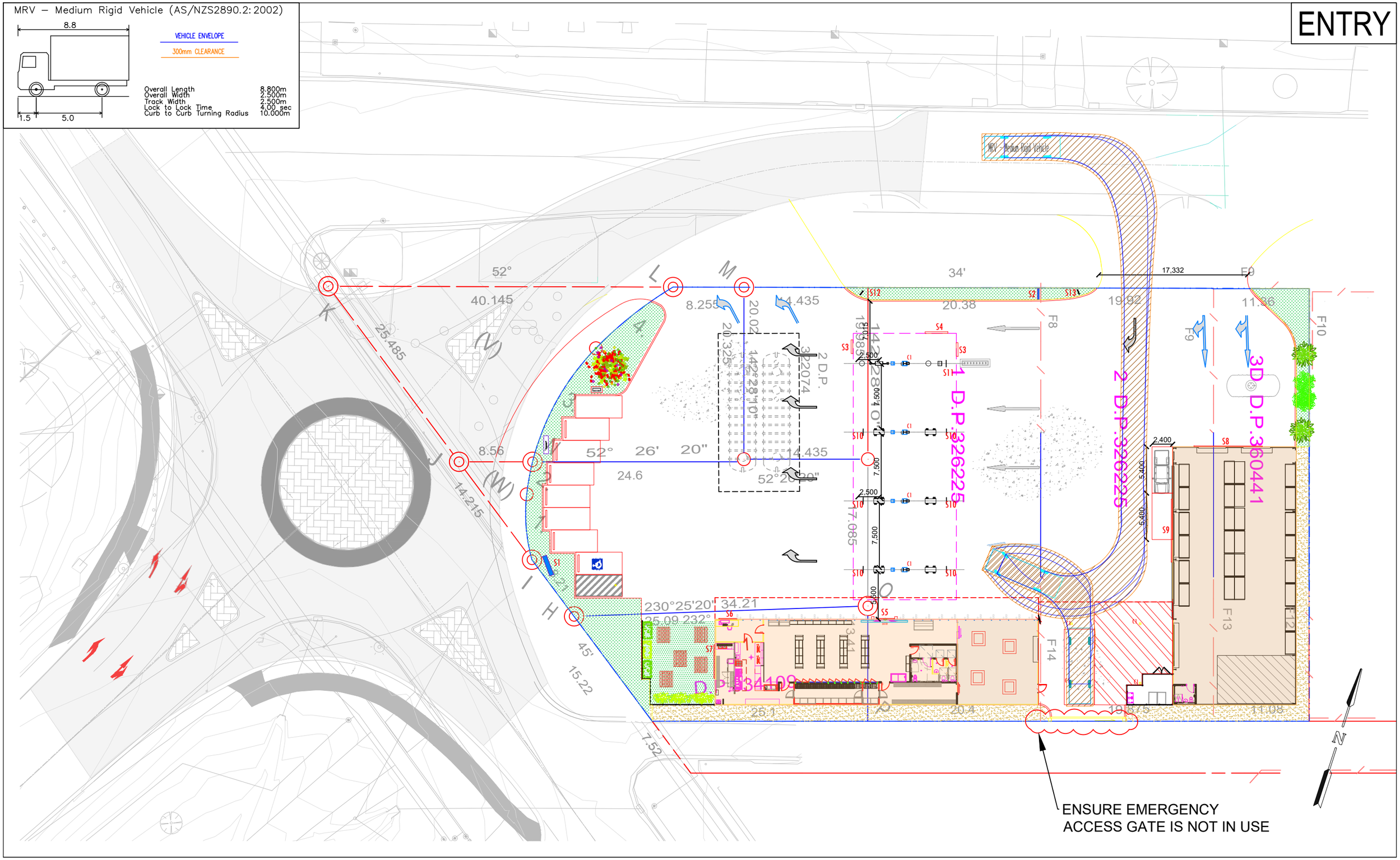

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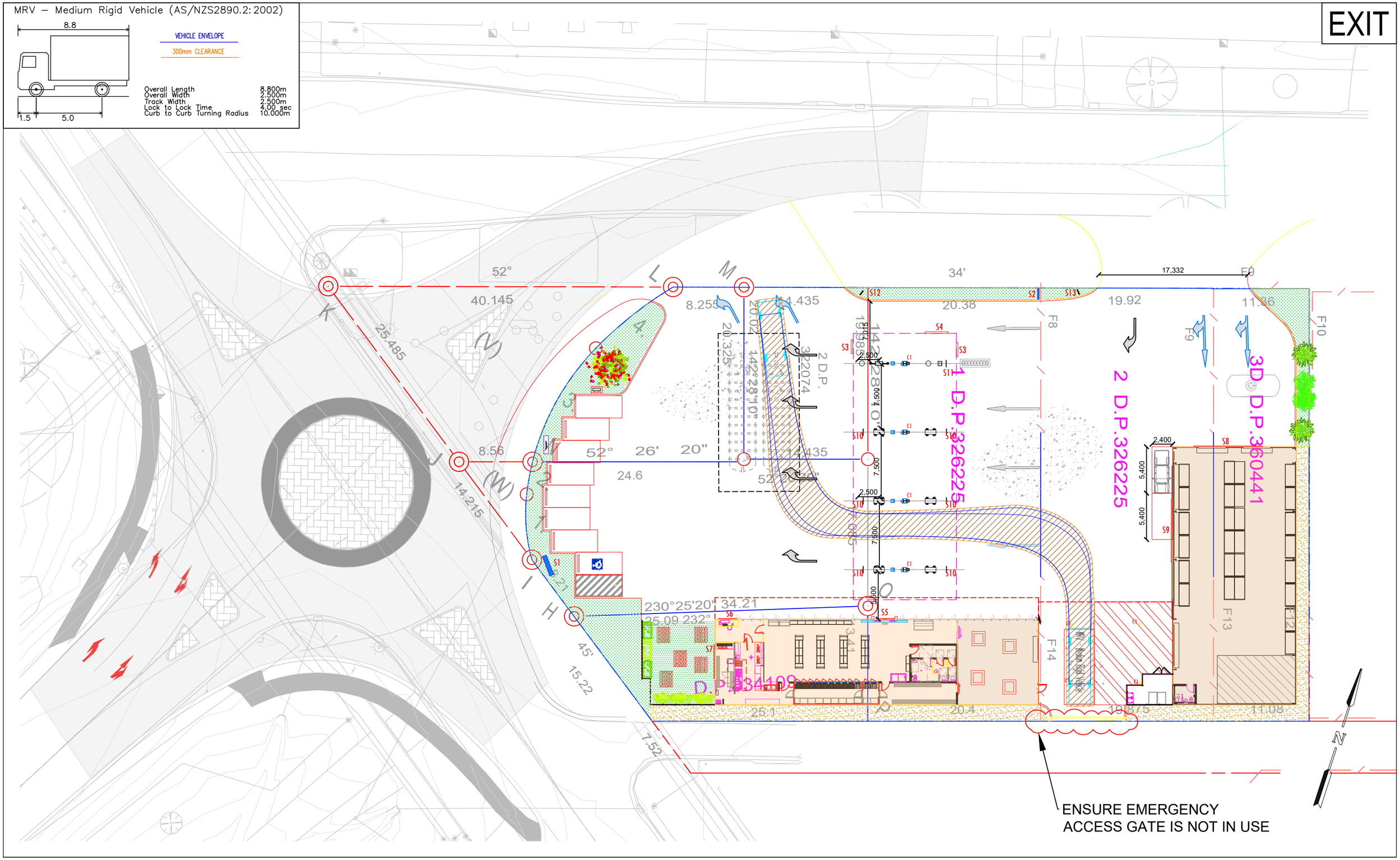

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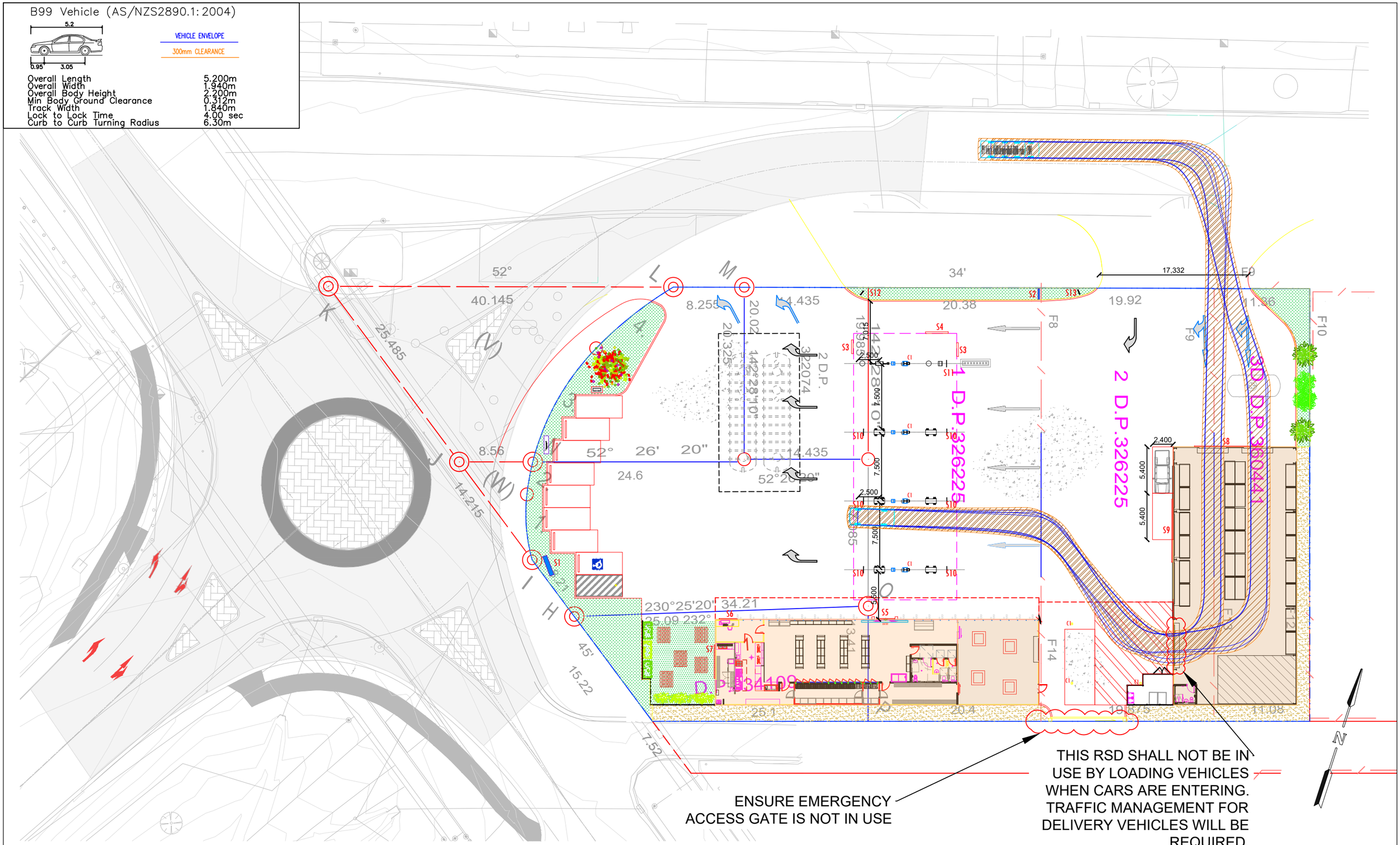

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