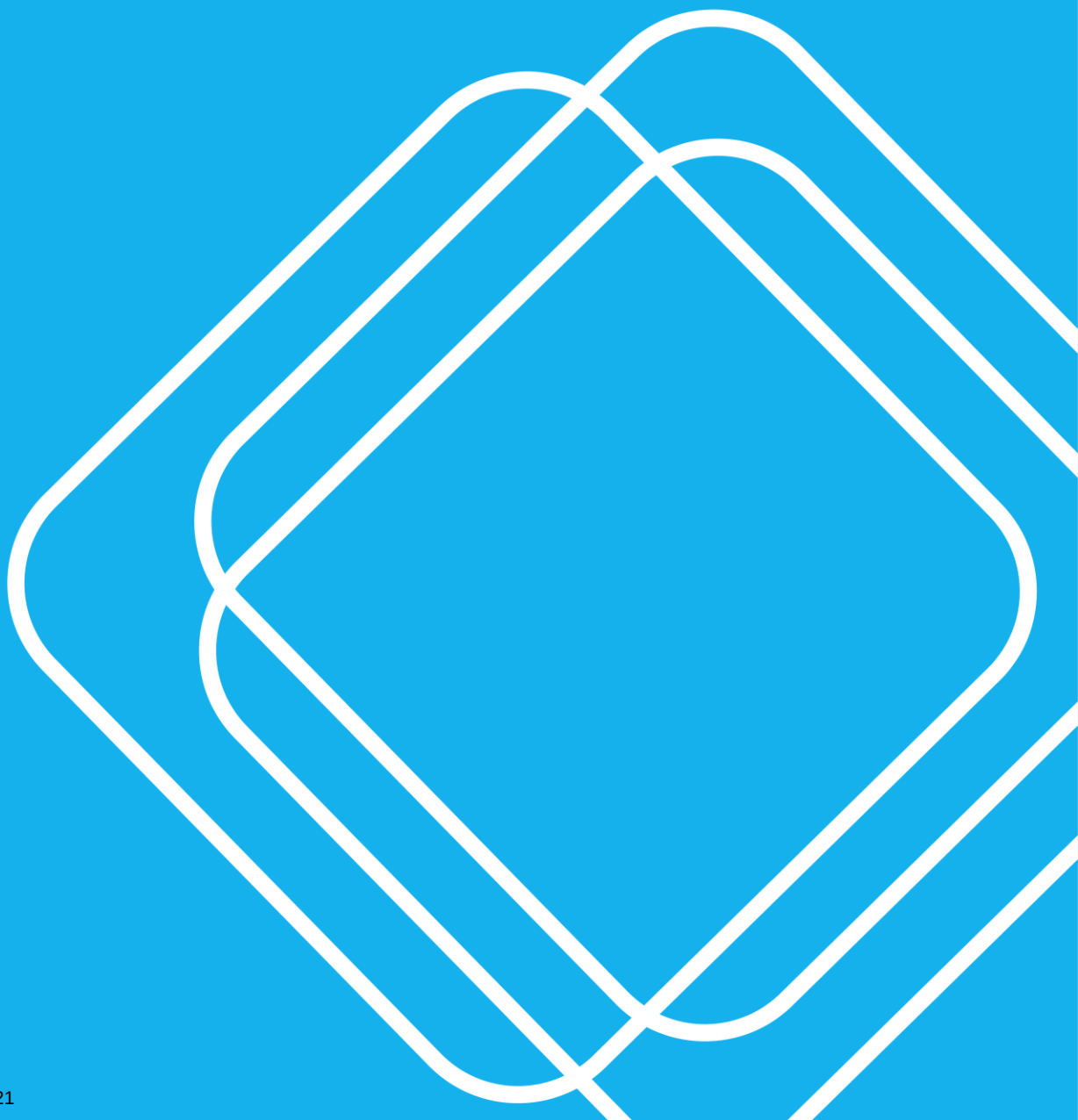
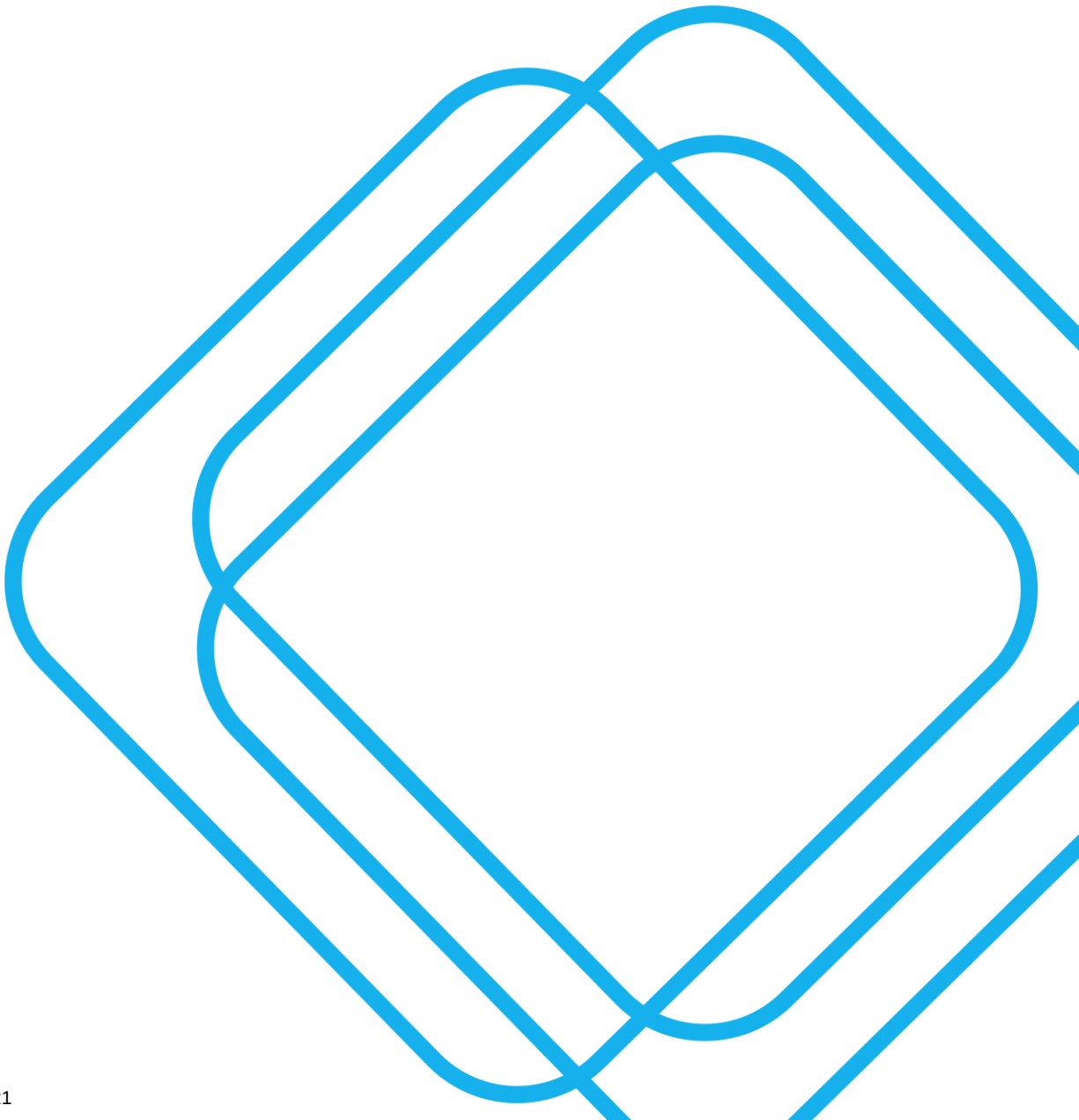
SCT Consulting

# REGATTA PARK – POLICE COTTAGE

## Traffic, Parking and Pedestrian Impact Study

**14 MAY 2021**





# Quality Assurance

| | | | |
|---|---|---|---|
| **Project:** | Regatta Park – Police Cottage | | |
| **Project Number:** | SCT_00123 | | |
| **Client:** | McGregor Coxall | **ABN:** | 17 082 334 290 |
| **Prepared by:** | SCT Consulting PTY. LTD. (SCT Consulting) | **ABN:** | 53 612 624 058 |

| Quality Information | |
|---|---|
| **Document name:** | Regatta Park – Police Cottage |
| **Prepared:** | Jennifer Chen, Consultant |
| **Reviewed:** | Nick Bernard, Associate Director |
| **Authorised:** | Andy Yung, Director |

| Revision | Revision Date | Details |
|---|---|---|
| 1.0 | 23 February 2021 | Draft Report |
| 2.0 | 30 March 2021 | Final Report |
| 3.0 | 14 May 2021 | Updated Final Report |

# Contents



# List of Figures



# List of Tables



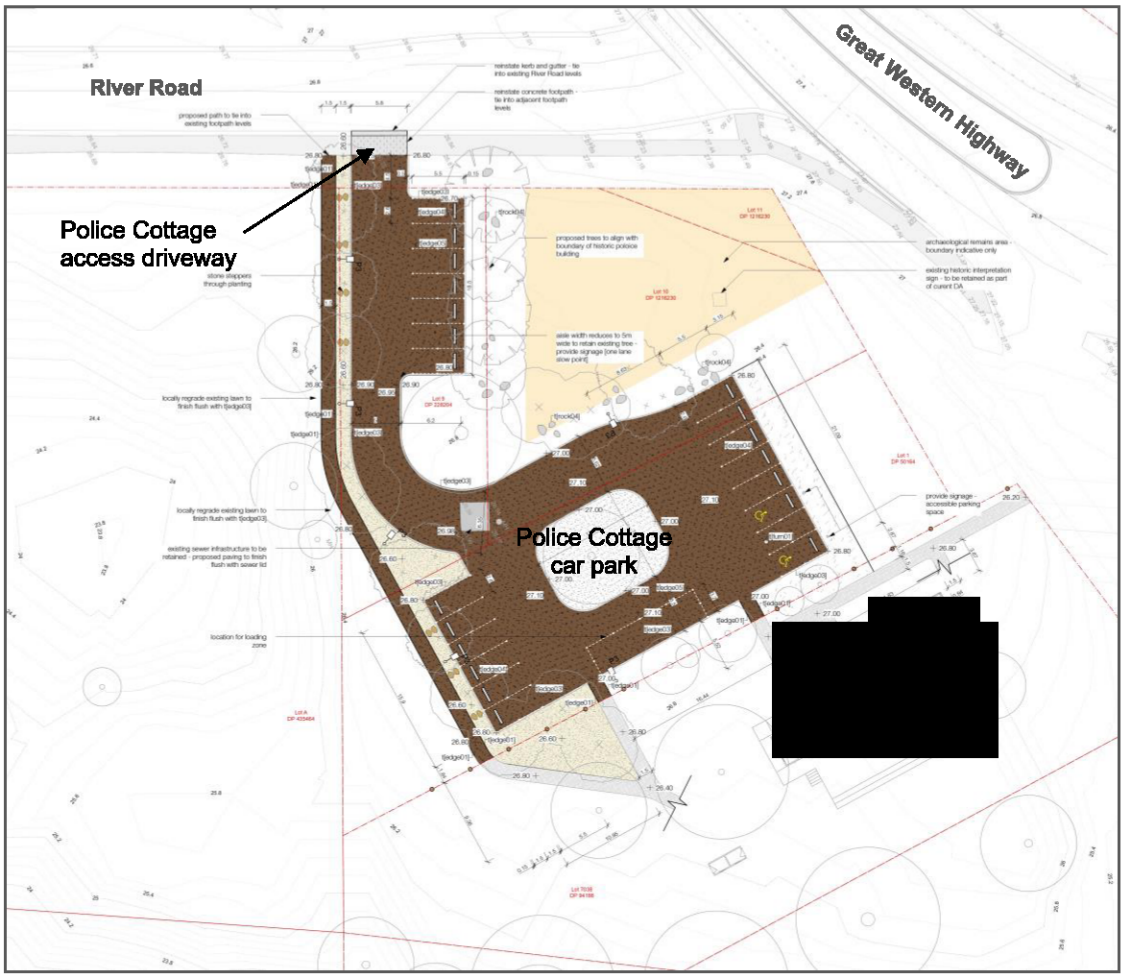
# Appendices

# 1.0 Introduction

## 1.1 Background

Lucas Stapleton and Johnson has prepared architectural plans for the Development Application (DA) to convert the Police Cottage at 4 Punt Road, Emu Plains into a restaurant. McGregor Coxall has prepared the concept design for the Police Cottage car park is shown in **Figure 1–1.** The proposed restaurant parking is provided as a new car park off River Road, Emu Plains or the new Regatta Park car park, when it is completed.

**Figure 1–1 Regatta Park Police Cottage Concept Design**




Source: McGregor Coxall, 2021

## 1.2 Purpose of report

This traffic, parking and pedestrian impact study was prepared to support the DA to convert the Police Cottage into a restaurant.

The traffic, parking and pedestrian impact study has considered the following elements:

- Assessment of proposed access arrangements for private and service vehicles into and through the site
- Manoeuvring / safe paths and turning circle assessments
- Assessment of likely vehicles generated by the proposed development and use of the site
- Review of existing carparking arrangements and commentary on compliance with relevant parking rates under the Penrith City Council's Development Control Plan (DCP) or relevant Australian Standards Guidelines.

## 1.3 Report structure

This report has been structured into the following sections:

– **Section 2** provides an overview of the existing traffic and transport conditions in the study area.

– **Section 3** provides an overview of the proposed development and an assessment of the operational traffic, parking and pedestrian impacts.

– **Section 4** summarises the study conclusions.

# 2.0 Existing conditions

## 2.1 Existing facility

The existing Police Cottage is currently located along Punt Road and is accessible from the Great Western Highway and Punt Road in Penrith City Council local government area (LGA), as show in **Figure 2–1**. The site adjoins Regatta Park to the south and the Emu Hall café and restaurant to the north.

Upgrades to Regatta Park, which include large open areas, play equipment and a kiosk, are currently being designed by McGregor Coxall. The new and expanded Regatta Park car park will be built on the current River Road alignment and accessed via a realigned River Road at new traffic lights at the Lamrock Street / Great Western Highway intersection. When completed, the new Regatta Park car park would then become the new access point for vehicles accessing the Police Cottage car park.

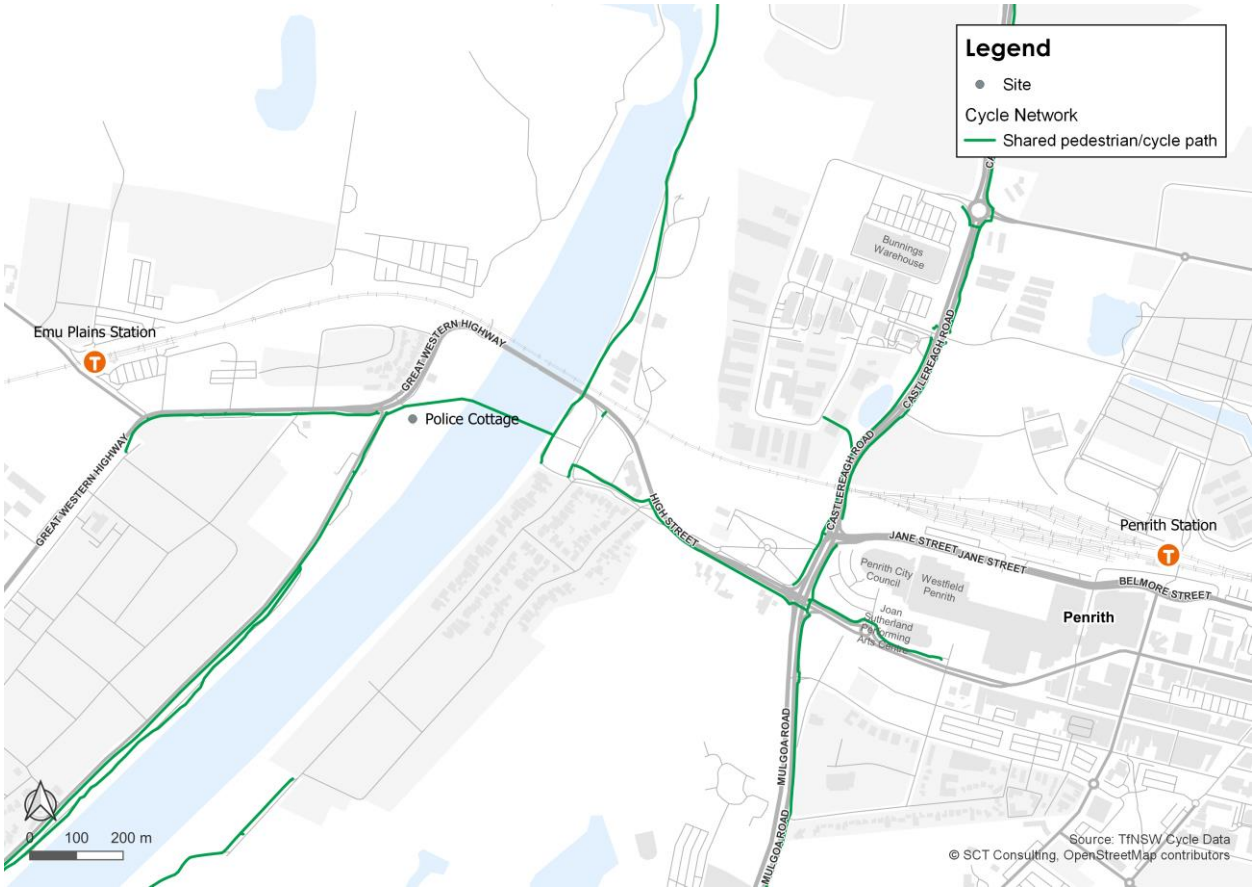
**Figure 2–1 Aerial photo of the site and surrounding context**


Source: Sixmaps, 2021

## 2.2 Walking and cycling

There are well established footpaths and shared paths within the vicinity of the Police Cottage. Shared paths and footpaths are provided from Emu Plains Station to the Police Cottage and from the Police Cottage to Penrith City Centre via the Yandhai Nepean Crossing (crossing the Nepean River). Shared paths are also located along River Road which runs along the Nepean River foreshore. A summary of the cycling network is show in **Figure 2–2**.

**Figure 2–2 Cycling network in the vicinity of the site**



## 2.3 Public transport

The Police Cottage is located between two train stations. Emu Plains Station is located 800m (10 minutes' walk) to the west and Penrith Station is located 2km (27 minutes' walk) to the east of the site.

Bus stops along Great Western Highway are located within 300m of the Police Cottage and take passengers east into Penrith and west to Lawson, Blaxland, Emu Heights and Leonay.

The public transport network surrounding the Police Cottage is shown in **Figure 2–3** and a summary of public transport services during the expected peak period for the Police Cottage is summarised in **Table 2-1**. Peak operating hours for the restaurant are expected to be similar to the nearby Emu Hall café, whose peak restaurant operating hours are Friday evenings from 7pm to 10pm and Saturday and Sunday from 11am to 10pm.

**Figure 2–3 Public transport services in the vicinity of the site**

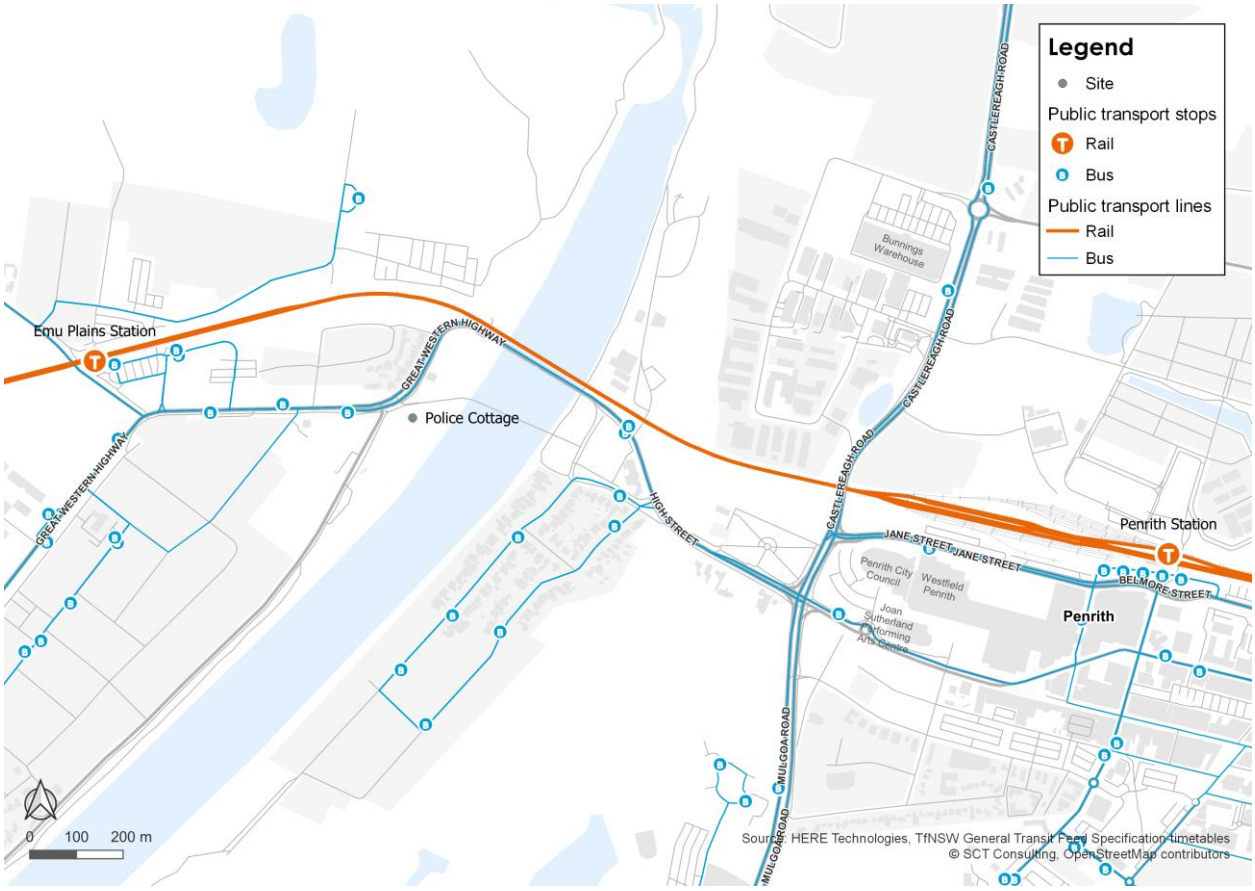



**Table 2-1 Public transport services during peak restaurant operating hours**

| Public transport services around the Police Cottage | Friday 6-8PM | Saturday 11AM-1PM | Saturday 6-8PM |
|---|---|---|---|
| Trains to Emu Plains Station | 10 | 5 | 6 |
| Trains to Penrith Station | 25 | 16 | 16 |
| Buses to Great Western Hwy after River Rd Stop ID: 2750273 | 3 | 5 | 2 |
| Buses to Great Western Hwy opposite York St Stop ID: 2750262 | 2 | 5 | 3 |

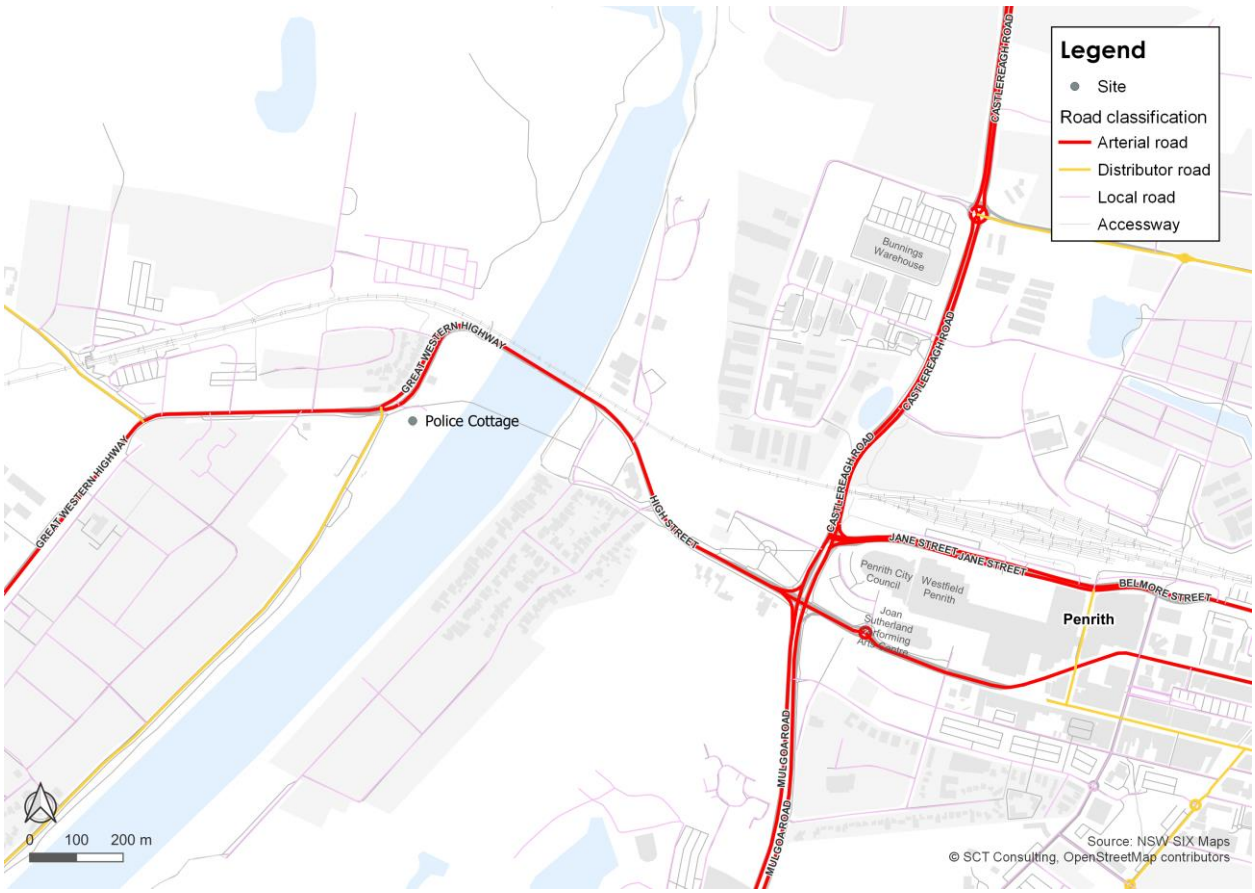
Source: Transport for NSW, 2021

## 2.4 Road network

The current access to the Police Cottage is from Great Western Highway and Punt Road. The Great Western Highway is a key east-west arterial road connecting Emu Plains to suburbs to the east like Penrith, St Marys and Parramatta. Punt Road is a local access that currently provides vehicular access to the existing Police Cottage and the Emu Hall café and restaurant.

The new access to the Police Cottage car park will be off the current River Road, and then when the Regatta Park upgrades are complete, access will be through the new Regatta Park car park, which will be accessed from the realigned River Road. River Road is a distributer road connecting Emu Plains to Leonay.

**Figure 2–4 Road classification in the vicinity of the site**



# 3.0 The Proposal

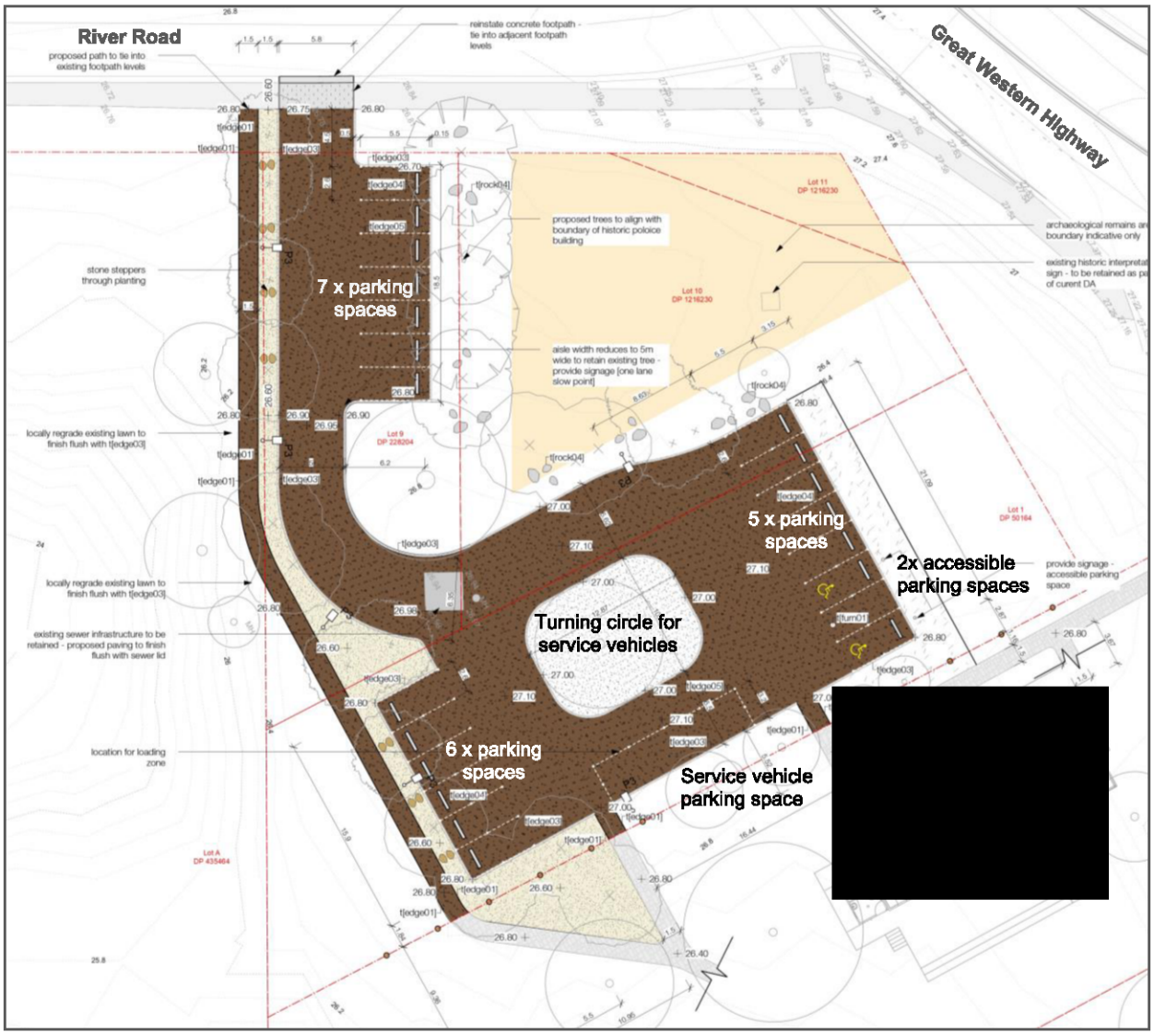
## 3.1 Proposed development

Council is planning to upgrade the Police Cottage at the Regatta Park into a restaurant. The proposed DA seeks to change the use of the Police Cottage to a restaurant. The proposed restaurant would include:

- Total indoor seating area: 80m$^2$
- Total outdoor seating area: 93m$^2$
- Up to a maximum of 5 employees working at its peak times.

The concept design for the Police Cottage car park is shown in **Figure 3–1**. The proposed restaurant parking and servicing is provided at a new car park off the current River Road, and then when the Regatta Park upgrades are complete, access will be through the new Regatta Park car park, which will be accessed from the realigned River Road.

**Figure 3–1 Regatta Park Police Cottage Concept Design**




Source: McGregor Coxall, 2021

## 3.2 Trip generation

Peak operating hours for the restaurant are expected to be similar to the nearby Emu Hall café, whose peak restaurant operating hours are Friday evenings from 7pm to 10pm and Saturday and Sunday from 11am to 10pm.

According to *Guide to Traffic Generating Developments (RTA, October 2002)*, restaurants are expected to generate 5 trips per 100m$^2$ of GFA in the evening peak hour. Hence, the proposed restaurant could generate up to 7 peak hour trips in the evening peak.

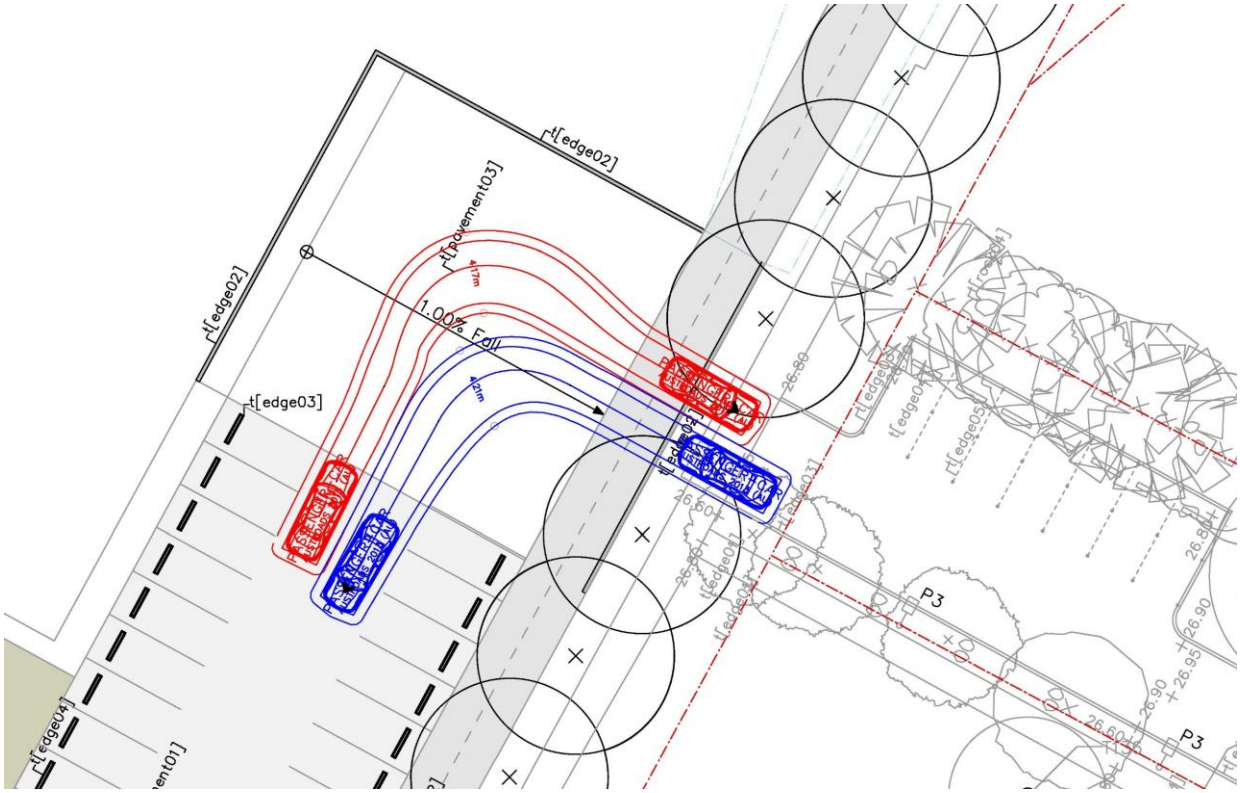
Therefore, the traffic generated by the restaurant is unlikely to have any significant impact on traffic performance on the surrounding road network during the peak hours. The peak traffic demand expected to be generated by the restaurant will be outside of the typical commuter peak hours and should be accommodated in the surrounding road network with spare network capacity outside of peak hours.

## 3.3 Traffic access arrangements

The proposed restaurant at the Police Cottage would be accessed from the current River Road, and, when complete, through the new Regatta Park car park. The new entry would provide access for customer parking, delivery vehicles as well as access for waste collection for the restaurant. The new Regatta Park car park has been designed to be accessed from the realigned River Road that would form a new signalised intersection with the Great Western Highway opposite Lamrock Street.

For general traffic, swept path analysis was undertaken that show two private vehicles can turn in and out of the Police Cottage car park at the same time across the shared path, as shown in **Figure 3–2**. The swept path was done for the worst case of access from the new Regatta car park, once it is complete.

**Figure 3–2 Swept path analysis for private vehicles entering and exiting the Police Cottage car park**



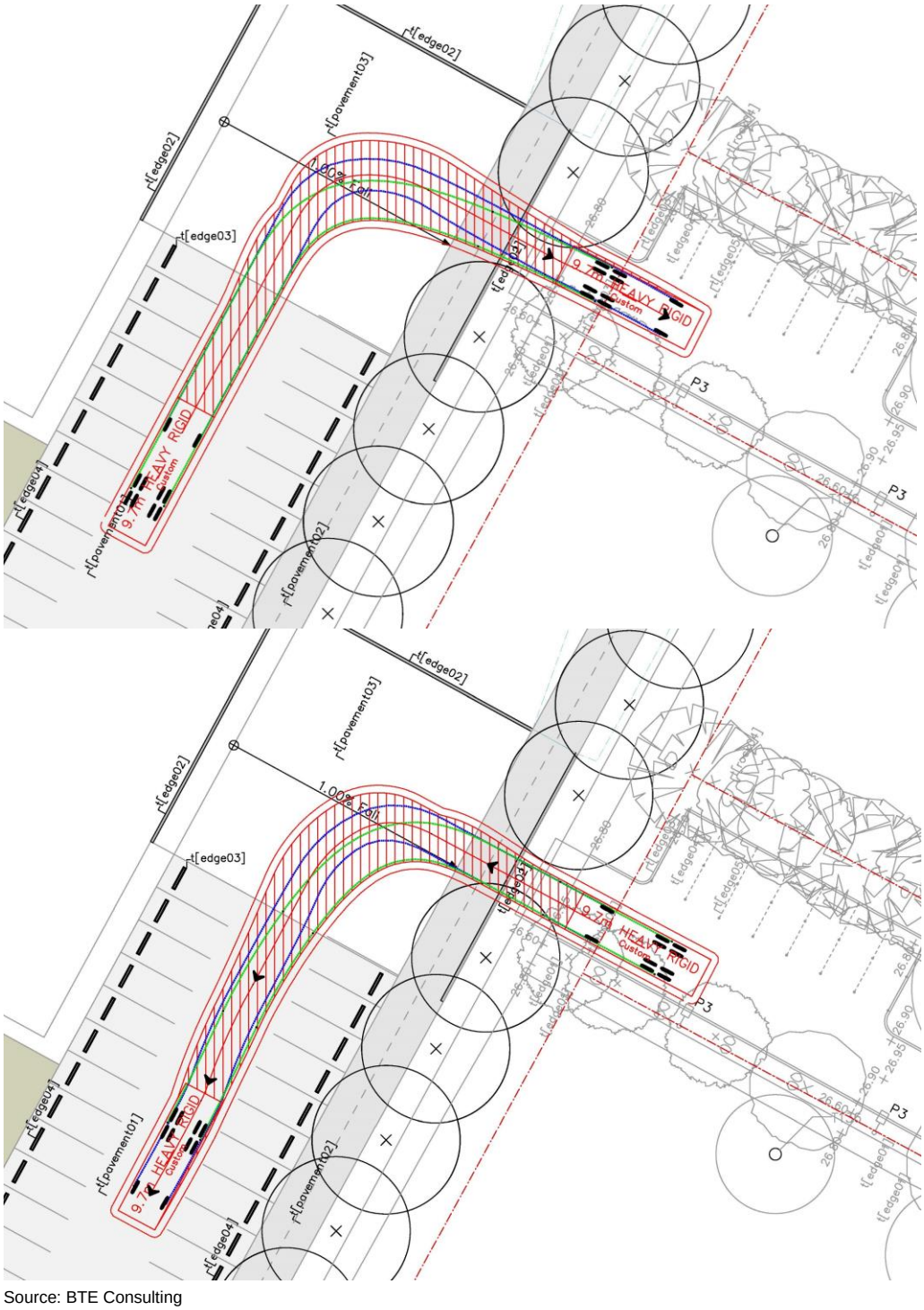

Source: BTE Consulting

## 3.4 Heavy vehicle access arrangements

It is anticipated that delivery vehicles and waste collection vehicles would access the Police Cottage outside of peak restaurant operating hours. Service vehicles for waste collection in Penrith City Council are typically 9.7m long. A custom template of a 9.7m rear load waste collection truck as specified in the Council waste management guidelines was used for swept path analysis to test turning movements in the carpark. It is assumed this would be the largest / longest vehicle type that would enter the Police Cottage car park.

Swept path analysis shows that a 9.7m truck can turn in and out of the Police Cottage car park without issue (see **Figure 3–3**). Again, the swept path was done for the worst case of access from the new Regatta car park, once it is complete.

**Figure 3–3 Swept path analysis for HRV vehicles entering and exiting the Police Cottage car park**

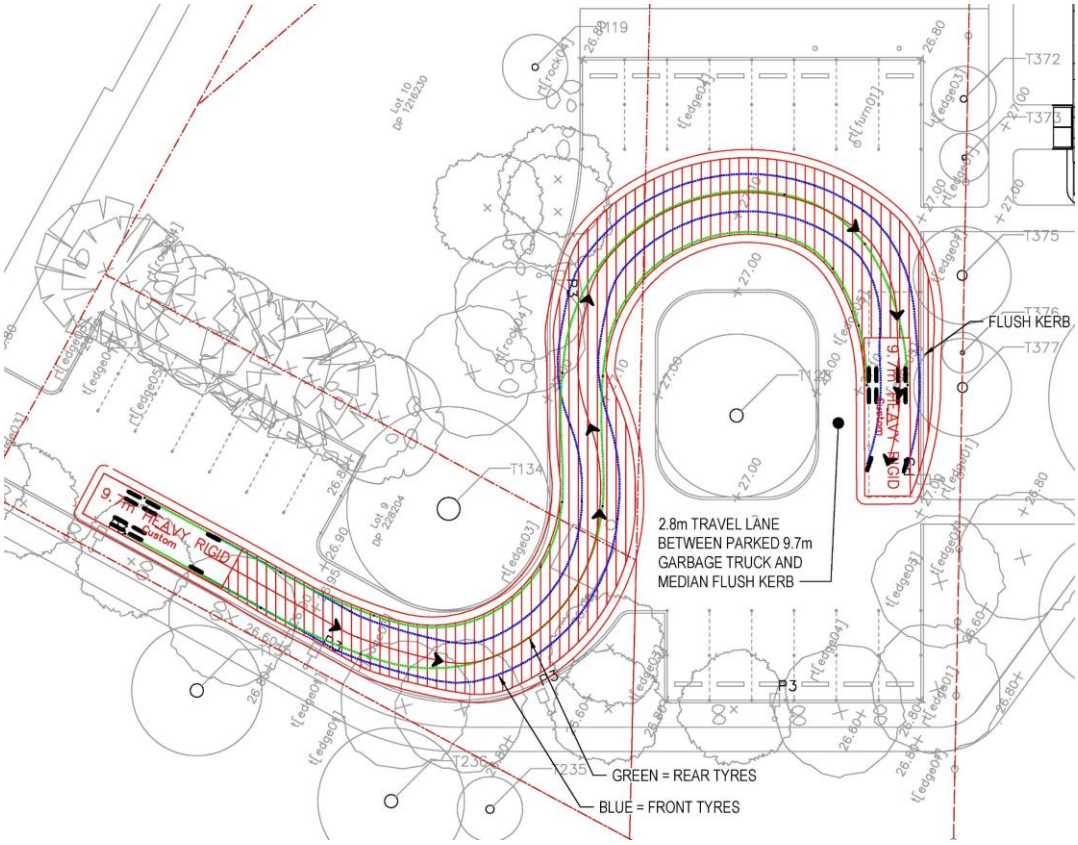



Source: BTE Consulting

The servicing / loading area is located at the eastern end of the car park, immediate outside the restaurant. Service vehicles accessing the Police Cottage to deliver goods or collect waste are expected to turn at the turning circle to move in and out of the car park in a clockwise direction. Swept path analysis in **Figure 3–4** and **Figure 3–5** shows that a 9.7m truck would be able to manoeuvre around the whole turning circle in a forward direction in a single movement.

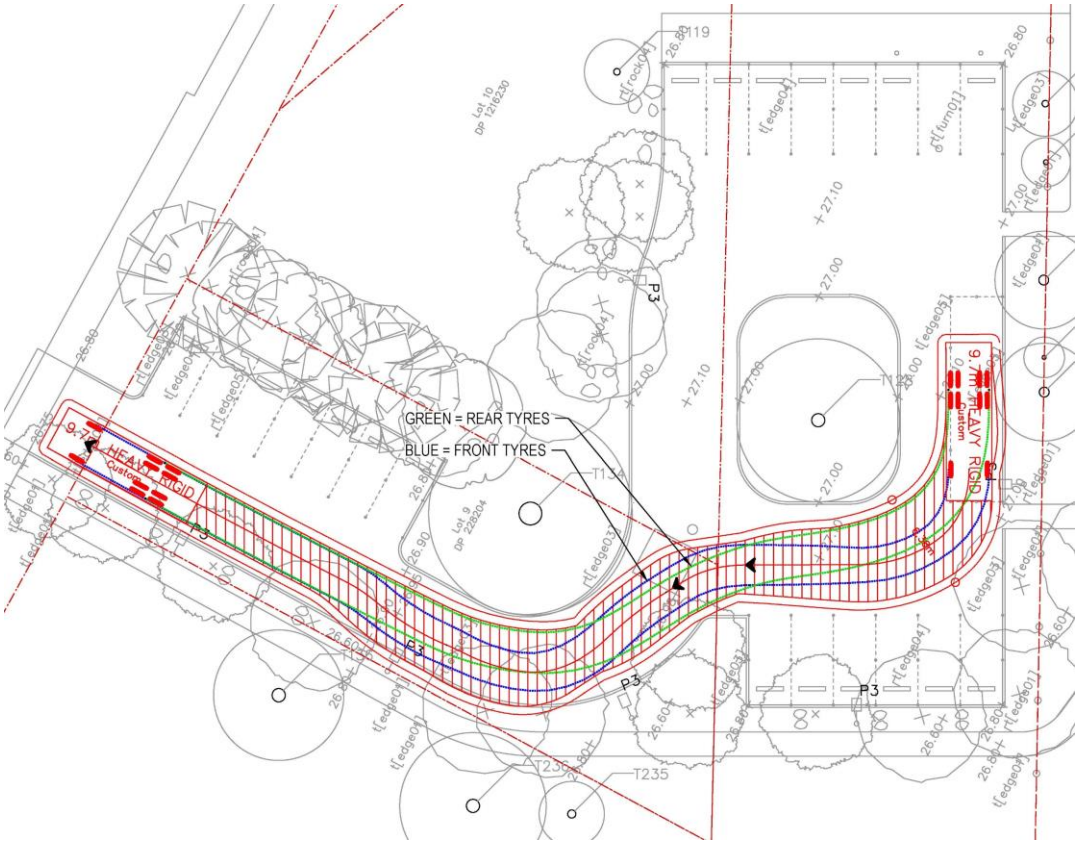
Further details of swept paths within the car park can be found in **Appendix A**

**Figure 3–4 Swept path analysis for a 9.7m heavy vehicle turning into the Police Cottage car park**




Source: BTE Consulting

**Figure 3–5 Swept path analysis for a 9.7m heavy vehicle turning out of the Police Cottage car park**




Source: BTE Consulting

## 3.5 Parking arrangements

### 3.5.1 Penrith City Council DCP parking requirements review

Penrith City Council DCP specifies that restaurants require 1 space per 6m$^2$ of seating area, plus 1 space per employee. Based on this, parking spaces required for the Police Cottage restaurant would be:

– Total indoor seating area: **80m$^2$ (13 spaces)**

– Total outdoor seating area: **93m$^2$ (16 spaces)**

– Total: **29 parking spaces + 1 per employee (assume 5 spaces) requiring 34 parking spaces in total**.

In the current layout, 18 parking spaces + 2 accessible spaces have been provided, fourteen spaces short of the requirements set out in the Penrith City Council DCP.

Archaeological and tree constraints at the Police Cottage site have restricted the design of the car park layout and the number of car parking spaces that can be provided. The project is unable to fully address the shortage of fourteen spaces as specified by the Penrith City Council DCP and requests that consideration of the amenity of the site, and the significant trees that have been retained, is considered and the reduced parking spaces are supported in order that car parking does not adversely affect the significance of the heritage areas or result in the loss of trees or reduced amenity in this area.

It is also proposed that, when the restaurant is at full capacity, the main car park at Regatta Park could be used as overflow parking for the restaurant. The timing of the restaurant peak periods during the evening would likely be outside of the Regatta Park car park peak usage times. There may also be linked trips for customers using both the restaurant and the wider Regatta Park facilities.

### 3.5.2 Car park review

A review of the proposed car park at the Police Cottage was completed and is presented in **Appendix B**. Key findings of the car park review are:

- The 90-degree parking bays of 2.6 x 5.5m and 2.6 x 5.4m are compliant in accordance with the requirements of user class 3 (short term parking facility), as specified in AS2890.1.
- The 5.8m aisle width for 90-degree parking bays is compliant.
- The disabled parking with a 2.6 x 5.5m shared space is compliant.
- The circulation roadway between the two parking bays is currently 4.5m allowing for one way circulation only. The reduced aisle to one lane wide contra flow (and passing width each side) has been designed to create a more traffic-controlled environment, reduce the impact on the tree roots and reduce the paved areas. This type of one lane passing point treatment is acceptable in low speed, low traffic areas such as this and is supported in Australian Standards for traffic calming device treatments. Though it is recommended that the roadway should allow for two-way circulation if possible, which would require a minimum width of 5.5m, this is not possible due to archaeological constraints in the area. Signage and line marking can be used to reduce conflicting movements.
- Swept path analysis for the access driveway was undertaken to assess the driveway width required for two cars to pass each other at the same time. A 5.8m driveway is required and is therefore compliant.
- Sight distance for the access driveway onto River Road indicates that the gap distance is below the minimum standard due to the proximity to the signalised intersection at Great Western Highway. For right turners into the car park, the angle of the Great Western Highway intersection would severely impact a driver's sightline to oncoming vehicles turning right from Great Western Highway into River Road, particularly if they have a low vehicle and/or if trucks are ahead of them in the queue. Also, vehicles that stop short of the intersection stop line to turn right into the Police Cottage car park, may not be anticipated by other approaching drivers and could increase the risk of rear-end crashes. For right turners out, there is likely to be queuing back from the intersection for the right turn onto Great Western Highway, which would interfere with the right turn out of the car park and would increase conflict with southbound traffic on River Road. Therefore, the driveway should only facilitate left in / left out movements while access is off the current River Road. Once the new Regatta Park car park is completed, access could be from all directions.
- Sight distance for cyclists has not been considered in the Australian Standards. To assess sight distances for cyclists, it was assumed that cyclists are able to travel up to 40km/h on shared paths. Based on this, the minimum sight distance for a car (and therefore a bicycle) should be 35m from the driver's location.
- Sight distances for pedestrians are compliant.

## 3.6 Pedestrian and cyclist arrangements

Pedestrians and cyclists are able to access the Police Cottage from Great Western Highway using the proposed footpath located north of the Police Cottage or from the shared path adjacent to the vehicle access driveway. A footpath located south of the carpark connects pedestrian from the shared path along Regatta Park to access the Police Cottage safely.

Sight distances for vehicles entering and exiting the car park were assessed for cyclist and pedestrians in the car park assessment. A driver should be able to see 35m from their position without any obstructions. Signage and shared path marking should be provided similar to what is planned at other shared path crossovers in Regatta Park.

## 3.7 Review of Penrith City Council Requirements

Responses to the requested Council requirements are summarised in **Table 3-1**.

**Table 3-1 Summary of responses to Council requirements**

| Council Requirements | Response |
|---|---|
| The application is requested to be supported by a traffic, parking and pedestrian assessment addressing traffic generation impact on the road network, size, type and volume of heavy vehicles to site, proposed driveway access from Regatta Park to car park and heavy vehicle access, accessible pedestrian access, car parking numbers in accord with Council Development Control Plans and RMS guidelines, accessible parking, waste collection vehicle and service vehicle access and manoeuvring. | Section 3.0 of this report provides a traffic, parking and pedestrian assessment addressing these requirements. |
| Car parking numbers should be in accordance with Council Development Control Plan C10 and RMS guidelines, any reduction in these car parking numbers should be justified by reference to parking demand at other similar type and locations of developments, development usage management plans to limit parking demand in peak Regatta Park usage times and site constraints regarding heritage and tree preservation requirements or other mitigations. | Based on the Penrith City Council DCP, 34 parking spaces are required for the proposed restaurant. The most recent design proposes 20 parking spaces (including two accessible parking spaces).<br>Archaeological and tree constraints have restricted the number of car parking spaces provided. To assist with the shortfall, when restaurant is at full capacity, the main car park at Regatta Park could be used as overflow parking for the restaurant. The timing of the restaurant peak periods during the evening would likely be outside of the Regatta Park car park peak usage times. There may also be linked trips for customers using both the restaurant and the wider Regatta Park facilities. |
| The vehicle and pedestrian access, parking arrangements (including accessible parking), parking numbers, waste collection vehicles / heavy service vehicle manoeuvring requirements are requested to be detailed to demonstrate compliance with AS2890.1, 2890.2, AS2890.6 and Council Development Control Plan C10. | – A review of the car park in accordance with AS2890.1 and AS2890.2 can be found in **Appendix B**.<br>– Two accessible parking spaces have been proposed in accordance with AS2890.6.<br>– Waste collection vehicles are expected to be the largest vehicle accessing the site. Swept paths for a 9.7m heavy vehicle accessing the site have been outlined in **Section 3.4** and detailed in **Appendix A**. |
| The application is requested be supported by dimensioned plans and details of the access driveways, aisles, car parking, heavy vehicle loading areas, car and heavy vehicle turning paths with turning path clearances from walls, columns and other obstructions for the car park, waste collection vehicles and the nominated largest vehicle expected to access the site in accordance with AS2890 and Council Waste Services Guidelines clearly demonstrating satisfactory vehicle manoeuvring on-site and forward entry and exit to and from the site. All waste collection / heavy service vehicle movements through the car park and site should preferably be in a forward direction with any unavailable reverse manoeuvring being confined to a separate heavy vehicle manoeuvring area away from public access. | – Swept paths and a complete car park review were undertaken in accordance with AS2890.1, AS2890.2 and AS2890.6 for the site and are detailed in **Appendix A** and **Appendix B** respectively.<br>– Swept path analysis shows that a 9.7m truck would be able to manoeuvre around the whole turning circle in a forward direction in a single movement. |
| The required driver and pedestrian sight lines, as set out in AS 2890.1 and AS 2890.2, around the footpath crossing points and driveway entrances and exits are not to be compromised by walls, street trees, landscaping, fencing, signposting or other obstructions. | – A review of sight lines for pedestrians and cyclists shows that there should be no sight obstructions for drivers for 35m on either side of the access driveway. |

# 4.0 Conclusion

An assessment of the traffic, parking and pedestrian impacts for the Police Cottage was undertaken and indicates:

– Traffic generated by the restaurant is unlikely to have any significant impact on traffic performance on the surrounding road network, since the peak traffic demand expected to be generated by the restaurant will be outside of the typical commuter peak hours.

– The proposed car park of the restaurant is compliant with AS2890.1, AS2890.2 and AS2890.6.

– A review of the car park numbers in accordance with Penrith City Council DCP C10 and Council requirements found that archaeological and tree constraints have restricted the number of car parking spaces with 20 parking spaces able to be provided, a fourteen-bay shortfall of the 34 parking spaces required under the DCP. The project requests that consideration of the amenity of the site, and the significant trees that have been retained, is considered and the reduced parking spaces are supported in order that car parking does not adversely affect the significance of the heritage areas or result in the loss of trees or reduced amenity in this area.

  When the restaurant is at full capacity, the main car park at Regatta Park could be used as overflow parking for the restaurant. The timing of the restaurant peak periods during the evening would likely be outside of the Regatta Park car park peak usage times. There may also be linked trips for customers using both the restaurant and the wider Regatta Park facilities.

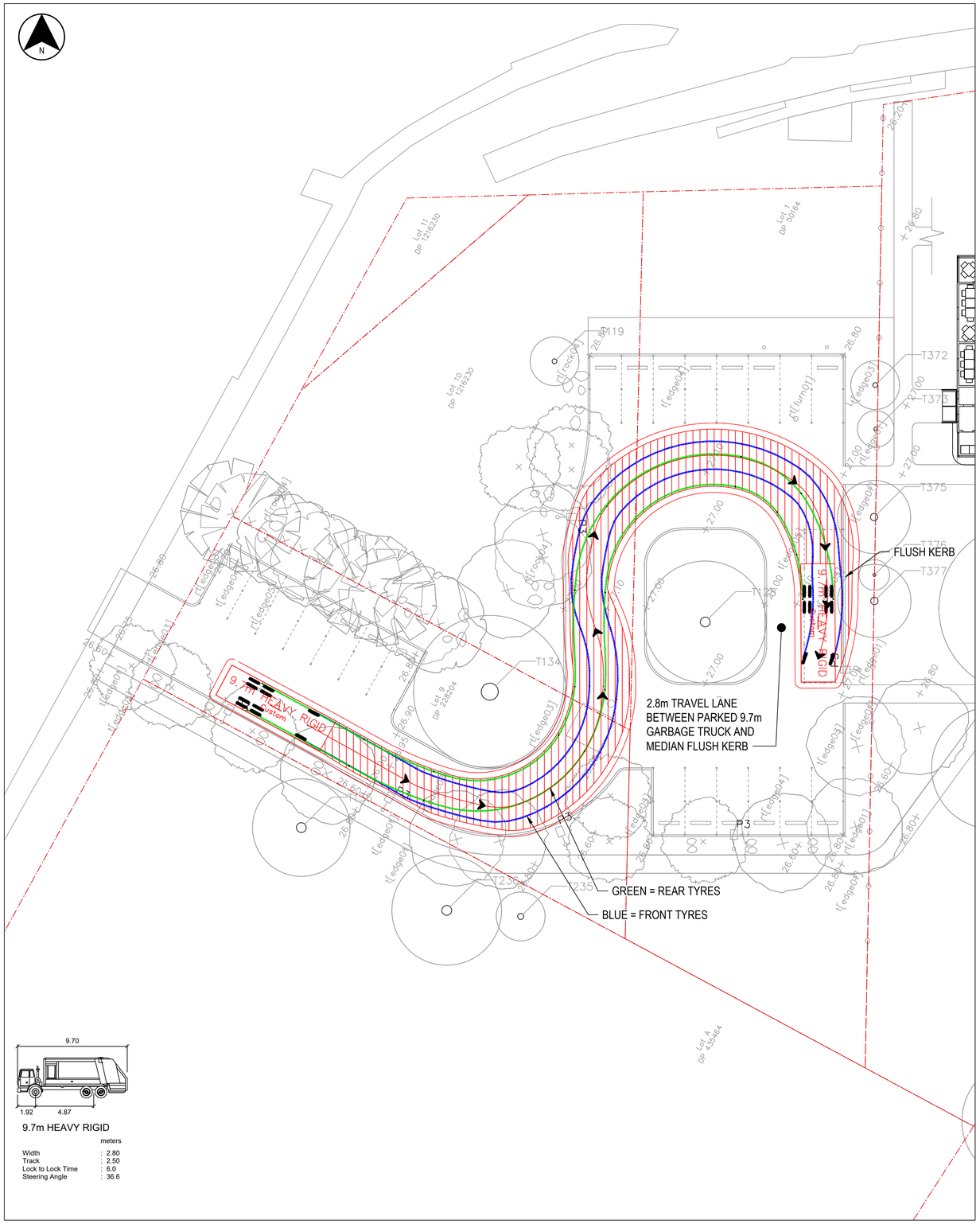
– While access is off the current River Road, the car park driveway should only facilitate left in / left out movements. Once the new Regatta Park car park is completed, access could be from all directions.

– Swept path analysis shows that a 9.7m truck would be able to manoeuvre around the whole turning circle in a forward direction in a single movement.

– The reduced aisle to one lane wide contra flow (and passing width each side) has been designed to create a more traffic-controlled environment, reduce the impact on the tree roots and reduce paved areas. This type of one lane passing point treatment is acceptable in low speed, low traffic areas such as this and is supported in Australian Standards for traffic calming device treatments

APPENDIX A

# Swept path analysis

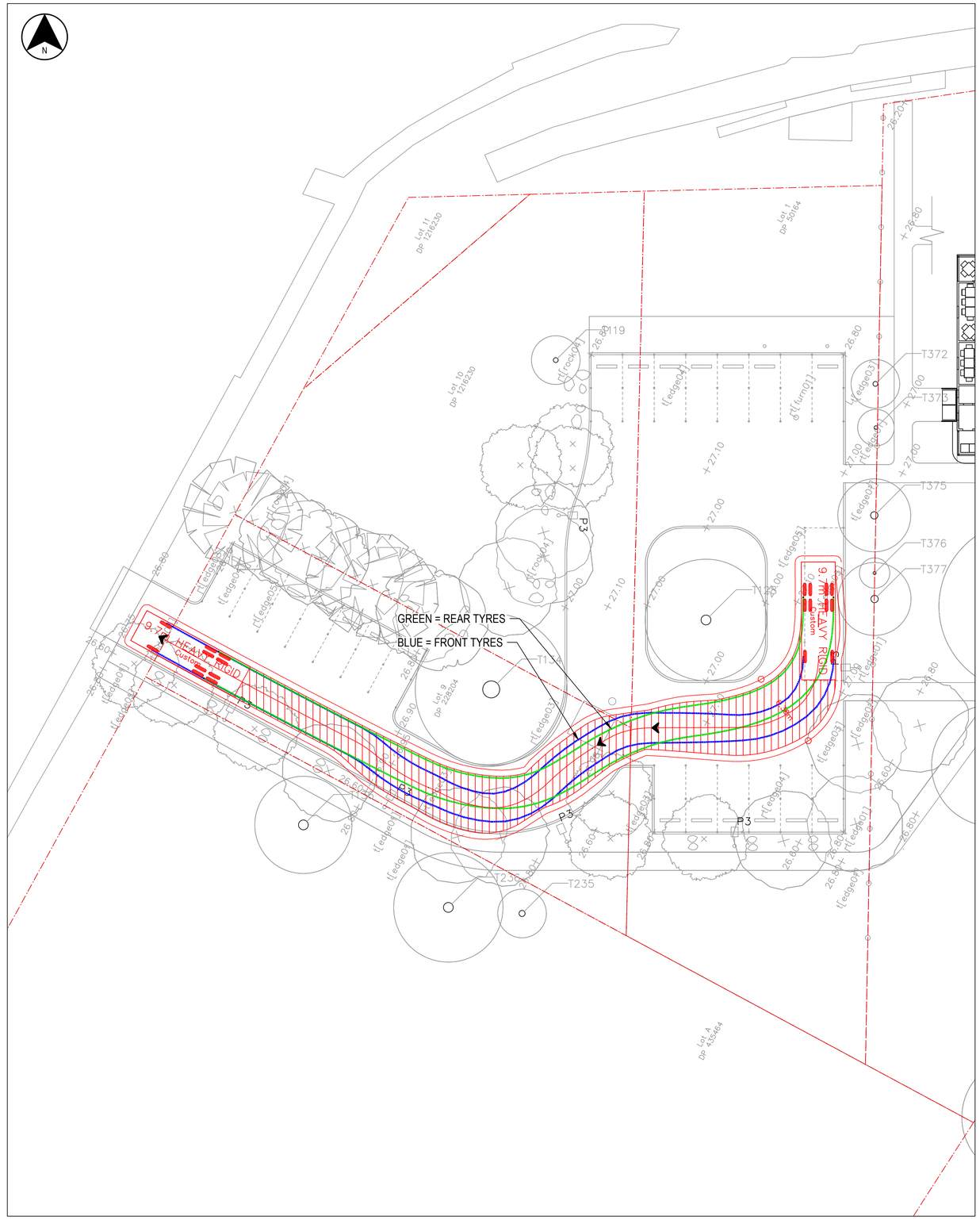






9.7m HEAVY RIGID

| | meters |
|---|---|
| Width | : 2.80 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 36.6 |




FOR INFORMATION ONLY



| No. | BY | DATE | DESCRIPTION | APPD |
|---|---|---|---|---|
| 04 | TB | 12.05.21 | FOR INFORMATION | TB |
| 03 | TB | 30.03.21 | FOR INFORMATION | TB |
| 02 | TB | 29.03.21 | FOR INFORMATION | TB |
| 01 | TB | 25.03.21 | FOR INFORMATION | TB |

SCALES

2 0 2 4 6 8m

1 : 200 (A1) 1 : 400 (A3)

CLIENT

SCT Consulting

SUITE 1 LEVEL 10
99 MOUNT STREET, NORTH SYDNEY 2060

DESIGNER

BTE CONSULTING

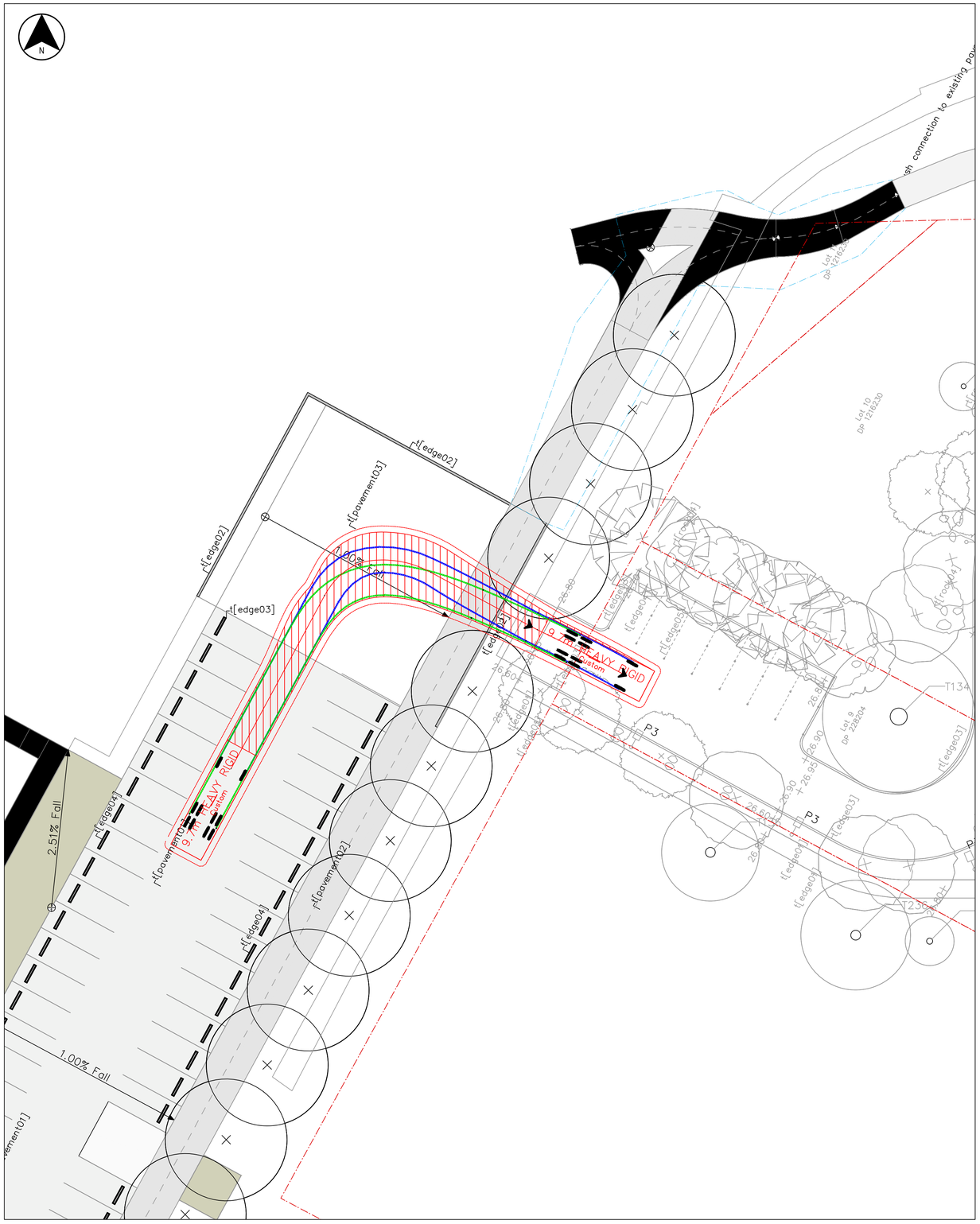
BTE CONSULTING PTY LTD
ABN 48 641 009 681 ACN 641 009 681

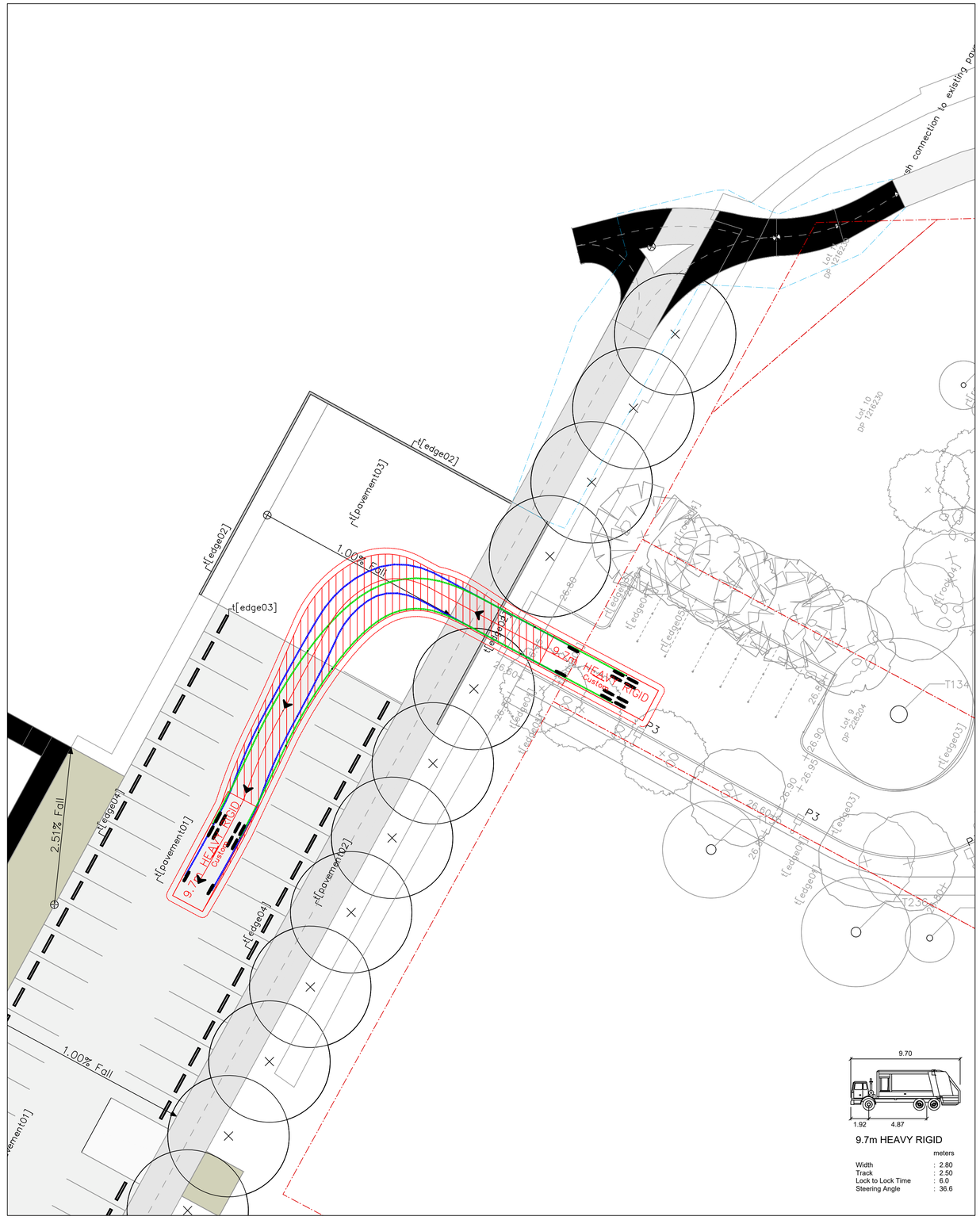
| | | | |
|---|---|---|---|
| SCALE | 1:200 | REVISION | 04 |
| DESIGNED | TB | CHECKED | |
| DRAWN | TB | CHECKED | |
| APPROVED | | DATE | |
| SIGNED | | | |

# REGATTA PARK POLICE COTTAGE

## VEHICLE TURNPATH PLAN
## 9.7m HEAVY RIGID COLLECTION VEHICLE

| PROJECT NO | SHEET NO | STATUS |
|---|---|---|
| BTE-210010 | SHT-TP-0005 | FIGURE |







9.7m HEAVY RIGID

| | meters |
|---|---|
| Width | : 2.80 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 36.6 |

# FOR INFORMATION ONLY



| No. | BY | DATE | DESCRIPTION | APPD |
|---|---|---|---|---|
| 02 | TB | 12.05.21 | FIR INFORMATION | TB |
| 01 | TB | 29.03.21 | FOR INFORMATION | TB |

SCALES

2 0 2 4 6 8m

1 : 200 (A1) 1 : 400 (A3)

CLIENT

SCT Consulting

SUITE 1 LEVEL 10
99 MOUNT STREET, NORTH SYDNEY 2060

DESIGNER

BTE CONSULTING

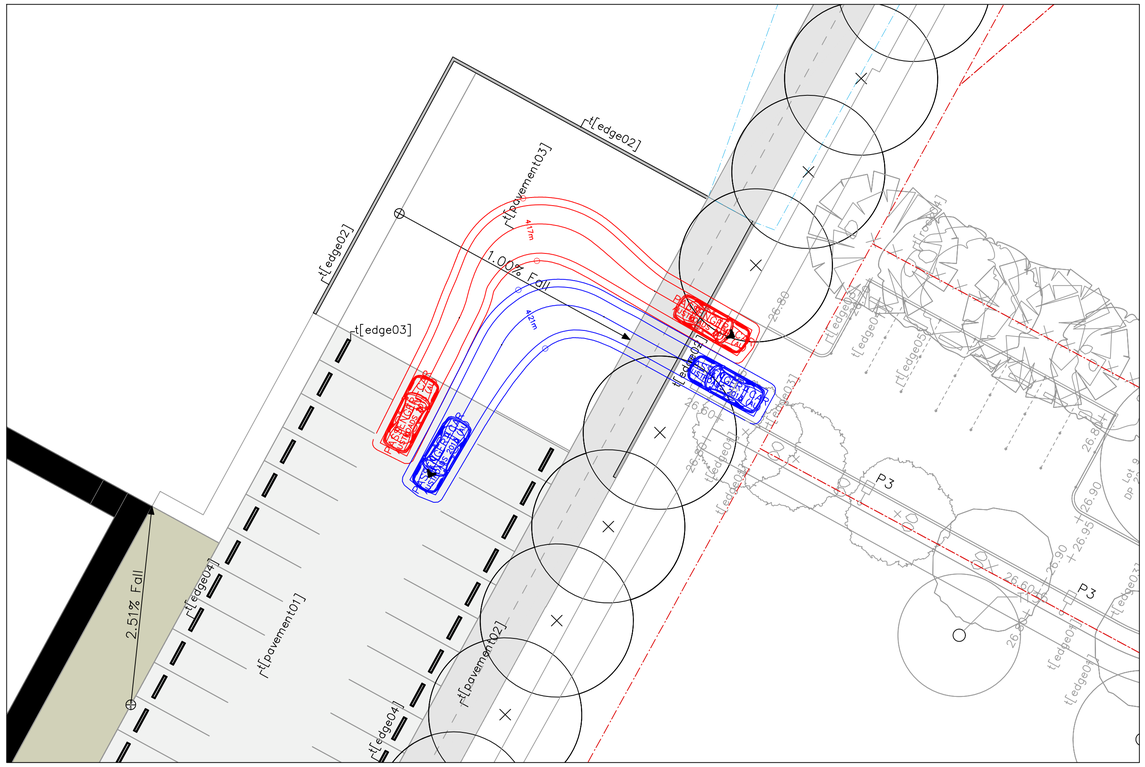
BTE CONSULTING PTY LTD
ABN 48 641 009 681 ACN 641 009 681

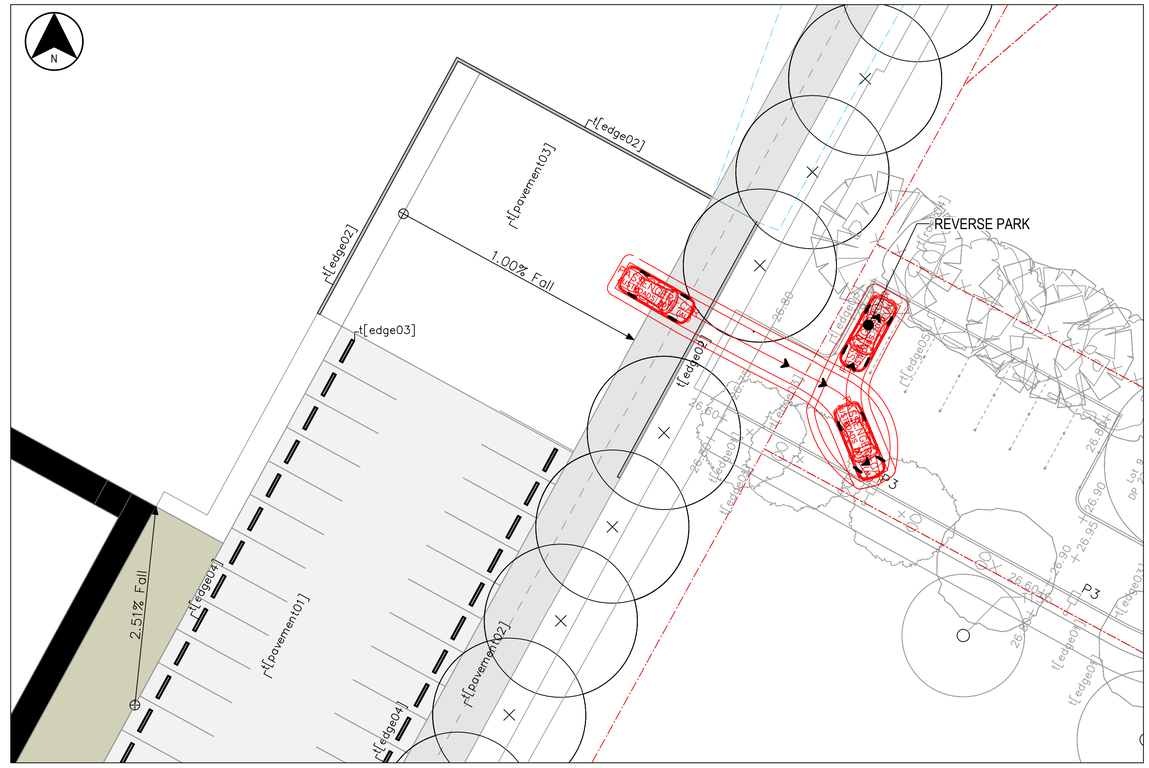
| | | | |
|---|---|---|---|
| SCALE | 1:200 | REVISION | 02 |
| DESIGNED | TB | CHECKED | |
| DRAWN | TB | CHECKED | |
| APPROVED | | DATE | |
| SIGNED | | | |

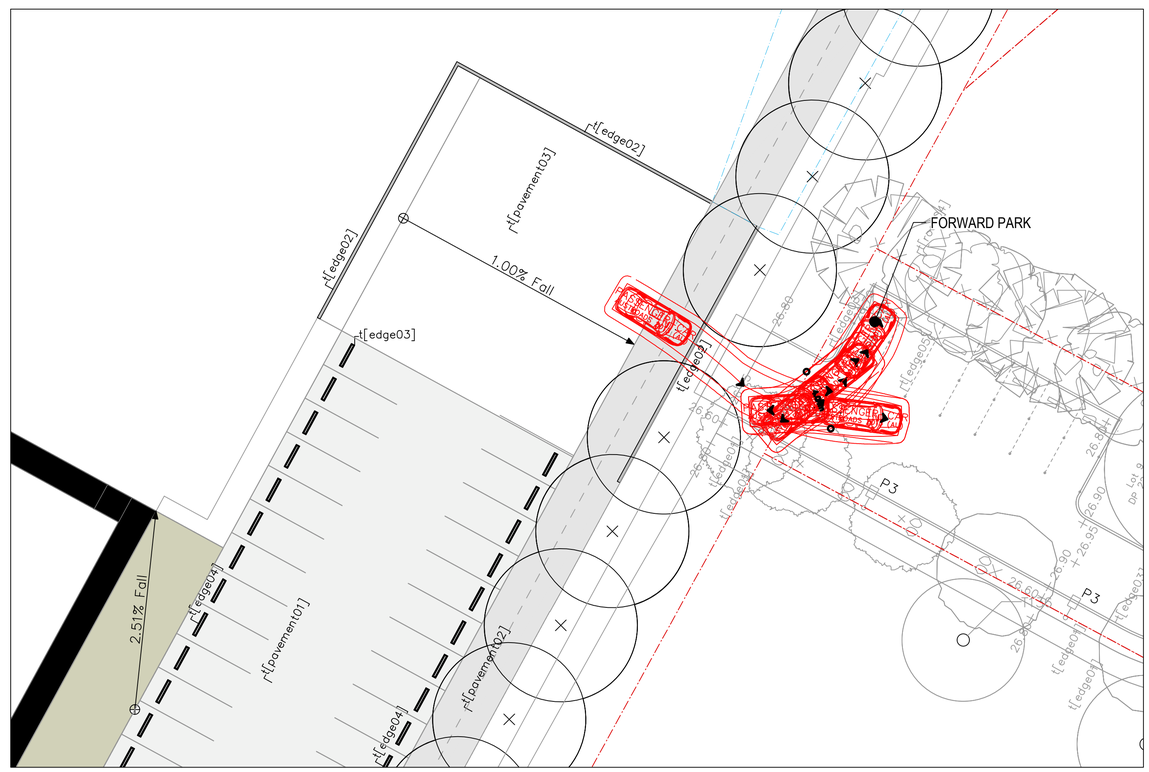
REGATTA PARK POLICE COTTAGE

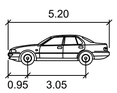
VEHICLE TURNPATH PLAN
9.7m TRUCK

| PROJECT NO | SHEET NO | STATUS |
|---|---|---|
| BTE-210010 | SHT-TP-0006 | FIGURE |




PASSENGER-CAR

| | meters |
|---|---|
| Width | : 1.94 |
| Track | : 1.84 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 33.6 |

FOR INFORMATION ONLY



| No. | BY | DATE | DESCRIPTION | APPD |
|---|---|---|---|---|
| 02 | TB | 12.05.21 | FOR INFORMATION | TB |
| 01 | TB | 29.03.21 | FOR INFORMATION | TB |

SCALES

2 0 2 4 6 8m

1 : 200 (A1) 1 : 400 (A3)

CLIENT

SCT Consulting

SUITE 1 LEVEL 10
99 MOUNT STREET, NORTH SYDNEY 2060

DESIGNER

BTE CONSULTING

BTE CONSULTING PTY LTD
ABN 48 641 009 681 ACN 641 009 681

| | | | |
|---|---|---|---|
| SCALE | 1:200 | REVISION | 02 |
| DESIGNED | TB | CHECKED | |
| DRAWN | TB | CHECKED | |
| APPROVED | | DATE | |
| SIGNED | | | |

# REGATTA PARK POLICE COTTAGE

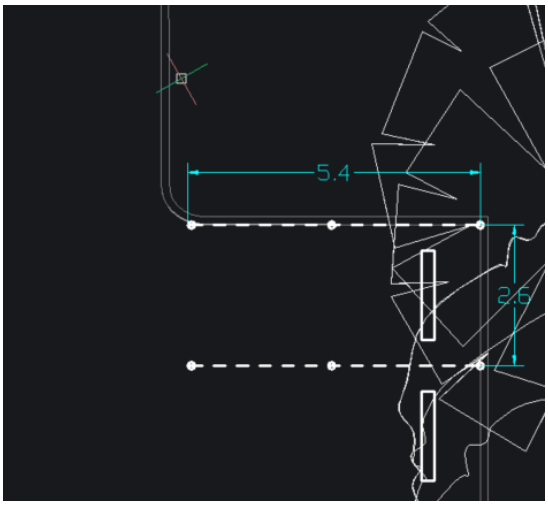
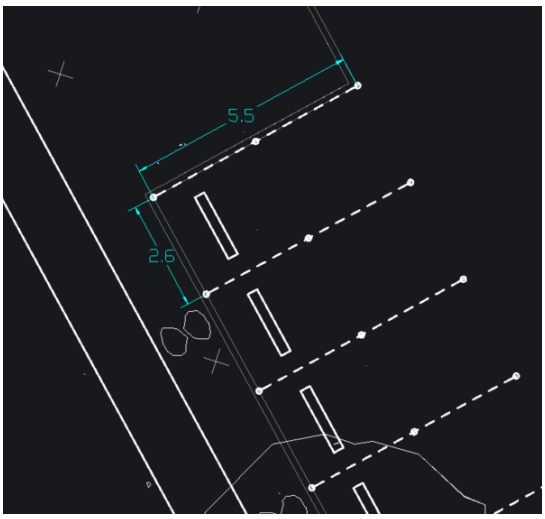
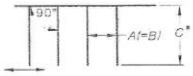
## VEHICLE TURNPATH PLAN
## 5.2m PASSENGER VEHICLE

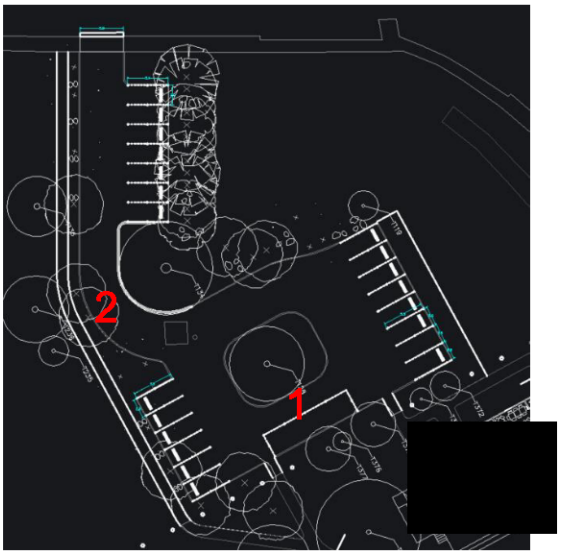
| PROJECT NO | SHEET NO | STATUS |
|---|---|---|
| BTE-210010 | SHT-TP-0007 | FIGURE |

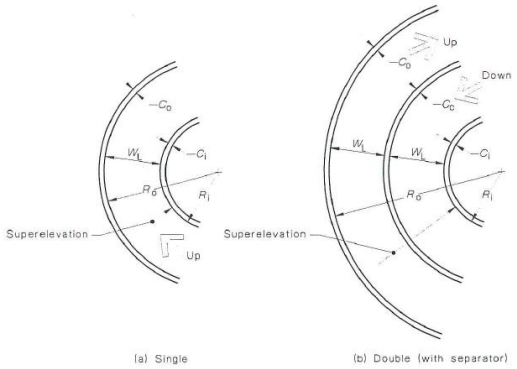
APPENDIX B

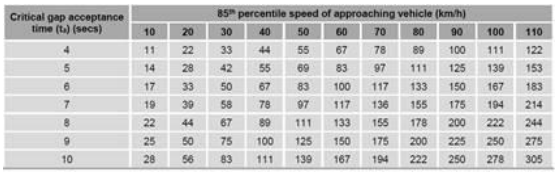
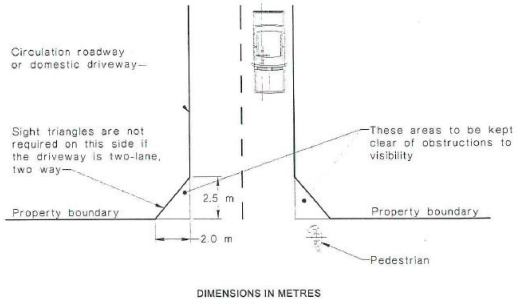
# Car park review

**Table B-1 Carpark review using AS2890.1 off-street parking facilities**

| Section of AS2890.1 | Comment |
|---|---|
| **Section 1 Scope and General** | - |
| **Section 2 Design of Parking Modules, Circulation Roadways and Ramps** | |
| **2.1 General** | - |
| **2.2 General Description** | - |
| **2.3 Preliminary Design Considerations** | - |
| **2.4 Design of Parking Modules** | |
| **2.4.1 Angle parking spaces**<br>(b) *Width* The minimum width of parking spaces required for each user class is shown in Figure 2.2 except as follows:<br>(i) *Spaces for small cars* The specified minimum width is given in Item (a)(iii).<br>(ii) *Adjacent obstruction* If the side boundary of a space is a wall or fence, or if there are obstructions such as columns placed so as to restrict door opening, 300 mm shall be added to the width of the space.<br>(iii) *Parking spaces for people with disabilities* See AS/NZS 2890.6*. | A minimum of 2.5m wide spaces are usually provided for long-term city and town centre parking, sports facilities and entertainment centres etc (user class 2).<br>Car parking spaces are 2.6 x 5.5m and 2.6 x 5.4 and have been designed for 90-degree parking bays. This is compliant.<br>  <br>  |
| **2.4.2 Angle parking aisle**<br>  <br>(d) Bays at 90°<br>User class (Note 1) / A (Note 3) / B / $C_1$ / $C_2$ / $C_3$ / Aisle width (Note 4)<br>1: 2.4 / 2.4 / 5.4 / 4.8 / 5.4 / 6.2<br>1A: 2.4 / 2.4 / 5.4 / 4.8 / 5.4 / 5.8<br>2: 2.5 / 2.5 / 5.4 / 4.8 / 5.4 / 5.8<br>3: 2.6 / 2.6 / 5.4 / 4.8 / 5.4 / 5.8<br>3A: 2.6 / 2.6 / 5.4 / 4.8 / 5.4 / 6.6<br>3A: 2.7 / 2.7 / 5.4 / 4.8 / 5.4 / 6.2<br>4: (See Note 5) | The angled parking aisles for 90-degree parking bays are compliant with aisles having a minimum aisle width of 5.8m. |

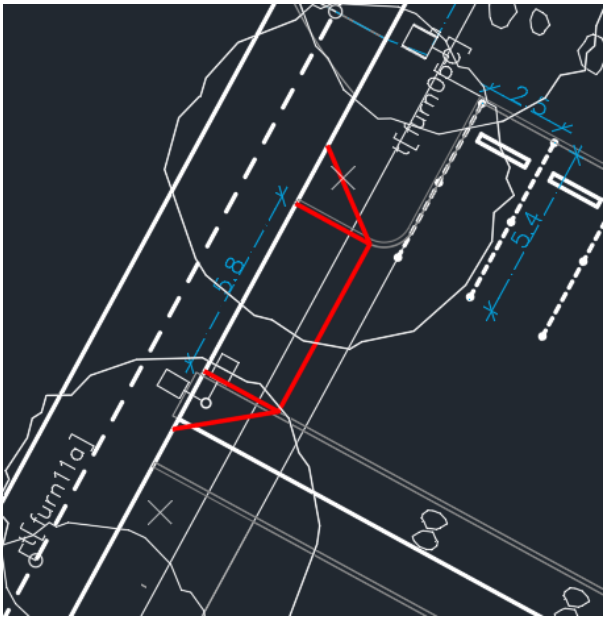
| Section of AS2890.1 | Comment |
|---|---|
| **2.4.3 Angle parking module layout** | The layout of angle parking module is compliant. |
| **2.4.4 Parallel parking** | The aisle width for parallel parking at the Police Cottage is greater than 3.0m for a one-way circulation aisle, which is compliant. |
| **2.4.5 Physical control** | If wheel stops are being considered, similar to the parking at regatta park, the following conditions will be required:<br>TABLE 2.1<br>WHEEL STOP DISTANCES<br>millimetre<br>Parking direction / Wheel stop distance to front of parking space<br>Parking to kerb ≤150 high / Parking to kerb >150 high or wal<br>Wheel stop height / Wheel stop height<br>90 / 100 / 90 / 100<br>Front-in: 630 / 620 / 830 / 820<br>Rear-in: 910 / 900 / 1110 / 1100 |
| **2.4.6 Gradients within parking modules** | N/A |
| **2.4.7 Provision for motorcycles** | N/A |
| **2.5 Design of Circulation Roadways and Ramps** | - |
| **2.5.1 General** | For the purposes of swept path analysis, it has been assumed that the circulatory direction for parking at the police cottage will be in a clockwise direction |
| **2.5.2 Layout design of circulation roadways and ramps**<br>**Curved roadways or ramps**<br>2.5.2 Layout design of circulation roadways and ramps<br>Cross sections of circulation roadways and ramps shall be as illustrated in Figure 2.8. Design requirements and dimensions shall be as follows:<br>(a) *Straight roadways and ramps*—as follows:<br>(i) One-way roadways or ramps—3.0 m minimum between kerbs (see also Item (c)).<br>(ii) Two-way roadways or ramps—5.5 m minimum between kerbs (see also Item (c)).<br>(iii) Double roadways or ramps—where there are to be two parallel roadways or ramps, separated by a raised median or separator, each roadway or ramp shall be designed as a one-way roadway or ramp, and the median or separator shall be 600 mm minimum in width and between 125 mm and 150 mm in height, the preferred height being 125 mm.<br>Where there is to be a kerb or barrier higher than 150 mm and closer than 300 mm from one edge of the roadway or ramp, the roadway or ramp shall be widened to provide a minimum of 300 mm clearance to the obstruction. If there is to be a high kerb or barrier on both sides, the width increase shall be sufficient to provide 300 mm on both sides.<br>TABLE 2.2<br>MINIMUM ROADWAY WIDTHS ON CURVED ROADWAYS AND RAMPS<br>metres<br>Turn radius $R_o$ (Note 1) / Single lane: Public facilities (Note 2) / Single lane: Domestic property / Two-way, no separator All cases (Note 3)<br>7.6 to 11.9: 3.9 / 3.6 / —<br>12.0 to 19.9: 3.4 / 3.1 / 6.7 (Note 4)<br>20.0 to 50.0: 3.2 / 3.0 / 6.3<br>>50.0: 3.0 / 3.0 / 5.5<br>NOTES:<br>1 See Figure 2.9 for Dimension $R_o$.<br>2 In New Zealand only, the widths shown for domestic property shall apply also to public facilities.<br>3 For parallel roadways with a median or separator, each roadway width shall be determined separately as a single lane.<br>4 Applies to $R_o$ range 15.0 m to 19.9 m only (see Clause 2.5.2(b)). | It is assumed that there are two circulating roadways at the police cottage.<br>  <br><br>Circulation roadway 1 is a straight roadway. It is recommended that this roadway should allow for two-way circulation if possible, which will require a minimum width of 5.5m.<br>If widening the roadway is not possible, signage and line marking can be used to reduce conflicting movements.<br>Circulation roadway 2 is a curved roadway with no visible outside radius. |

| Section of AS2890.1 | Comment |
|---|---|
|  <br>(a) Single (b) Double (with separator)<br><br>**Limiting dimensions, m**<br>Characteristic / One-way / Two-way<br>Outside radius, $R_o$ / 7.6 min. / 11.8 min.<br>Inside radius, $R_i$ / 4.0 min. / 4.0 min.<br>Lane width, $W_L$ / See Table 2.2 / See Table 2.2<br>Clearance to obstruction—<br>(a) inside, $C_i$ / 0.3 min. / 0.3 min.<br>(b) outside, $C_o$ (see Note) / 0.5 min. / 0.5 min.<br>(c) between paths, $C_c$ / — / 0.6 min.<br>Superelevation / 1 in 20 (5%) max. / 1 in 20 (5%) max.<br><br>NOTE: This clearance will be sufficient to allow the outside front wheel to touch the kerb before the vehicle body can contact the obstruction. | |
| **2.5.3 Circulation roadways and ramp grades** | N/A |
| **2.6 Design of Domestic Driveways** | - |
| **2.6.1 Width** | N/A |
| **2.6.2 Gradients** | N/A |
| **Section 3 Access Facilities to Off-street Parking Areas and Queuing Areas** | |
| **3.1 General** | |
| **3.1.1 Access design principles** | - |
| **3.1.2 Categories of access facilities**<br><br>TABLE 3.1<br>SELECTION OF ACCESS FACILITY CATEGORY<br><br>Class of parking facility (see Table 1.1) / Frontage road type / Access facility category / Number of parking spaces (Note 1) / <25 / 25 to 100 / 101 to 300 / 301 to 600 / >600<br>1.1A / Arterial / 1 / 2 / 3 / 4 / 5<br>Local / 1 / 1 / 2 / 3 / 4<br>2 / Arterial / 2 / 2 / 3 / 4 / 5<br>Local / 1 / 2 / 3 / 4 / 4<br>3.3A / Arterial / 2 / 3 / 4 / 4 / 5<br>Local / 1 / 2 / 3 / 4 / 4 | Access facilities for the Police Cottage assumes the following:<br>– Class of parking facility – 2<br>– Frontage road type – Local road<br>– Number of parking spaces – 20<br>– Access facility category: 1 |
| **3.2 Access Driveways- Width and Location** | |
| **3.2.1 Access driveway width** | The minimum driveway width required for cars is 3-5.5m. Swept path analysis for the access driveway was undertaken to assess the driveway width required for two vehicles to pass each other at the same time (see appendix A).<br>A 5.8m driveway is required to achieve this, 6m would be ideal. |
| **3.2.2 Width requirements at low volume (Category 1) access driveways and connecting roadways** | N/A - Circulation roadway to access driveway is less than 30m and the frontage road is not arterial or sub-arterial. |
| **3.2.3 Access driveway location** | N/A |
| **3.2.4 Sight distance at access driveway exits** | ***Vehicle sight distance*** |

| Section of AS2890.1 | Comment |
|---|---|
| Austroads Guide to Road Design<br>**Part 4A: Unsignalised and Signalised Intersections**<br>  <br>**Table 3.6: Table of minimum gap sight distances ('D' metres) for various speeds**<br>  <br>  <br>FIGURE 3.3 MINIMUM SIGHT LINES FOR PEDESTRIAN SAFETY | A sight distance review of the driveway exit onto River Road was conducted considering acceptance gaps and gap sight distance. Five seconds was selected for the "ta" value, which requires an oncoming vehicle to slow for an exiting vehicle from the driveway.<br>The Great Western Highway turn onto River Road contains a horizontal curve of <15m. Based on this, 85th percentile speed of a vehicle at this location would be reduced below 30km/h.<br>• Minimum gap sight distance on River Road @5s for 20km/h = 28m<br>• Minimum gap sight distance on River Road @5s for 30km/h = 42m<br>The proposed exit is about 40m from the intersection, which is below the 30km/h minimum gap distance standard.<br>For left-in / left-out from the driveway, the impact would be minimal due to the reduced vehicle speeds from Great Western Highway onto River Road being between 20 – 30km/h. It is recommended that the driveway should only facilitate left in / left out movements while access is off the current River Road due to the proximity to the Great Western Highway intersection and increased risk of vehicle crashes for these movements. Once the new Regatta Park car park is completed, access could be from all directions.<br>***Cyclist and pedestrian sight distance***<br>The worst case for the cyclist and pedestrian review was considered to be when access is from the new Regatta car park due to the new shared path facilities.<br>Sight distance for cyclists is not considered in the Australian Standards.<br>Cyclists are shown to be able to travel up to 40km/h on shared paths; based on this, the minimum sight distance for a car (and therefore a bike) should be 35m from the driver's location.<br>Sight distance assessment for cyclists are shown below. It is recommended that the two trees closest to the driveway on both sides should be removed to give drivers more visibility. |

| Movement | Diagram | Description | $t_a$[1] (sec) | $t_g$[2] (sec) |
|---|---|---|---|---|
| Left turn | | Not interfering with A<br>Requiring A to slow | 14–40<br>5 | 2–3<br>2–3 |

| Critical gap acceptance time ($t_a$) (secs) | 85th percentile speed of approaching vehicle (km/h) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 |
| 4 | 11 | 22 | 33 | 44 | 55 | 67 | 78 | 89 | 100 | 111 | 122 |
| 5 | 14 | 28 | 42 | 55 | 69 | 83 | 97 | 111 | 125 | 139 | 153 |
| 6 | 17 | 33 | 50 | 67 | 83 | 100 | 117 | 133 | 150 | 167 | 183 |
| 7 | 19 | 39 | 58 | 78 | 97 | 117 | 136 | 155 | 175 | 194 | 214 |
| 8 | 22 | 44 | 67 | 89 | 111 | 133 | 155 | 178 | 200 | 222 | 244 |
| 9 | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 |
| 10 | 28 | 56 | 83 | 111 | 139 | 167 | 194 | 222 | 250 | 278 | 305 |

| Section of AS2890.1 | Comment |
|---|---|
| |  <br>Sight distances for pedestrians are shown below. The tree to the north of the driveway and the light pole south of the driveway will need to be removed to be compliant<br>  |
| **3.3 Gradients of Access Driveways** | The grade outside the driveway at the property line should be a maximum of 5%. The grade outside the driveway should be checked during detailed design. |
| **3.4 Queuing Areas** | No boom gates or other entry control facilities have been included in the design. |
| **3.5 Access to mechanical parking installations** | N/A |
| **Section 4 Other Considerations** | |
| **4.1 Pedestrian Service** | - |
| **4.1.1 General** | - |
| **4.1.2 Parking Structures** | N/A |
| **4.1.3 Surface car park** | N/A |

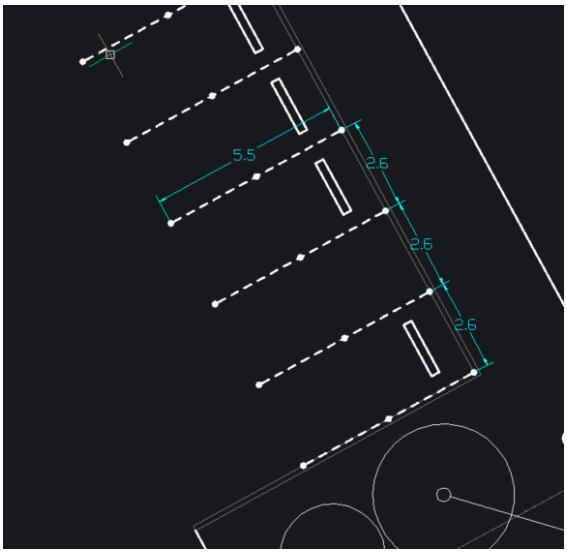
| Section of AS2890.1 | Comment |
|---|---|
| **4.2 Bicycle Parking AS2890.3 (2015)** | N/A |
| **4.3 Signposting** | N/A |
| **4.4 Pavement Markings** | N/A |
| **4.5 Parcel Pick up** | N/A |
| **4.6 Shopping Trolley Requirements** | N/A |
| **4.7 Lighting** | N/A |
| **4.8 Landscaping** | N/A |
| **4.9 Humps** | N/A |
| **4.10 Special Loading/ Unloading Parking Spaces** | N/A |
| **5 Additional Requirements for Car Parking Structures** | |
| **5.1 General** | - |
| **5.2 Column Location and Spacing** | N/A |
| **5.3 Headroom** | N/A |

Table B-2 Carpark review using AS2890.1 off-street commercial vehicles

| Section of AS2890.2 | Comment |
|---|---|
| **Section 1 Scope and General** | |
| **Section 2 Design Vehicles** | |
| **2.1 General** | - |
| **2.2 Description and dimensions** | Waste collection vehicles in Penrith Council LGA are 9.7m with an operational length of 11.7m.<br>Custom swept paths for a 9.7m truck has been undertaken and shown in appendix A. |
| **Section 3 Access driveways and circulation driveways** | |
| 3.1 General | **-** |
| 3.2 Design Principles | |
| 3.2.1 General | **-** |
| 3.2.2 Occasional Service | **-** |
| 3.2.3 Regular Service | **-** |
| 3.3 Circulation Roadway | |
| 3.3.1 Width | Circulation roadways have a radius of less than 40m. Swept paths are required along circulation roadways to assess if roadways are wide enough. |
| 3.3.2 Parking on Circulation Roadway | Parking on circulation roadways are compliant |
| 3.3.3 Maximum grades on circulation roadways | N/A |
| 3.3.4 Maximum rates of change of grade on circulation roadways | N/A |

| Section of AS2890.2 | Comment |
|---|---|
| 3.4 Access Driveway | - |
| 3.4.1 General | N/A |
| 3.4.2 Provision of one-way access driveways | N/A |
| 3.4.3 Layout design requirements | Swept paths were undertaken to assess if driveways are wide enough. The access driveways at 5.8m wide are compliant. |
| 3.4.5 Sight distance requirements | Sight distance for access driveways indicates that the driveway should only facilitate left in / left out movements while access is off the current River Road. Once the new Regatta Park car park is completed, access could be from all directions.<br>It is recommended that the two trees closest to the driveway on both sides should be removed to give drivers more visibility.<br>Sight distances for pedestrians require the light pole to the south of the access driveway and the tree to the north of the access driveway will need to be removed or relocated. |
| 4.1 Service Areas | N/A |
| Section 5 Design vehicle turn paths | Swept path analysis has been undertaken to assess if carpark has sufficient room for heavy vehicles. **This is shown in Appendix A.** |

**Table B-3 Carpark review using AS2890.6 off-street parking for people with disabilities**

| Section of AS2890.6 | Comment |
|---|---|
| **Section 1 Scope and General** | |
| **Section 2 Parking Space Layout and Access** | |
| **2.2 Parking Space Dimensions** | Two disabled parking spaces (2.6 x 5.5m with a 2.6 x 5.5m shared space) have been provided and is located near the police cottage. This is compliant.<br>  |