

# Taronga Zoo

Taronga Wildlife Hospital, Sydney – Nutrition Centre  
Transport Impact Assessment

Prepared by: Stantec Australia Pty Ltd for Taronga Conservation Society Australia  
on 01/12/2021  
Reference: 301400288  
Issue #: A



now



# Taronga Zoo

## Taronga Wildlife Hospital, Sydney – Nutrition Centre Transport Impact Assessment

Client: Taronga Conservation Society Australia

on 01/12/2021

Reference: 301400288

Issue #: A

### Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	01/12/2021	Final	Ashish Modessa	Kane Williams	Kane Williams	

# CONTENTS

<b>1. Introduction</b>	<b>3</b>
1.1. Background & Proposal	3
1.2. Purpose of this Report	5
1.3. Secretary's Environmental Assessment Requirements	5
1.4. References	6
<b>2. Existing Conditions</b>	<b>7</b>
2.1. Location	7
2.2. Road Network	7
2.3. Car Parking	8
2.4. Traffic Generation	10
2.5. Traffic Conditions	11
2.6. Public Transport	12
2.7. Pedestrian and Cycle Infrastructure	13
2.8. Travel Behaviour	14
<b>3. Transport Assessment</b>	<b>15</b>
3.1. Car Parking Assessment	15
3.2. Loading and Servicing Assessment	16
3.3. Sustainable Transport Assessment	17
3.4. Traffic Assessment	19
<b>4. Preliminary Construction Traffic Impact</b>	<b>20</b>
4.1. Overview	20
4.2. Proposed Works	20
4.3. Work Hours	20
4.4. Construction Vehicle Access	20
4.5. Construction Vehicle Routes	22
4.6. Expected Traffic and Parking Demands	23
4.7. Pedestrian and Cyclists	24
4.8. Public Transport	24
4.9. Management of On-Street Parking Demand	25
4.10. Emergency Access	25
<b>5. Conclusion</b>	<b>26</b>

## Appendices

---

### A. Swept path analysis

#### Figures

---

Figure 1.1:	Site location within Taronga Zoo	4
Figure 1.2:	TWH Staging	4
Figure 2.1:	Subject site and its environs	7
Figure 2.2:	Peak daily visitor car park occupancy	9
Figure 2.3:	Hourly visitor parking occupancy (first two weeks in January)	9
Figure 2.4:	Hourly traffic generation (first two weeks in January)	10
Figure 2.5:	Sydney bus network map	13
Figure 2.6:	Mosman cycle map	14
Figure 3.1:	Level three layout	16
Figure 3.2:	Level two layout	17
Figure 4.1:	Internal Construction Vehicle Path	21
Figure 4.2:	External Approach and Departure Routes	23

#### Tables

---

Table 1.1:	SEARs on Traffic, Parking and Access	5
Table 2.1:	Summary of on-site parking supply	8
Table 2.2:	SIDRA INTERSECTION level of service criteria	12
Table 2.3:	Existing intersection operating conditions	12
Table 2.4:	Public transport provision	13
Table 3.1:	Anticipated peak visitor parking demand	15

# 1. INTRODUCTION

## 1.1. Background & Proposal

The Taronga Wildlife Hospital (TWH) project replaces the existing veterinary, quarantine and animal nutrition facilities. The relocated and expanded hospital will not only provide modern facilities for wildlife care, nutrition and research but also significantly increase capacity for the treatment of resident animals in addition to expanding and improving capacity for the treatment and rehabilitation of wildlife species.

A central part of the design and purpose of the new hospital is the critical role it will play in education. The proposed new facilities will double the current teaching space and upskill future conservationists, students, veterinary practitioners, scientists and wildlife carers.

This new specialist hospital will also play a vital role in engaging the public in wildlife conservation by deeply engaging Taronga Zoo's visitors in previously 'back of house' activities including opportunities to view animal treatment, surgeries, and breeding centres.

The new TWH will:

- increase capacity for wildlife treatment, rehabilitation and improved wildlife first response times
- increase space for training and educating thousands of veterinary professionals, volunteer wildlife carers and students
- increase space for quarantine and care of confiscated wildlife
- expand capacity for breeding endangered birds and mammals for release to the wild.

Crucially, the new TWH is not expected to increase staffing, with majority relocating from existing facilities already on-site.

The TWH will be delivered in two stages, reflecting the two key components of the project.

Stage 1, the TWH, Sydney – Nutrition Centre, the focus of this State Significant Development Application (SSDA), is located back of house and will replace several standalone buildings currently providing animal food preparation and storage.

Stage 2, will incorporate the main wildlife treatment, teaching and rehabilitation spaces. The facility will be linked to the Stage 1 Nutrition Centre via a tunnel and will be located on the footprint of the existing Serpenteria exhibit following the construction of a new Reptile & Amphibian Conservation Centre (currently under SSDA Assessment). Stage 2 – Hospital will be delivered under a separate SSDA.

It is understood that a traffic and transport report is required to accompany an Environmental Impact Statement (EIS) for the State Significant Development (SSD-17655146).

Taronga Conservation Society Australia commissioned GTA, now Stantec to undertake a transport impact assessment for the Stage 1 proposal.

Previous feedback from Transport for NSW for the Upper Australia Precinct SSDA lodged in 2020 has been considered in the preparation of the transport impact assessment.

The location of the proposed Wildlife Hospital is presented in Figure 1.1.

# INTRODUCTION

Figure 1.1: Site location within Taronga Zoo



Base Image Source: Nearmap, June 2020

Figure 1.2: TWH Staging



Source: Taronga Conservation Society Australia

## 1.2. Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposal during operation and construction stages, including consideration of the following:

- existing traffic and parking conditions at the site
- suitability of the proposed parking in terms of supply (quantum)
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposal
- the transport impact of the proposal on the surrounding road network
- construction traffic impact during the construction stages.

## 1.3. Secretary's Environmental Assessment Requirements

GTA, now Stantec has reviewed the Secretary's Environmental Assessment Requirements (SEARs) in regard to traffic, parking and access. As per the requirements, the following items are evaluated in the chapters specified below in Table 1.1.

**Table 1.1: SEARs on Traffic, Parking and Access**

SEARs	Report Section
<ul style="list-style-type: none"> <li>• A transport and accessibility impact assessment, prepared in consultation with Transport for NSW and Council with comments addressed prior to lodgement, which provides:                             <ul style="list-style-type: none"> <li>○ The predicted transport mode share split for the proposed development</li> <li>○ An analysis of the existing traffic network, including the road hierarchy, current daily and peak hour vehicle movements and existing performance levels of nearby intersections</li> <li>○ A forecast of additional daily and peak hour vehicle movements as a result of the proposal (using SIDRA modelling or similar at 5-year intervals) and identification of potential traffic impacts on road capacity, intersection performance and road safety (including pedestrian and cycle conflict)</li> <li>○ Proposals to mitigate any traffic impacts, including intersection upgrades to achieve acceptable performance</li> <li>○ Details of car parking provision, having regard to relevant parking rates, specifications and standards, and identify opportunities to decrease car parking in areas with good public transport accessibility</li> <li>○ Details of proposed vehicular access, loading, deliveries and servicing arrangements, and any proposed infrastructure improvements or measures to reduce potential conflicts with pedestrians and cyclists</li> <li>○ Proposals to improve walking and cycling, such as connections into existing walking and cycling networks, high equality end-of-trip facilities and adequate bicycle parking for visitors, employees and residents (provided in accordance with the relevant rates, specifications and standards)</li> <li>○ Measures to promote sustainable travel choices for employees, residents or visitors, such as minimising car parking provision, encouraging car share and public transport, cycling and walking, implementing a green travel plan and providing end of trip facilities.</li> </ul> </li> </ul>	
	Sections 2.8 and 3.3.3
	Sections 2.2, 2.4 and 2.5
	Section 3.4
	Section 3.4
	Section 3.1
	Section 3.2
	Section 3.3.1
	Section 3.3.3
<ul style="list-style-type: none"> <li>• A Construction Traffic Management Plan, prepared in consultation with Transport for NSW and Council with comments addressed prior to lodgement, providing details of predicted construction traffic movements, routes and access arrangements, and outline how construction traffic impacts on existing traffic, pedestrian and cycle networks would be appropriately managed and mitigated (including cumulative impacts).</li> </ul>	Chapter 4

## 1.4. References

In preparing this report, the following documents have been reviewed and where appropriate reference has been made to the following:

- Mosman Council Development Control Plan (DCP) 2012, amended 2018
- Mosman Municipal Council Local Environmental Plan (LEP) 2012
- Transport for NSW (TfNSW) Guide to Traffic Generating Development
- Transport for NSW Traffic Control at Work Site manual
- NSW Planning Guidelines for Walking and Cycling
- site layout plans prepared by dwp
- other documents and data as referenced in this report.

# 2. EXISTING CONDITIONS

## 2.1. Location

Taronga Zoo is located west of Bradleys Head Road, Mosman and it bound by Whiting Beach Road to the north, Athol Wharf Road to the south and Little Sirius Cove to the west. The location of the zoo and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject site and its environs



Base source: Sydway Publishing Pty Ltd

## 2.2. Road Network

### Bradleys Head Road

Bradleys Head Road functions as a local collector road and is aligned in a north-south direction linking the area with Military Road and Spit Junction in the heart of Mosman. At the entrance of the zoo, it is a two-way road configured with a two-lane, nine-metre-wide carriageway, including a right turn lane to access the Taronga Zoo multistorey and at-grade car parks.

Kerbside parking is permitted north of the site entrance and angled parking spaces are marked south of entrance.

301400288 // 01/12/21

Transport Impact Assessment // Issue: A  
Taronga Zoo, Taronga Wildlife Hospital, Sydney –  
Nutrition Centre

## Whiting Beach Road

Whiting Beach Road is a local road and near the site is aligned in an east-west direction. It is a two-way road configured with a two-lane, eight-metre-wide carriageway. Whiting Beach Road provides staff and delivery access to Taronga Zoo car parking and the back-of-house area of the zoo via the northern access.

Unrestricted kerbside parking is permitted on the northern side of the road.

## 2.3. Car Parking

Table 2.1 provides a breakdown of the location and type of parking spaces provided on-site within Taronga Zoo.

**Table 2.1: Summary of on-site parking supply**

Location	General car spaces	Accessible car spaces	Motorcycle spaces	Total
Multistorey	639	14	12	665
Overflow area	176	5	-	181
Staff (and contractor) parking	103	-	-	103
Total	918	19	12	949

It is noted that the overflow parking area is typically made available once the multistorey car park approaches its capacity. The total visitor car park capacity including the multistorey car park and overflow area is 834 spaces, with a further 12 motorcycle spaces.

A further 103 staff spaces are provided north of the multistorey car park and accessible via Whiting Beach Road. Staff also have access to the multistorey car park via a separate access point from the staff parking area located to the north. Staff are encouraged to park on the lower level, northern parking section. The staff parking includes 25 overflow spaces designated to contractors when construction activities are occurring within the Zoo; as well as 33 spaces linemarked over on-site coach parking area, used during peak periods. During these times, coaches are directed to park along Bradleys Head Road.

Historical car park occupancy data has been provided by Taronga Zoo showing typical visitor parking usage throughout the year. Figure 2.2 presents the peak daily visitor parking occupancy profile over about a two-year period, which would represent typical demand in any year.

A summary of the historical parking data is provided below:

- The parking data has been collected for a total of 653 days.
- Over the duration of 653 days, parking occupancy exceeded the total car park capacity for only 10 days within the survey period.
- On average, the parking demand exceeds the total car park capacity five to six days per year.
- The 85<sup>th</sup> percentile peak parking occupancy is 618 spaces. In simple terms, for 85 per cent of the times, the parking demand is less than 618 spaces. This equates to a minimum of 216 available car parking spaces.

# EXISTING CONDITIONS

Figure 2.2: Peak daily visitor car park occupancy

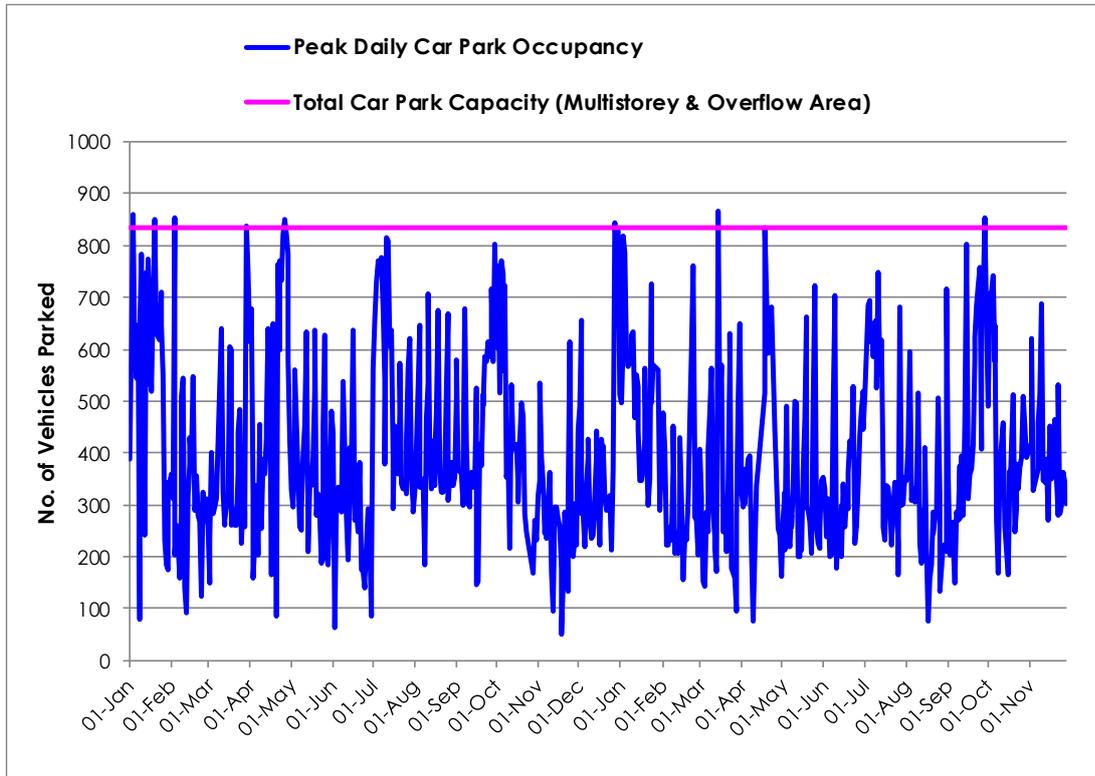


Figure 2.3 also presents historical hourly parking occupancy profile over the first two weeks for a typical January.

Figure 2.3: Hourly visitor parking occupancy (first two weeks in January)

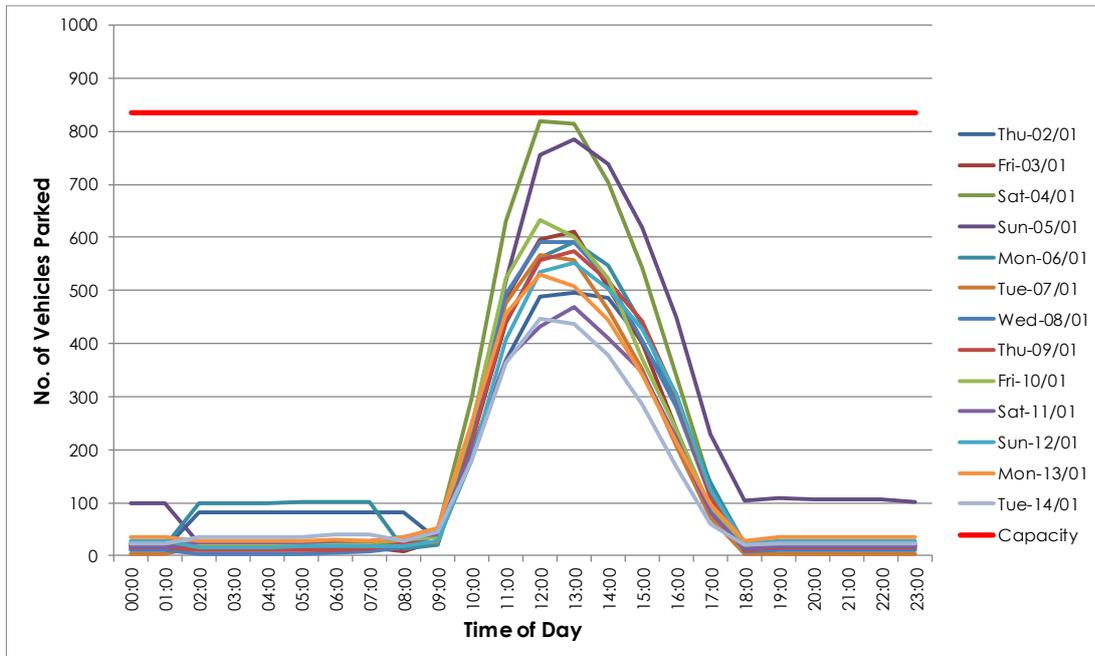


Figure 2.3 indicates that peak parking occupancy generally occurred between 12:00pm and 1:00pm and the parking occupancy decreases significantly after 2:00pm.

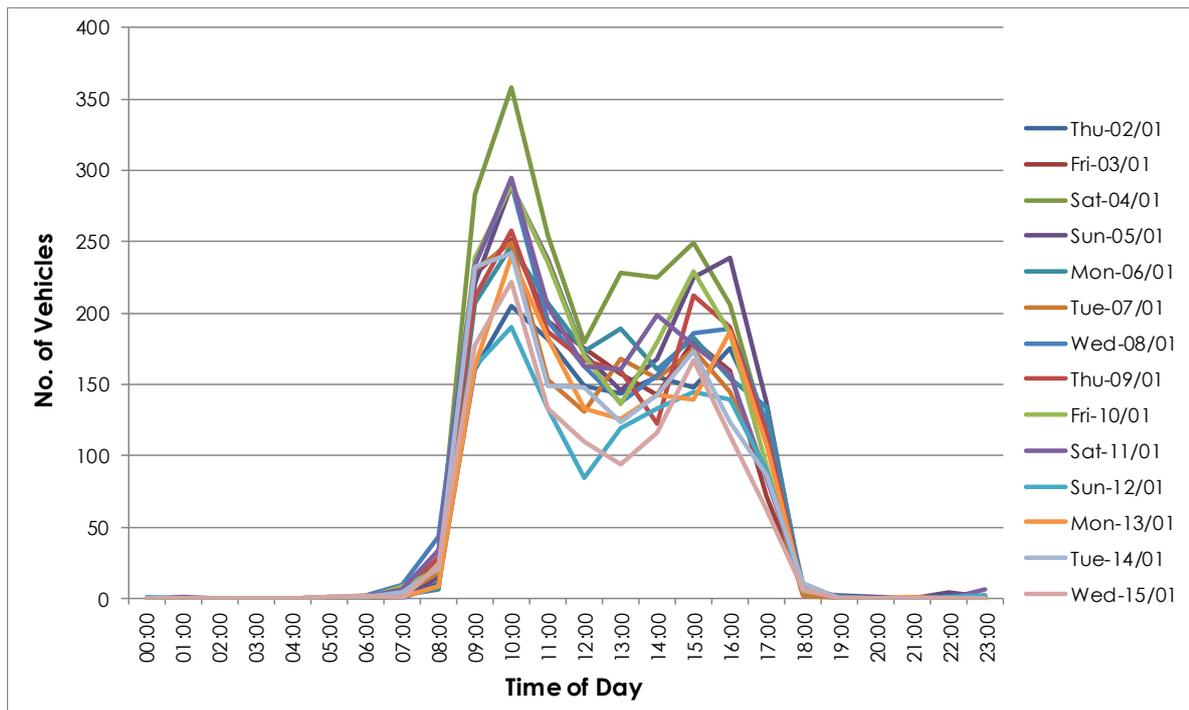
## 2.4. Traffic Generation

The traffic generation of the Taronga Zoo can be estimated from the number of vehicles entering and exiting the multistorey car park. Figure 2.4 presents historical hourly traffic generation (i.e. sum of total vehicles entering and exiting the car park) profile over the first two weeks in January.

A summary of the historical hourly traffic generation is provided below:

- weekday peak hour traffic generation of the zoo was 290 vehicles per hour, which occurred at 10:00am to 11:00am
- weekend peak hour traffic generation was 358 vehicles per hour, which occurred at 10:00am to 11:00am
- the majority of vehicles entered the car park between 9:00am and 12:00pm
- profile of vehicles exiting the car park was more spread out i.e. between 1:00pm and 6:00pm
- during the traffic network peak hour, the zoo generates in average of 20 vehicles (between 8:00am to 9:00am) and 100 vehicles (between 5:00pm to 6:00pm)
- average daily traffic generation is approximately 1,550 and 1,900 vehicles during the weekdays and weekends, respectively.

Figure 2.4: Hourly traffic generation (first two weeks in January)



## 2.5. Traffic Conditions

### 2.5.1. Base Data

Given current health situation, the associated traffic conditions within the roads of Sydney are considered an inaccurate representation of normal road conditions.

Based on the historic usage data obtained for the existing multistorey car park during the first two weeks in January (i.e. busiest period of the year), the average daily traffic generation of the zoo is approximately 1,550 and 1,900 vehicles during the weekdays and weekends, respectively.

Traffic surveys were previously completed at the two Whiting Beach Road intersections with Bradleys Head Road and Prince Albert Street during the following peak periods:

- Thursday 2 July 2020 from 7:30am to 11:30am and 2:30pm to 6:30pm
- Saturday 4 July 2020 from 9:00am to 11:00am.

It is noted that the surveys occurred at the request of Transport for NSW as part of the Taronga Zoo Upper Australia Precinct SSDA in the last week of Term 2 for NSW schools.

The morning and afternoon peak hours on the Thursday were found to occur from 9:30am to 10:30am and 3:30pm to 4:30pm respectively. The Saturday peak occurred from 9:15am to 10:15am.

Taronga Zoo advised that 2,125 and 4,580 visitors attended the zoo on the 2020 surveyed days and that 60 per cent of staff returned on site. In comparison, there were on average 3,150 and 4,900 visitors that attended the zoo on the same days in June and July 2019 (excluding the NSW school holiday period). This suggested there had been an approximately 30 per cent reduction in visitation on the Thursday and a seven per cent reduction on Saturday compared to 2019.

Notwithstanding this, there had been a significant impact on interstate/ overseas visitors due to the current health situation who typically account for 30 to 40 per cent of total visitors and travel by public transport (i.e. some 2,000 and 3,100 visitors being locals on Thursdays and Saturday typically). When this is considered and noting visitors on the surveyed days were predominantly locals that drove, the traffic conditions surveyed would not represent a typical day as there were more vehicles in 2020 than typically, particularly on the Saturday.

It was also advised that visitors could only purchase tickets online at the time of the 2020 surveyed period, so the arrival patterns are atypical as visitors arrive closer to opening time and not spread across the day to avoid long queues at the ticket booth. This would suggest the site peaks would have been more concentrated than typical, which is evident in the Saturday results that showed the peak hour occurred from 9:15am.

Therefore, a conservative approach has been adopted for the purposes of this study using the peak hours recorded from the surveys with no adjustments, noting traffic conditions were higher than typical.

### 2.5.2. Intersection Operation

The operation of the 2020 surveyed intersections has been assessed using SIDRA INTERSECTION<sup>1</sup>, a computer-based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by TfNSW, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

<sup>1</sup> Program used under license from Akcelik & Associates Pty Ltd.

## EXISTING CONDITIONS

Table 2.2 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

**Table 2.2: SIDRA INTERSECTION level of service criteria**

Level of Service (LOS)	Average Delay per vehicle (secs/ veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.3 presents a summary of the 2020 operation of the surveyed intersections. The results for these priority-controlled intersections are based on the movement with highest delay.

**Table 2.3: Existing intersection operating conditions**

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Whiting Beach Road/ Bradleys Head Road	Weekday AM	0.14	6	4	A
	Weekday PM	0.03	5	1	A
	Saturday	0.11	6	3	A
Whiting Beach Road/ Prince Albert Street	Weekday AM	0.11	5	3	A
	Weekday PM	0.03	5	1	A
	Saturday	0.02	5	1	A

Table 2.3 indicates that the 2020 surveyed intersections operated satisfactorily, with acceptable delays, queues and capacity during the surveyed peak periods.

## 2.6. Public Transport

The site is accessible by bus and ferry. Bus stops are located at the main entrance off Bradleys Head Road and ferry wharf is located at southern entrance of the zoo.

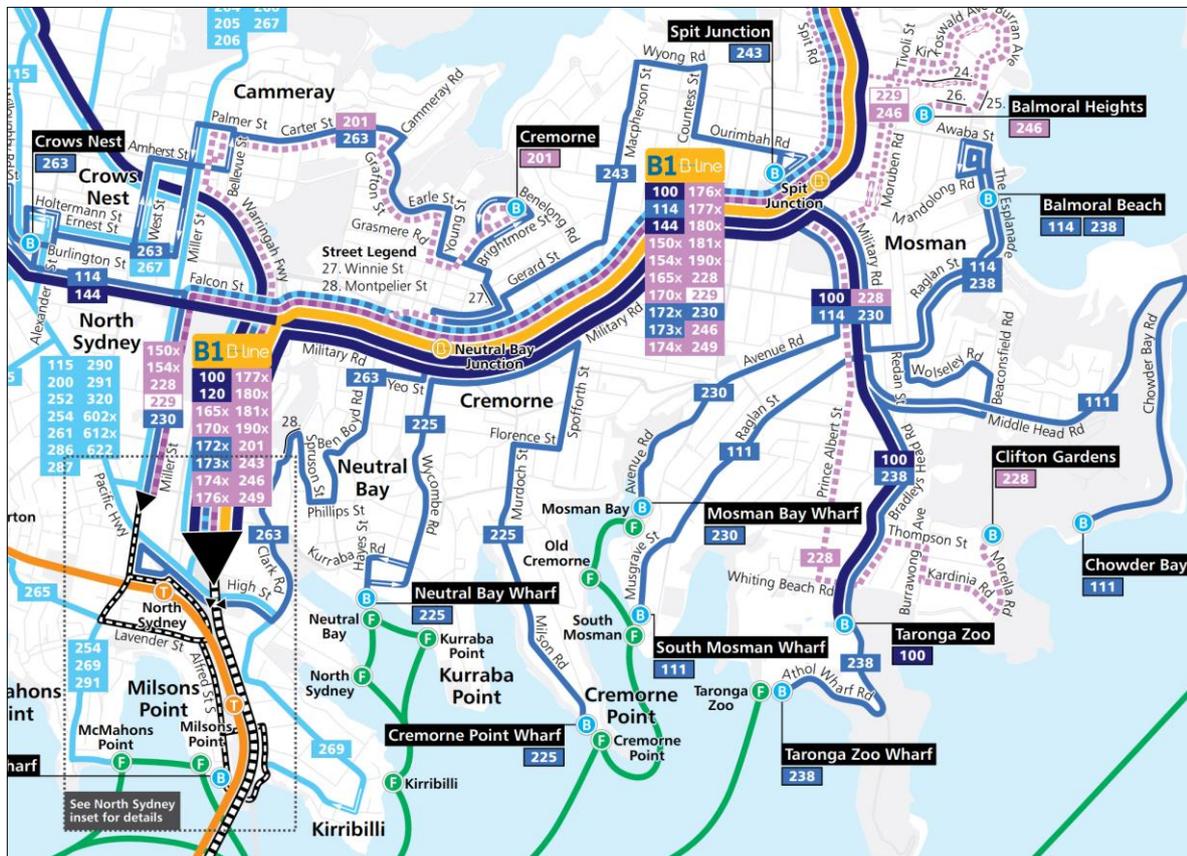
A review of the public transport available near the site is summarised in Table 2.4 and a bus route map is provided in Figure 2.5.

## EXISTING CONDITIONS

Table 2.4: Public transport provision

Service	Route #	Route description	Location of stop	Distance to nearest stop	Frequency on/off peak
Bus	100	Taronga Zoo to City QVB (Loop Service)	Taronga Zoo	on site	10 minutes peak and off peak
Bus	228	Milsons Point to Clifton Gardens	Bradleys Head Road	150 m	1 service during AM peak and 4 services during PM peak
Bus	238	Taronga Zoo Wharf to Balmoral	Taronga Zoo	on site	30 minutes peak and off peak
Ferry	F2	Circular Quay to Taronga Zoo	Taronga Zoo Wharf	on site	30 minutes peak and off peak

Figure 2.5: Sydney bus network map



Source: <https://transportnsw.info/travel-info/waysto-get-around/bus/bus-operator-maps> accessed 06/10/2021

## 2.7. Pedestrian and Cycle Infrastructure

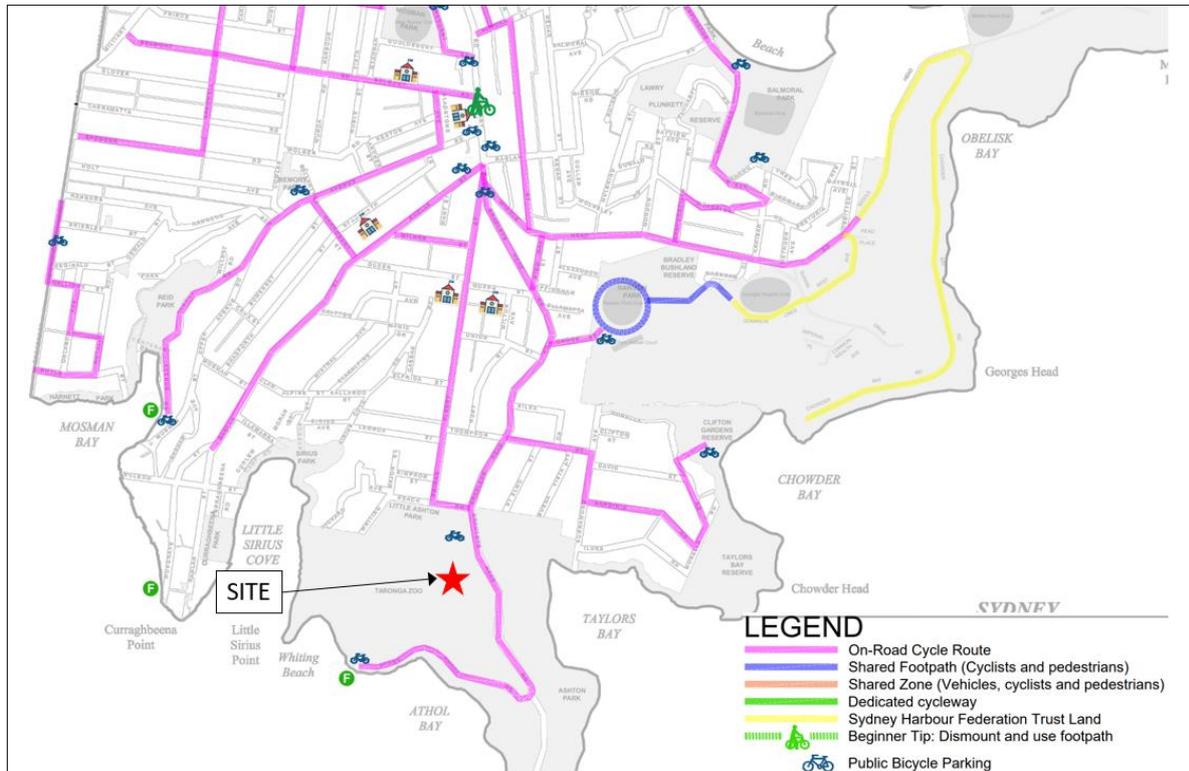
Pedestrian footpaths are provided at the following locations:

- Both sides of Bradleys Head Road, north of the main zoo entrance.
- Eastern side of Bradleys Head Road, south of the main zoo entrance for approximately 300 metres.
- Western side of Bradleys Head Road, south of the main zoo entrance for approximately 100 metres.
- Northern side of Whiting Beach Road.

## EXISTING CONDITIONS

A safe pedestrian crossing point is provided across the Bradleys Head Road, at the main entrance. The nearest cycle route in vicinity of the site runs along the Bradleys Head Road-Athol Wharf Road. The cycle network surrounding the subject site is illustrated in Figure 2.6, which shows the site has a good connectivity to on/ off street cycle routes.

Figure 2.6: Mosman cycle map



Source: <https://mosman.nsw.gov.au/recreation/cycling> accessed 06/10/2021

## 2.8. Travel Behaviour

The site is generally well serviced by established and frequent public transport services. Based on available information and historical data from the zoo, approximately 60 per cent of zoo visitors travel to and from the zoo by ferry or bus, with the remaining 40 per cent using private vehicles.

Based on a 2015 questionnaire survey of some 60 staff at the Taronga Institute of Science and Learning, it was found that 48 per cent of staff travelled to and from the zoo by private vehicles (as driver or passenger), 32 per cent travelled by public transport (train/ bus and/ or ferry) and 20 per cent either cycled or walked only.

# 3. TRANSPORT ASSESSMENT

## 3.1. Car Parking Assessment

This proposed TWH Nutrition Centre involves the relocation and upgrade of an existing facilities. As such the proposal would not intensify the existing staffing and visitation numbers. On this basis, additional on-site car parking is not required for the proposal.

As presented in Section 2.3, Taronga Zoo currently provides in total of 834 car parking and 12 motorcycle spaces in its multistorey and overflow parking areas, as well as up to 103 spaces in a designated staff and contractor parking area.

The historical peak daily visitor parking occupancy profile is presented in Figure 2.2. The results of the parking analysis indicates that the historical 85<sup>th</sup> percentile peak parking occupancy is 618 spaces with a minimum of 216 car parking spaces available. The number of days which the parking demand exceeded the capacity was on average five to six days a year.

It is noted that the parking data provided predates the opening of the Australia Habitat and Taronga Wildlife Retreat, as such parking demand from the Retreat has not been accounted for. GTA's Transport Impact Assessment for the Australia Habitat and Taronga Wildlife Retreat<sup>2</sup> indicated that retreat guests would typically require 62 car spaces. An additional nine spaces would be required for use by staff and accommodated within the staff carpark. A subsequent approved modification<sup>3</sup> to the Australia Habitat and Taronga Wildlife Retreat prepared by GTA now Stantec proposes to open the facilities of the retreat to the broader Zoo patrons and general public. The assessment assumed a car occupancy of 2 to 2.5 person per car, which can cater for 400 to 500 additional visitors to the Zoo and also the venues at Taronga Centre based on the available 200 spaces during the peak period (12:00pm to 1:00pm).

Guest arrival typically occurs between 3:30pm and 5:30pm and departures between 10:00am and 11:00am. With peak parking demand generally between 12:00pm and 1:00pm and decreasing significantly after 2:00pm, the existing on-site car parking provision will be sufficient to accommodate the additional demand arising from the retreat. That said, it is conservatively assessed that 50 per cent of the parking demand will occur during the peak parking occupancy period, equivalent to 31 spaces.

As presented in Table 3.1, there is still availability for 185 spaces of an 85<sup>th</sup> percentile day when considering Wildlife Retreat demand.

**Table 3.1: Anticipated peak visitor parking demand**

Taronga Zoo parking	Peak visitor parking occupancy	Percentage
Total parking available	834	100%
85 <sup>th</sup> percentile parking demand	618	74%
Wildlife Retreat parking demand	31	4%
<b>Total anticipated peak parking demand</b>	<b>649</b>	<b>78%</b>

<sup>2</sup> Transport Impact Assessment – Taronga Zoo – Proposed Australia Habitat & Taronga Wildlife Retreat – Transport Impact Assessment, GTA Consultants, 7 March 2016

<sup>3</sup> Taronga Wildlife Retreat – Modification to Approved SSD 15\_7419, GTA Consultants now Stantec, 7 May 2021

### 3.2. Loading and Servicing Assessment

The TWH Nutrition Centre includes one dedicated loading dock on level three (shown in Figure 3.1) that is accessed via the existing back of house service road. The loading dock has been designed to accommodate vehicles up to a 6.4 metre small rigid vehicle (SRV).

Figure 3.1: Level three layout



Source: dwp, drawing no. TWH 20-0527 AA-N1202 dated 24 November 2021

With the demolition of the existing dry feed and office building to the south of the Nutrition Centre, there is improved and increase hardstand area for vehicle manoeuvring as illustrated in Figure 3.2. A retaining wall is proposed within the hardstand area to allow loading and unloading to occur adjacent to the Nutrition Centre, whilst maintaining through traffic south of the retaining wall.

Bin storage rooms are provided on levels two and three of the Nutrition Centre near the loading areas.

Swept path analysis of the relevant design vehicles has been completed and is included in Appendix A.

Figure 3.2: Level two layout



Source: dwp, drawing no. TWH 20-0527 AA-N1201 dated 24 November 2021

## 3.3. Sustainable Transport Assessment

### 3.3.1. Pedestrian and Cyclist Implications

Pedestrian and cyclist access around the back-of-house area will remain the same as current arrangement after the opening of the TWH Nutrition Centre.

A new accessible path will be provided between the back-of-house service road and the Nutrition Centre. The path commences close to the security guard house, providing direct access to the staff car park.

### 3.3.2. Public Transport Implications

With staffing for the TWH Nutrition Centre to remain the same as existing facilities that are being replaced, there is not expected to be any additional trips utilising the existing public transport system after the opening of the centre.

### 3.3.3. Green Travel Plan

#### Overview

A GTP is a package of measures aimed at promoting sustainable travel and reducing reliance on the private car. It is not designed to be 'anti-car' however will encourage and support people's aspirations for carrying out their daily business in a more sustainable way. Travel plans can provide both:

- measures which restrict car use (disincentives or 'sticks')
- measures which encourage or support sustainable travel, reduce the need to travel or make travelling more efficient (incentives or 'carrots').

The travel plan would promote the use of transport, other than the private car, provide choice for staff and visitors to travel to and from the site, which is more sustainable and environmentally friendly.

Indeed, there are a range of “non-car” transport options that are available at the site which have been described in this report.

The aim of GTPs is to bring about better transport arrangements for working and visiting a site. The key objectives of GTPs are:

- to encourage walking
- to encourage cycling
- to encourage the use of public transport
- to reduce the use of the car, in particular single car occupancy
- where it is necessary to use the car, encourage more efficient use.

It is the intention therefore that the travel plan will deliver the following benefits:

- enable higher public and active travel mode share targets to be achieved
- contribute to greenhouse gas emission reductions and carbon footprint minimisation
- contribute to healthy living for all
- contribute to social equity and reduction in social exclusion
- improve knowledge and contribute to learning.

### Site Specific Application

The TWH Nutrition Centre is not expected to increase trips to Taronga Zoo or have the capability to change travel patterns to/ from Taronga Zoo which is accessible by established bus/ coach and ferry services. Furthermore, the proposal will not increase staff numbers at the zoo.

On this basis, the proposal does not alone warrant a GTP, with any need for a GTP required for the overall zoo operation.

Notwithstanding, Taronga Zoo has implemented a GTP for staff and visitors (primarily primary and secondary school students that arrive by coach) to the Taronga Institute of Science and Learning (TISL) that was prepared by Traffix and dated 4 July 2018.

The GTP investigated travel modes for TISL staff in 2015 and set targets and measures to increase use of public transport and carpooling for the new facility. The GTP included targets to reduce staff trips by vehicle from 48 per cent to 40 per cent, at the same time increase public transport trips from 32 per cent to 39 per cent. The target for walking only was 14 per cent (one per cent increase), whilst cycling was proposed to remain at seven per cent.

A Transport Access Guide (TAG) was also prepared by Traffix that requires updating every six months. This TAG is recommended to be distributed to all zoo staff and visitors, including integrating into the Taronga Zoo website within the ‘Getting to the Zoo’ page.

It is expected that similar travel patterns and behaviours apply to all staff at Taronga Zoo and therefore the GTP and its strategies and transport initiatives, such as the TAG and use the TISL carpooling service called Comovee would apply and should be available for all zoo staff.

As such, it is recommended that the GTP is updated to account for all zoo staff once operation and staff numbers are normalised following the current health situation based on a new travel mode and staff residence survey to reset mode share targets and adjust strategies and transport initiatives accordingly.

## 3.4. Traffic Assessment

### 3.4.1. Traffic Generation

Like parking demand, the proposed TWH Nutrition Centre is not expected to generate additional traffic to Taronga Zoo. This is because there is no proposal to intensify staffing for the new facility.

### 3.4.2. Summary

Local traffic conditions near the site would not be affected by the proposed TWH Nutrition Centre and as such no mitigation measures are necessary.

# 4. PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

## 4.1. Overview

This chapter provides some preliminary details and assessment of the construction traffic management required for the TWH Nutrition Centre. A detailed Construction Traffic Management Plan will be developed by the appointed contractor prior to the commencement of any works.

## 4.2. Proposed Works

The TWH Nutrition Centre is expected to be constructed in the following phases:

- Phase 1 – site establishment
- Phase 2 – demolition of existing buildings, preparation of temporary access ramp and excavation of tunnel
- Phase 3 – construction of the TWH Nutrition Centre and supporting infrastructure and landscaping
- Phase 4 – site demobilisation.

## 4.3. Work Hours

It is proposed that construction works will be carried out between the following hours:

- Mondays to Fridays: 7:00am to 5:00pm
- Saturdays: 8:00am to 1:00pm
- Sundays: No work.

No construction vehicle access is to be permitted on public holidays.

Any work outside the proposed construction hours will be subject to specific prior approval from Mosman Council or Department of Planning, Industry and Environment (DPIE).

## 4.4. Construction Vehicle Access

Construction vehicles will access the construction site via the existing Taronga Zoo's staff car park access on Whiting Beach Road. The car park access is gate controlled, with further security gate to access the back of house area.

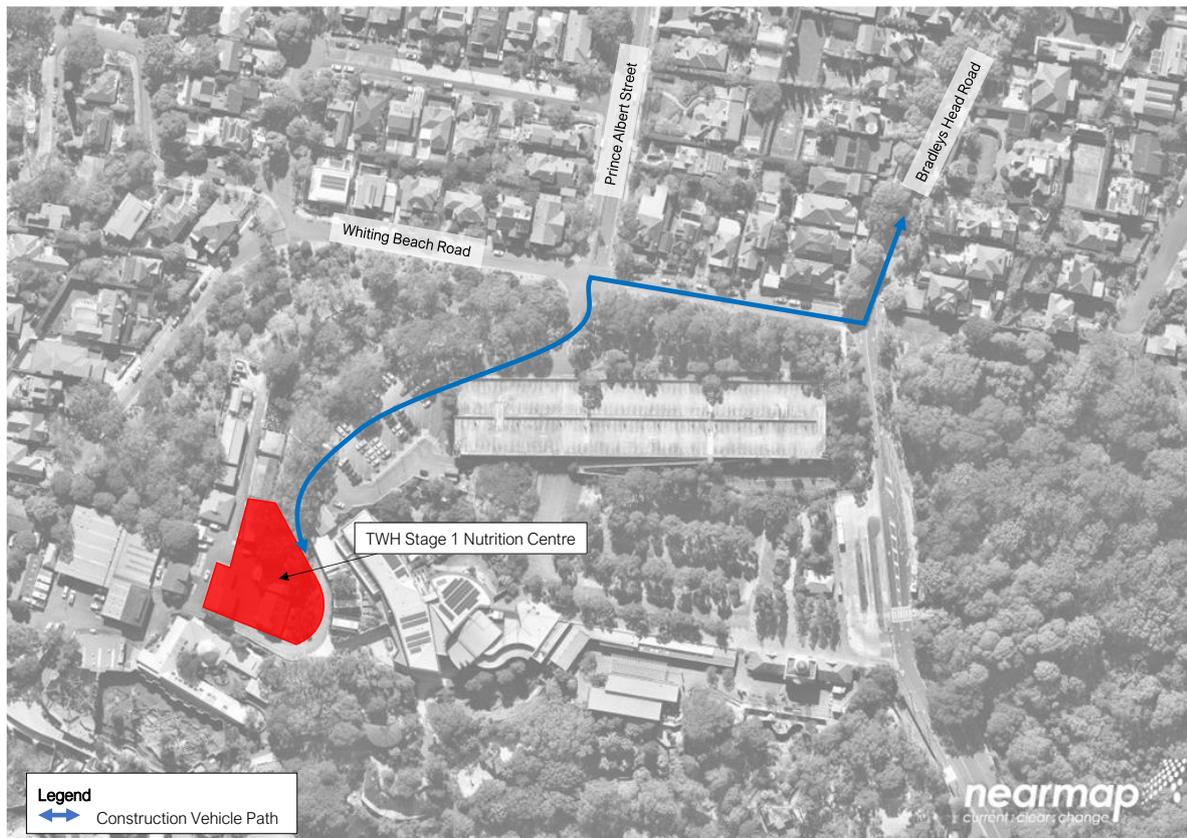
It is not expected that traffic controller will be required on Whiting Beach Road to manage the interaction of construction vehicle access and pedestrian, cyclist, and general traffic movements, as it is an existing vehicle access. Construction vehicles entering and exiting the site will be required to give way to vehicles, pedestrians, and cyclists under normal road rules.

If traffic and pedestrian control is required, a traffic control plan that shows required traffic and pedestrian control signage will be prepared and implemented by accredited personnel prior to works commencing.

## PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

Figure 4.1 presents the construction vehicle path.

Figure 4.1: Internal Construction Vehicle Path



Base Image Source: Nearmap, accessed 07 October 2021

Taronga Zoo also implements a strict vehicle policy within the zoo grounds, which is applicable for the proposed construction works. Vehicle policy is as follows:

1. Restrict movements of vehicles to the minimum requirements for executing the Works. Do not drive private vehicles into the zoo grounds.
2. Do not exceed 10 kilometres per hour.
3. Do not drive vehicles including suppliers' delivery vehicles within the public areas of the zoo between the hours of 9:00am to 5:00pm during school holidays and weekends, and 10:00am to 3:00pm at other times.
4. Between 6:00am and 9:00am and between 5:00pm and 6:00pm during school holidays and between 6:00am and 10:00am and between 3:00pm and 6:00pm at other times, up to 10 vehicle movements are permitted per day in the public areas. Escort larger vehicles to the construction site.
5. Movements of vehicles in other areas of the zoo are restricted to between the hours of 6:00am to 6:00pm subject to the approval of the zoo's management.
6. Roads within the zoo may not have a heavy-duty pavement. The roads may not be suitable for articulated or long wheelbase vehicles. Some of the roads are unsealed and may not be suitable for use in wet weather.
7. Roads within the zoo may have limited width and headroom. Check the access before organising vehicular transport.
8. Use a route as directed by zoo staff and notified prior to start and use service roads where possible.

## PRELIMINARY CONSTRUCTION TRAFFIC IMPACT

9. Limit movement of heavy vehicles to be used in removing spoil or other materials from the Taronga Zoo to between the hours of 7.30am to 4.30pm on Monday to Friday and between 7.30am to 1:00pm on Saturday, or as required by Mosman Council, subject to restrictions in item 3 above for vehicle movements within the zoo.
10. Take responsibility for any damage caused by vehicles, including those of subcontractors and suppliers, using the roads and repair any such damage at no cost to the Principal.
11. Keep access roads and adjacent footpaths, gutters and drains clear of construction waste, debris and mud, clean as required and remove waste, debris and mud from the zoo, all at the Contractor's cost.
12. Comply with the physical limitations on the height of vehicles using zoo roads.
13. Where it is necessary to remove fences within the zoo to enable access to be gained to work areas, keep the areas secure at all times and reinstate the fences as soon as practical.
14. Do not ride in/ on back of vehicles; and ride in seat with seat belt fastened.
15. Fuelling of vehicle at or near public areas is not permitted.
16. Park vehicles on site within the site compound or at locations as directed by zoo staff.
17. The zoo is a pedestrian park and pedestrians have right of way.

As listed above, the construction vehicles accessing the zoo grounds are restricted to occur outside of the busy zoo operating period. Vehicle access within the zoo grounds would generally be limited to 6:00am to 10:00am and 3:00pm to 6:00pm.

### 4.5. Construction Vehicle Routes

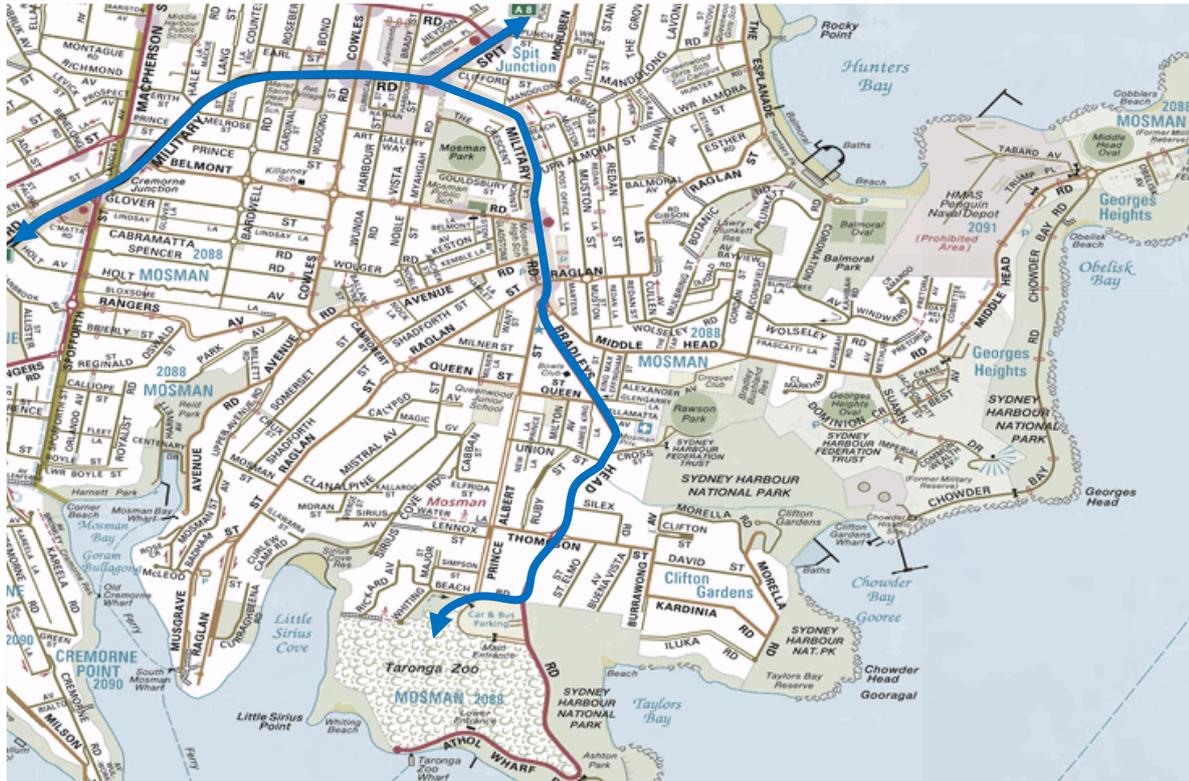
Construction vehicles likely to be generated by the proposed construction activities include:

- articulated trucks for the delivery of machinery (including mobile cranes, diggers)
- trucks to collect demolition and excavated materials
- general vehicles such as concrete trucks, large, medium, small rigid trucks, tradespeople's utilities and courier vans.

The designated truck routes to/ from the arterial road network includes the use of Military Road, Bradley Head Road and Whiting Beach Road. The approach and departure routes on the external road network are shown in Figure 4.2.

All construction vehicles accessing the site would do so in full compliance with the required clearway and parking restrictions. No queuing of trucks would be permitted on public roads. Truck arrivals would be coordinated to ensure incoming trucks are not required to wait for a truck space to be available on-site.

Figure 4.2: External Approach and Departure Routes



Base map Source: Sydney

## 4.6. Expected Traffic and Parking Demands

### 4.6.1. Expected Peak Periods

The zoo's peak operating periods occur between 11:00am and 3:00pm. It is understood that construction activities are typically carried out from 7:00am to 5:00pm Monday to Friday and 8:00am to 1:00pm on Saturdays with peak vehicle movements relating to the construction works generally occurring an hour before construction activities start as well as an hour after construction activities ends, as workers enter and leave the site. As such, given the peak vehicle movements relating to the construction works will only overlap with the zoo's peak operation on a Saturday midday, i.e. between 1:00pm and 2:00pm, this assessment will focus on this period only.

The assessment for parking and traffic impacts in the surrounding neighbourhood considers the traffic and parking generation associated with the following overlapping activities:

- movement of construction related workers
- movement of staff members
- movement of zoo visitors.

### 4.6.2. Existing Traffic and Parking Circumstance

The analysis detailed in Section 2.4 reported a surveyed traffic generation of 358 vehicles per hour (vph) during the weekend peak, which is 10:00am to 11:00am. Corresponding to this period, the carpark occupancy survey revealed spare capacity of 216 available car parking spaces for 85 per cent of the year (based on 85<sup>th</sup> percentile demand). Considering the peak construction traffic is envisaged to occur within the hour after construction activities end at 1:00pm, it is noted that both the peak visitation and construction traffic would not coincide.

### 4.6.3. Heavy Vehicle Generation

Heavy vehicle traffic would mainly be generated by activities associated with the following:

- delivery of construction materials
- delivery and removal of construction equipment and machinery.

The number of daily truck movements will vary depending on the works being conducted on the specific day or timeframe in the construction programme. The heavy vehicle generation for TWH Nutrition Centre is estimated to be four to six trucks per hour during peak construction activities.

No parking demand is expected of heavy vehicles.

### 4.6.4. Light Vehicle Generation

Light vehicle traffic generation would be largely generated by construction worker traffic movements to and from the site.

It is expected in the worst-case scenario there could be up to 30 construction workers on the typical day, with an average of 20 workers. Construction workers will be encouraged to carpool and to use public transport where possible to ensure that parking can be accommodated wholly within the zoo. Based on the above, 20 light vehicles per day could be expected during peak construction.

It is noted that not all the workers would arrive and depart at the same time as some are likely to remain at site to pack up after shutting down for the day and some might have left earlier depending on their work schedule. As such, the worker traffic would likely be further distributed over the space of a few hours, thereby reducing the hourly traffic impact.

Likewise, it is not expected that peak worker arrivals and departures will coincide with peak heavy vehicle movements.

### 4.6.5. Traffic Impact

The overall traffic impact during construction period is expected to be nominal with the Taronga Zoo site and the adjacent roads expected to accommodate the peak construction traffic generation.

### 4.6.6. Parking Impact

The extensive parking survey demonstrated spare capacity of 216 spaces for 85 per cent of the collection periods of 22 months (i.e. 85<sup>th</sup> percentile demand), thus takes into consideration seasonal effects. The anticipated peak parking demand during construction, which would be up to 20 spaces, will be comfortably accommodated within the 85<sup>th</sup> percentile car parking capacity.

## 4.7. Pedestrian and Cyclists

The appointed contractor will be responsible to maintain pedestrian and vehicle access around the work site. At minimum, Class A hoarding will be provided around the work site to ensure separation between pedestrians and the work site.

## 4.8. Public Transport

The construction activities are not expected to impact existing bus services near the site.

#### 4.9. Management of On-Street Parking Demand

Based on the findings presented in the previous section with respect to the available capacity outside of the peak times, it is assessed that the management of carpark usage and in particular, its impact on surrounding on street parking, is the subject of choice rather than capacity.

Initiatives to encourage on-site parking, include internal communications amongst staff members to avoid using on street parking and the promotion of public transport.

#### 4.10. Emergency Access

Emergency vehicle access to the construction site and the broader zoo grounds should not be affected by the construction activities.

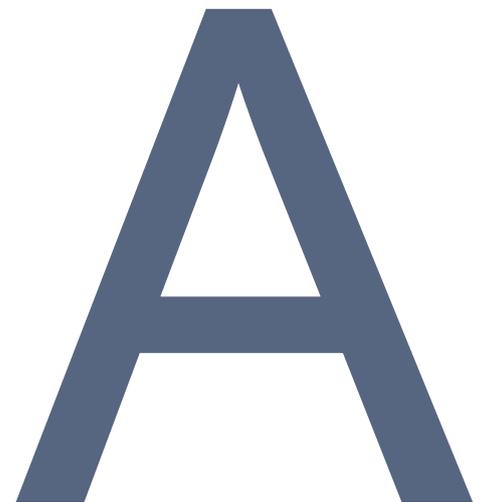
In addition, access to neighbouring sites by emergency vehicles should not be affected by the works as the roads and footpaths near the site are unaffected.

## 5. CONCLUSION

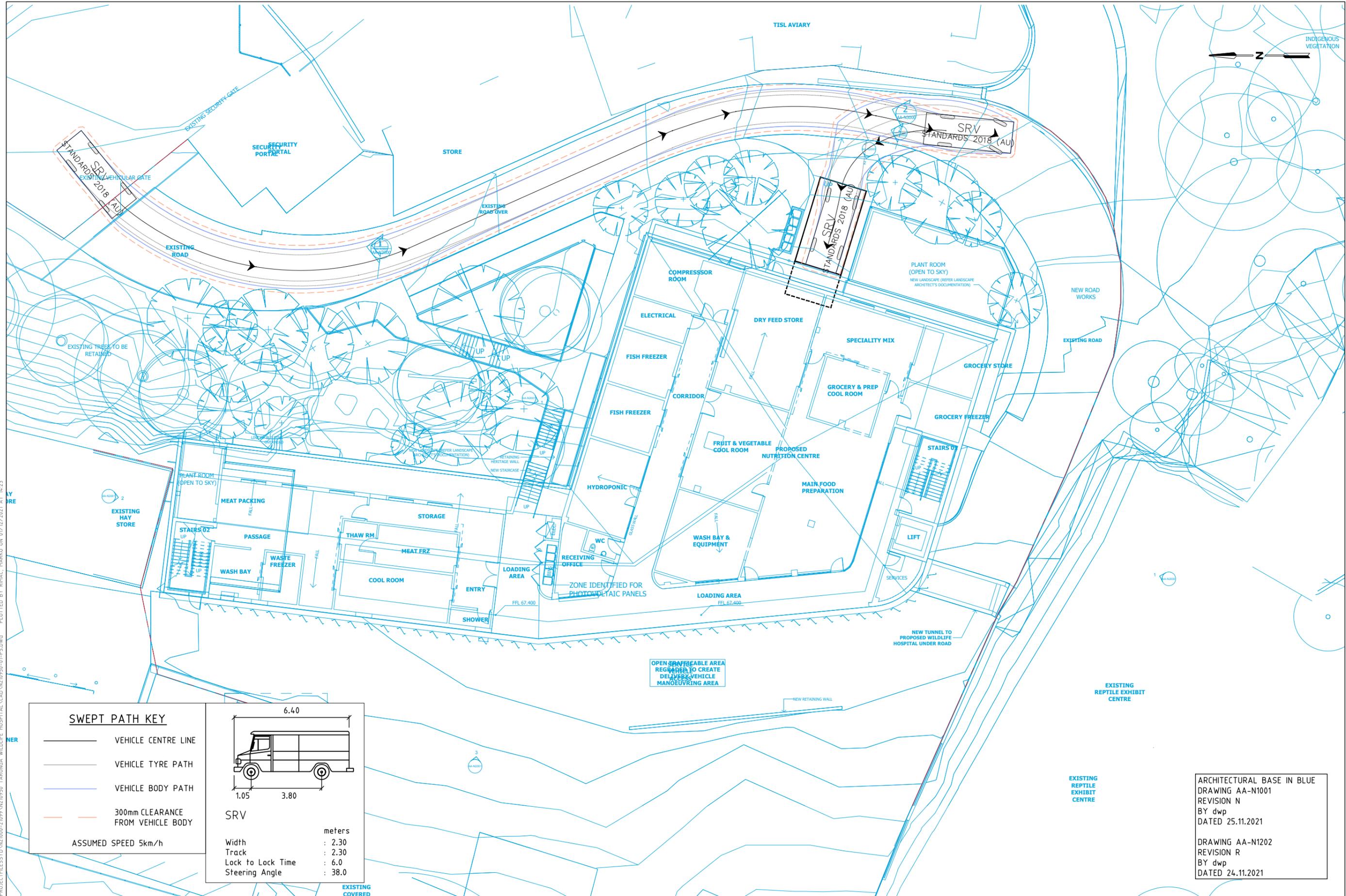
Based on the analysis and discussions presented within this report, the following conclusions are made:

1. The proposal involves construction of Taronga Wildlife Hospital – Stage 1 Nutrition Centre to replace existing facilities at the zoo
2. No increase to staffing is proposed therefore it will not generate any additional parking demand. On this basis, additional parking is not proposed to be provided on site.
3. Likewise, there will be no increase in traffic generation by the proposal, therefore no impact to the surrounding road network.
4. Two loading areas are proposed for the TWH Nutrition Centre that are designed to accommodate the anticipated largest vehicles to service each of them.
5. During the construction of the TWH Nutrition Centre, the anticipated construction vehicle movements is unlikely to adversely impact the surrounding road network.
6. Whilst the proposal itself does not warrant a Green Travel Plan, Taronga Zoo has a Green Travel Plan and Transport Access Guide for staff and visitors (primarily primary and secondary school students that arrive by coach) to the Taronga Institute of Science and Learning; which is recommended to be updated for all zoo staff based on a new travel mode and staff residence survey to reset mode share targets and adjust strategies and transport initiatives accordingly.

# A. SWEEP PATH ANALYSIS

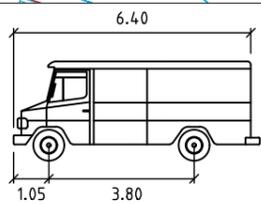






**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
  - VEHICLE TYRE PATH
  - VEHICLE BODY PATH
  - 300mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 5km/h



SRV

	width	2.30
	Track	2.30
	Lock to Lock Time	6.0
	Steering Angle	38.0

ARCHITECTURAL BASE IN BLUE  
 DRAWING AA-N1001  
 REVISION N  
 BY dwp  
 DATED 25.11.2021

DRAWING AA-N1202  
 REVISION R  
 BY dwp  
 DATED 24.11.2021



**PRELIMINARY PLAN**  
 FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**  
 BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021



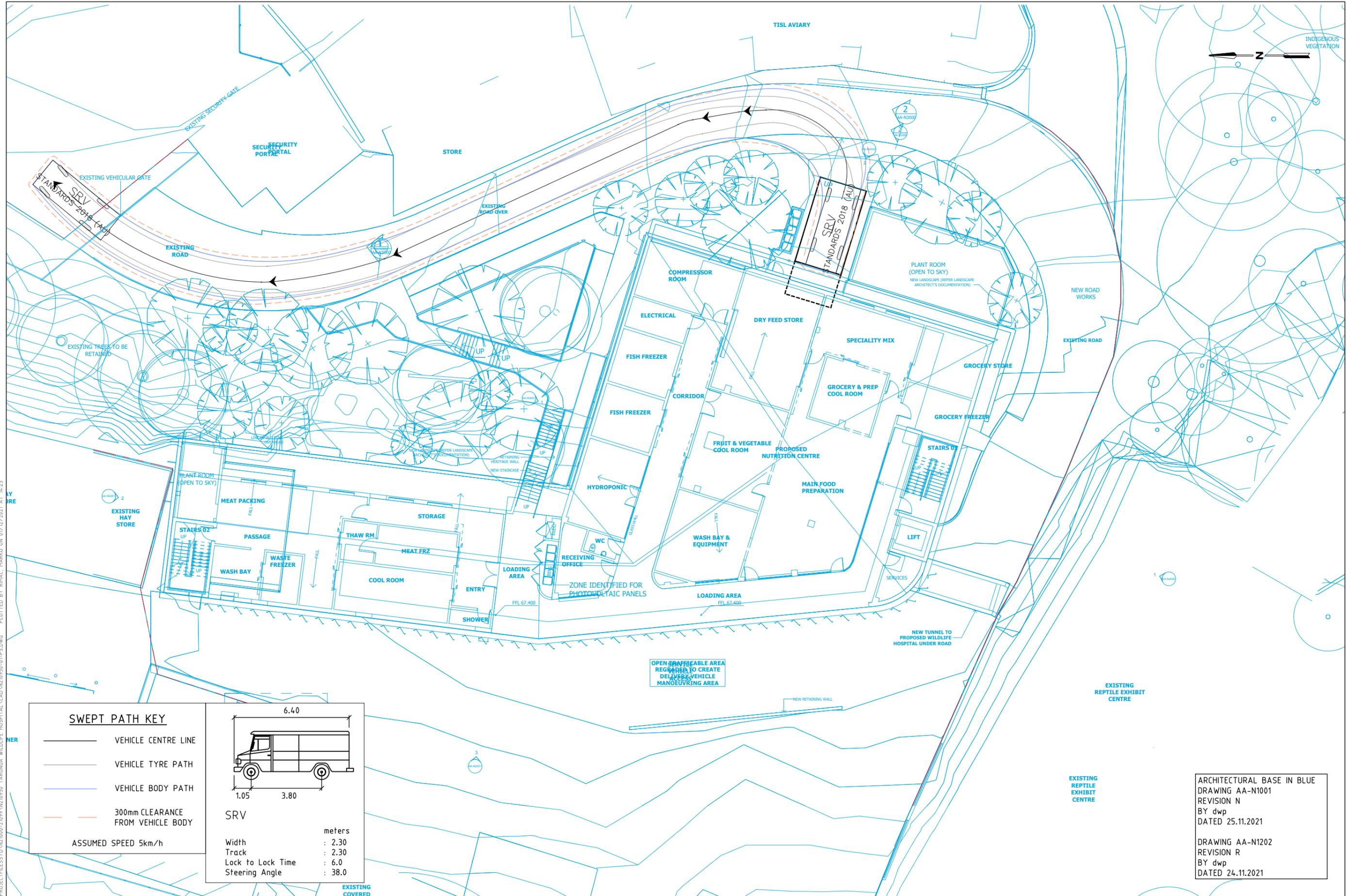
SCALE  
A3 0 1.25 2.5 5 1:250

TARONGA ZOO  
WILDLIFE HOSPITAL

VEHICLE SWEEP PATH ASSESSMENT

DRAWING NO. N210950-01-02 SHEET 02 OF 07 ISSUE P5

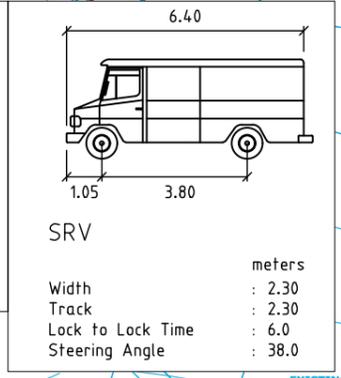
\\CORP-ADS\GTADATA\PROJECT\FLESHYD\N21000-21099\N210950-TARONGA WILDLIFE HOSPITAL\CAD\N210950-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 01/12/2021 AT 16:23



**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



ARCHITECTURAL BASE IN BLUE  
 DRAWING AA-N1001  
 REVISION N  
 BY dwp  
 DATED 25.11.2021

DRAWING AA-N1202  
 REVISION R  
 BY dwp  
 DATED 24.11.2021

**PRELIMINARY PLAN**  
 FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**  
 BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

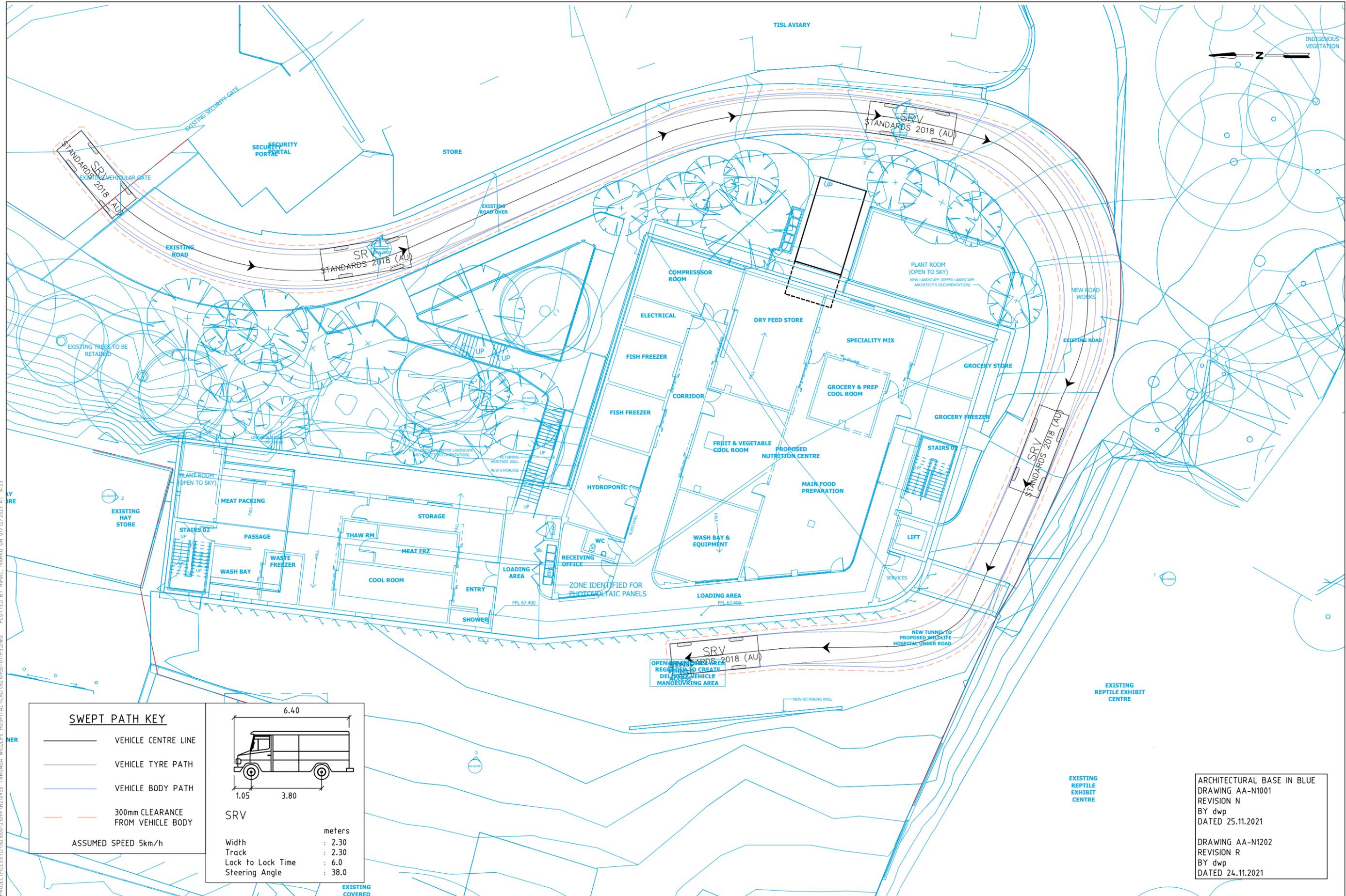
DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021

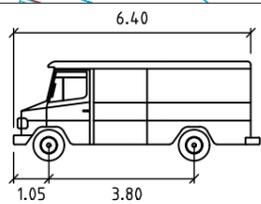
SCALE  
A3 0 1.25 2.5 5 1:250

CAD FILE NO.  
N210950-01-P5.DWG



**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
  - VEHICLE TYRE PATH
  - VEHICLE BODY PATH
  - 300mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 5km/h



SRV

	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

ARCHITECTURAL BASE IN BLUE  
DRAWING AA-N1001  
REVISION N  
BY dwp  
DATED 25.11.2021

DRAWING AA-N1202  
REVISION R  
BY dwp  
DATED 24.11.2021

\\CORP-ADS\GTADATA\PROJECT\FLESHYD\N21000-21099\N210950-TARONGA WILDLIFE HOSPITAL\CAD\N210950-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 01/12/2021 AT 14:23



**PRELIMINARY PLAN**

FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**

BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021

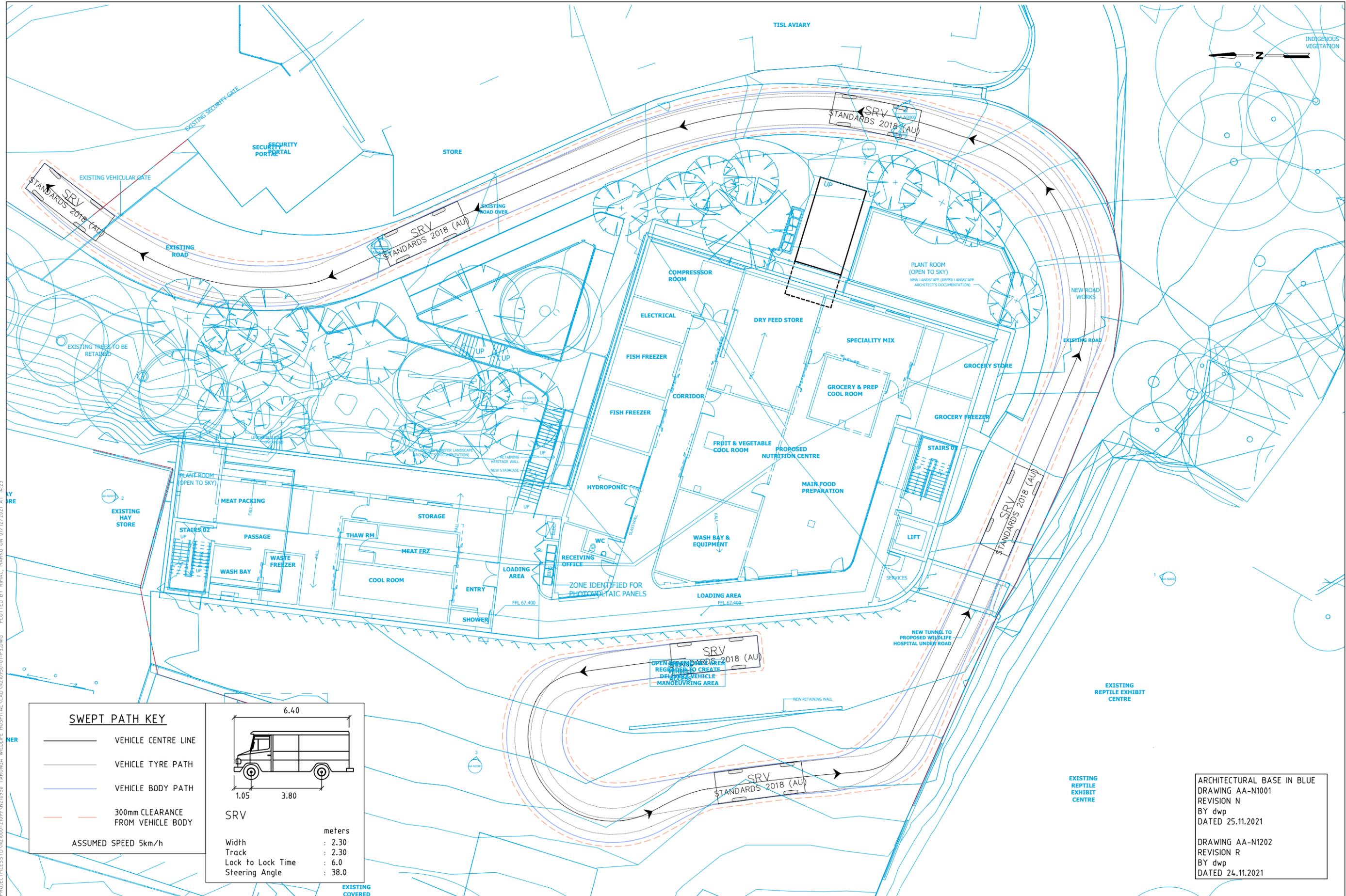


CAD FILE NO.  
N210950-01-P5.DWG

**TARONGA ZOO  
 WILDLIFE HOSPITAL**

**VEHICLE SWEEP PATH ASSESSMENT**

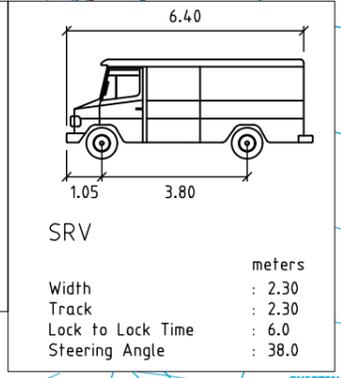
DRAWING NO. N210950-01-04      SHEET 04 OF 07      ISSUE P5



**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



ARCHITECTURAL BASE IN BLUE  
 DRAWING AA-N1001  
 REVISION N  
 BY dwp  
 DATED 25.11.2021

DRAWING AA-N1202  
 REVISION R  
 BY dwp  
 DATED 24.11.2021

\\CORP-ADS\GTADATA\PROJECT\FLESHYD\N210950-21099\N210950-TARONGA WILDLIFE HOSPITAL\CAD\N210950-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 01/12/2021 AT 16:23



**PRELIMINARY PLAN**  
 FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**  
 BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021

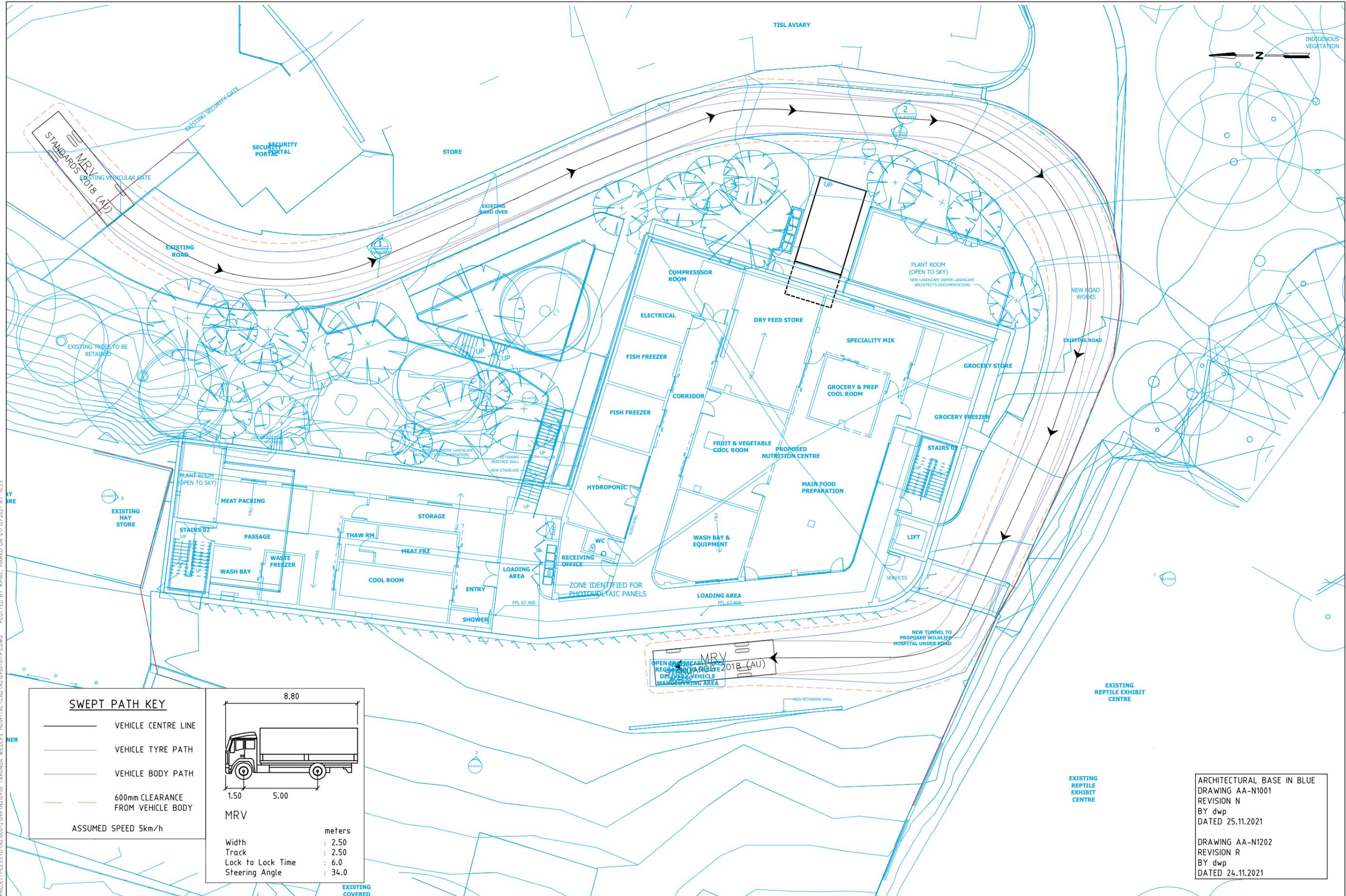
SCALE  
A3 0 1.25 2.5 5 1:250

CAD FILE NO.  
N210950-01-P5.DWG

**TARONGA ZOO  
 WILDLIFE HOSPITAL**

**VEHICLE SWEEP PATH ASSESSMENT**

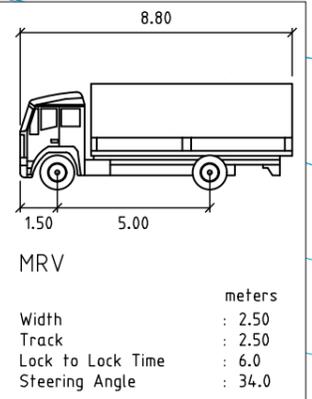
DRAWING NO. N210950-01-05 SHEET 05 OF 07 ISSUE P5



**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



ARCHITECTURAL BASE IN BLUE  
 DRAWING AA-N1001  
 REVISION N  
 BY dwp  
 DATED 25.11.2021

DRAWING AA-N1202  
 REVISION R  
 BY dwp  
 DATED 24.11.2021

\\CORP-ADS\GTADATA\PROJECTS\N210950-21099\N210950-TARONGA WILDLIFE HOSPITAL\CAD\N210950-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 01/12/2021 AT 14:23



**PRELIMINARY PLAN**  
 FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**  
 BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021

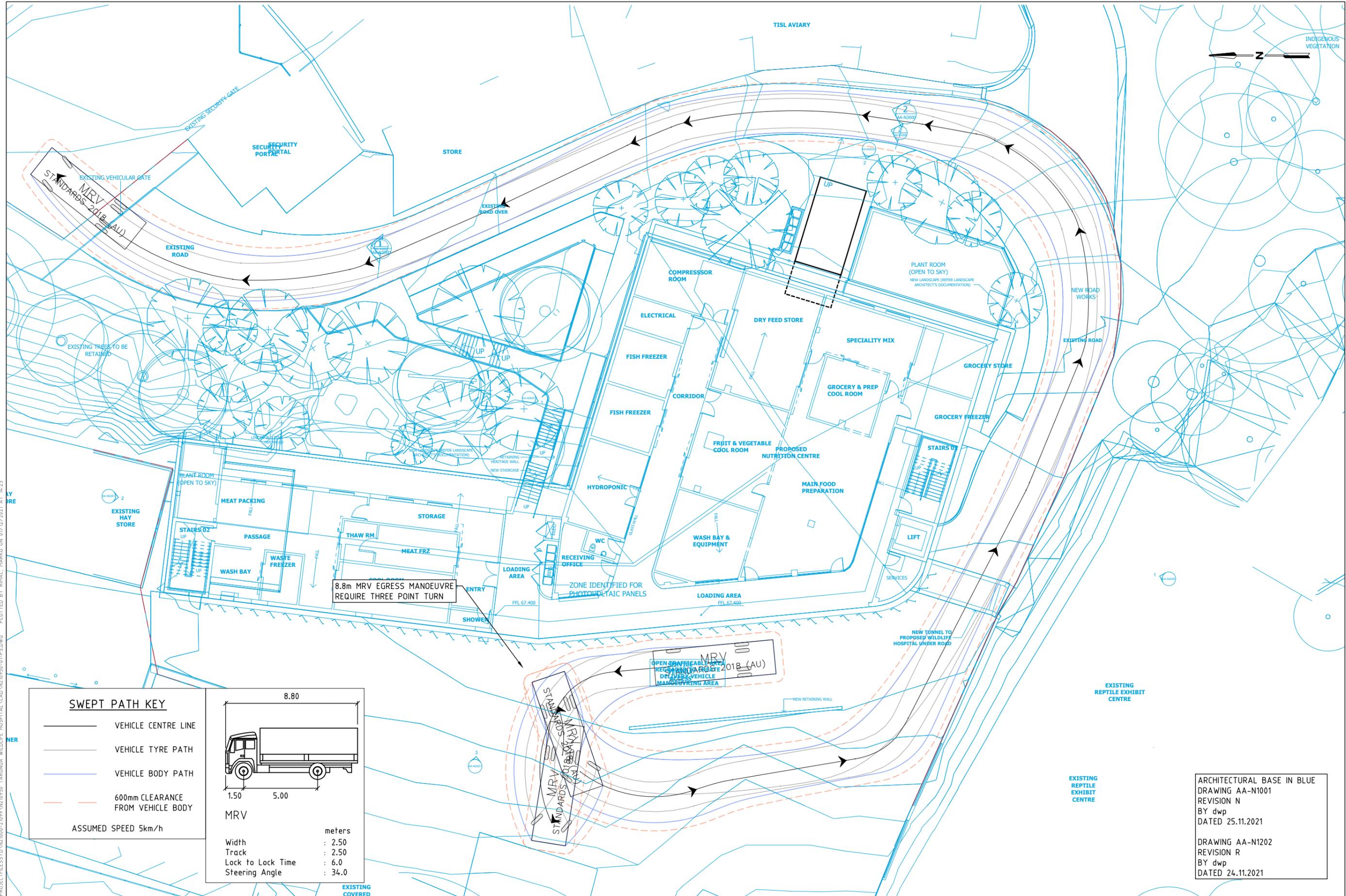
SCALE  
 A3 0 1.25 2.5 5 1:250

CAD FILE NO.  
N210950-01-P5.DWG

**TARONGA ZOO  
 WILDLIFE HOSPITAL**

**VEHICLE SWEEP PATH ASSESSMENT**

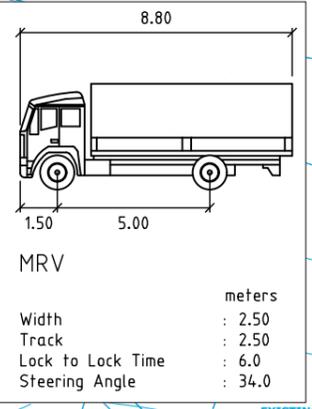
DRAWING NO. N210950-01-06 SHEET 06 OF 07 ISSUE P5



**SWEPT PATH KEY**

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 600mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



ARCHITECTURAL BASE IN BLUE  
 DRAWING AA-N1001  
 REVISION N  
 BY dwp  
 DATED 25.11.2021

DRAWING AA-N1202  
 REVISION R  
 BY dwp  
 DATED 24.11.2021

\\CORP-ADS\GTADATA\PROJECTFILES\YD\N210950-21099\N210950-TARONGA WILDLIFE HOSPITAL\CAD\N210950-01-P5.DWG PLOTTED BY RIMAC, MARKO ON 01/12/2021 AT 14:23



**PRELIMINARY PLAN**  
 FOR DISCUSSION PURPOSES ONLY  
 SUBJECT TO CHANGE WITHOUT  
 NOTIFICATION

**WARNING**  
 BEWARE OF UNDERGROUND SERVICES  
 THE LOCATIONS OF UNDERGROUND SERVICES ARE  
 APPROXIMATE ONLY AND THEIR EXACT POSITION  
 SHOULD BE PROVEN ON SITE. NO GUARANTEE IS  
 GIVEN THAT ALL EXISTING SERVICES ARE SHOWN.

DESIGNED  
M.RIMAC

DESIGN CHECK  
A.MODESSA

APPROVED BY  
K.WILLIAMS

DATE ISSUED  
1 DECEMBER 2021

SCALE  
A3 0 1.25 2.5 5 1:250

CAD FILE NO.  
N210950-01-P5.DWG

**TARONGA ZOO  
 WILDLIFE HOSPITAL**

**VEHICLE SWEEP PATH ASSESSMENT**

DRAWING NO. N210950-01-07 SHEET 07 OF 07 ISSUE P5



now



[www.stantec.com](http://www.stantec.com)