TRAFFIC IMPACT ASSESSMENT

Proposed Senior Living Development
24 Coronation Road, Congarinni North

Reference: 20.340r02v04
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CONTENTS

1. INTRODUCTION

TRAFFIX has been commissioned by Congarinni North Pty Ltd to undertake a traffic impact assessment in support of a development application (DA) in relation to a senior living development at 24 Coronation Road, Congarinni North. The development is located within the Nambucca Valley Council Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately. The development is of a size and nature that is considered to require formal referral to Transport for NSW (formerly RMS) under the provisions of SEPP (Infrastructure) 2007.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. LOCATION AND SITE

The site at 24 Coronation Road, Congarinni North is located approximately 1.1 kilometre northwest of Macksville Railway Station and is legally known as Lot 88 in DP755537. More specifically, it is situated on the west side of the Wilson Road and Coronation Road intersection, opposite the Taylors Arm Wilson Bridge.

The site is irregular in configuration and has a site area of 57.3 hectares. It has a northern boundary of 1,292.5 metres and western boundary of 446.8 metres to land zoned for the purposes of Environmental Conservation (E2) and Environmental Management (E3). The southern boundary to vacant land and eastern frontage to Coronation Road/Wilson Road, measure 1,219.2 metres and 581.5 metres, respectively.

The site currently accommodates a single rural residential dwelling and associated sheds, with vehicular access provided via a single driveway onto Coronation Road.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

Figure 1: Location Plan

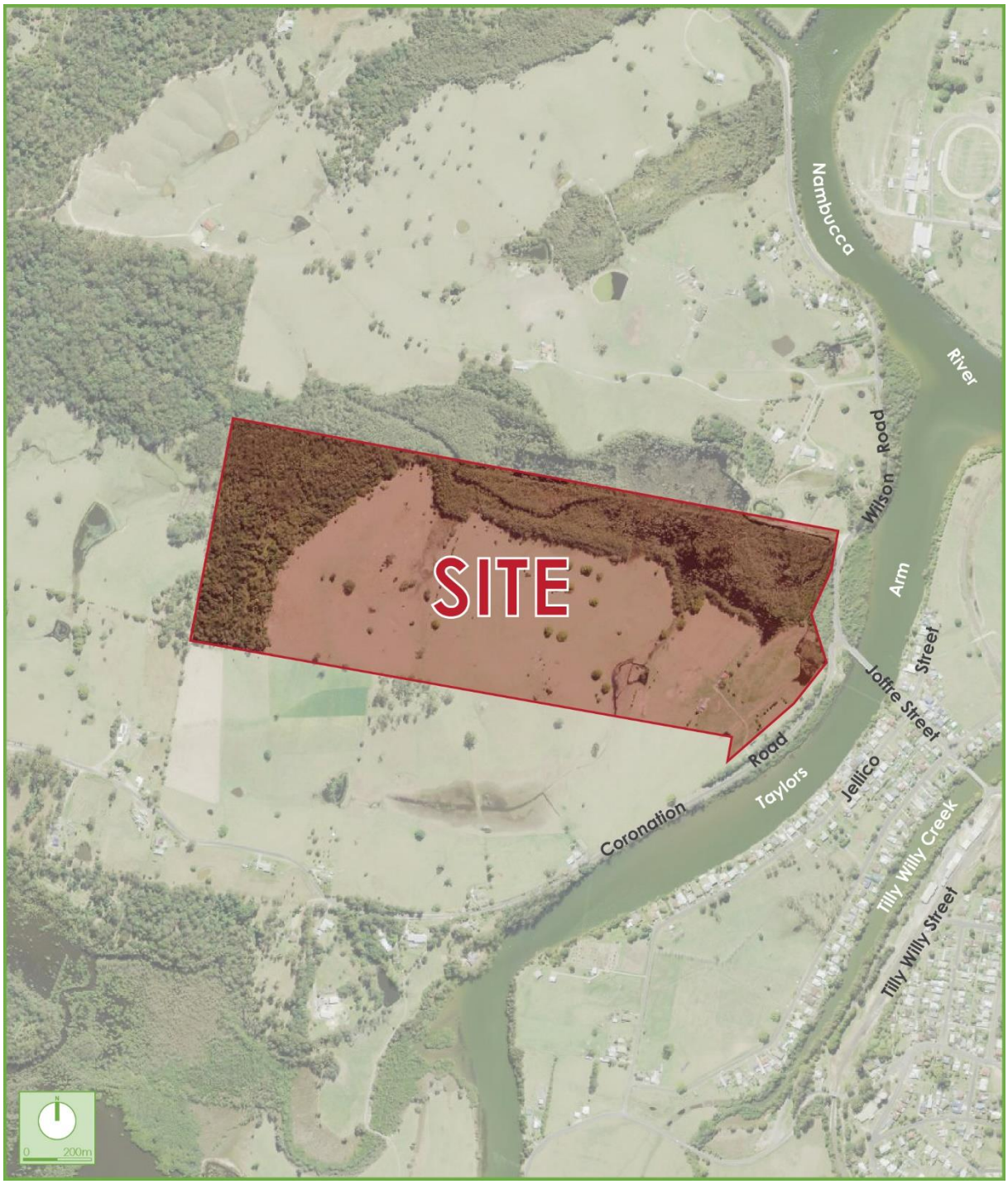


Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Pacific Highway: an RMS highway (HW 10) that traverses north-south between the Queensland border in the north and the Warringah Freeway at North Sydney in the south. Within the vicinity of the site, it is subject 110km/h speed zoning and accommodates two (2) lanes of traffic in each direction. The Pacific Highway provides a shoulder along both sides of the road and does not permit on-street parking.
- Giinagay Way: a local road that traverses north-south between Keevers Drive at Raleigh in the north and the Pacific Highway at Congarinni in the south. Within the vicinity of the site, it is subject to 50km/h speed zoning and accommodates a single lane of traffic in each direction. Giinagay Way generally permits sections of on-street parking along both sides of the road.
- Joffre Street: a local road that traverses east-west between Tilly Willy Street in the east and Wilson Road in the west. It is subject to 50km/h speed zoning and accommodates a single lane of traffic in each direction. Joffre Street permits on-street parking along both sides of the road, east of Taylors Arm Wilson Bridge.
- Wilson Road: a local road that traverses north-south between Carbin Street at Bowraville in the north and Joffre Street in the south. Within the vicinity of the site, it is subject to 50-60km/h speed zoning and accommodates a single lane of traffic in each direction. Wilson Road does not permit on-street parking along both sides of the road.

- Coronation Road: a local road that traverses east-west between Wilson Road/Joffre Street in the east and Congarinni Road North in the west. Within the vicinity of the site, it is subject to 100km/h speed zoning, which is reduced to 50km/h on its approach to the Wilson Road / Joffre Street intersection. Coronation Road primarily provides local access to rural residential properties along the western bank of Taylors Arm and generally accommodates a single lane of traffic in each direction.

It can be seen from **Figure 3** that the site is conveniently located with respect to the various arterial (Giinagay Way), sub-arterial (Taylors Arm Road and Ferry Street) and collector road (Wilsons Road) serving the region. As such, traffic is effectively able to be distributed onto the wider road network, minimising traffic impacts.

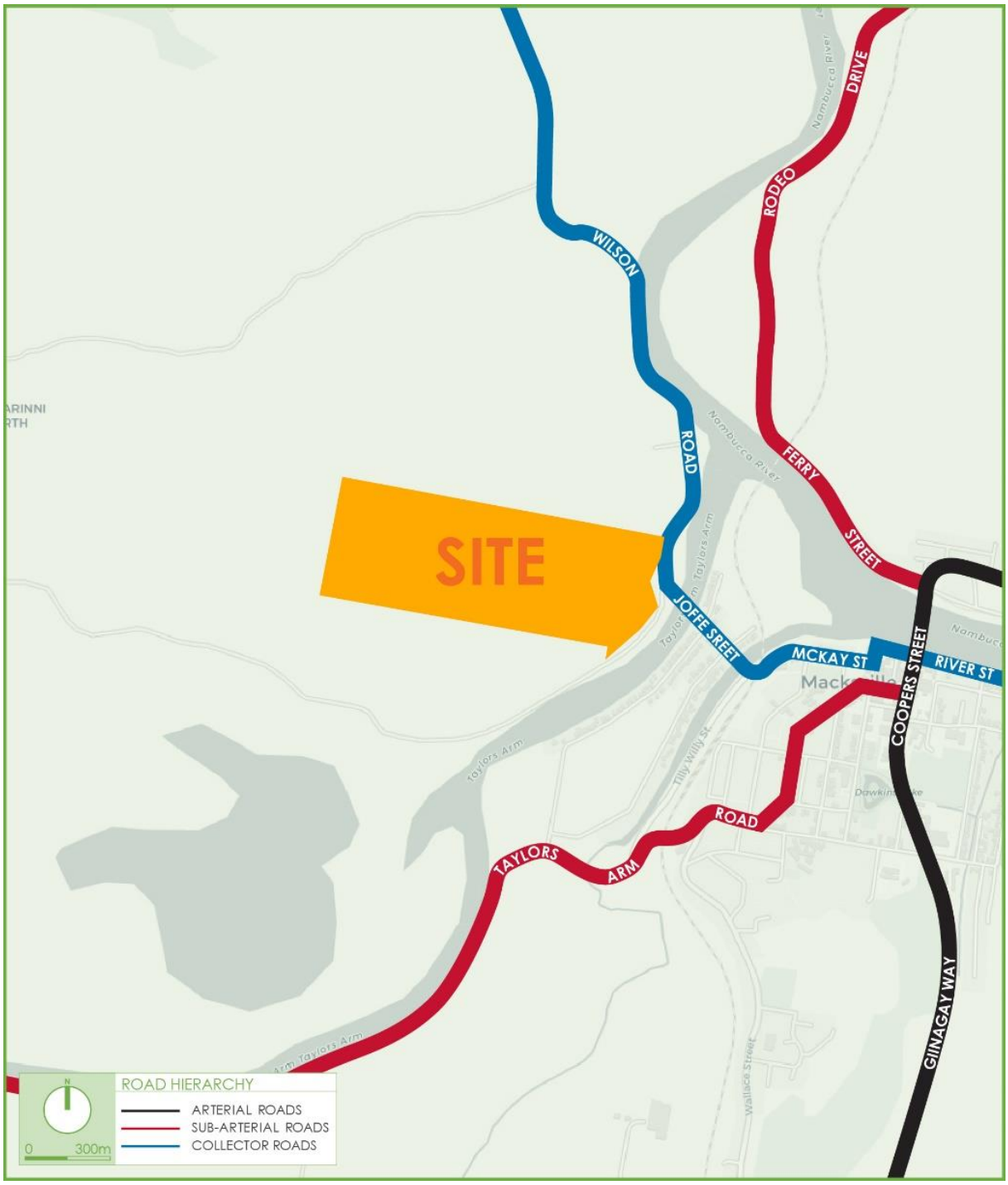


Figure 3: Road Hierarchy

3.2 Key Intersection

The key intersection in the locality is the intersection of Coronation Road, Wilson Road and Joffre Street, situated along the eastern frontage of the site, as presented in **Figure 4** below.

Figure 4: Coronation Road, Wilson Road and Joffre Street Intersection

It can be seen from **Figure 4** that the key intersection is a three-legged priority intersection, with Wilson Road / Joffre Street being the major road. The main attributes of each approach are outlined below:

- Wilson Road / Joffre Street (north-south)
  - The northern approach provides one (1) through lane from which right-turns can be made; and
  - The southern approach provides one (1) through lane from which left-turns can be made.
- Coronation Road (west)
  - The western approach provides one (1) lane from which left and right turns can be made.

3.3 Public Transport

The public transport services operating within the vicinity of the site are presented in **Figure 5** and summarised as follows.

3.3.1 Bus Services

The bus stops serving the area typically operate from Macksville town centre, along Wallace Street. These bus stops provide services along the following routes:

- 351 – Bowraville to Macksville via Rodeo Drive;
- 352 – Bowraville to Macksville via Wilson Road;
- 356 – Macksville to Scotts Head via Grassy Head;
- 358 – Macksville to Bellingen via Nambucca Heads and Urunga; and
- 360 – Macksville to Coffs Harbour via Nambucca Heads and Toormina.

3.3.2 Train Services

The subject site is located approximately 520 metres northwest of Macksville Railway Station. This railway station provides train services along the North West Regional NSW Line, as well as intercity buses between Casino and Central (Routes 3416 and 3418).

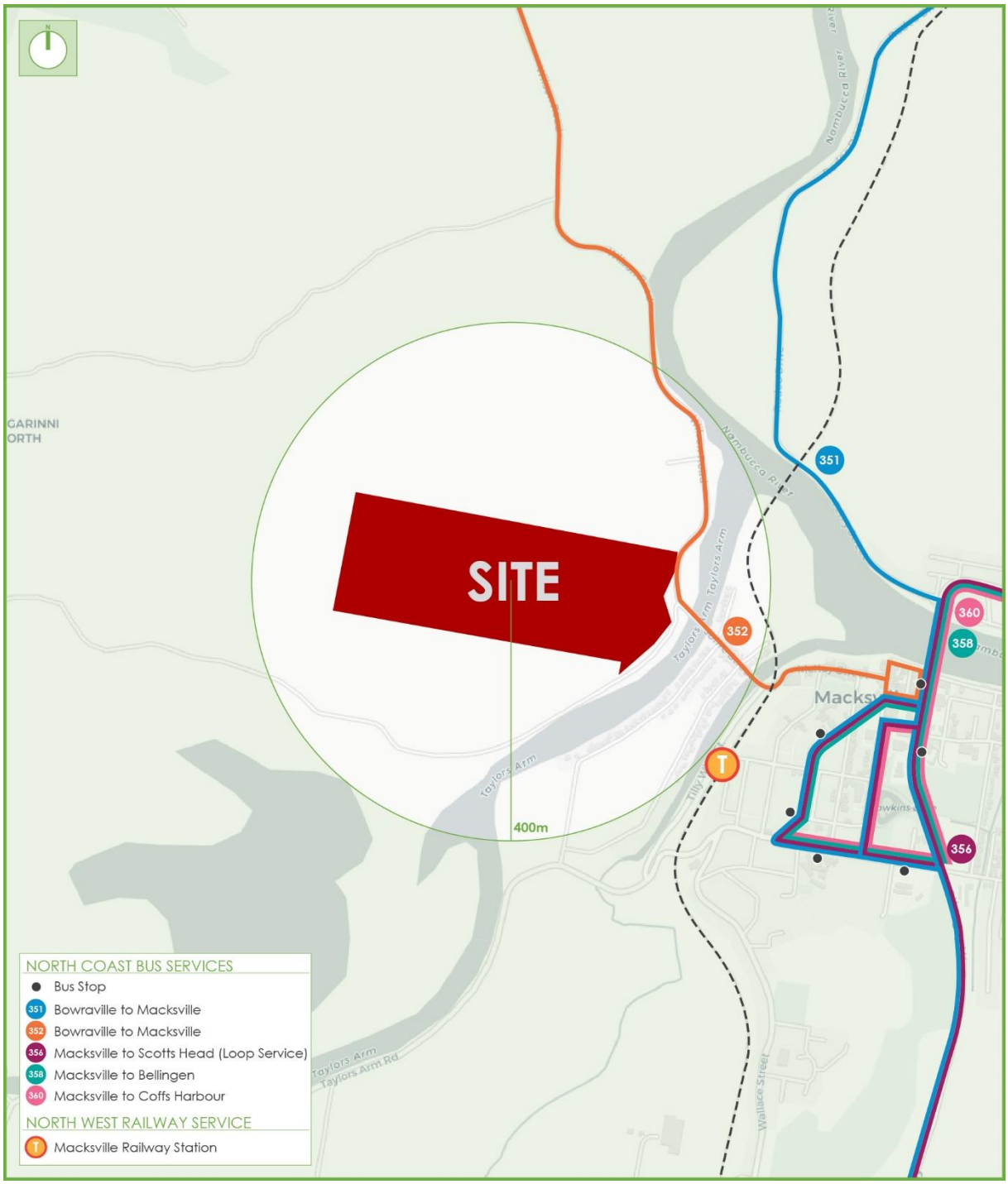


Figure 5: Public Transport

3.4 Pedestrian and Cycling Networks

A footpath is currently provided from the Macksville town centre along the southern side of Mackay Street, Tilly Willy Street and Joffre Street to its intersection with Coronation Road. There are a number of localised constraints to this footpath as a result of the available width on the two (2) bridges between the subject site and Macksville township. The pedestrian path on the 170 metre long Wilson Bridge is 1.87 metres wide, with a reduced width of only 1.17 metres provided on the 70 metre long Tilly Willy Bridge.

No footpath is provided within Coronation Road.

In accordance with Austroads Guide to Road Design Part 6A: Pedestrian and Cyclist Paths, a minimum width of 2.5 metres is required for a Shared Path, whereby both pedestrians and cyclists share an off-road path. This is the consistent with Clause B2.4.2 of the Nambucca Consolidated Development Control Plan (DCP) 2010, which requires a minimum footpath width of 1.2 metres on at least one side of the road reserve. This is to be increased to 2.5 metres where serving as a shared pedestrian / cycleway.

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Statement of Environmental Effects, prepared separately. In summary, the residential development for which approval is now sought comprises the following components:

- Demolition of all existing structures;
- Construction of seniors housing independent living units (ILUs) with a total of 271 dwellings, including:
  - 163 x Type 1 two-bedroom dwellings (2 spaces per dwelling)
  - 54 x Type 2 two-bedroom dwellings (1 spaces per dwelling); and
  - 54 x three-bedroom dwellings (2 spaces per dwelling).
- Construction of an aged care centre with a total of 75 beds and 15 employees;
- Construction of a sports facility and ancillary café with a total 750.4m^2 gross floor area (GFA);
- Construction of an internal road network (including fire trail) with access from Coronation Road; and
- Provision of a total of 595 car parking spaces, including:
  - 488 x spaces for ILUs and associated caretaker;
  - 48 x spaces for visitors throughout the internal road network;
  - 41 x spaces for the aged care centre; and
  - 18 x spaces for the sports facility.

The parking requirements and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the architectural plans submitted separately prepared by Tony Owens Partners.

5. PARKING REQUIREMENTS

5.1 Car Parking

5.1.1 Self-Contained Units

Residential Parking

The Nembucca DCP 2010 provides the car parking provisions for residents of seniors housing (self-contained units) at the recommended rates outlined in **Table 1**.

Table 1: DCP Car Parking Provisions for Self Contained Units

Type	Unit	DCP Car Parking Rate	Parking Required [1]	Parking Provided
Seniors Housing – Self-Contained Units				
Two-bedroom (55-85m² GFA)	163 dwellings [2]	0.85 spaces per dwelling	184.5	326
	54 dwellings [3]			54
Three-bedroom (> 85m² GFA)	54 dwellings	1 space per dwelling; plus 1 space per caretaker	108	108
		TOTAL	**292.5 (293)**	**488**

[1] – Rounded up to the next whole number, as per DCP.
[2] – Type 1 dwelling with two (2) parking spaces.
[3] – Type 2 dwelling with one (1) parking space.

It can be seen from **Table 1** that the seniors housing component of the development is nominally required to provide a total of 293 car parking spaces for residents. In response, the development proposes a total of 488 car parking spaces, comprising:

- 326 x spaces for Type 1 two-bedroom dwellings (2 spaces per dwelling);
- 54 x spaces for Type 2 two-bedroom dwellings (1 space per dwelling); and
- 108 x three-bedroom dwellings (2 spaces per dwelling).

The above residential car parking provisions are therefore sufficient to comply with the requirements of the DCP and as such, considered acceptable to ensure all residential parking demands are contained within the development.

Visitor Parking

The Nambucca DCP 2010 provides the car parking provisions for visitors of seniors housing (self-contained units) at a recommended rate of one (1) space per five (5) dwellings. Application of this rate to the proposed 271 dwellings, results in a requirement for 54.2 spaces or 55 visitor parking spaces (rounded up, as per the DCP).

In response, the development proposes 48 visitor car parking spaces in the form of 30 parallel parking spaces and 18 90-degree angled spaces throughout the internal road network of the development. In addition, the development proposes a total of 163 Type 1 two-bedroom dwellings that each provide two (2) spaces each, where the additional space can be utilised for visitor parking. Accordingly, the development effectively accommodates a total of 211 visitor parking spaces (48 spaces plus 163 spaces), which is considered acceptable to ensure all visitor parking demands are contained within the development.

5.1.2 Aged Care and Sports Facilities

The Nambucca DCP 2010 provides the car parking provisions for seniors housing (hostel, nursing and convalescent home) at the recommended rates outlined in **Table 2**.

Table 2: DCP Car Parking Provisions for the Aged Care and Sports Facilities

Type	Unit	DCP Car Parking Rate	Parking Required [1]	Parking Provided
Seniors Housing – Hostel, Nursing, Convalescent Home				
Employees	15 employees	1 space per 2 employees	7.5	8
Visitors	75 beds	1 space per 10 beds	7.5	33
Recreation Facilities – Gymnasiums				
Employees	12 employees	1 space per 2 employees	6	6
Visitors	750.4m² GFA	4 spaces per 100m² GFA	30	12
		TOTAL	**51**	**59**

[1] – Rounded up to the next whole number, as per DCP.

It can be seen from **Table 2** that the aged care and sports facilities would generate a total demand for 51 car parking spaces for employees and visitors. In response, the development proposes a total of 59 car parking spaces, comprising eight (8) staff spaces for the aged care centre, six (6) staff spaces for the sports facility and 45 visitor spaces for both facilities, noting

that visitors can also utilise kerbside parking along the internal collector road, should there be an increased demand. This car parking provision is therefore considered appropriate, given the proximity of the aged care centre and self-contained dwellings with respect to both facilities. As such, these car parking arrangements will ensure all parking demands are contained within the development.

5.2 Accessible Parking

The Nambucca DCP 2010 provides the accessible parking provision for health service (other than hospitals) and recreational facilities at a rate of 3% of total car parking spaces, noting no requirement for ILUs. Application of this rate to the proposed 59 car parking spaces for the aged care and sports facilities, results in a requirement for two (2) accessible parking spaces.

In response, the development proposes a single accessible space for the aged care centre and designated drop-off areas at the pedestrian entrance of both facilities that can accommodate visitor drop-off for people with disabilities. These arrangements are considered acceptable and will ensure all people with disabilities are provided direct access to both the aged care and sports facilities of the development.

5.3 Motorcycle Parking

The Nambucca DCP 2010 provides the following advice regarding motorcycle parking:

> *'Council will accept the limited substitution of motorcycle parking spaces for car parking spaces. Such substitution shall reflect the proportion that motorcycles represent of private passenger vehicles registered in NSW. Any provision of motorcycle parking in excess of this level shall be additional to the car parking requirements set out in Table 5.'*

In light of the above, the development provides an abundance of car parking spaces that can be utilised for motorcycle parking, as well as kerbside parking along the internal collector road can also accommodate motorcycle parking, should there be an increased demand. This arrangement is therefore considered acceptable, given the nature of the development.

5.4 Bicycle Parking

The Nambucca DCP 2010 provides the bicycle parking provision for community and recreational facilities at a rate of 20% of total car parking spaces, noting no requirement for ILUs. Application of this rate to the proposed 59 car parking spaces for the aged care and sports facilities, results in a requirement for 12 bicycle parking spaces.

In response, the development provides individual garages for all ILUs that can accommodate bicycle parking and eight (8) bicycle parking spaces in the form of bicycle loops at the sports facility. It should be noted that given the large scale of the development, there is ample room to accommodate additional bicycle parking spaces, should there be a demonstrated demand. These bicycle parking arrangements are therefore considered acceptable and will ensure all bicycle parking demands are accommodated within the development.

5.5 Ambulance Bay

The Nambucca DCP 2010 specifies a requirement for a single ambulance bay for the seniors housing (hostel, nursing and convalescent home) component of the development.

In response, the aged care centre is provided a drop-off area adjacent the main pedestrian access that is able to accommodate ambulance parking. This is considered sufficient to satisfy the requirements of the DCP, therefore acceptable.

5.6 Loading and Refuse Collection

The Nambucca DCP 2010 does not provide specific loading and refuse collection parking provisions for the various components of the development. Nevertheless, the development proposes two (2) loading bays for the aged care centre and one (1) loading bay for the sports facility that are all able to accommodate an 8.8 metre long medium rigid vehicle (MRV), with kerbside refuse collection proposed to be undertaken along the internal road network for all ILUs.

These arrangements are considered acceptable and will ensure all loading and refuse collection demands are contained within the development.

5.7 Shuttle Bus

The State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (SEPP), residents of the proposed development are required to be provided access to shops, banks, recreational facilities, general medical practitioners and other retail/commercial services.

In response, the development proposes a shuttle bus service that will operate to Macksville town centre and originate from the residential aged care facility. Accordingly, the aged care facility has been provided a pick-up and drop-off area that is able to accommodate a 6.9 metre long Toyota Coaster. These provisions are sufficient to comply with the requirements of the SEPP, therefore considered acceptable.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Existing Site Generation

The site currently accommodates a single low density residential dwelling. In accordance with the RMS Technical Direction TDT 2013/04a (RMS TDT), low density residential dwellings in regional areas attract a trip rate of 0.71 and 0.78 vehicle trips per hour during the morning and evening peak periods, respectively. Application of these rates, results in the following existing traffic generation:

- 1 vehicle trip per hour during the morning peak period (0 in, 1 out); and
- 1 vehicle trip per hour during the evening peak period (1 in, 0 out).

6.2 Development Trip Generation

The traffic generation of the proposed development with respect to the surrounding road network is envisaged to comprise primarily from the ILU and aged care centre components, with the sports facility considered ancillary, given the majority of trips are envisaged to be contained within the internal road network of the development. Accordingly, the traffic generation of the development has been assessed as follows, noting that the morning peak does not coincide with the network peak period:

6.2.1 Self-Contained Units

The RMS TDT 2013 recommends a trip rate of 0.4 vehicle trips per dwelling during the evening peak period. Application of this rate to the proposed 271 dwellings, results in a trip generation of 108 vehicle trips per hour during the evening peak period for the ILU component of the development.

6.2.2 Aged Care Centre

The RMS TDT 2013 also recommends a trip rate of 0.4 vehicle trips per dwelling during the evening peak period for the aged care centre component. This rate is however, considered inappropriate for the aged care centre, given that this rate is derived from data which includes a large proportion of ILUs. In this regard, a trip rate of 0.2 vehicle trips per bed has been adopted for the aged care centre component, noting that this rate has historically been utilised for aged care facilities in line with the RMS Guide to Traffic Generating Developments

2002. Application of this rate to the proposed 75 beds, results in a trip generation of 15 vehicle trips per hour during the evening peak period for the aged care centre component of the development.

6.3 Intersection Performance

6.3.1 Traffic Surveys

In order to assess the traffic impacts of the proposed development, traffic count surveys were conducted at the critical intersection of Coronation Road, Wilson Road and Joffre Street during a typical Monday between 7:00am-9:00am and 3:30pm-5:30pm.

It should be noted that the above surveys were undertaken in February 2014 and are still considered applicable, given the regional area of the subject site and marginal increases in population/traffic since 2014. This is further emphasised with census data for the Nembucca Shire LGA identifying a population of 18,639 people in 2011 and 19,213 people in 2016, which equate to a marginal increase of 3.1% in 5 years or 0.62% per year. As such, the traffic count surveys conducted in 2014 are considered applicable and have been adopted, noting that a 2% per annum growth scenario has also been applied to the survey traffic volumes.

6.3.2 Trip Generation and Distribution

In reference to the traffic generation in **Section 6.2**, the development is anticipated to generate 125 vehicle trips per hour during the evening peak period, noting that the morning peak does not coincide with the network peak period. Accordingly, for the purposes of a conservative assessment, the following trip generation have been adopted to consider any additional staff and visitor traffic associated with the development:

- 140 vehicle trip per hour during the morning peak period (45 in, 95 out); and
- 140 vehicle trip per hour during the evening peak period (95 in, 45 out).

Accordingly, 95% of the above traffic generation have been distributed to and from the south to represent destinations such as Macksville town centre and the wider region via the Pacific Highway.

6.3.3 SIDRA Intersection Analysis

The surveys were analysed using the SIDRA Intersection 9 computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way / stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 3**.

Table 3: Intersection Performance Indicators (RMS)

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

6.3.4 SIDRA Intersection Results

The following scenarios have been assessed utilising the abovementioned aspects:

- Base case 2014 scenario utilising the 2014 surveys;
- Future case 2024 scenario, assuming a 2% per annum growth to the 2014 surveys; and
- Future case 2024 plus development scenario, which includes the 2% per annum growth and conservative trip generation of 140 vehicles per hour during both peak periods.

Reference should be made to the SIDRA outputs provided in **Appendix A** that provide the detailed results for individual lanes and approaches, with a summary of the modelled results outlined in **Table 4** below.

Table 4: Existing Intersection Performance

Intersection	Scenario	Period	Degree of Saturation	Intersection Delay	Level of Service
Coronation Road, Wilson Road and Joffre Street	Base Case 2014	AM	0.024	5.4	A
		PM	0.012	5.4	A
	Future Case 2024 [1]	AM	0.033	5.7	A
		PM	0.017	5.6	A
	Future Case 2024 [1] + Development	AM	0.130	6.5	A
		PM	0.065	6.5	A

[1] – 2% per annum growth applied to 2014 traffic volumes.

It can be seen from **Table 4** that the intersection operates satisfactorily (LoS A) under all scenarios during both peak periods, with minor increases to intersection delays. As such, no external improvements to the road network are required to facilitate the development, with respect to intersection performance.

6.3.5 Unsignalised Intersection Treatment

A review of additional turning facilities is also considered appropriate on safety grounds and having regard for the semi-rural character in the vicinity of the subject intersection. In this regard, Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings Management 2020 (AGTM06), Figure 3.25 (c) outlines the 'Warrants for Turn Treatments on Major Roads at Unsignalised Intersections', as presented in **Figure 6** below.

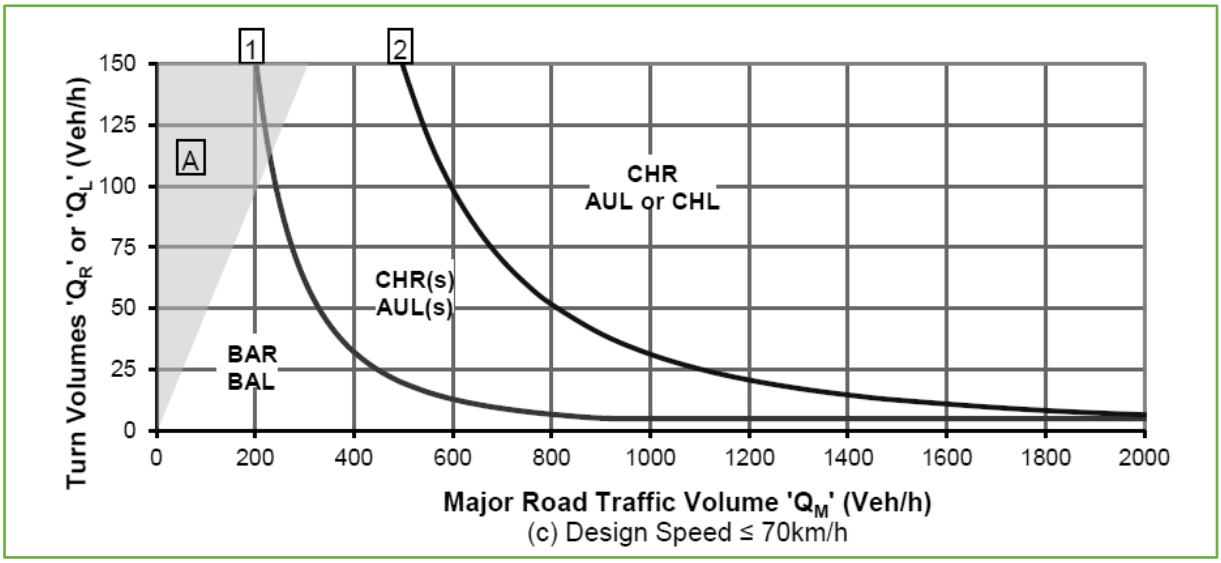


Figure 6: Warrants for Turn Treatments on Major Roads at Unsignalised Intersections

(Source: AGTM06, Figure 3.25)

In light of the above, the required turn treatments are based on the major road traffic (Q_M) and turn ($Q_{L/R}$) volumes of the 'Future Case 2024 plus Development' scenario, as summarised in **Table 5** below.

Table 5: Intersection Turning Treatment Warrant Assessment

Turn	Movement ID	Period	Major Road Volume (Q_M) veh/hr	Turning Volume ($Q_{L/R}$) veh/hr	Treatment Required
Left Turn from Joffre Street	1 – L2	AM	73	48	BAL
		PM	142	109	BAL
Right Turn from Wilson Road	9 – R2	AM	274 [1]	3	BAR
		PM	326 [2]	6	BAR

[1] – AM Joffre Street volume (121) + Wilson Road through volume (153).

[2] – PM Joffre Street volume (251) + Wilson Road through volume (75).

It can be seen from **Table 5** that a Basic Left turn (BAL) and Basic Right turn lane (BAR) treatments are required for Joffre Street and Wilson Road, respectively. These changes will require minor widening of the southbound carriageway (to minimum of 6.5 metres from the centreline, plus additional width as a result of curved alignment of Wilson Road) to accommodate the BAR treatment.

It is emphasised that a standard BAR intersection treatment is technically required as a result of existing turning volumes. The proposed development will not substantially increase right turning volumes from Wilson Road and therefore, in the absence of any historic crash history, the additional works to the northern side of this intersection are not considered necessary. A review of crash statistics between 2015 to 2020 identified no crashes at this intersection, with the closest being a minor non-fatal crash in 2016, approximately 340 metres south, near the Joffre Street and Sturdee Street intersection, which is unrelated to whether or not a BAL / BAR treatment is provided.

6.4 Pedestrian and Cycle Network Improvements

6.4.1 Walking

There is potential for future residents of the development to walk, cycle and/or utilise mobility scooters to and from Macksville. However, the distance of approximately 1.5 kilometres is considered relatively long and will discourage walking as a viable travel mode, particularly for elderly and disabled residents. In this regard, the development is not anticipated to generate significant numbers of pedestrian movements outside the development.

6.4.2 Cycling and Mobility Scooters

A small increase in the number of bicycle trips and use of 'mobility scooters' could be anticipated as a result of the proposed development. Research into the width of 'mobility scooters' indicates that these devices generally have a width comparable to, if not narrower than, standard wheelchairs. As such, the width requirements associated with wheelchairs are also considered to accommodate access by these vehicles. The existing footpath between the development and Macksville town centre typically provides the following aspects:

- Generally provides informal passing opportunities by way of driveway crossings and grass verge areas;
- Wilson Bridge provides a 1.8 metre wide footpath that is sufficient for two (2) wheelchairs to pass in accordance with the Austroads requirements; and
- Tilly Willy Bridge provides a footpath with a width (slightly less than) nominally required for a single wheelchair and/or mobility scooter.

In light of the above, additional management may be required in the event that a high volume of mobility scooter trips were to be generated by the subject development. This could include a small button activated signal system on the bridge to prevent two (2) opposing scooters from simultaneously crossing the bridge, noting that this scenario would be unlikely.

There is insufficient width on Tilly Willy Bridge to accommodate widening of the Joffre Street footpath to a 2.5 metre Shared Path. In addition, traffic volumes within Joffre Street (50km/h speed zoning) are currently in the order of 2,055 vehicles per day, with volumes anticipated to increase to approximately 3,155 vehicles per day as a result of the development and background traffic growth. Accordingly, this increased traffic flows are not considered sufficient to warrant provision of a dedicated Shared Path, having regard for the inherent constraints of the existing network.

Austroads Cycling Aspects of Austroads Guides nominally recommends provision of an on-road bicycle lane for the future traffic volumes and existing vehicle speed, noting that a reduced speed zoning of 40km/h would not necessarily warrant provision of a dedicated bicycle lane. Either alternative is considered a detailed matter that will require input from Council's Traffic Committee and TfNSW officers, prior to resolving.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Vehicular Access

The development proposes vehicular access approximately 130 metres southwest of Wilson Road and prior to the speed zoning change from 50km/hr to 100km/hr for southbound traffic, with the south side of the access generally providing a relatively straight section of Coronation Road. As such, suitable sight distances can readily be achieved, subject to maintenance of kerbside planting/vegetation. The minimum sight distance requirements for the site access, based on the existing 100km/hr speed zoning, depending on whether the new access road is dedicated to Council is summarised in **Table 6** below.

Table 6: Sight Distance Requirements

Ownership of Site Access Road	Relevant Standard	Distance from Coronation Road	Sight Distance Required
Public (Council)	Austroads GRD Part 4A Safe Intersection Sight Distance (SISD)	5.0 metres	262 metres
Private (Community)	AS2890.1 Stopping Sight Distance (SSD)	2.5 metres	160 metres

The proposed vehicular access is situated prior to the speed zoning change from 50km/hr to 100km/hr for southbound traffic, with the following aspects noteworthy:

- Vehicles travelling south along Coronation Road will be travelling at 50km/hr and be able to observe any vehicles turning right at the access driveway prior to accelerating to 100km/hr (after the access). As such, sight distances to the north of the access are considered less critical, with a minimum SISD and SSD of only 97 metres and 45 metres, respectively, required for a speed zoning of 50km/hr;
- Vehicles travelling north along Coronation Road will be required to travel at the posted speed limit of 50km/hr, prior to the vehicular access and posted speed limit, as per the NSW Road Rules.

Traffic volumes on Coronation Road are currently in the order of only 25 vehicles per hour during peak periods. Therefore, the proposed access will only require a basic (BAL/BAR) type intersection arrangement in the event that it is designed as a public road intersection. This requires only a localised widening of the road shoulder in the vicinity of the site access to 6.5 metres from the centreline. It is preferable that this increased shoulder width be sealed, however that is not a mandatory requirement.

7.2 Internal Road Network

The Nembucca DCP 2010 provides the public road widths as summarised in **Table 7** below.

Table 7: DCP Public Road Widths

Road Type	Max No. of Lots Served	Carriageway (minimum)	Road Reserve (minimum)
Access Road	30	5.5 metres - 7.0 metres	13.0 metres
Local Road	170	7.0 metres - 8.0 metres	15.0 metres
Collector Road	300	11.0 metres	20.0 metres

In light of the above, the development proposes an 11.0 metre wide collector road accessible from Coronation Road that traverses towards the middle of the development, prior to traversing along the southern boundary of the site, as well as 5.5 metre wide internal access roads throughout the site. The proposed collector road is able to accommodate two-way 8.8m long MRV circulation at the critical areas and is therefore superior to the requirements of AS2890.2 (2018). Accordingly the proposed collector roads and access roads are sufficient to comply with the minimum requirements of the Nembucca DCP 2010.

With regard to the internal local roads, the development proposes 6.0 metre wide internal local roads that connect the collector road to the various internal access roads. This width is considered acceptable due to the following:

- The above road widths are guidelines based on 'public roads', with all proposed local roads being internal and contained within the site. As such, the proposed internal local road width of 6.0 metres is considered appropriate, given the nature and scale of the development;
- The reduced carriageway width of 6.0 metres would assist in reducing the speed of vehicles traversing along the internal local roads. Accordingly, this would result in increasing the safety of pedestrians, bicycles and vehicles utilising the internal local roads; and
- The internal local road width is consistent with the requirements of AMCORD for access streets, which require a minimum carriageway width of 5.5-7.0 metres in order to accommodate a car to pass a service vehicle.

In summary, the proposed internal road configuration of collector, local and access roads are considered appropriate given the nature and scale of the development.

7.3 Internal Design

The internal design aspects generally comply with the requirements of AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009), with the following characteristics noteworthy:

7.3.1 Parking Modules

- All residential parking spaces have been designed in accordance with AS2890.1 (2004) User Class 1A, being a minimum width of 2.4 metres and length of 5.4 metres.
- All aged care centre and sports facility spaces have been designed in accordance with AS2890.1 (2004) User Class 2, being a minimum width of 2.5 metres and length of 5.4 metres.
- All residential single garages are to be designed in accordance with AS2890.1 (2004), Figure 5.2, having a minimum width of 3.0 metres.
- All residential double garages are to be designed in accordance with AS2890.1 (2004), Figure 5.2, having a minimum width of 5.4 metres.
- All parallel parking spaces within the internal road network have been designed in accordance with AS2890.1 (2004), being a minimum width of 2.1 metres and length of 6.6 metres.
- All accessible parking spaces have been designed in accordance with AS2890.6 (2009), being a minimum width of 2.4 metres, length of 5.4 metres and provide an adjacent shared zone with the same dimensions.
- All parking spaces are to provide a maximum gradient of 1 in 16 (6.25%) measured in any direction, as required under AS2890.1 (2004).
- Spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.

7.3.2 Service Vehicles

- All trafficable areas of the service vehicle have been designed to accommodate an 8.8 metre long MRV, having a maximum gradient rate of change of 1 in 16 (6.25%) in 7.0 metres if travel, as required under AS2890.2 (2018).
- All trafficable areas of the fire truck have been designed to accommodate 12.5 metre long heavy rigid vehicles (HRV).

- All loading bays have been designed to accommodate an 8.8 metre long MRV. It is noted that service vehicles are permitted to perform contraflow movements to access the loading bays at the aged care and sports facilities, with all movements contained within private roads. This is considered appropriate, given the infrequent utilisation of these vehicles.

7.3.3 Clear Head Heights

- A minimum clear head height of 2.2 metres is to be provided for all trafficable areas throughout the development, as required by AS2890.1 (2004).
- A minimum clear head height of 2.5 metres is to be provided for all accessible parking spaces and shared zones, as required by AS2890.6 (2009).
- A minimum clear head height of 4.5 metres is to be provided for all trafficable areas of the service vehicle, as required by AS2890.2 (2018).

7.3.4 Other Considerations

- All residential vehicular accesses onto the internal road network are to be located in accordance with AS2890.1 (2004), Figure 3.1.
- All dead-end aisles are provided with the required 1.0m aisle extension in accordance with AS2890.1 (2004), Figure 2.3.
- Appropriate visual sight splays have been provided at the vehicular access in accordance with AS2890.1 (2004), Figure 3.3.
- A swept path analysis has been included in **Appendix B**, demonstrating satisfactory vehicle movements.
- A fire trail is provided to accommodate 12.5m long heavy rigid vehicles.

In summary, the internal configuration of the development has generally been designed in accordance with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. CONCLUSION

In summary:

- The development application seeks approval for a senior living development at 24 Coronation Road, Congarinni North. The development comprises 271 ILUs, an aged care centre and sports facility, with associated parking and internal road network.
- The development proposes a total of 595 car parking spaces, including 488 spaces for ILUs, 48 visitor spaces throughout the internal road network and 59 spaces for the aged care and sports facilities. These parking provisions are sufficient to comply with the DCP and will ensure all parking demands are contained within the development.
- The proposed development has been assessed to generate 123 vehicle trips during the evening peak period. For the purposes of a conservative assessment, 140 vehicle trips during the morning and evening peak periods were adopted and analysed with SIDRA Intersection 9 at the key intersection of Coronation Road, Wilson Road and Joffre Street.

  The results indicate no change to the Los A throughout all scenarios, with minor increases to delay. As such, no external improvements to the road network are required to facilitate the development, with respect to intersection performance.

  Nevertheless, in accordance with the AGTM06, BAL and BAR treatments are required for Joffre Street and Wilson Road, respectively, based on safety grounds and having regard for the semi-rural character in the vicinity of the subject intersection.
- The internal configuration of the development has generally been designed in accordance with AS2890.1 (2004), AS2890.2 (2018) and AS2890.6 (2009). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

This Traffic Impact Assessment therefore demonstrates that the subject application is supportable on transport planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

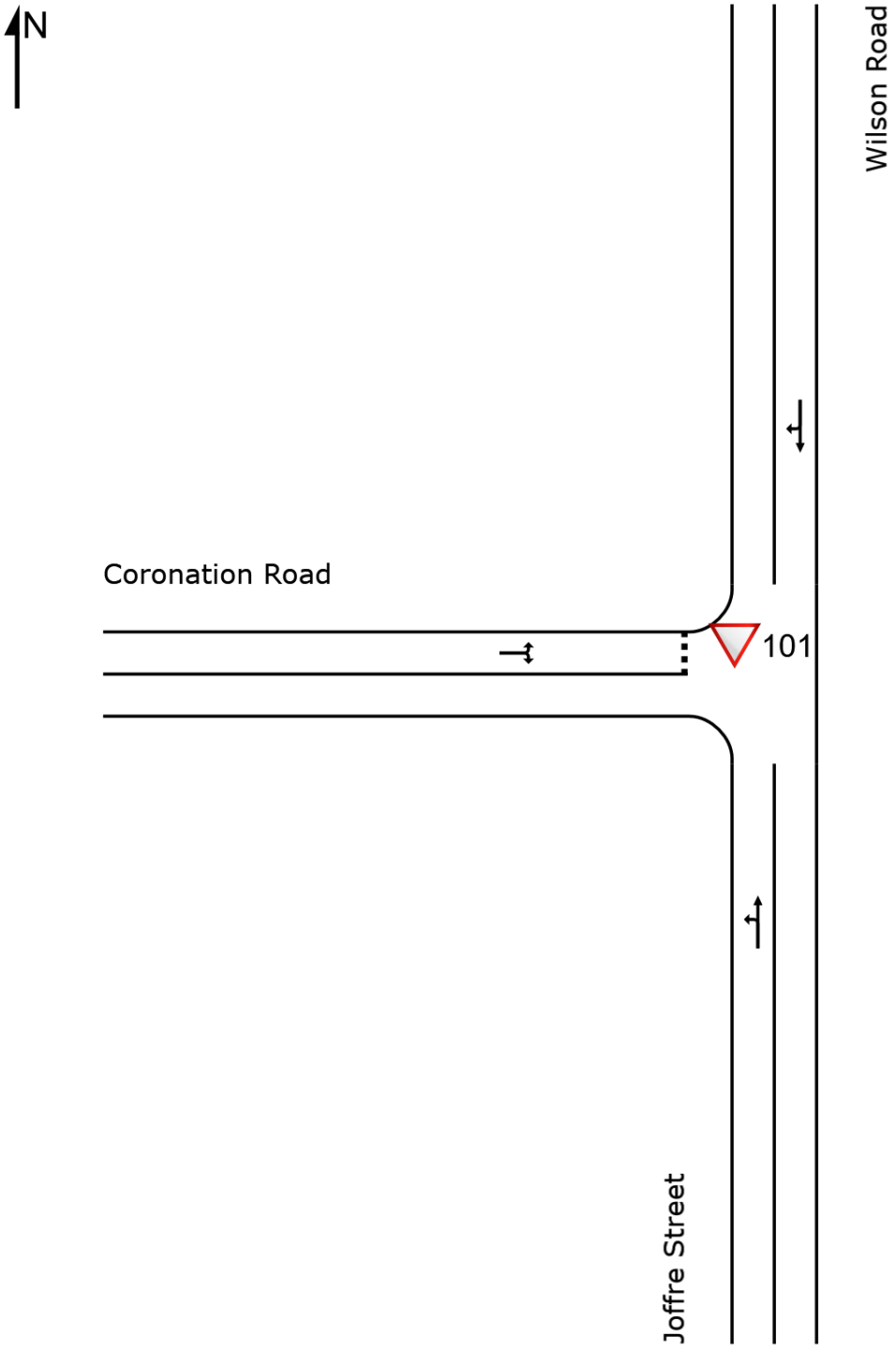
SIDRA Outputs

SITE LAYOUT

Site: 101 [A - Coronation Rd x Wilson St x Joffre St - EX_AM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: AM Peak
Scenario: Base 2014
Site Category: Base Year
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: 101 [A - Coronation Rd x Wilson St x Joffre St - EX_AM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: AM Peak
Scenario: Base 2014
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	4	0	4	0.0	0.035	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	49.3
2	T1	59	6	62	10.2	0.035	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.8
Approach		63	6	66	9.5	0.035	0.3	NA	0.0	0.0	0.00	0.03	0.00	49.7
North: Wilson Road														
8	T1	125	4	132	3.2	0.067	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
9	R2	1	0	1	0.0	0.067	4.8	LOS A	0.0	0.0	0.00	0.00	0.00	49.2
Approach		126	4	133	3.2	0.067	0.0	NA	0.0	0.0	0.00	0.00	0.00	50.0
West: Coronation Road														
10	L2	4	0	4	0.0	0.024	4.7	LOS A	0.1	0.6	0.21	0.53	0.21	46.1
12	R2	21	2	22	9.5	0.024	5.4	LOS A	0.1	0.6	0.21	0.53	0.21	45.7
Approach		25	2	26	8.0	0.024	5.3	LOS A	0.1	0.6	0.21	0.53	0.21	45.8
All Vehicles		214	12	225	5.6	0.067	0.7	NA	0.1	0.6	0.03	0.08	0.03	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 102 [B - Coronation Rd x Wilson St x Joffre St - EX_PM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: PM Peak
Scenario: Base 2014
Site Category: Base Year
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	15	0	16	0.0	0.070	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	49.1
2	T1	115	5	121	4.3	0.070	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	49.6
Approach		130	5	137	3.8	0.070	0.5	NA	0.0	0.0	0.00	0.06	0.00	49.5
North: Wilson Road														
8	T1	61	0	64	0.0	0.032	0.0	LOS A	0.0	0.0	0.01	0.01	0.01	49.9
9	R2	1	0	1	0.0	0.032	5.0	LOS A	0.0	0.0	0.01	0.01	0.01	49.2
Approach		62	0	65	0.0	0.032	0.1	NA	0.0	0.0	0.01	0.01	0.01	49.9
West: Coronation Road														
10	L2	1	0	1	0.0	0.012	4.9	LOS A	0.0	0.3	0.25	0.53	0.25	46.1
12	R2	11	1	12	9.1	0.012	5.4	LOS A	0.0	0.3	0.25	0.53	0.25	45.7
Approach		12	1	13	8.3	0.012	5.3	LOS A	0.0	0.3	0.25	0.53	0.25	45.7
All Vehicles		204	6	215	2.9	0.070	0.7	NA	0.0	0.3	0.02	0.07	0.02	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 201 [C - Coronation Rd x Wilson St x Joffre St - FU_AM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: AM Peak
Scenario: Future 2024 (2% pa growth)
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	5	0	5	0.0	0.043	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	49.3
2	T1	73	8	77	11.0	0.043	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	49.8
Approach		78	8	82	10.3	0.043	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.7
North: Wilson Road														
8	T1	153	5	161	3.3	0.082	0.0	LOS A	0.0	0.1	0.00	0.00	0.00	50.0
9	R2	1	0	1	0.0	0.082	4.8	LOS A	0.0	0.1	0.00	0.00	0.00	49.2
Approach		154	5	162	3.2	0.082	0.0	NA	0.0	0.1	0.00	0.00	0.00	50.0
West: Coronation Road														
10	L2	5	0	5	0.0	0.033	4.8	LOS A	0.1	0.8	0.25	0.55	0.25	46.1
12	R2	27	3	28	11.1	0.033	5.7	LOS A	0.1	0.8	0.25	0.55	0.25	45.6
Approach		32	3	34	9.4	0.033	5.5	LOS A	0.1	0.8	0.25	0.55	0.25	45.7
All Vehicles		264	16	278	6.1	0.082	0.8	NA	0.1	0.8	0.03	0.08	0.03	49.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 202 [D - Coronation Rd x Wilson St x Joffre St - FU_PM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: PM Peak
Scenario: Future Case 2024 (2% pa growth)
Site Category: Future Conditions 1
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	19	0	20	0.0	0.087	4.6	LOS A	0.0	0.0	0.00	0.06	0.00	49.1
2	T1	142	7	149	4.9	0.087	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	49.6
Approach		161	7	169	4.3	0.087	0.6	NA	0.0	0.0	0.00	0.06	0.00	49.5
North: Wilson Road														
8	T1	75	0	79	0.0	0.040	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	49.9
9	R2	1	0	1	0.0	0.040	5.1	LOS A	0.0	0.1	0.01	0.01	0.01	49.2
Approach		76	0	80	0.0	0.040	0.1	NA	0.0	0.1	0.01	0.01	0.01	49.9
West: Coronation Road														
10	L2	1	0	1	0.0	0.017	5.0	LOS A	0.1	0.4	0.29	0.55	0.29	46.0
12	R2	15	2	16	13.3	0.017	5.6	LOS A	0.1	0.4	0.29	0.55	0.29	45.5
Approach		16	2	17	12.5	0.017	5.6	LOS A	0.1	0.4	0.29	0.55	0.29	45.6
All Vehicles		253	9	266	3.6	0.087	0.7	NA	0.1	0.4	0.02	0.08	0.02	49.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 301 [E - Coronation Rd x Wilson St x Joffre St - FU + Development_AM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: AM Peak
Scenario: Future Case 2024 (2% pa growth) + Development
Site Category: Future Conditions 2
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	48	0	51	0.0	0.067	4.9	LOS A	0.0	0.0	0.00	0.27	0.00	50.7
2	T1	73	8	77	11.0	0.067	0.4	LOS A	0.0	0.0	0.00	0.27	0.00	52.0
Approach		121	8	127	6.6	0.067	2.2	NA	0.0	0.0	0.00	0.27	0.00	51.4
North: Wilson Road														
8	T1	153	5	161	3.3	0.083	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	50.0
9	R2	3	0	3	0.0	0.083	5.6	LOS A	0.0	0.2	0.01	0.01	0.01	51.7
Approach		156	5	164	3.2	0.083	0.1	NA	0.0	0.2	0.01	0.01	0.01	50.0
West: Coronation Road														
10	L2	10	0	11	0.0	0.130	5.3	LOS A	0.5	3.2	0.30	0.61	0.30	50.3
12	R2	117	3	123	2.6	0.130	6.5	LOS A	0.5	3.2	0.30	0.61	0.30	50.9
Approach		127	3	134	2.4	0.130	6.4	LOS A	0.5	3.2	0.30	0.61	0.30	50.8
All Vehicles		404	16	425	4.0	0.130	2.7	NA	0.5	3.2	0.10	0.28	0.10	50.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 302 [F - Coronation Rd x Wilson St x Joffre St - FU + Development_PM (Site Folder: General)]

Intersection: Coronation Road x Wilson Street x Joffre Street
Period: PM Peak
Scenario: Future Case 2024 (2% pa growth) + Development
Site Category: Future Conditions 2
Give-Way (Two-Way)

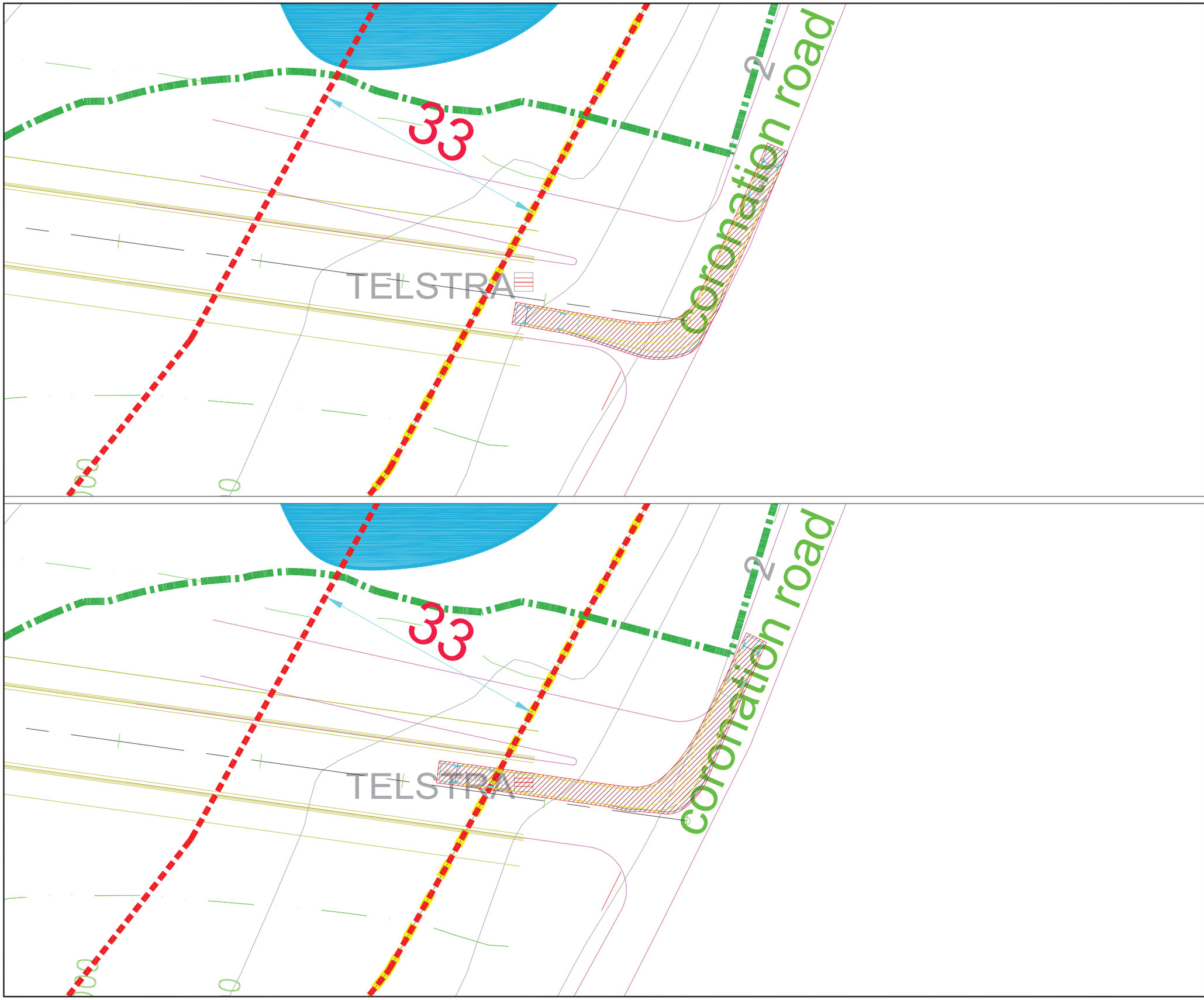
Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Joffre Street														
1	L2	109	0	115	0.0	0.136	4.9	LOS A	0.0	0.0	0.00	0.28	0.00	50.6
2	T1	142	7	149	4.9	0.136	0.4	LOS A	0.0	0.0	0.00	0.28	0.00	51.9
Approach		251	7	264	2.8	0.136	2.4	NA	0.0	0.0	0.00	0.28	0.00	51.3
North: Wilson Road														
8	T1	75	0	79	0.0	0.044	0.1	LOS A	0.0	0.3	0.07	0.04	0.07	49.8
9	R2	6	0	6	0.0	0.044	6.2	LOS A	0.0	0.3	0.07	0.04	0.07	52.1
Approach		81	0	85	0.0	0.044	0.6	NA	0.0	0.3	0.07	0.04	0.07	50.0
West: Coronation Road														
10	L2	3	0	3	0.0	0.065	5.7	LOS A	0.2	1.5	0.33	0.61	0.33	50.8
12	R2	58	2	61	3.4	0.065	6.5	LOS A	0.2	1.5	0.33	0.61	0.33	50.6
Approach		61	2	64	3.3	0.065	6.4	LOS A	0.2	1.5	0.33	0.61	0.33	50.6
All Vehicles		393	9	414	2.3	0.136	2.6	NA	0.2	1.5	0.06	0.29	0.06	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX B

Swept Path Analysis



Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1:2004 Parking facilities - Off-street car parking*, and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	VD	17-02-2021
C	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 5 10 15 20m
1:500 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

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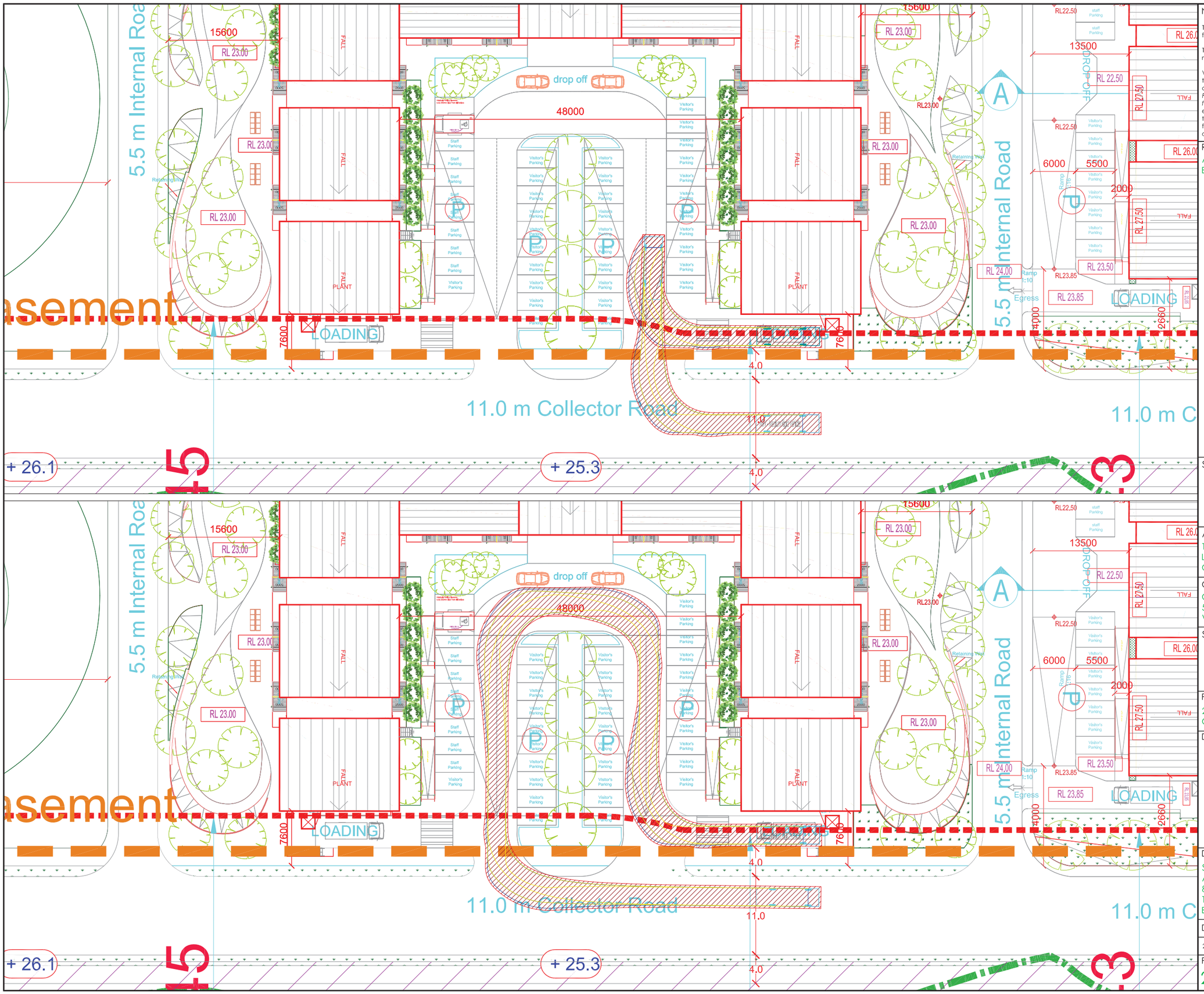
Drawing Title
Swept Path Analysis
Coronation Road Access
8.8m Medium Rigid Vehicle
TOP: Entry Movement
BOTTOM: Exit Movement

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.01	C



Notes:

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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (*AS/NZS 2890.1:2004 Parking facilities - Off-street car parking*, and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 5 10 15 20m

1:500 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

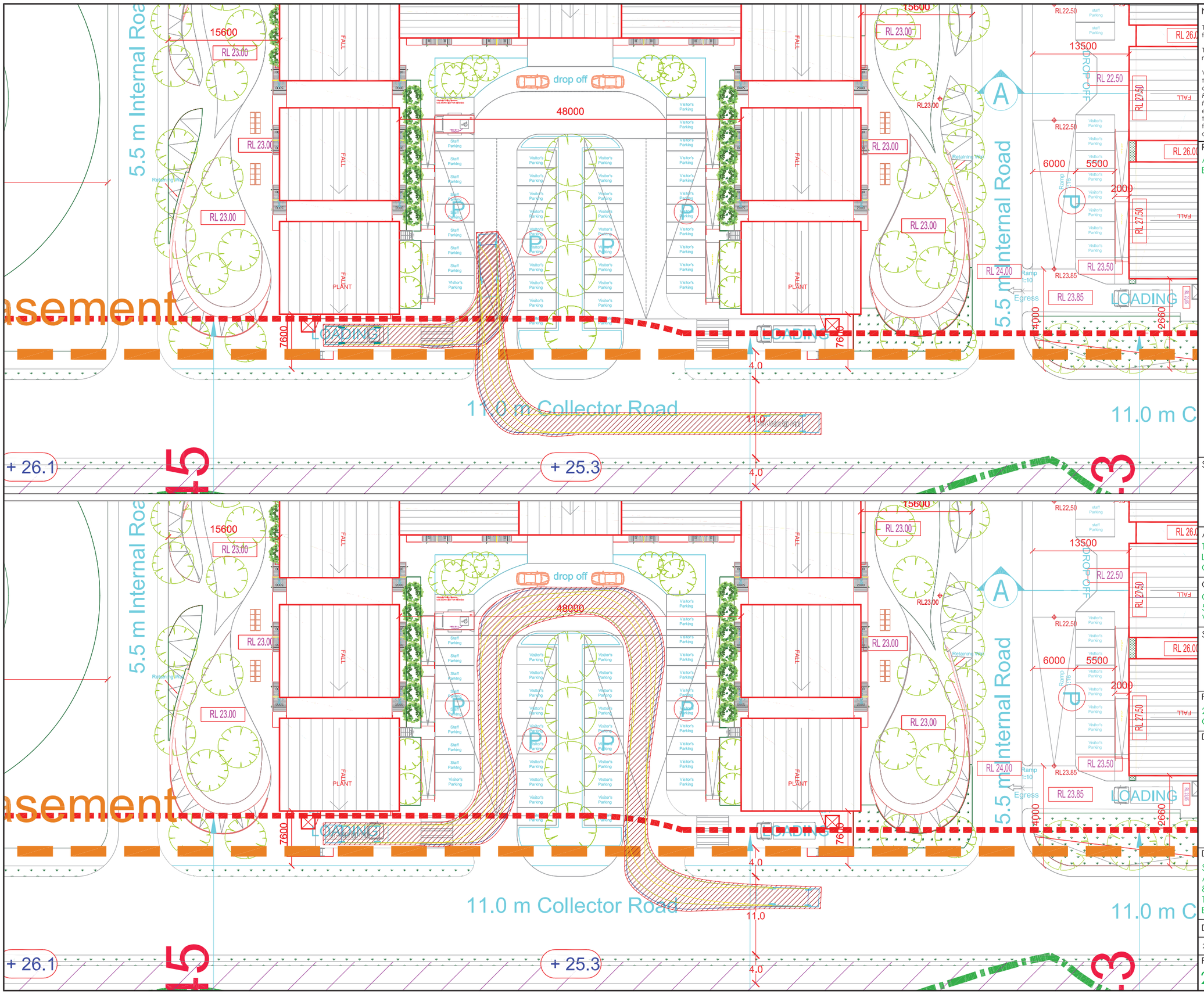
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Aged Care Facility - East Loading Dock
8.8m Medium Rigid Vehicle
TOP: Entry Movement
BOTTOM: Exit Movement

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.02	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 5 10 15 20m

1:500 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
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Strawberry Hills, NSW 2012

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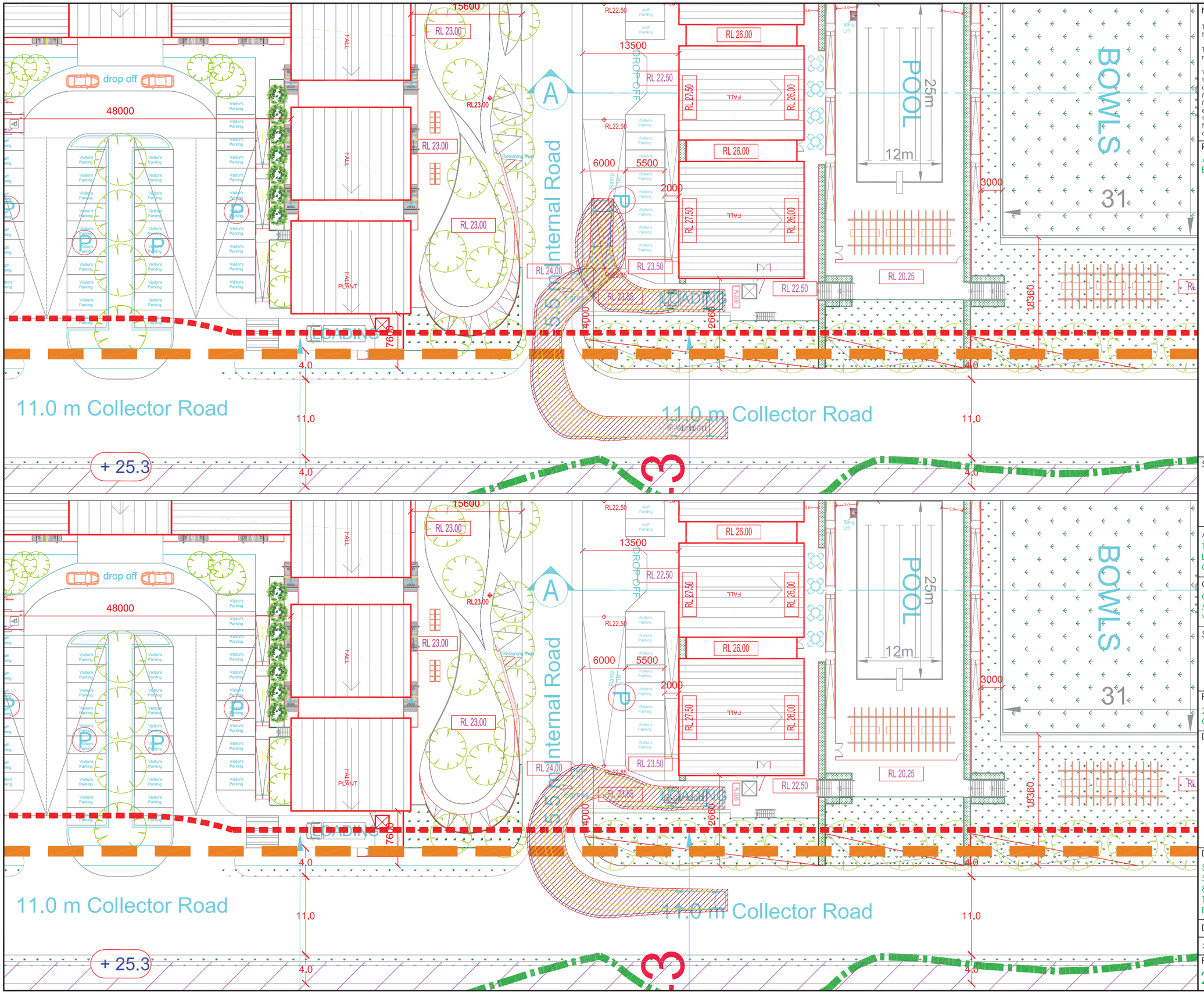
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Aged Care Facility - West Loading Dock
8.8m Medium Rigid Vehicle
TOP: Entry Movement
BOTTOM: Exit Movement

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.03	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 5 10 15 20m
1:500 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
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PO Box 1124
Strawberry Hills, NSW 2012

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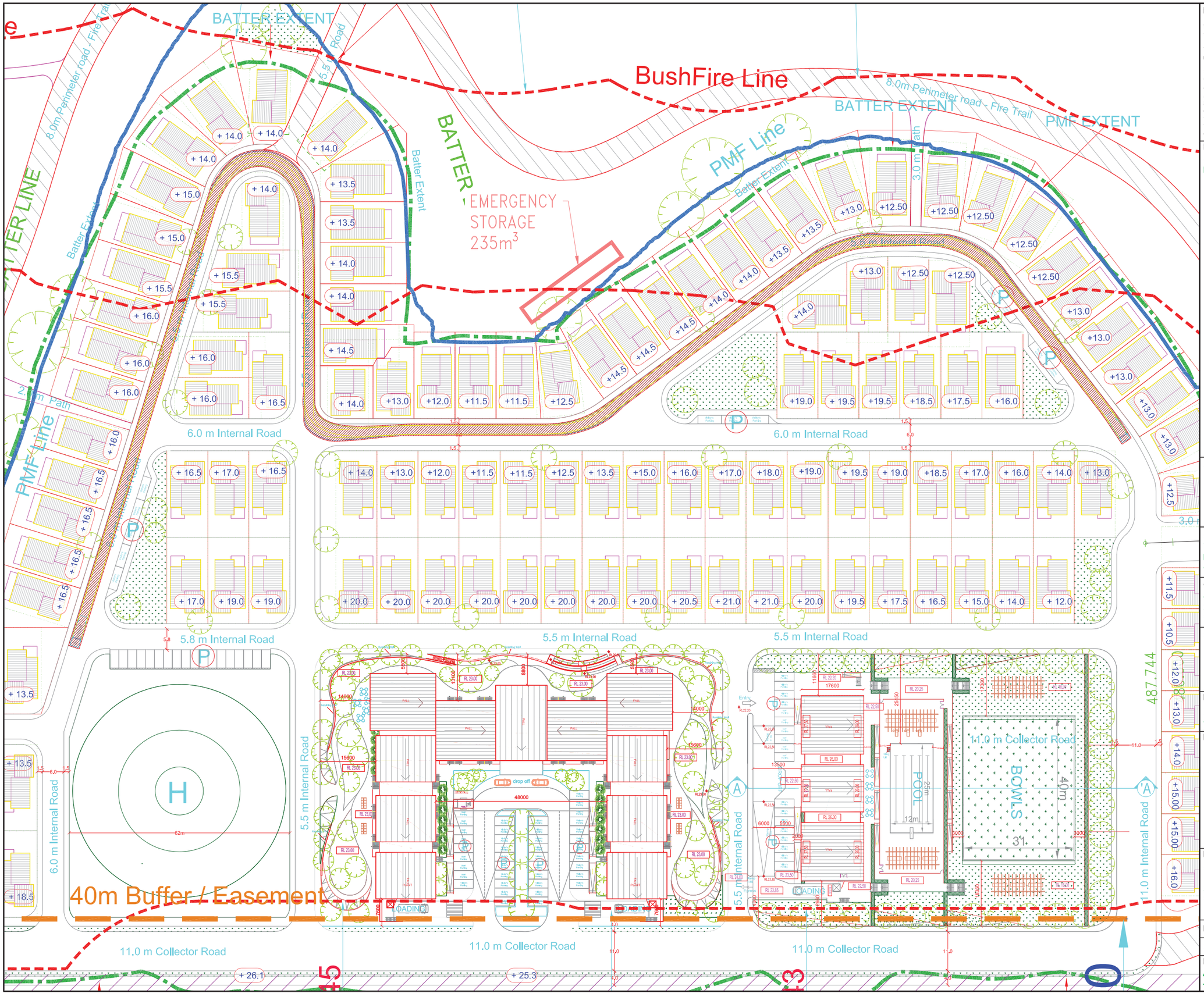
Drawing Title
Swept Path Analysis
Sports Facility - Loading Dock
8.8m Medium Rigid Vehicle
TOP: Entry Movement
BOTTOM: Exit Movement

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.04	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 10 20 30 40m
1:1000 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

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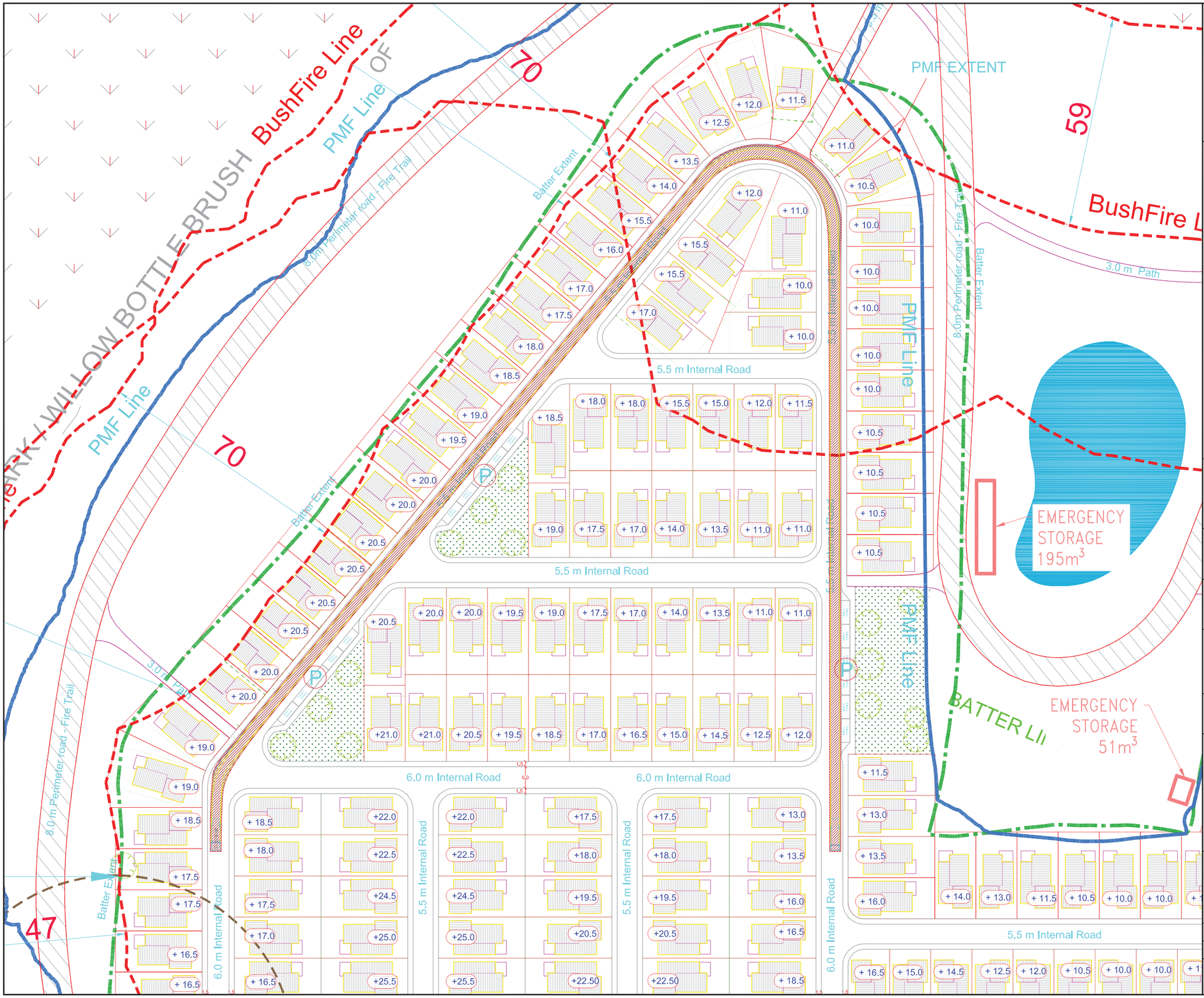
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Internal Road Network - East Section
8.8m Medium Rigid Vehicle
Vehicle Circulation

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.05	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 10 20 30 40m

1:1000 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Internal Road Network - West Section
8.8m Medium Rigid Vehicle
Vehicle Circulation

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.06	B

5.5 m Internal Road
6.0 m Internal Road
5.5 m Internal Road
11.0 m Collector Road
11.0 m Collector Road
3.0 m Path
PMF Line
PMF Line
BushFire Line
TRANSGRID STRUCTURE 290
(FROM SITE SURVEY)
EMERGENCY STORAGE 63m³
DAM WALL
IP 416.794
TP 403.414
TP 385.295
8.0m Perl
Batter Extent
Batter Extent
POOL
BOWLS
LOADING
BushFire Line
1.8m Acoustic Wall
Batter Line
site boundary
1.8m Acoustic Wall
TRANSGRID
EAS

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	15-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend
- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation
0 10 20 30 40m
1:1000 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

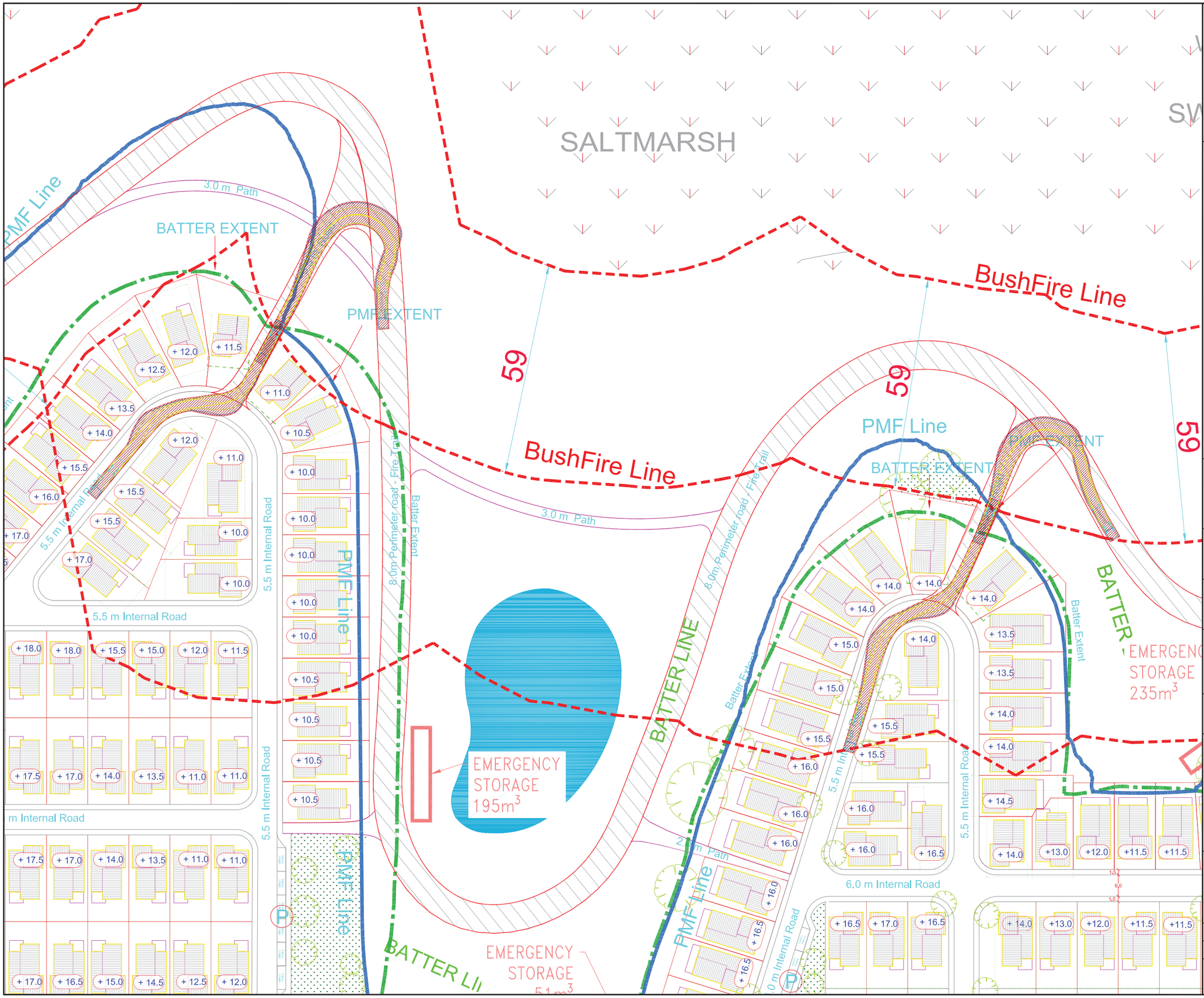
Drawing Prepared By
TRAFFIX
TRAFFIC & TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Internal Road Network - Collector Road
8.8m Medium Rigid Vehicle
Vehicle Circulation

Drawn:	Checked:	Date:
NC	VD	15-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.07	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	17-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 10 20 30 40m
1:1000 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
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w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Fire Trail to Internal Road
12.5m Heavy Rigid Vehicle (Fire Truck)
Vehicle Circulation

Drawn:	Checked:	Date:
NC	VD	17-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.08	B

SALTMARSH

BushFire Line

PMF Line

BATTER EXTENT

PMF EXTENT

3.0 m Path

59

5.5 m Internal Road

6.0 m Internal Road

8.0m Perimeter road / Fire Trail

Batter Extent

BATTER LINE

EMERGENCY STORAGE 195m³

EMERGENCY STORAGE 235m³

EMERGENCY STORAGE 51m³

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	17-02-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation

0 10 20 30 40m

1:1000 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

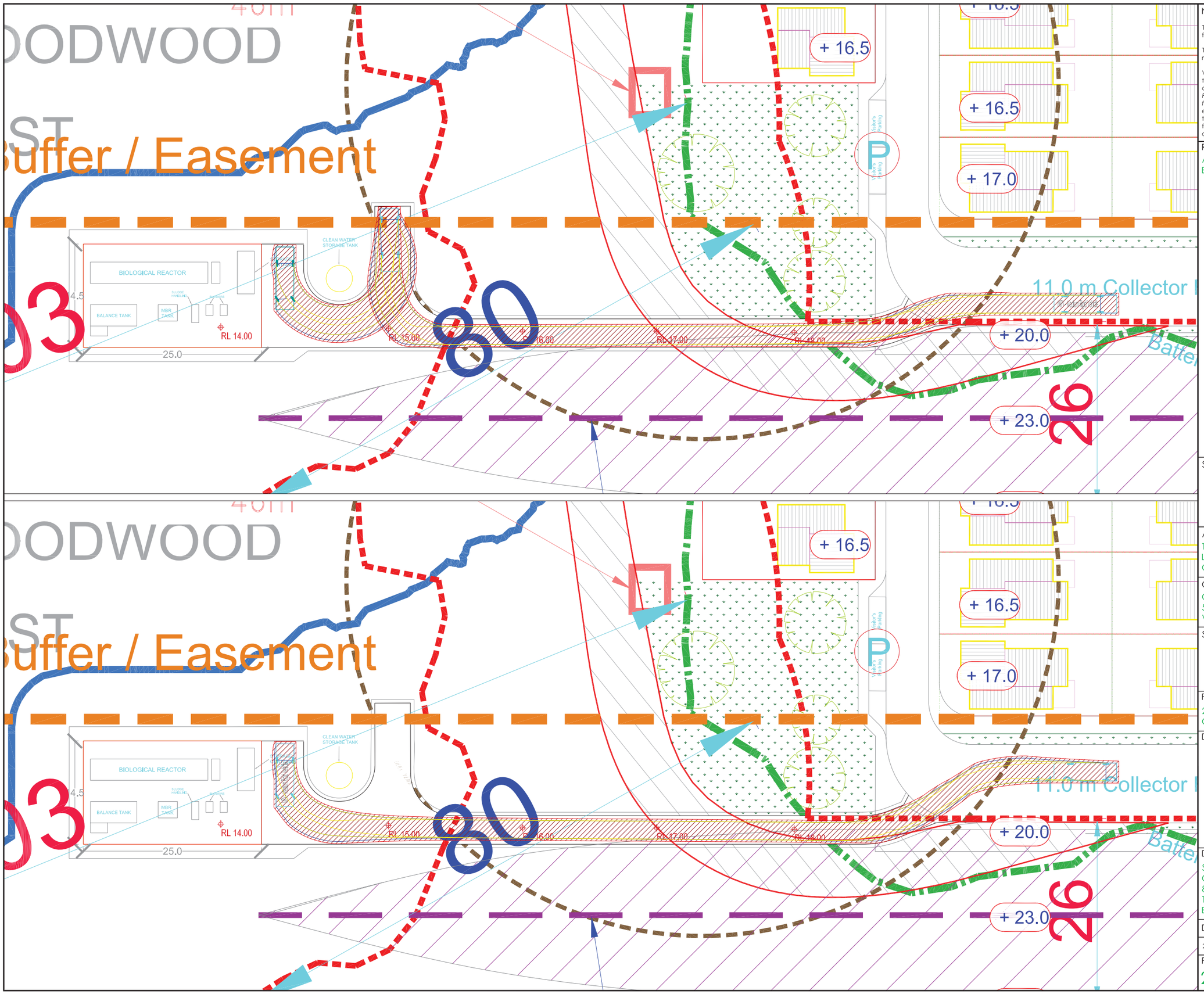
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
Internal Road to Fire Trail
12.5m Heavy Rigid Vehicle (Fire Truck)
Vehicle Circulation

Drawn:	Checked:	Date:
NC	VD	17-02-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.09	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	NC	12-07-2021
B	Swept Path Analysis	NC	08-10-2021

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Tony Owens Partners
Level 2, 12-16 Queen Street
CHIPPENDALE NSW 2008

Client
Congarinni North Pty Ltd
50 Hopetoun Avenue
VAUCLUSE NSW 2030

Scale / Plan Orientation
0 5 10 15 20m
1:500 @ A3

Project Description
24 Coronation Road
CONGARINNI NORTH NSW 2447

Drawing Prepared By

TRAFFIX
TRAFFIC & TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
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Strawberry Hills, NSW 2012
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Drawing Title
Swept Path Analysis
On-Site Sewage Treatment Plant
8.8m Medium Rigid Vehicle
TOP: Entry Movement
BOTTOM: Exit Movement

Drawn:	Checked:	Date:
NC	VD	12-07-2021

20.340d07v01 TRAFFIX [2021-10-07] - Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
20.340	DA	TX.10	B