

Med-X

**Clinical Waste Management
Facility**

**Operational Traffic Management
Plan**

Issue 1 | 8 October 2020

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1 Introduction

1.1 Overview

Med-X Pty Ltd (Med-X) operates the Arndell Park Clinical Waste Management Facility (the facility) located at 9 Kenoma Place, Arndell Park.

The facility has been approved to receive and process up to 2,300 tonnes per annum (tpa) of clinical and related wastes (including 2,000 tpa of clinical waste and 300 tpa of related wastes).

All clinical waste undergoes non-thermal treatment before being collected and transported off-site to the Kemps Creek landfill site at 1725 Elizabeth Drive, Kemps Creek. The collection of treated clinical waste will occur daily, Monday-Friday.

Related waste is separated and stored on-site before being transferred by a waste contractor to a licenced incineration facility for thermal treatment. The collection of related wastes will occur daily, Monday-Friday. Currently, related wastes are transferred to either Weston Thermal Solutions at 129 Mitchell Avenue, Kurri Kurri or Cleanaway Medical Waste Services, 2 Wiblin Street, Silverwater.

An associated site at 7 Vangeli Street, Arndell Park (from this point on referred to as the parking depot) is used as a vehicle delivery depot and for the storage of clean sharp waste containers.

The site is subject to operation in accordance with Environmental Protection Licence (EPL) 20233, issued by the NSW Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997* (POEO Act).

Med-X also hold Environmental Protection Licence (EPL) 12609 which provides a licence for the transport of category 1 and category 2 trackable waste.

Development Consent for State Significant Development (SSD) 6761, comprising expansion of the facility, was granted by the NSW Department of Planning, Infrastructure and Environment (DPIE) on 28 September 2020 in accordance with Section 4.38 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Operational Traffic Management Plan (OTMP) has been prepared to address the regulatory requirements for operation of the facility, and in particular Conditions B20 and C1 of the SSD 6761 Development Consent. The purpose of the plan is to outline the processes and measures required to manage the traffic movements at the facility and the associated parking depot, safely and efficiently.

1.2 Regulatory requirements

1.2.1 Conditions of Development Consent

Condition B20 of Part B Specific Environmental Conditions of the Development Consent relates to traffic management, specifically the requirement for an OTMP. Condition C1 of Part C Environmental Management, Reporting and Auditing provides the requirements for the OTMP.

The conditions of consent relevant to this OTMP are presented in Table 1, along with the sections of the report which address each point.

Table 1: Operational Consent Requirements

Condition	Section
B20. Prior to the commencement of operation, the Applicant must prepare an Operational Traffic Management Plan (OTMP) for the development to the satisfaction of the Planning Secretary. The OTMP must form part of the OEMP required by condition C2 and must:	
a) Be prepared by a suitably qualified and experienced person(s),	Document Verification Sheet
b) Detail the measures that are to be implemented to ensure road safety and network efficiency during operation;	Road safety - 4 Network efficiency – 3.6
c) Detail the measures that are to be implemented to ensure delivery vehicle arrival times are appropriately staggered including the use of an electronic tracking system;	4.4
d) Detail heavy vehicle routes, access and parking arrangements; and	4.1, 4.2 and 4.3
e) Include a program to monitor the effectiveness of these measures.	5
C1. Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
a) detailed baseline data;	3.6, Appendix C
b) details of: <ul style="list-style-type: none"> (i) the relevant statutory requirements (including any relevant approval, licence or lease conditions); (ii) any relevant limits or performance measures and criteria; and (iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	3.6, 4 and 5 5 5
c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	3.6, 4 and 5
d) a program to monitor and report on the: <ul style="list-style-type: none"> (i) impacts and environmental performance of the development; and 	5

	(ii) effectiveness of the management measures set out pursuant to paragraph c) above	5
e)	a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	4.4 and 5
f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	5
g)	a protocol for managing and reporting any: <ul style="list-style-type: none"> (i) failure to comply with statutory requirements; and (ii) complaint; (iii) incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria); 	5 5 5
h)	a protocol for periodic review of the plan	5

1.2.2 Mitigation measures

In addition, the operational mitigation measures contained in Appendix 2 of the Development Consent for traffic management are presented in Table 2.

Table 2: Operational Mitigation Measures

Mitigation requirement	Section	
General traffic management	A traffic management plan is to be developed and implemented and is to include measures relevant to the management of traffic, as described in this report and supporting information.	This OTMP
Traffic congestion at Kenoma Place	Vehicle arrivals at the facility are to be closely monitored, to limit congestion and ensure waste delivery is evenly spaced across the daily operating hours. This includes use of the existing real-time vehicle tracking system, combined with additional monitoring of daily trends in arrivals.	4.4
Traffic congestion at Kenoma Place	Waste delivery and collection vehicles are to avoid idling in Kenoma Place and utilise the area on-site adjacent to the staff carpark where possible when waiting to unload.	4.4
Noise emissions to nearby residential receivers	Vehicles departing the Vangeli Street Parking Depot between 5am and 7am are to follow the designated route to the Great Western Highway, avoiding driving through residential areas.	4.1

1.3 Site description

The facility is located within the Arndell Park Industrial Precinct at the southern end of the Kenoma Place the cul-de-sac, as shown on Figure 1. The site is zoned 'IN1 General Industrial' under the Blacktown Local Environmental Plan 2015 (Blacktown LEP) and is surrounded by other industrial and commercial businesses. The nearest residences to the site are located on Mariko Place, Blacktown, approximately 400 m away.

The parking depot, an industrial property leased by Med-X, is situated on the eastern side of Vangeli Street, immediately south of the Kenoma Place intersection, as shown on Figure 1. The parking depot is also within the Blacktown LEP 'IN1 General Industrial' zone. The nearest residences to the parking depot are located at Mariko Place, Blacktown, around 300 m away.



Figure 1: Site locations (Source: Sixmaps 2020)

2 Goals of the OTMP

2.1 Scope and objective

The objective of this OTMP is to provide traffic management procedures to form part of the Arndell Park Clinical Waste Management Facility Operational Environmental Management Plan (OEMP). It has been prepared to align with the SSD 6761 operational mitigation measures and commitments and the Conditions of Development Consent.

The objectives of the TMP are to describe the measures to ensure that:

- Traffic congestion and conflicts with other road users are minimised at both Kenoma Place and Vangeli Street
- The nominated routes are followed for vehicles departing the Vangeli Street Parking Depot between 5am and 7am to avoid driving through residential areas
- On-site movements are managed to ensure safety and efficiency; and
- Operations comply with regulatory requirements.

2.1.1 Roles and responsibilities

Table 3 outlines the roles and responsibilities associated with the OTMP.

Table 3: OTMP roles and responsibilities

Action	Responsibility	Timing
Overall implementation of the TMP	Facility Manager	Ongoing
Implementation of the monitoring program (as described in Section 5)	Facility Manager	Ongoing
Review of daily vehicle arrivals data	Facility Manager	Bi-monthly
Maintain internal records of monitoring	Facility Manager & Compliance and Governance Manager	As required
Authorised and confirm the implementation of any additional mitigation measures	Facility Manager & National Manager	As required
Facilitate external auditing (as described in Section 5)	Compliance and Governance Manager	As required

3 Existing environment and operational activities

This section explains the day to day operations and management at the facility and parking depot and the associated traffic movements.

3.1 Site infrastructure

3.1.1 Waste management facility

The layout of the waste management facility is presented on Figure 2. The facility includes the following infrastructure:

- An enclosed building housing the warehouse (for the unloading, processing, handling, storage and treatment of waste and cleaning and storage of bins) and office facilities
- A 6m wide driveway entry providing vehicle access from Kenoma Place
- Two distinct car parking areas providing 11 staff parking spaces in total, including one disabled space
- A hardstand area for operational vehicle servicing and manoeuvring
- A defined outdoor bin storage area adjacent to a stand-alone water tank and industrial radiator
- An LPG gas tank, with a guard rail and 6m exclusion zone marked in yellow paint and
- A bollard located adjacent to parking bay 11 to stop vehicles parking within the LPG gas tank exclusion zone
- A 75mm high and 455mm wide speed hump across the parking area (to provide a continuous bund).

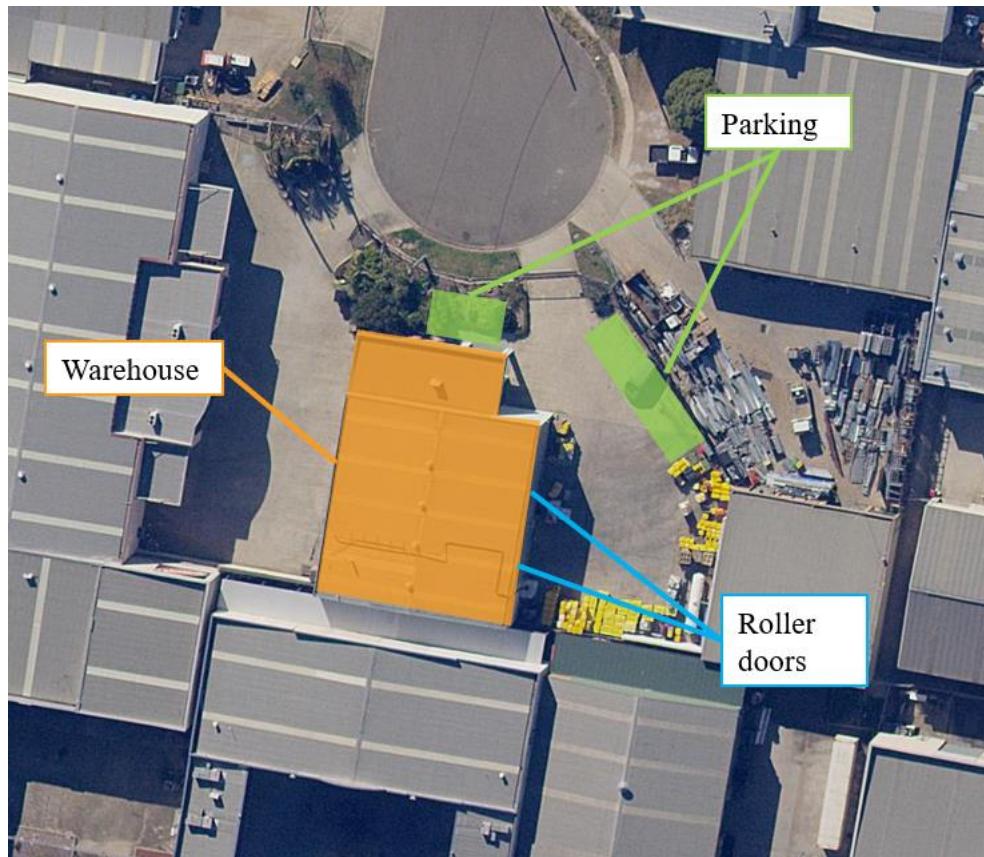


Figure 2: Waste management facility site layout

3.1.2 Parking depot

The parking depot contains a single building within the eastern portion of the site, providing warehouse, ancillary office and covered awning spaces.

Access between Vangeli Street and the parking depot is currently provided via an 8m wide access.

The warehouse is serviced by two roller doors which connect to a large hardstand area. This accommodates an operational vehicle servicing / manoeuvring area and parking area, capable of accommodating up to 19 vehicles.

The parking areas comprise 90-degree angled rows, serviced by a central circulation / manoeuvring area. The parking and circulation areas have been designed in accordance with Part 1: Off-street car parking (AS2890.1-2004). All vehicles are able to enter and exit the facility in forward gear to ensure safety for drivers and other road users.

The layout of the site is presented in Figure 3.



Figure 3: Parking depot site layout

3.2 Operational processes

The facility processes clinical and related wastes collected from hospitals and other medical facilities across the Greater Sydney Metropolitan Area.

A simplified summary of the operational processes that occur are as follows:

- Med-X provide specially marked wheelie bins (SMBs) to hospitals and medical centres for the collection of clinical and related wastes;
- When full, the SMBs are collected by a Med-X service vehicle and a replacement bin is provided;
- The SMBs are transported to the waste management facility for processing;
- Each SMB delivered to the facility is weighed, recorded and processed;
- Clinical waste undergoes non-thermal treatment via an autoclave and the treated waste is then shredded and transferred to a compactor for storage;
- Once the compactor reaches capacity, it is loaded onto a Medium Rigid Vehicle (MRV) and transported off-site. The empty compactor is returned to the waste management facility;
- Related waste is stored appropriately on-site before being transferred off-site by a contractor;
- SMBs are washed and stored before being collected for redistribution by an empty operational vehicle; and
- Operational vehicles are stored within the parking depot overnight.

3.3 Vehicle fleet

Med-X operate and maintain a purpose-built fleet of vehicles that collect and deliver clinical and related wastes in SMBs from clients across the Greater Sydney Metropolitan Area. The composition of the fleet of vehicles and the number of deliveries per day is outlined in Table 4.

Table 4: Operational Vehicle Fleet

Vehicle type	No. vehicles	Deliveries per day
MRV	8	16
Vans	8	16
Total	16	32

Vehicles are maintained over and above industry standards in order to ensure that reliability of service is never compromised. Each Med-X vehicle is tracked using Global Positioning Systems (GPS) so the vehicle's exact location can be monitored.

All service vehicles are equipped with the following:

- Cabins separate from the carrying compartment. No clinical or cytotoxic waste is permitted to be carried in the cabin of the vehicle;
- Purpose built drains to contain spills within the vehicle;
- Spill kits and instructions for use;
- Emergency response plans;
- EPA licenses;
- Fire extinguishers inside the cabin and also attached to the outside of the vehicle;
- Purpose built bodies with:
 - Rails and carrying bars to hold bins in place securely;
 - Internal lighting;
 - Tailgate lifters to reduce manual handling of waste bins;
 - Internal surfaces that are inert and able to be cleaned with disinfecting agents;
 - Locks for secure transport of waste; and
 - Infectious waste placarding indicating clinical waste is being transported.

3.4 Operational hours and traffic movements

The approved operating hours of the waste management facility are:

- 07:00-19:00 Monday to Saturday (including public holidays that fall on Saturday).

Fleet vehicles arrive at the facility at a consistent rate throughout the vehicle receipt periods of 7:00am – 5:00pm, Monday to Saturday. The average time to unload and service a vehicle is 12.5 minutes. The maximum number of vehicles expected to arrive at the facility at once is two.

At the parking depot, operational vehicles are:

- Permitted to travel to and from the facility between 05:00-19:00 Monday to Saturday (including public holidays that fall on Saturday).

Controls have been placed on the routes of these vehicles to avoid residential areas in early hours (particularly before 7am). Further information regarding this is provided in Section 4.1.

The collection of the treated clinical waste from the compactor occurs daily, Monday-Friday. The collection of related wastes by a nominated contractor also occurs daily, Monday-Friday.

In addition to the vehicle fleet, the following operational vehicles visit the waste management facility and parking depot:

- Gas delivered to the facility once a week; and
- Clinical sharps containers are delivered to the parking depot once a week.

The largest vehicle accessing the sites is expected to be an MRV.

Vehicular access to and from the facility and parking depot currently operates safely with minimal conflicts with other road users. Drivers familiar with the waste management facility and parking depot layouts, provisions and arrangements further reduces the risk of vehicle conflicts or accidents.

3.5 Staff

3.5.1 Waste management facility staff

Staff numbers at the facility are outlined in Table 5.

Table 5: Waste management facility staff

	No. staff	Shift(s)
Floor staff	6 (3 per shift)	07:00-15:00 and 11:00-19:00
Administrative staff	5	Arrive from 06:15
Total	11	-

3.5.2 Drivers

Med -X contact drivers to operate the vehicle fleet outlined in Section 3.3, as outlined in Table 6.

Table 6: Fleet drivers

	No. staff	Shift(s)
Drivers	16	Arrive -05:00-09:00 Depart – 15:00-19:00

3.6 Predicted traffic impacts

The local road network surrounding the facility and the parking depot is comprised of:

- Kenoma Place - a local access road and cul-de-sac with one through lane of traffic in each direction and a speed limit of 50km/h.
- Vangeli Street - a minor collector road with one through lane of traffic in each direction, providing connectivity between a series of lower order industrial access roads.
- Holbeche Road - a major collector road between the Arndell Park industrial precinct and the surrounding regional road network. In the vicinity of Vangeli Street, Holbeche Road provides one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments.
- Doonside Road - a sub-arterial road providing a north-south connection between the Doonside residential precinct and the Huntingwood and Eastern Creek industrial precincts to the south (via Brabham Drive), and an intersection with the Great Western Highway.

The surrounding road network currently provides motorists with a reasonable level of service.

A Traffic Impact Assessment (TIA) was prepared by Stanbury Traffic Planning as part of the Response to Submissions and Amended Project Report for SSD 6761. The TIA assessed the potential impacts of the project on traffic and transport for an operational capacity at the facility of 2,300 tpa

At full operating capacity, the site is expected to generate 53 vehicle movements during the am and pm peak hours, as outlined in Table 7.

Table 7: Expected weekday peak hourly traffic generation

	Inbound movements	Outbound movements	Total movements
AM peak hour	31	22	53
PM peak hour	22	31	53

The TIA found that traffic projected as a result of the site operations is not anticipated to result in any noticeable impacts on the surrounding road network, including at Kenoma Place and Vangeli Street.

The intersection of Holbeche Road and Vangeli Street will be used by vehicles accessing both sites and was modelled in the TIA to estimate the likely impact of on this intersection. This intersection was assessed for the years of 2020 and 2030, assuming an annual traffic growth rate of 2%.

Traffic modelling outputs, shown in Table 8 indicate that the traffic generated by operation of the facility is not projected to have noticeable impacts on the operation of the intersection in 2020 or 2030. Only minor alterations to delay and degree of saturation are observed.

The full SIDRA modelling outputs for both models are included in Appendix C.

Table 8: 2020 and 2030 intersection level of service

SIDRA output – projected weekday peak hour performance with expanded operations				
	2020 Demands		2030 Demands	
	AM	PM	AM	PM
Vangeli Street Approach				
Delay	14.1	21.3	17.2	36.1
Degree of Saturation	0.14	0.44	0.18	0.64
Level of Service	A	B	B	C
Eastern Holbeche Road Approach				
Delay	5.6	5.6	5.6	5.6
Degree of Saturation	0.17	0.29	0.21	0.35
Level of Service	A	A	A	A
Western Holbeche Road Approach				
Delay	8.8	10.0	9.9	12.2
Degree of Saturation	0.32	0.24	0.37	0.30
Level of Service	A	A	A	A
Total Intersection				
Delay	14.1	21.3	17.2	36.1
Degree of Saturation	0.32	0.44	0.37	0.64
Level of Service	A	B	B	C

4 Traffic management measures

4.1 Heavy vehicle routes

Kenoma Place and Vangeli Street provide direct access to both the waste management facility and the parking depot. Operational vehicles accessing the site are expected to use:

- Great Western Highway;
- Reservoir Road;
- Holbeche Road; and
- Doonside Road.

These routes have been selected to avoid residential areas and drivers will be instructed to always use these routes. This is particularly important for vehicle movements that occur prior to 07:00.

The routes for all operational vehicles are outlined on Figure 4.

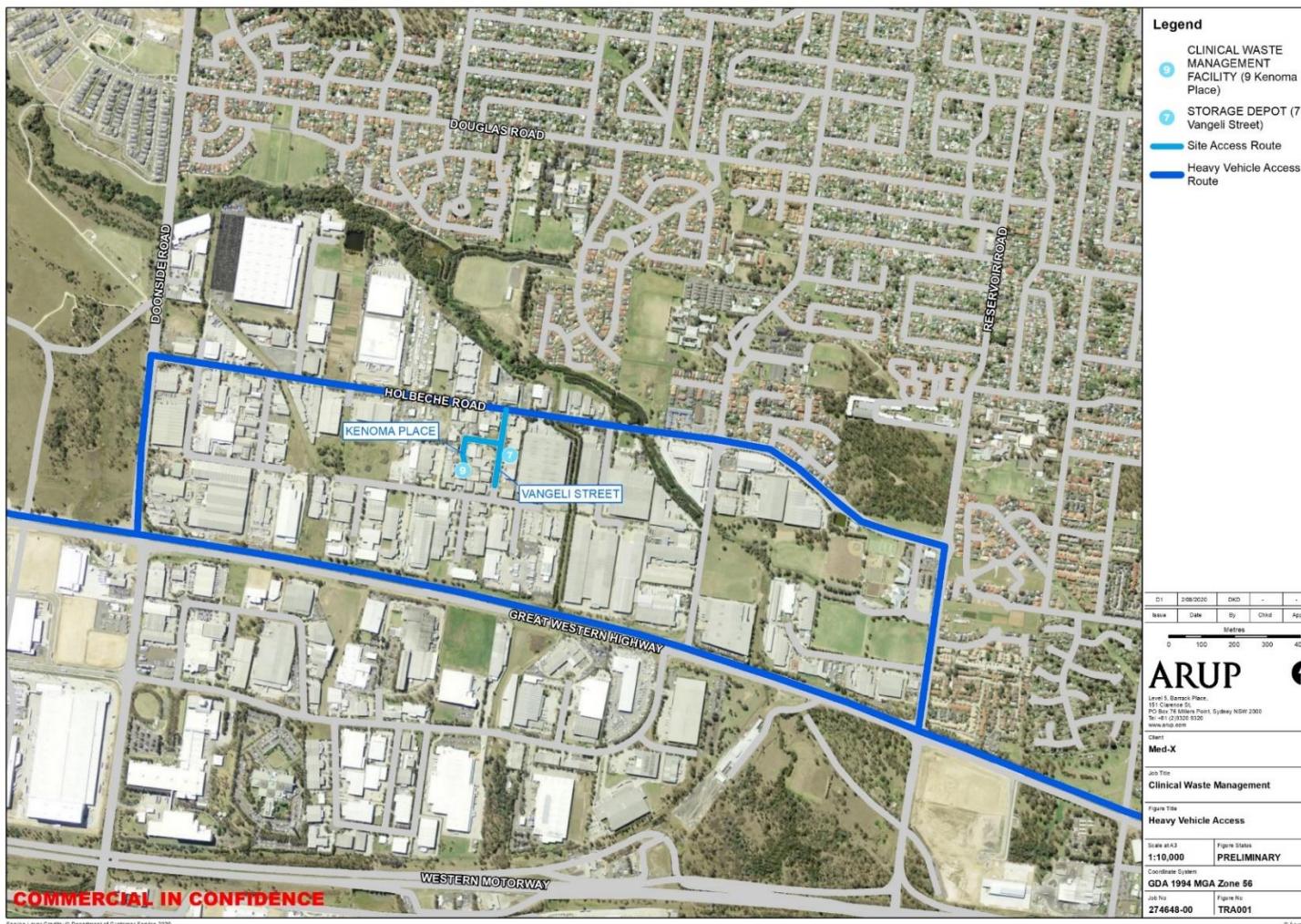


Figure 4: Heavy vehicle routes

4.2 On-site access

4.2.1 Waste management facility

Vehicles will enter and exit the in a forward direction, as shown in Figure 5.

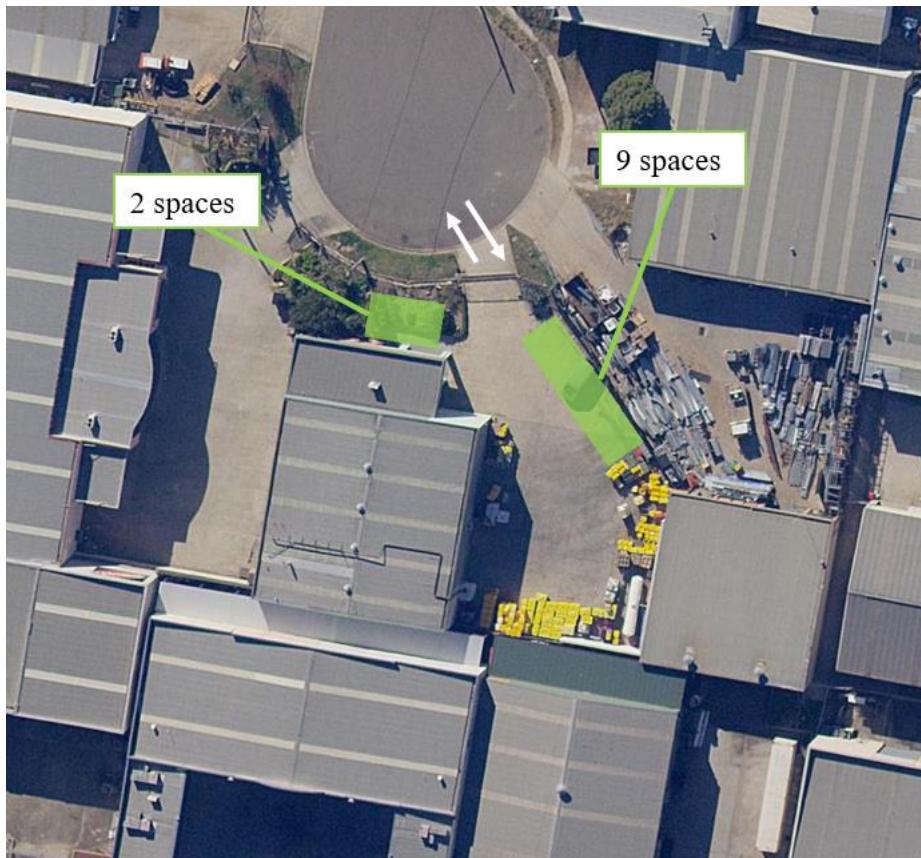


Figure 5: Waste management facility access and parking arrangement

Swept path diagrams prepared as part of the TIA by Stanbury Traffic Planning, (July 2020) demonstrate the ability of MRVs to enter and exit the waste management facility in a safe and efficient manner. These are included in Appendix A and will be followed during operations at the site.

A key risk for vehicle movements within the facility is the gas cylinder and associated 6m exclusion zone located in the south east corner of the site. Risks have been mitigated via the provision of infrastructure including a guard rail around the LPG tank and a bollard within the 6m exclusion zone.

Floor staff will supervise on-site vehicle movements as part of the loading and unloading process to mitigate any risk.

4.2.2 Parking depot

All vehicles will enter and exit the site in a forward direction, as shown in Figure 6.



Figure 6: Parking depot access and parking arrangements

Swept path diagrams prepared as part of the TIA by Stanbury Traffic Planning (July 2020) demonstrate the ability of MRVs to enter and exit the parking depot in a forward direction. These drawings are included in Appendix A and will be followed during operations at the site.

Vangeli Street is a low trafficked road reducing the likelihood of conflicts with other road users. There are sufficient sightlines for vehicles accessing and egressing the parking depot.

4.3 Parking arrangements

4.3.1 Waste management facility

The parking arrangement within the waste management facility is presented in Figure 7. A more detailed site plan drawing is provided in Appendix B.

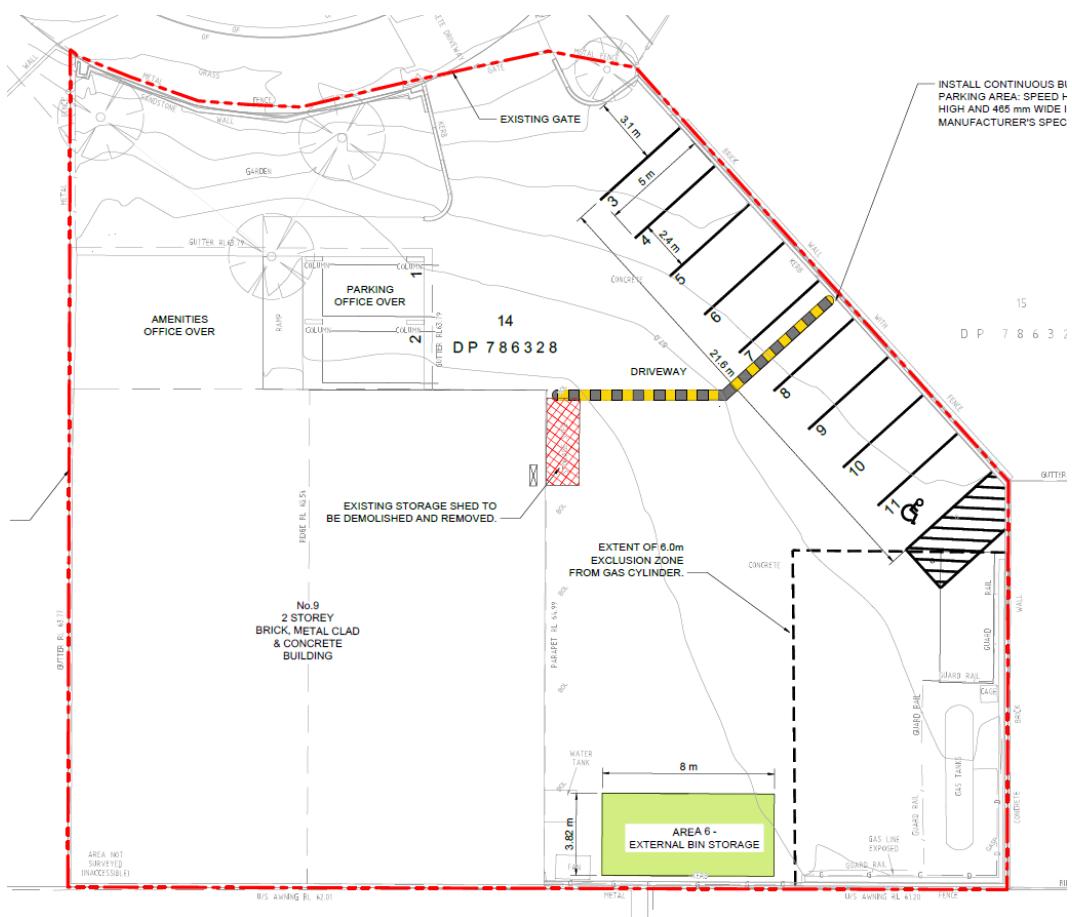


Figure 7: Waste management facility site plan

Parking within the facility site will be utilised by the eleven staff and any potential visitors. Due to the nature of the facility visitors are expected to be minimal. Staff will not park on Kenoma Place or surrounding streets.

Vehicles will be required to cross the LPG gas exclusion zone to access parking bay 11.

4.3.2 Parking depot

The site plan for the parking depot is presented in Figure 8 and a technical drawing is provided in Appendix B.

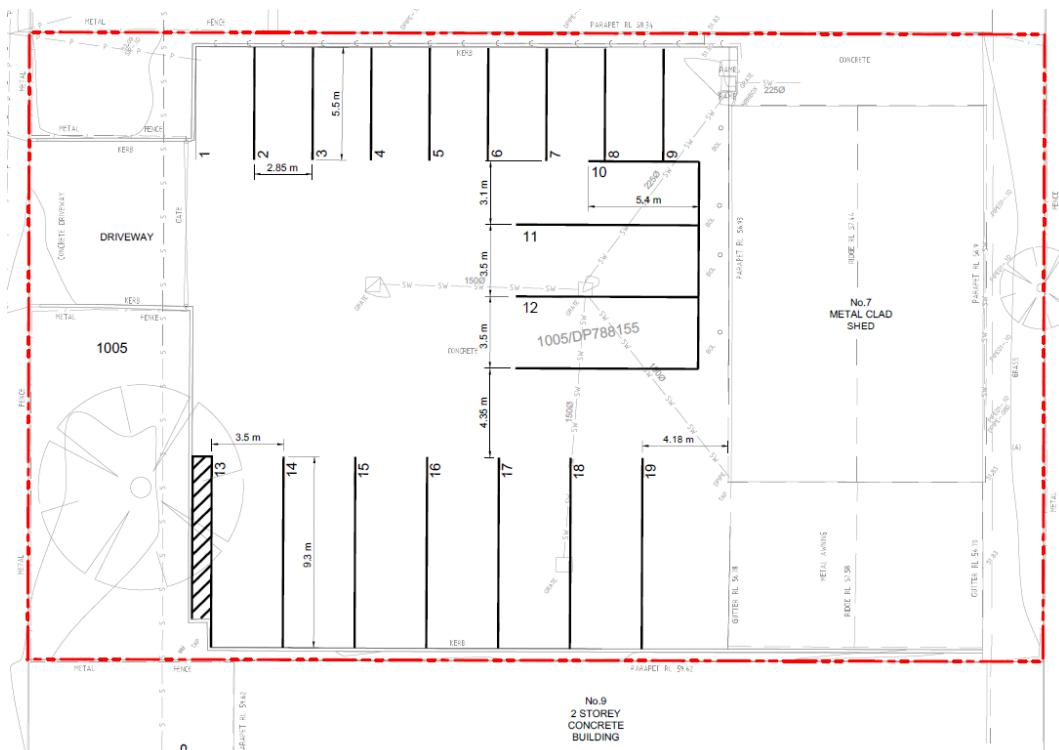


Figure 8: Parking depot site plan

At the start of the working day drivers will replace operational vehicles with their private vehicle using the marked bays. At the end of the day once drivers have finished their shift the process will be reversed.

Drivers will need to be made aware of the order in which vehicles need to be parked so all spaces can be utilised. Bays 10, 11 and 12 which are orientated east-west will need to be emptied first and filled last so swept paths into other bays on the northern and southern boundaries of the site are not restricted. This information will be included on the PDA provided to each driver. This document will outline the required checks a driver will need to undertake before starting the vehicle and departing.

New drivers will be provided with guidance on the processes outlined on the Pre-start checklist. Vehicles will not park on surrounding streets.

4.4 Delivery scheduling and queuing

The logistics operations for the facility is managed through the Verizon system. This draws from client information in the Client Relationship Management database and the GPS trackers attached to each fleet vehicle. The Verizon system generates route sheets for each driver at the start of their shift. This system can also be used dynamically to extend or change drivers' routes. Staff are able to override the system if required to adjust delivery schedules or driver routes. The interactions between the various Med-X systems are outlined on Figure 9.

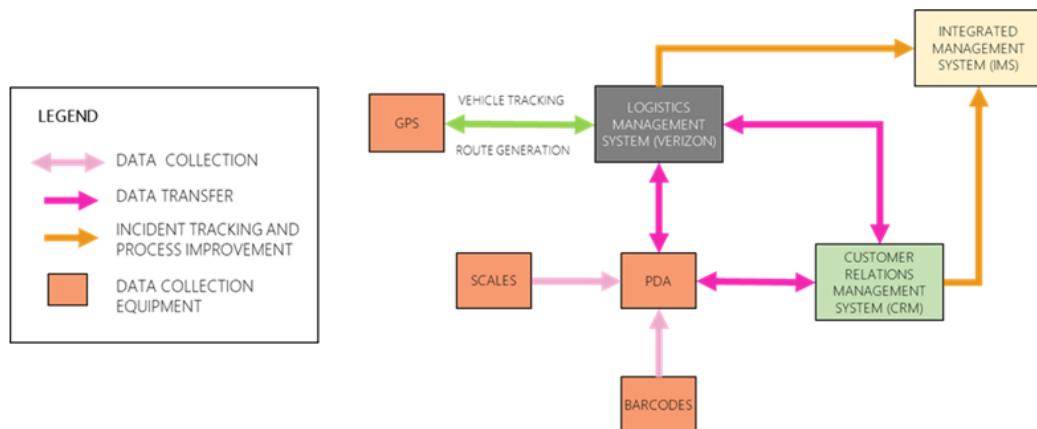


Figure 9: Interactions between Med-X systems

Several factors outside of the operator's control may affect vehicle arrival times:

- Traffic congestion;
- Unexpected delays during customer servicing; and
- Vehicle breakdown.

Vehicle arrivals at the facility will be closely monitored, to limit congestion and ensure waste delivery is evenly spaced across the daily operating hours. This includes the use of the GPS real-time vehicle tracking system, combined with additional monitoring of daily trends in arrivals. Data collected through daily monitoring will be reviewed bi-monthly.

It is expected that the maximum number of vehicles expected to arrive at the facility at once is two. The waste management facility has redundancy to accommodate one additional vehicle if more than two operational vehicles arrive at similar times.

To mitigate queuing and ensure vehicle deliveries are evenly spread across the vehicle receipt periods of 7:00am – 5:00pm, it is essential that the Verizon system is used by Logistics Manager to extend fleet vehicle routes to delay the time which they arrive at the waste management facility, if required.

While waiting to be serviced, vehicles will queue in the holding positions illustrated on the swept path diagrams in Appendix A.

Vehicles waiting to be serviced at the facility are not to:

- Access the parking depot site; and
- Idle or park on Kenoma Place or Vangeli Street.

4.5 Vehicle servicing at the facility

The waste management facility procedure for vehicles delivering clinical waste is as follows:

1. Operational vehicles enter the waste management facility from Kenoma Place in a forward direction and queue adjacent to the staff parking spaces;
2. The vehicles then use the manoeuvring area to reverse towards the southern warehouse roller door, where unloading activity occurs;
3. Following unloading, vehicles are repositioned to be parallel with the western warehouse building wall, where loading activity occurs. When a vehicle is located in the loading position a second vehicle is then able to manoeuvre into the unloading position so both processes can occur simultaneously; and
4. Upon completing loading, the vehicle can exit the waste management facility in forward gear.

Waste collection from the compactors occurs from the northern warehouse door. This involves MRVs manoeuvring to reverse towards the northern warehouse roller door. This manoeuvring can be undertaken when unloading activities are occurring at the southern warehouse roller door, however it cannot be undertaken simultaneously with loading activities.

Swept paths of these vehicle movements are presented in Appendix A.

Floor staff will supervise these movements to mitigate any risk.

5 Monitoring program

To ensure all measures are implemented and to confirm they are having the desired impact, monitoring and management of this plan will be required. Roles and responsibilities are outlined in Section 2.1.1.

The monitoring program will collect the following information:

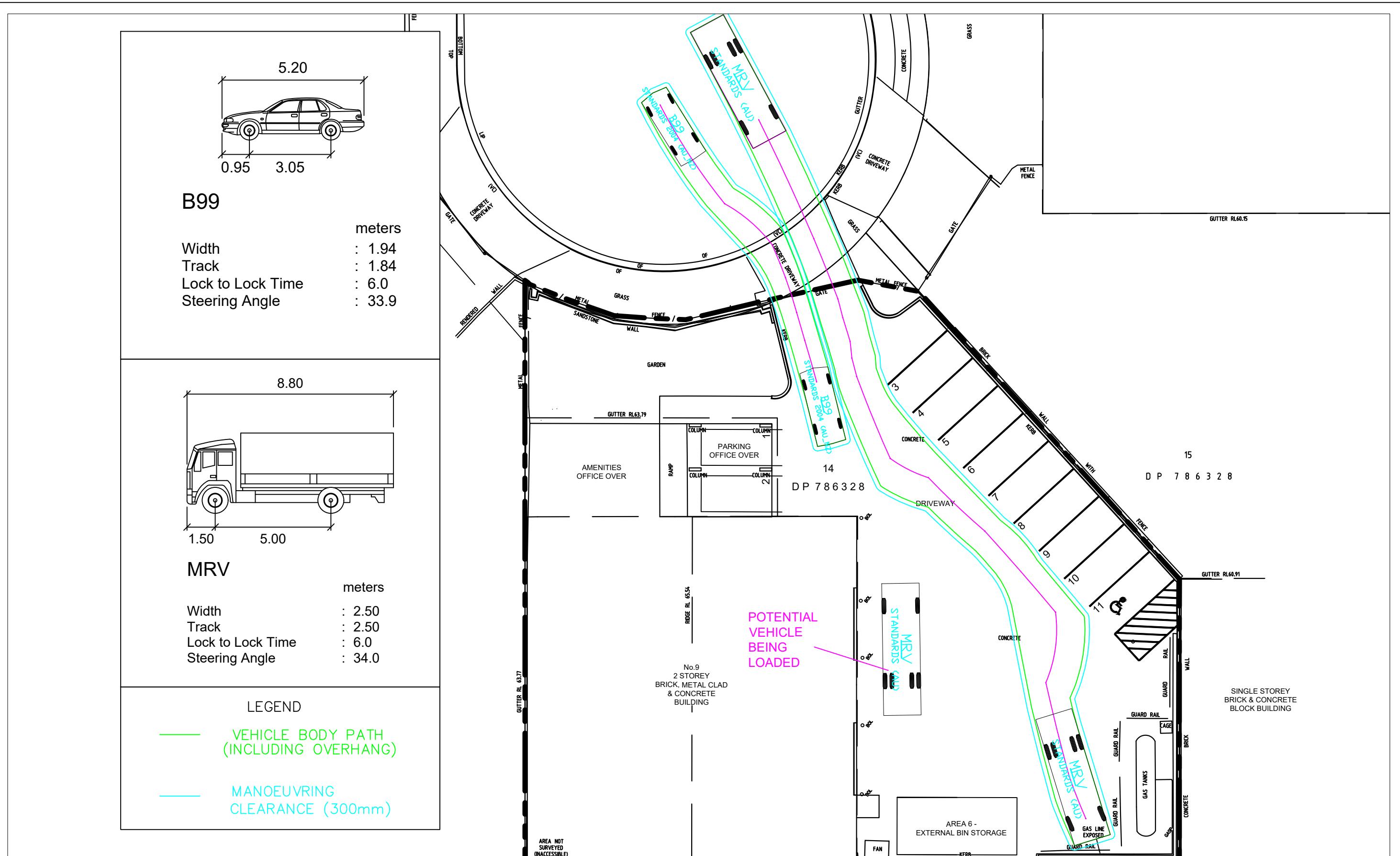
- A log of all deliveries including arrival, processing and departure times at the waste management facility. This can be used to identify causes of congestion and interrogate the effectiveness of the Verizon system;
- An incident register that adheres to the MXNATSPR004 – WHS Incident and Hazard Reporting Procedure. This will capture details such as the location of the incident, staff members involved, extent of injuries or damage and identified hazards. The register can be used as starting point for reviewing safety measures and refining protocols;
- A log of the start and end time of each fleet vehicles shift to confirm operational hours are being adhered to. This may be an output of the Verizon system;
- A log of all instances when contingency measures were required to manage queuing at the waste management facility. The cause of the congestion would need to be identified; and
- A record of any breaches of heavy vehicle routes including the cause of the breach.

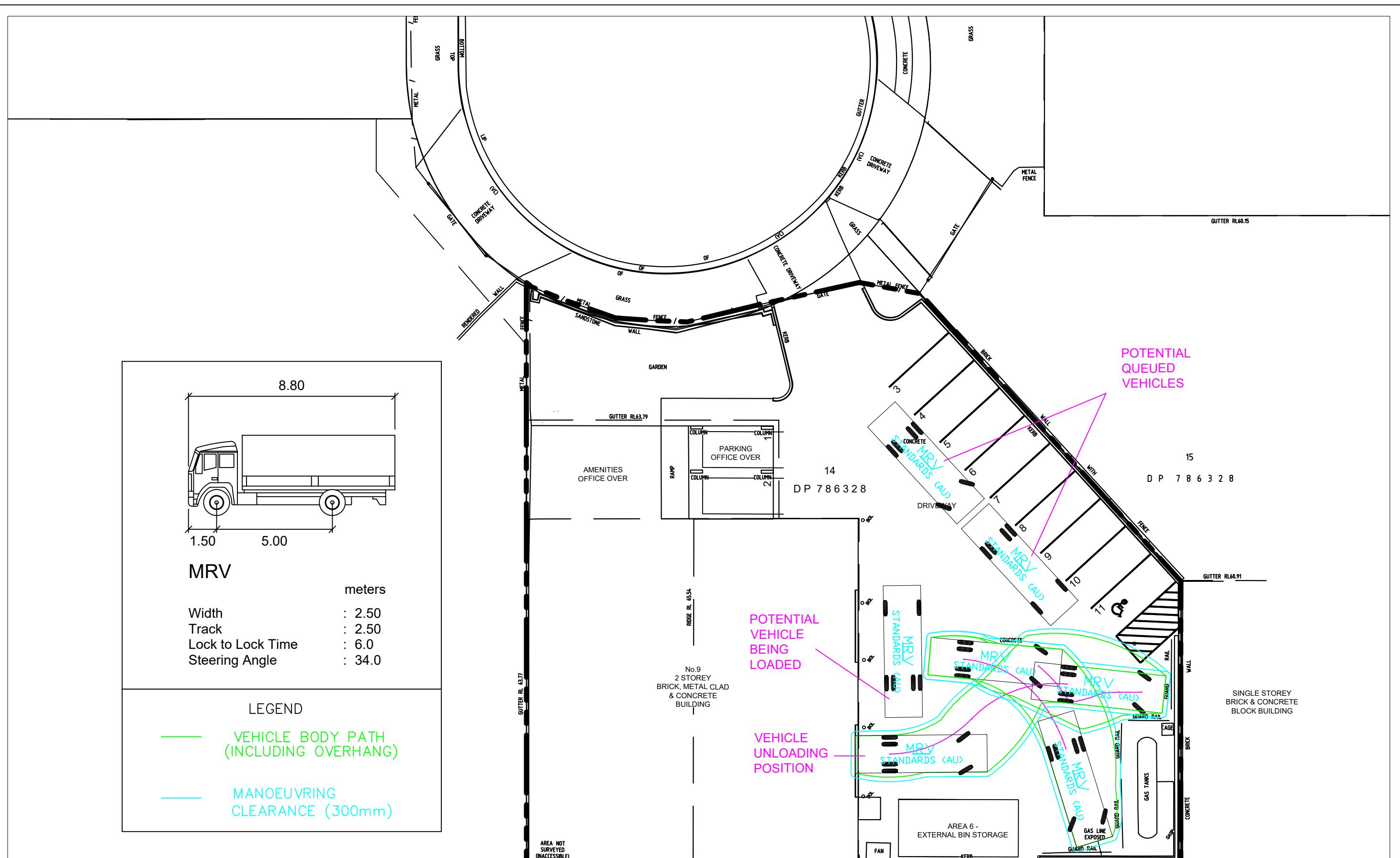
Data collected through this monitoring program will be reviewed bi-monthly to identify and address any issues in a timely manner.

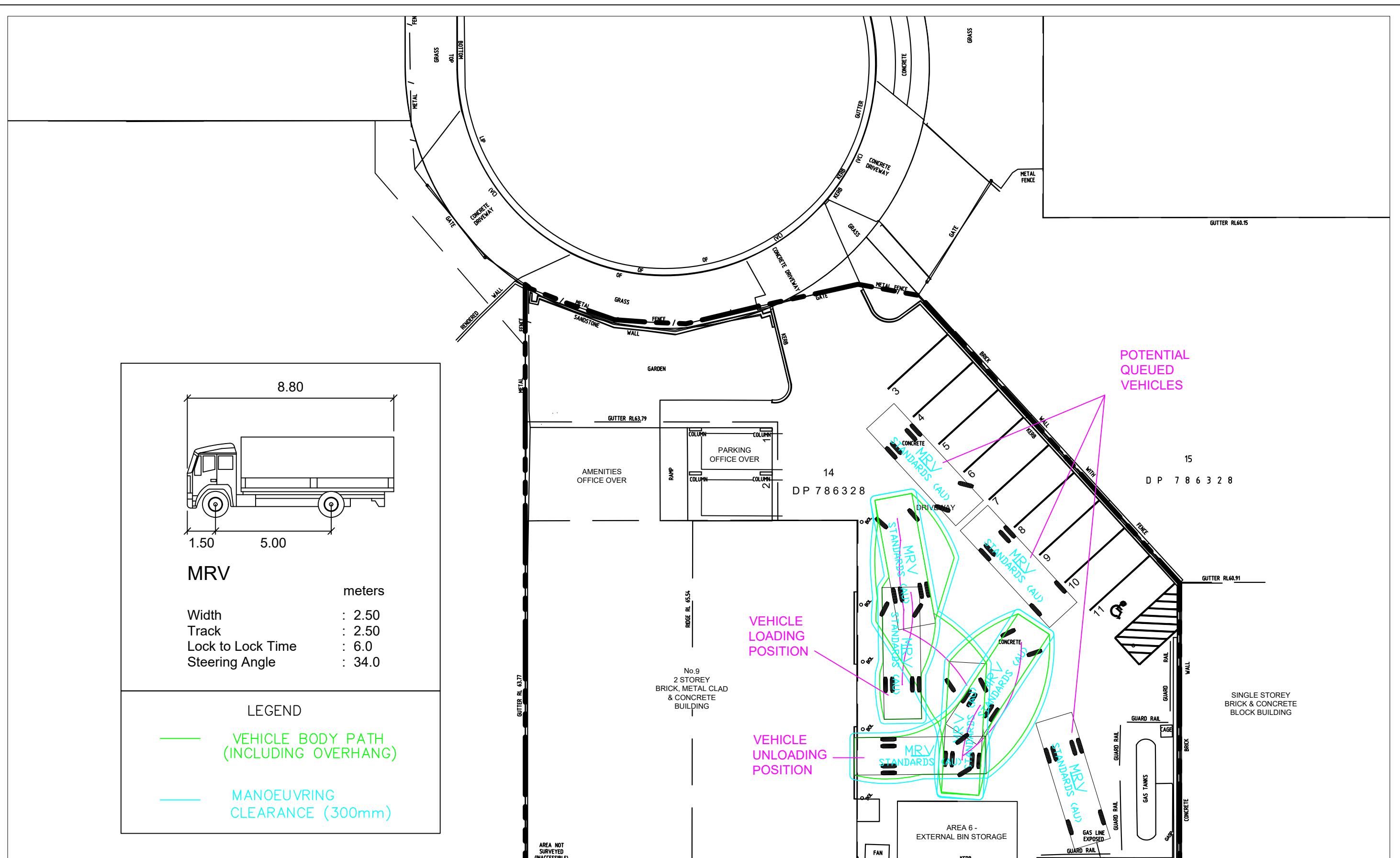
The monitoring program will be audited by an external consultant one year following commencement of the OTMP and every three years thereafter. This will be prepared in accordance with the Independent Audit Post Approval Requirements (DPIE 2020) and will be conducted by a suitably qualified team of experts. The external audit will be issued to the Planning Secretary within the 3 months of the audit being commissioned. This audit would review the data collected by the monitoring program and may involve an on-site review of traffic operations.

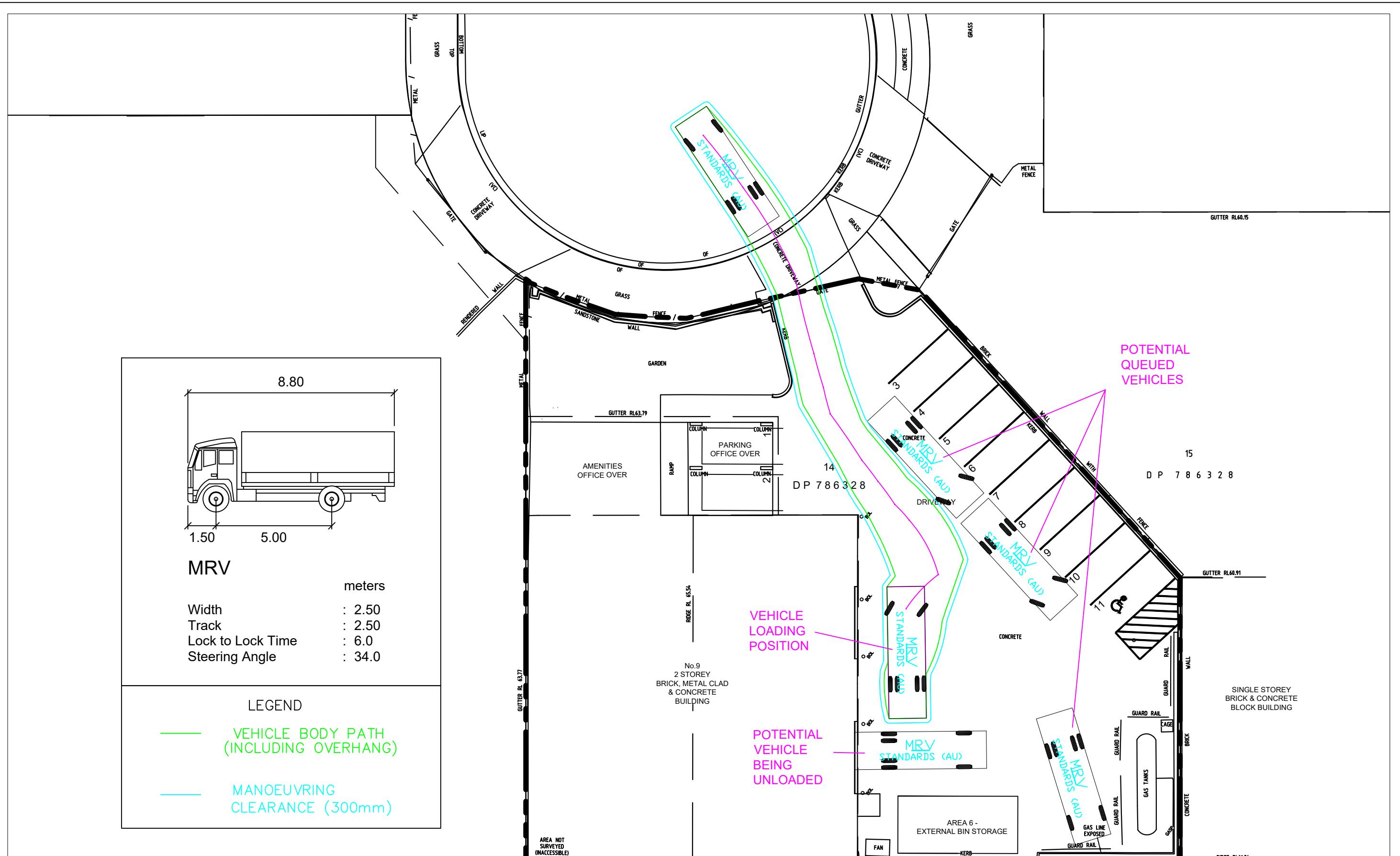
Appendix A

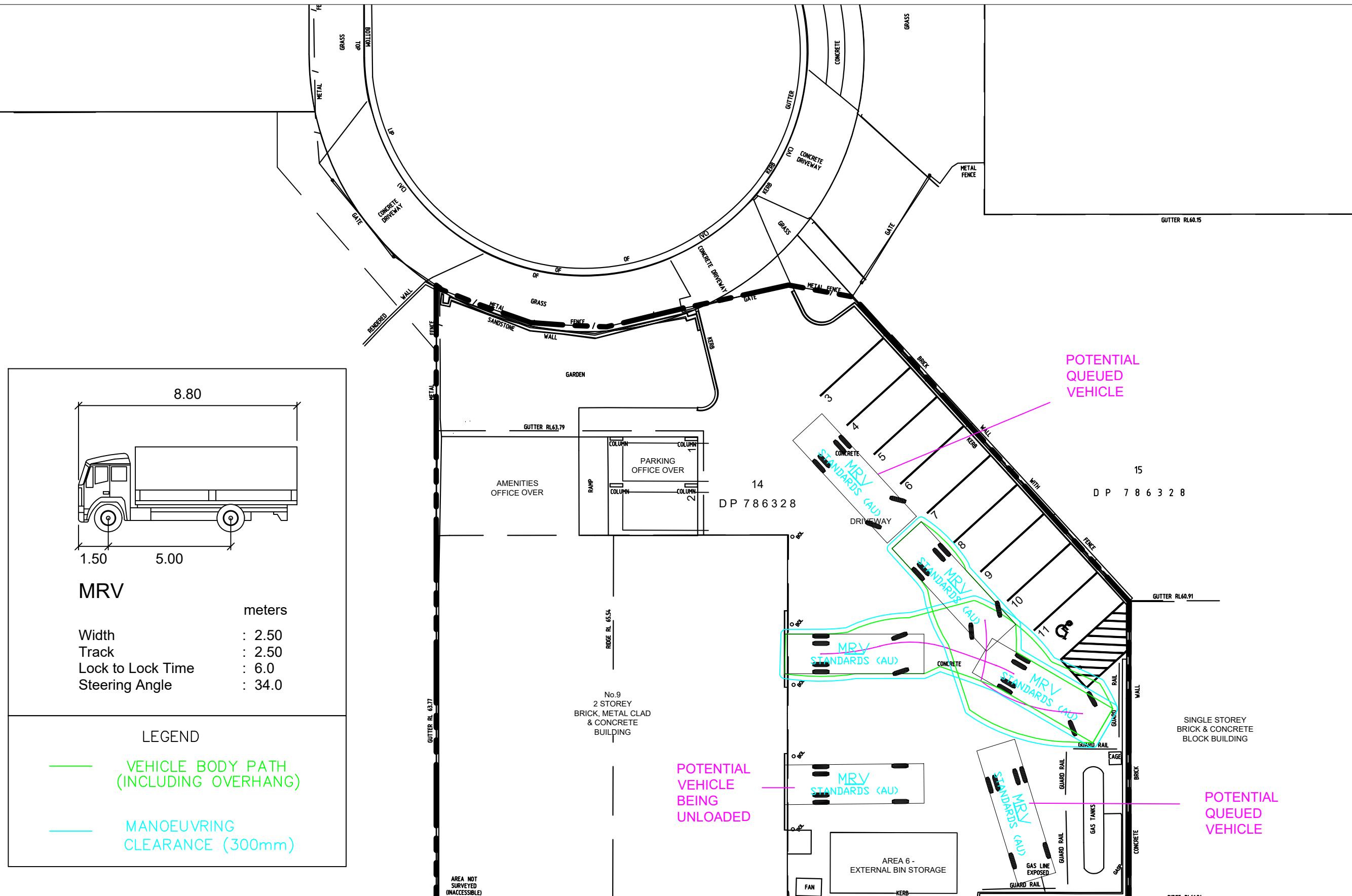
Vehicle Swept Paths

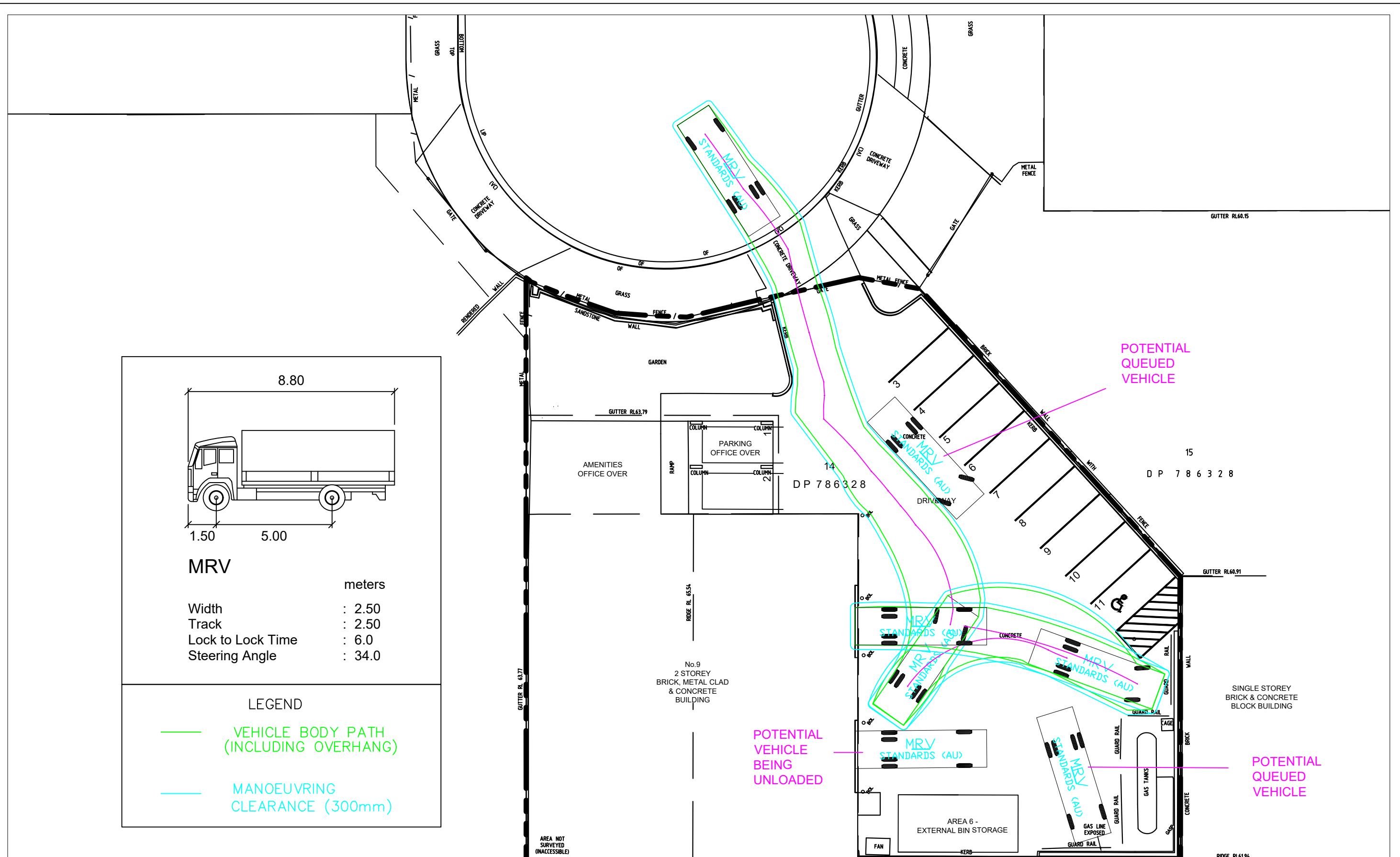


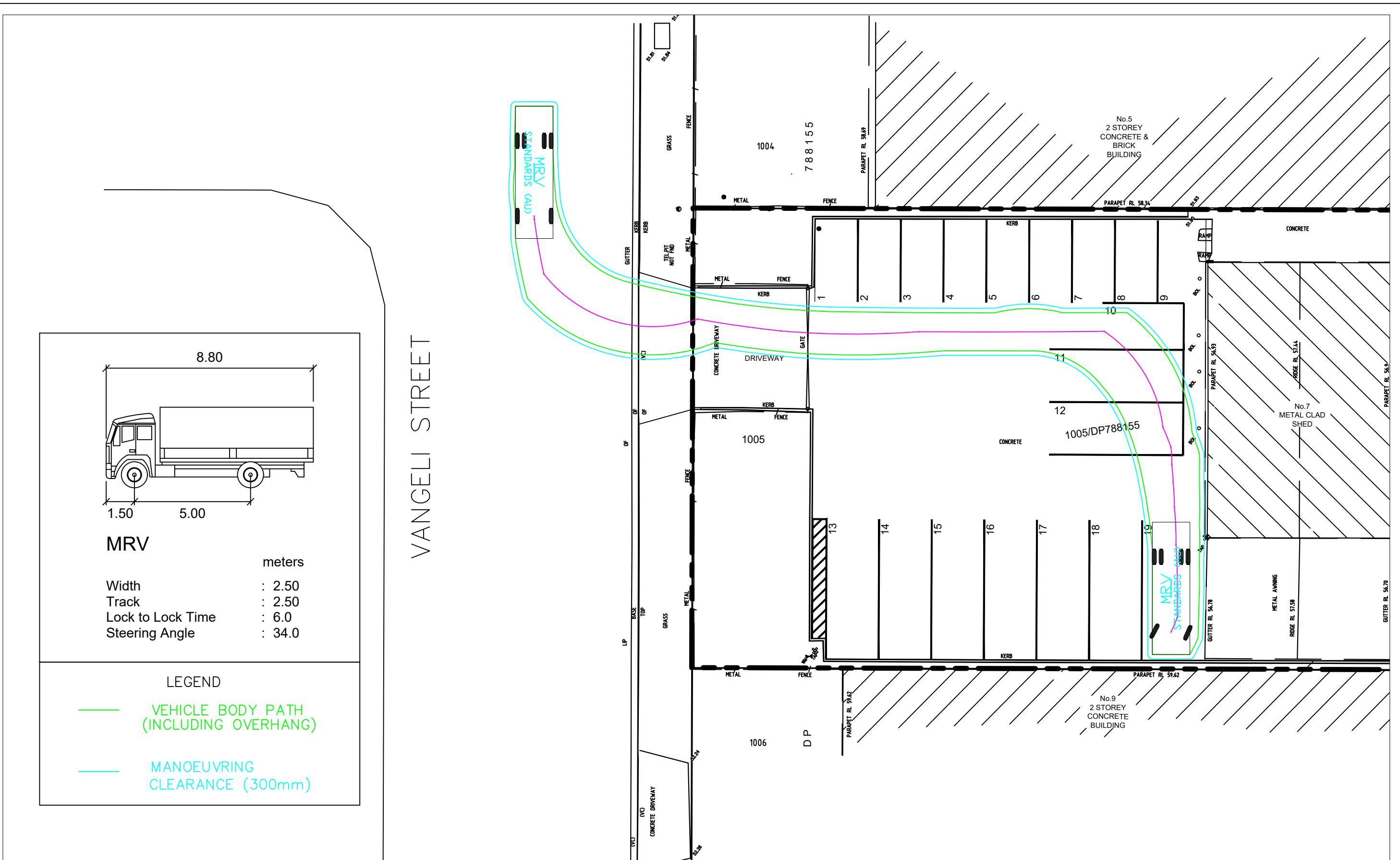




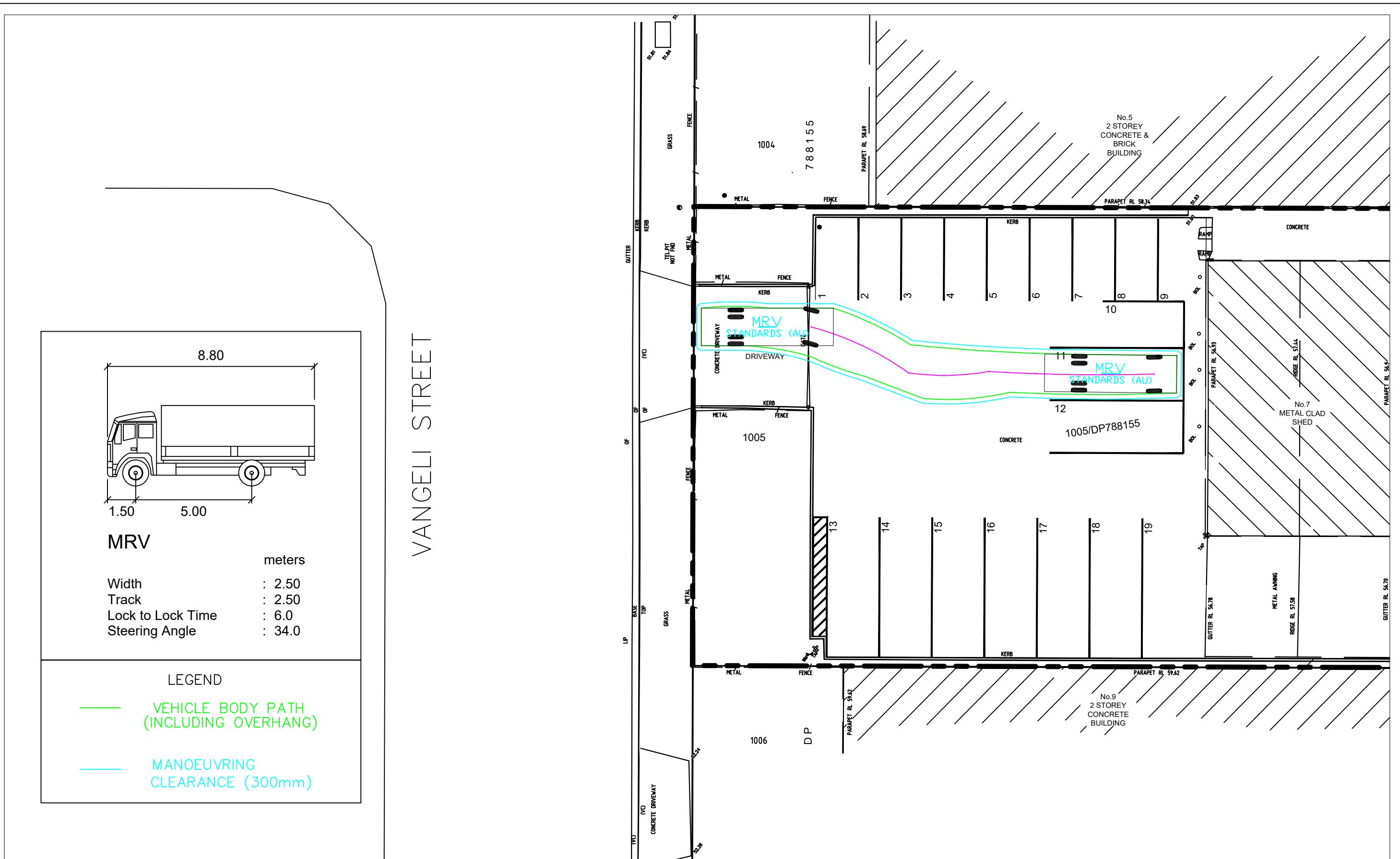


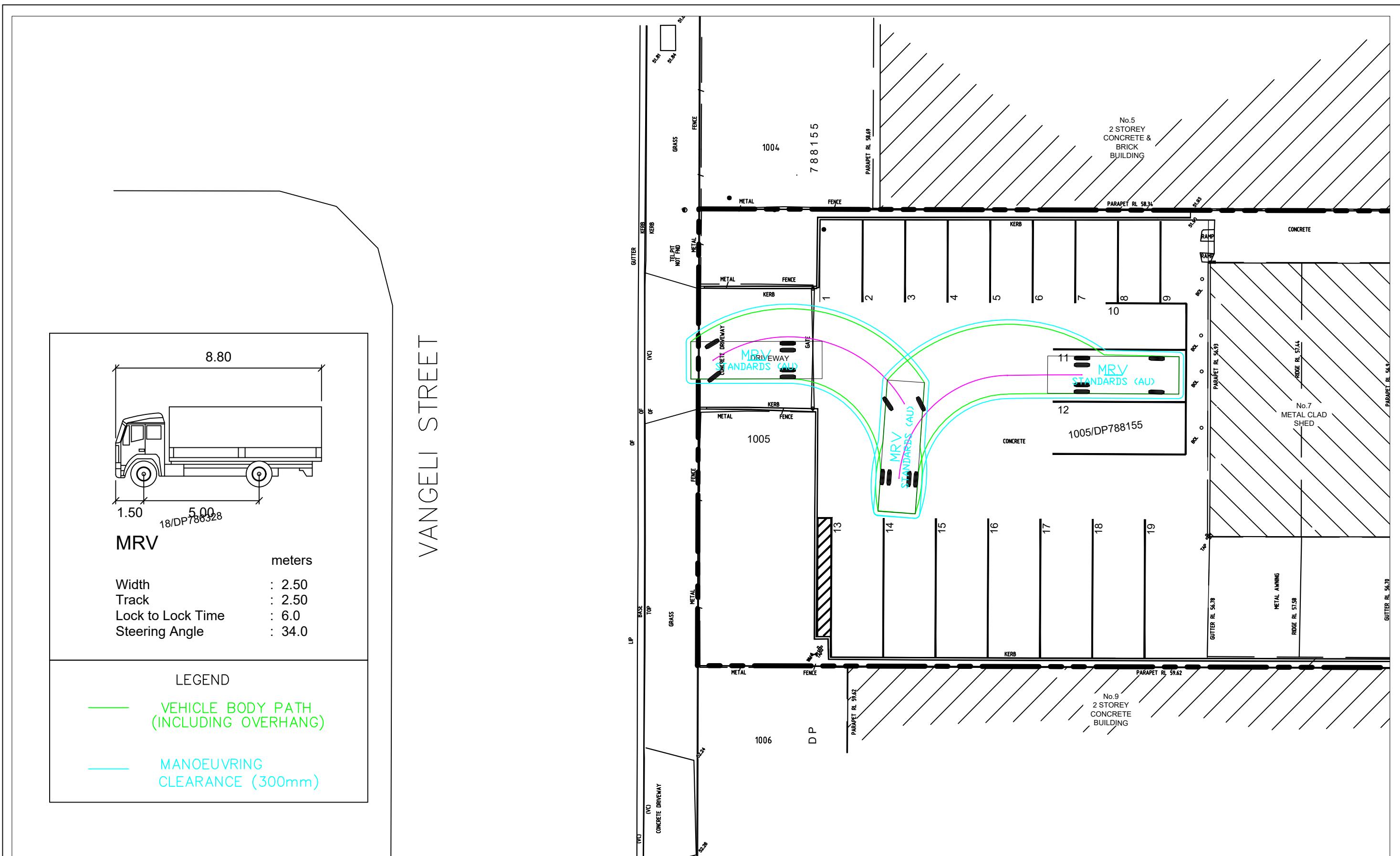


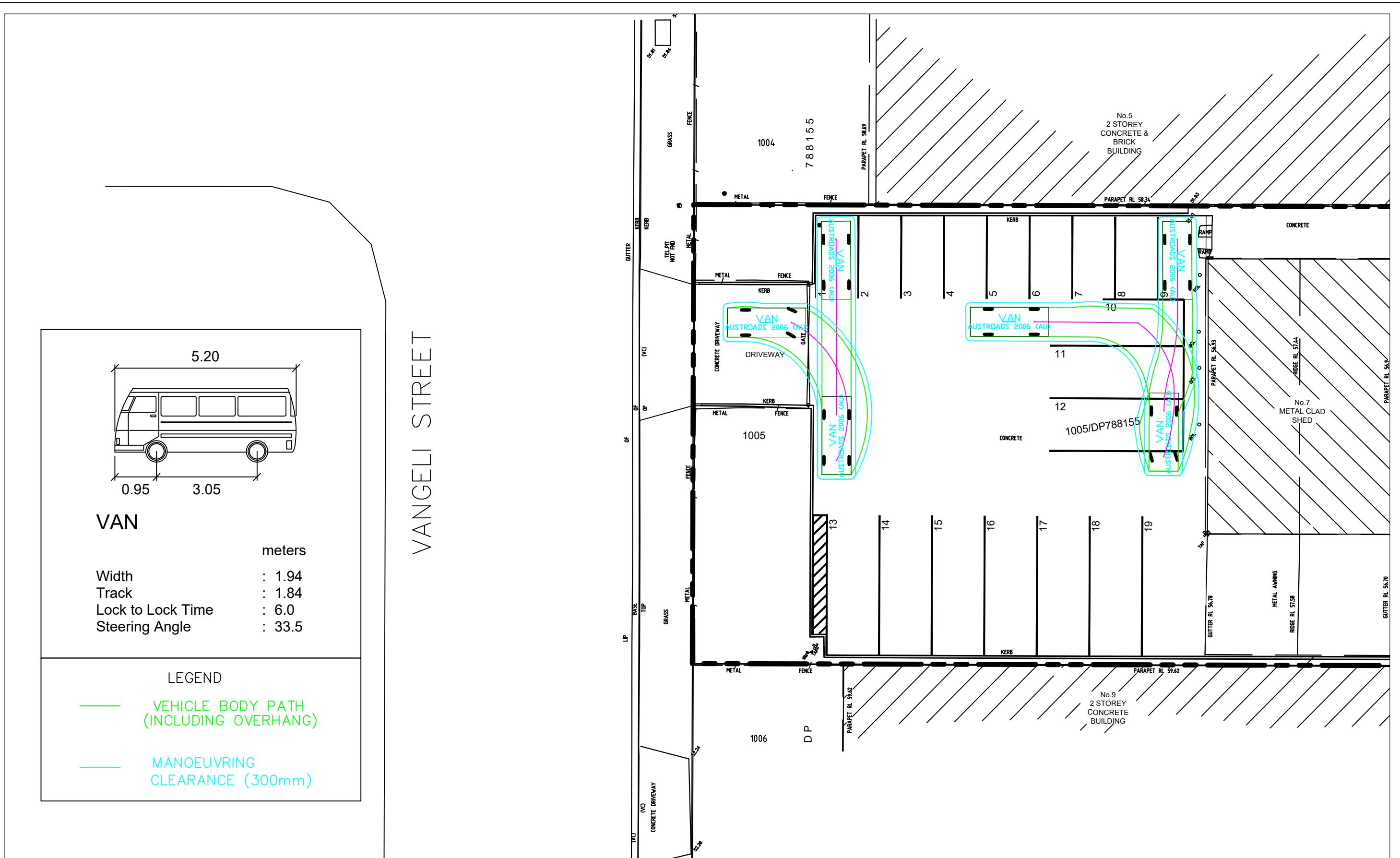


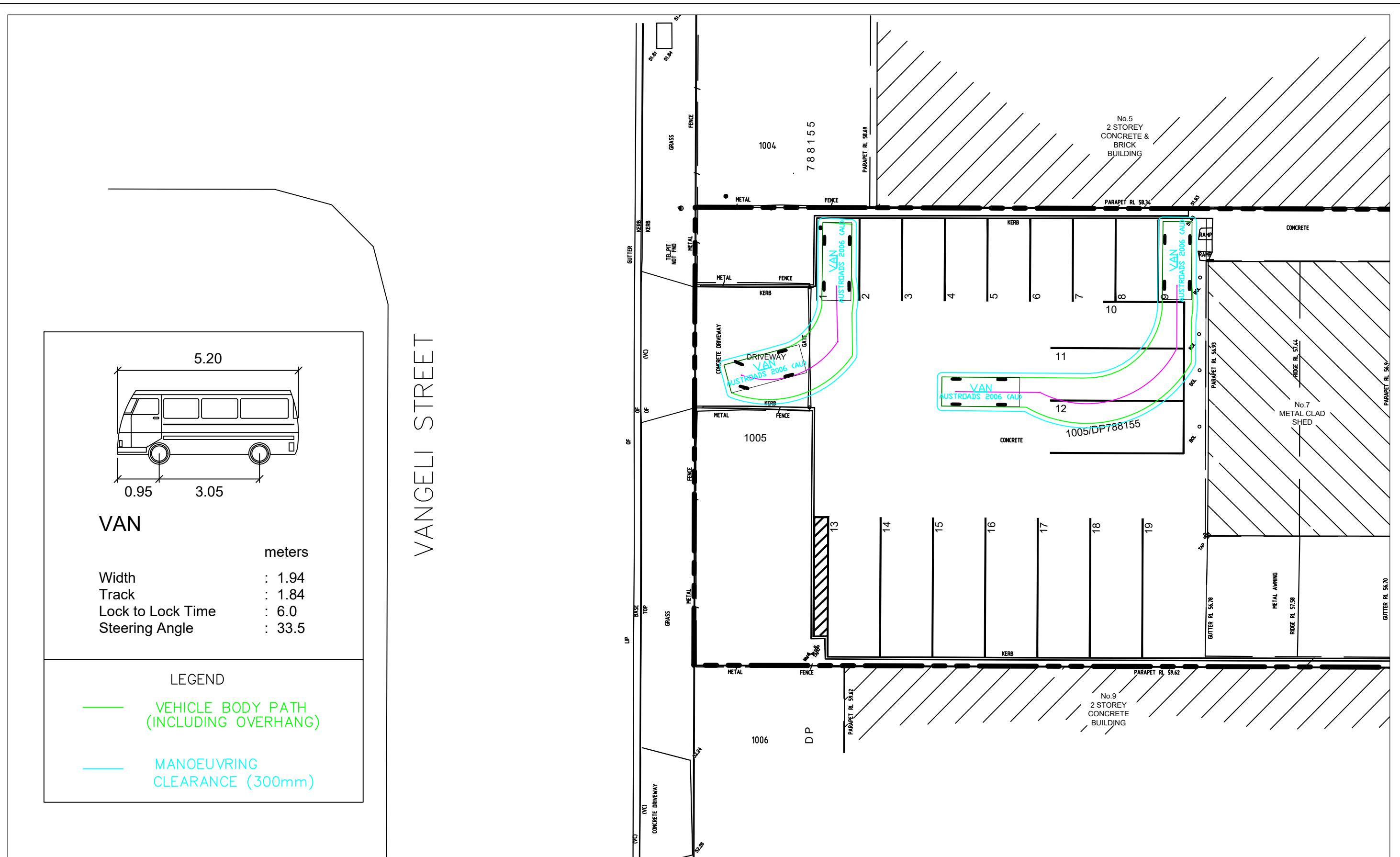






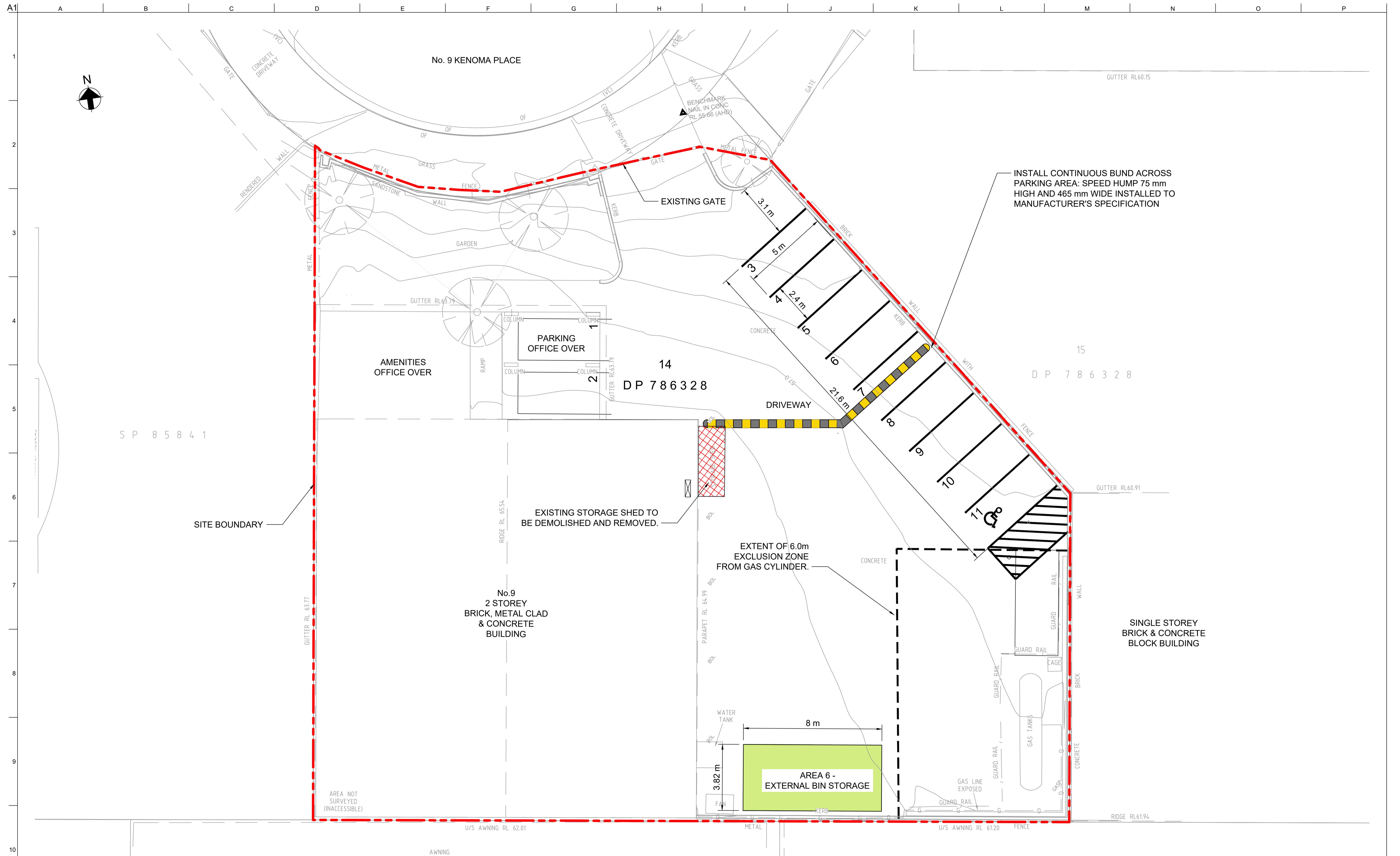






Appendix B

Site Plans



NOT FOR CONSTRUCTION

Scales 0 2.5 5m A1 / A3 1:100 / 1:200

Design Model Version

Issue	Date	By	Chkd	Appd

Issue	Date	By	Chkd	Appd

Issue	Date	By	Chkd	Appd

1 14/05/2020 HNA EM LH FOR APPROVAL	0 1/05/2020 HNA EM EM FOR INFORMATION

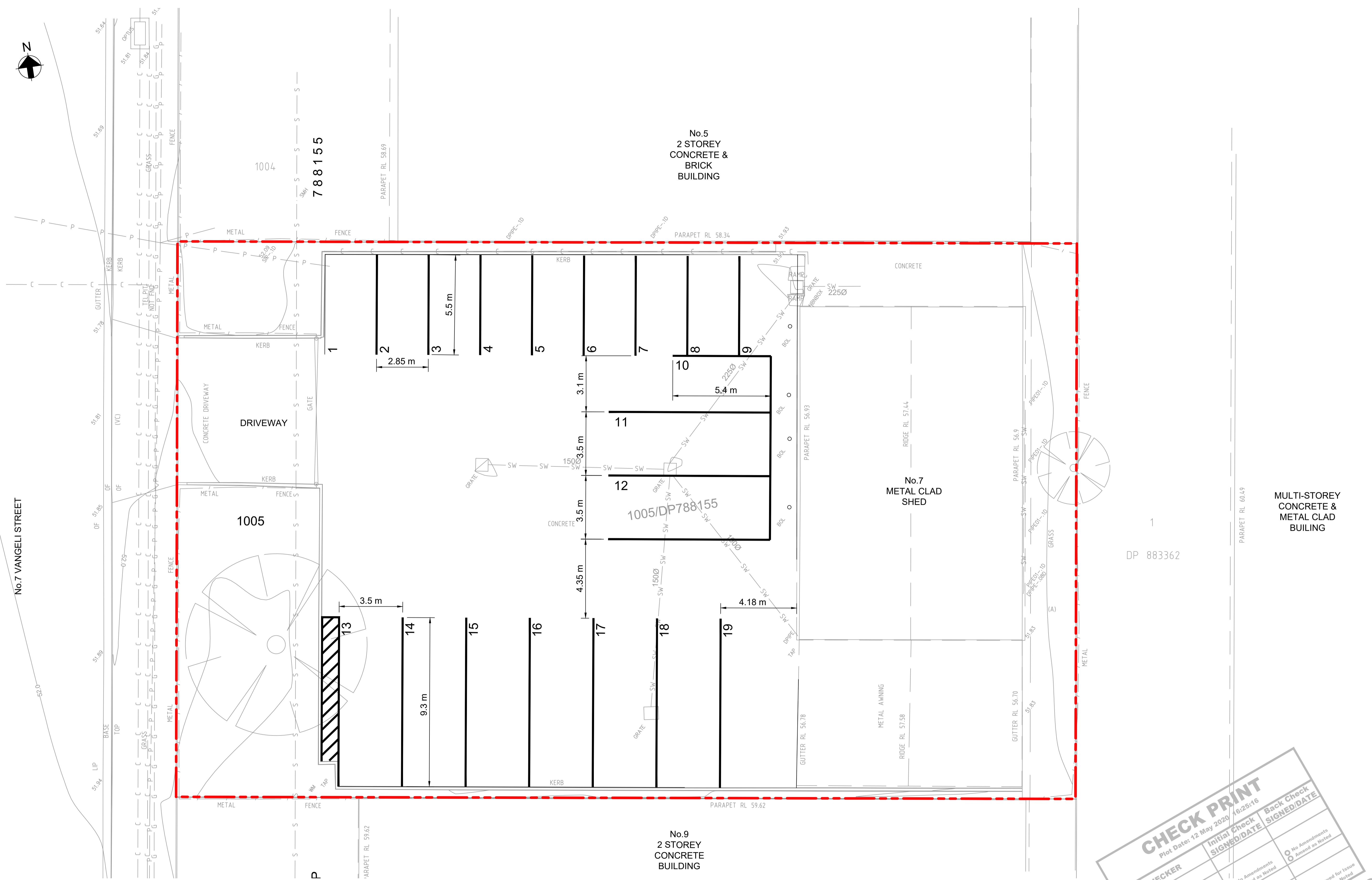
Client **MED-X**
Engineering Certification (CEng)
Name:
Signature: Date:

Job Title **CLINICAL WASTE MANAGEMENT FACILITY ARNDELL PARK**
Scale at A1 1:100
Signature: Date:

ARUP

CONSULT AUSTRALIA
Member Firm
Arup Pty Ltd
ABN 18 000 966 165

Drawing Title **9 KENOMA PLACE PROPOSED SITE PLAN**
Drawing Status **FOR APPROVAL**
Job No **274648-00** Drawing No **CICW-DRG-0111** Issue **1**



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Date: 12 May 2020 16:25:16	
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Scales 0
Design Model Version

Issue	Date	By	Chkd	Appd

Issue	Date	By	Chkd	Appd

05/2020	HNA	EM	EM
OR INFORMATION			
Date	By	Chkd	Appd

Client


Engineering Certification (CEng)

 Name:
 Signature: Date:

Job Title	CLINICAL WASTE MANAGEMENT FACILITY ARNDELL PARK
Scale at A1	1:100
Discipline	CIVL

ARUP

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Sydney, NSW, 2000
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<p>FOR INFORMATION ONLY</p>		
Job No	Drawing No	Issue
274648-00	CICW-DRG-0211	0

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Appendix C

SIDRA modelling results

MOVEMENT SUMMARY

▽ Site: [Holbeche Road & Vangeli Street]

Projected AM Peak

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Vangeli Street												
1	L2	57	5.0	0.048	6.7	LOS A	0.2	1.4	0.38	0.60	0.38	52.2
3	R2	54	5.0	0.143	14.1	LOS A	0.5	3.7	0.71	0.88	0.71	47.3
Approach		111	5.0	0.143	10.3	LOS A	0.5	3.7	0.54	0.74	0.54	49.7
East: Holbeche Road East												
4	L2	119	5.0	0.066	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
5	T1	317	5.0	0.168	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		436	5.0	0.168	1.5	NA	0.0	0.0	0.00	0.16	0.00	58.0
West: Holbeche Road West												
11	T1	307	5.0	0.322	1.9	LOS A	1.9	13.7	0.41	0.23	0.45	56.3
12	R2	137	5.0	0.322	8.8	LOS A	1.9	13.7	0.41	0.23	0.45	54.4
Approach		444	5.0	0.322	4.0	NA	1.9	13.7	0.41	0.23	0.45	55.7
All Vehicles		991	5.0	0.322	3.6	NA	1.9	13.7	0.24	0.26	0.26	55.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▽ Site: [Holbeche Road & Vangeli Street]

Projected PM Peak

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Vangeli Street												
1	L2	128	5.0	0.144	8.2	LOS A	0.6	4.0	0.53	0.75	0.53	51.4
3	R2	133	5.0	0.441	21.3	LOS B	2.0	14.3	0.84	1.02	1.16	43.3
Approach		261	5.0	0.441	14.9	LOS B	2.0	14.3	0.69	0.89	0.85	46.9
East: Holbeche Road East												
4	L2	34	5.0	0.019	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
5	T1	544	5.0	0.288	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		578	5.0	0.288	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.5
West: Holbeche Road West												
11	T1	330	5.0	0.244	1.2	LOS A	0.9	6.3	0.23	0.09	0.24	57.8
12	R2	48	5.0	0.244	10.0	LOS A	0.9	6.3	0.23	0.09	0.24	55.8
Approach		378	5.0	0.244	2.3	NA	0.9	6.3	0.23	0.09	0.24	57.5
All Vehicles		1217	5.0	0.441	4.1	NA	2.0	14.3	0.22	0.23	0.26	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

▼ Site: [Holbeche Road & Vangeli Street (Site Folder: General)]

Projected 10 Year AM Peak (With Development)

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay v/c	Level of Service sec	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist. m]				
South: Vangeli Street														
1	L2	57	5.0	57	5.0	0.052	7.1	LOS A	0.2	1.5	0.42	0.63	0.42	52.1
3	R2	54	5.0	54	5.0	0.181	17.2	LOS B	0.6	4.6	0.78	0.91	0.79	45.4
Approach		111	5.0	111	5.0	0.181	12.0	LOS A	0.6	4.6	0.60	0.77	0.60	48.6
East: Holbeche Road East														
4	L2	119	5.0	119	5.0	0.066	5.6	LOS A	0.0	0.0	0.00	0.57	0.00	53.4
5	T1	387	5.0	387	5.0	0.205	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		506	5.0	506	5.0	0.205	1.4	NA	0.0	0.0	0.00	0.14	0.00	58.2
West: Holbeche Road West														
11	T1	375	5.0	375	5.0	0.374	2.4	LOS A	2.5	17.9	0.42	0.22	0.53	56.0
12	R2	137	5.0	137	5.0	0.374	9.9	LOS A	2.5	17.9	0.42	0.22	0.53	54.1
Approach		512	5.0	512	5.0	0.374	4.4	NA	2.5	17.9	0.42	0.22	0.53	55.5
All Vehicles		1129	5.0	1129	5.0	0.374	3.8	NA	2.5	17.9	0.25	0.23	0.30	55.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\erick\Desktop\Reports\16-031 Kenoma Place\15-06 10 year projections\Holbeche\Projected 10 Year AM Peak (With Development).sip9

MOVEMENT SUMMARY

▼ Site: [Holbeche Road & Vangeli Street (Site Folder: General)]

Projected 10 Year PM Peak (With Development)

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay v/c	Level of Service sec	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist. m]				
South: Vangeli Street														
1	L2	128	5.0	128	5.0	0.171	9.2	LOS A	0.6	4.7	0.59	0.82	0.59	50.7
3	R2	133	5.0	133	5.0	0.644	36.1	LOS C	3.1	22.3	0.93	1.14	1.57	36.8
Approach		261	5.0	261	5.0	0.644	22.9	LOS B	3.1	22.3	0.76	0.98	1.09	42.5
East: Holbeche Road East														
4	L2	34	5.0	34	5.0	0.019	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
5	T1	663	5.0	663	5.0	0.351	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		697	5.0	697	5.0	0.351	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
West: Holbeche Road West														
11	T1	403	5.0	403	5.0	0.297	1.7	LOS A	1.3	9.2	0.26	0.08	0.31	57.3
12	R2	48	5.0	48	5.0	0.297	12.2	LOS A	1.3	9.2	0.26	0.08	0.31	55.3
Approach		451	5.0	451	5.0	0.297	2.9	NA	1.3	9.2	0.26	0.08	0.31	57.1
All Vehicles		1409	5.0	1409	5.0	0.644	5.4	NA	3.1	22.3	0.22	0.22	0.30	54.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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