STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

TRAFFIC & PARKING IMPACT ASSESSMENT

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
44 - 48 RODLEY AVENUE
PENRITH

PREPARED FOR INGLOW INVESTMENT TWO PTY. LTD.
OUR REF: 20-066-3

JANUARY 2021

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TABLE OF CONTENTS

APPENDICES

1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been retained by Inglow Investment Two Pty. Ltd. to prepare an updated Traffic & Parking Impact Assessment to accompany a Development Application to be lodged with Penrith City Council. The Development Application seeks consent for the demolition of three detached residential dwellings and the construction of a residential apartment development containing 29 dwellings at 44 – 48 Rodley Avenue, Penrith (hereafter referred to as the 'subject site').

This aim of this assessment is to investigate and report upon the potential traffic and parking consequences of the development application and to recommend appropriate ameliorative measures where required. This report provides the following scope of assessment:

- Section 1 provides a summary of the site location, details, existing and surrounding land-uses;
- Section 2 describes the proposed development;
- Section 3 assesses the adequacy of the proposed site access arrangements, parking provision, internal circulation and servicing arrangements with reference to relevant Council, Transport for NSW (formally Roads & Maritime Services) and Australian Standard specifications;
- Section 4 assesses the existing traffic, parking and transport conditions surrounding and servicing the subject development site including a description of the surrounding road network, traffic demands, operational performance and available public transport infrastructure; and
- Section 5 estimates the projected traffic generating ability of the proposed development and assesses the ability or otherwise of the surrounding road network to be capable of accommodating the altered demand in a safe and efficient manner.

The report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007. The application is not of sufficient scale to be referred to Transport for NSW (TfNSW) under this Instrument.

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- Transport for NSW's (TfNSW) *Guide to Traffic Generating Developments* and the more recently released *Technical Direction TDT 203/04a*;
- Penrith City Council's *Penrith Development Control Plan 2014* (DCP 2014);

- Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1:2004);

- Australian Standard for *Parking Facilities Part 3: Bicycle Parking Facilities* (AS2890.3:2015); and

- Australian Standard for *Parking Facilities Part 6: Off-Street Parking for People with Disabilities* (AS2890.6:2009).

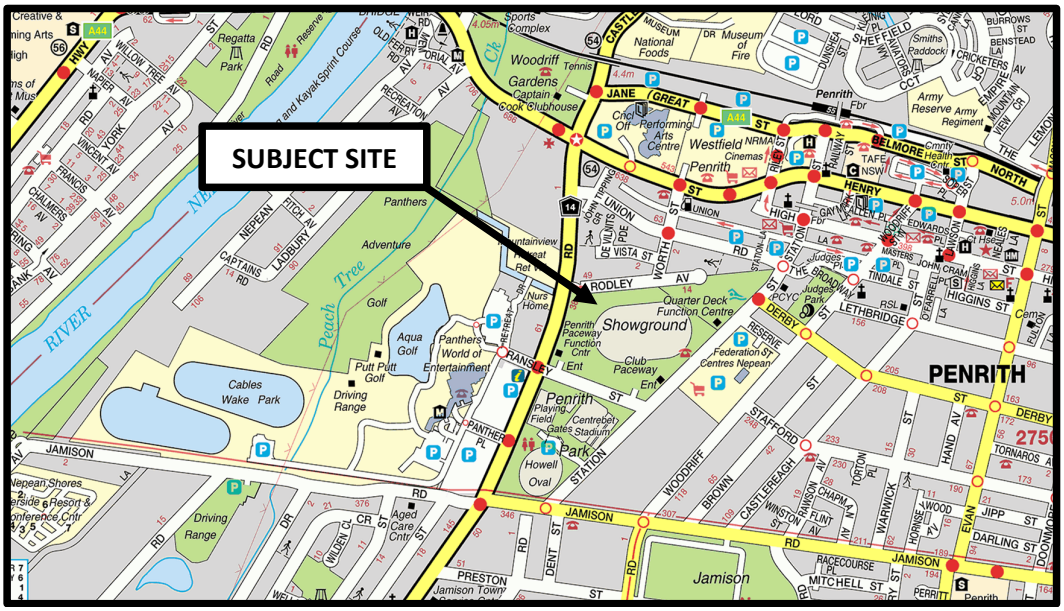
Architectural plans have been prepared by Morson Group and should be read in conjunction with this report, reduced copies of a selection of which are included as **Appendix 1** for reference.

1.3 Site Details

1.3.1 Site Location

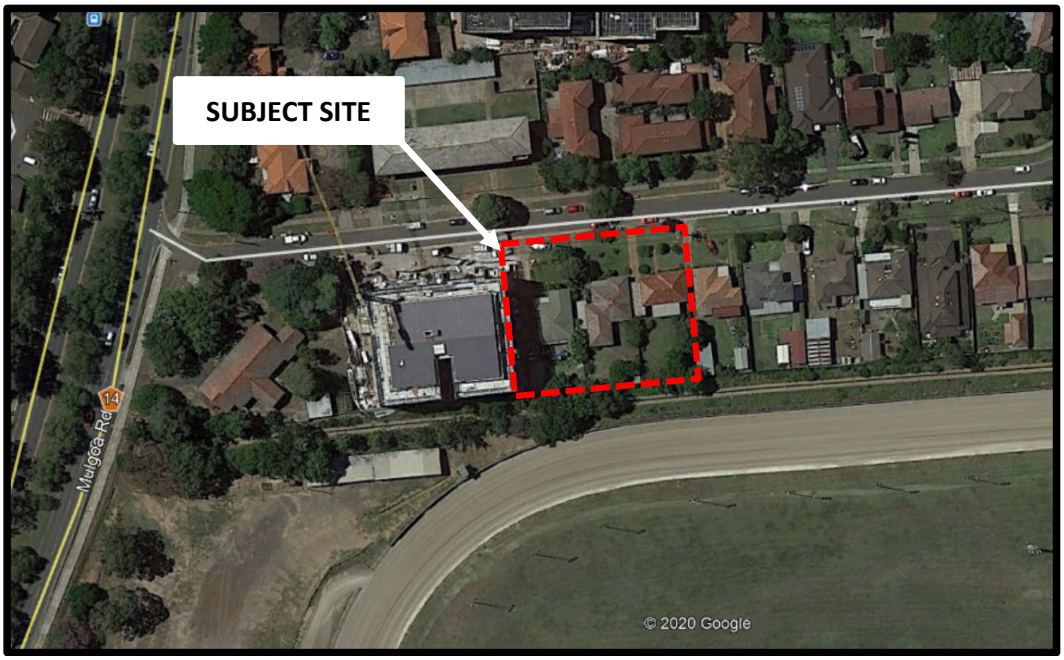
The subject site is situated on the southern side of Rodley Avenue, approximately 100m to the east of Mulgoa Road, Penrith. The site location is illustrated overleaf within a local and aerial context by **Figure 1** and **Figure 2**, respectively.

FIGURE 1
SITE LOCATION WITHIN A LOCAL CONTEXT



Source: UBD's Australian City Streets – Version 8

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT



Source: Google Earth (accessed 10/6/20)

1.3.2 Site Description

The subject site provides a real property description of Lots 62, 63 and 64 DP 33490 and a street address of 44, 46 and 48 Rodley Avenue, Penrith. Collectively, the allotments form a rectangular shaped parcel of land, providing an approximate frontage of 46m to Rodley Avenue. The site extends to the south away from Rodley Avenue some 37m, providing a total area of approximately 1,672m^2.

1.3.3 Existing Site Use

The subject site currently accommodates three detached residential dwellings. Each dwelling is serviced by vehicular access driveway connecting separately with Rodley Avenue, situated in the north-western corner of each lot.

1.3.4 Surrounding Uses

The site is adjoined to the west by a recently constructed residential apartment building, fronting and serviced by Rodley Avenue. The site is adjoined to the east by detached residential dwellings similar to that which occupy the subject site, also fronting and serviced by Rodley Avenue.

A series of medium density residential developments are situated to the north, north-east and north-west of the site, fronting Rodley Avenue, Worth Street and Vista Street.

Penrith Paceway adjoins the site to the south.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The subject application seeks Council's approval to demolish the existing dwellings and for the construction of a residential apartment development comprising a total of 29 dwellings, made up of the following:

- 26 two bedroom dwellings (including one adaptable); and
- 3 three bedroom dwellings (including two adaptable).

The dwellings are proposed to be contained within a five storey building located approximately central to the site.

The development is to be serviced two levels of basement parking accommodating 38 passenger vehicle spaces. Access between this parking area and Rodley Avenue is proposed via combined ingress / egress driveway located within the north-western corner of the site.

Pedestrian connectivity is proposed between the development and the southern Rodley Avenue footway to the east and separate from the abovementioned vehicular access driveway.

2.2 Public Domain Works

In conjunction with the on-site works, the proposal involves the following public domain works:

- The removal of three redundant driveway connections to Rodley Avenue, servicing the existing three dwellings situated within the site;
- The construction of the proposed single access driveway connecting with Rodley Avenue in the north-western corner of the site;
- A reconfiguration of the existing potential kerb-side parallel parking areas adjoining the southern Rodley Avenue kerb alignment, associated with the abovementioned removal of redundant driveways and the construction of a new access driveway;
- The implementation of parking restrictions along the southern side of Rodley Avenue, in order to ensure refuse collection vehicles are able to access / vacate the proposed new site access driveway (see Section 3.4 of this report), resulting in the potential removal of three on-street parking spaces adjacent to the site.

Appendix 2 provides graphical representations of the existing and proposed modified on-street parking arrangements / capacities within Rodley Avenue.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Vehicular Access

3.1.1 Passenger Vehicle Access

Vehicular access between the development site and Rodley Avenue is proposed to be provided via a 10.0m wide combined ingress / egress driveway located within the north-western corner of the site. The access driveway provides direct connectivity to separated but adjacent 4.5m and 4.3m wide ingress and egress travel lanes, divided by a 0.6m wide median.

AS2890.1:2004 provides driveway design specifications based on the proposed primary land use, the functional order of the access road and the number of spaces the driveway is to serve. Tables 3.1 and 3.2 of AS2890.1:2004 specify that a Category 1 type driveway is required, providing a combined ingress / egress driveway width of between 3m and 5.5m based on the local (non-arterial) nature of Rodley Avenue, the residential land-use and the on-site passenger vehicle parking provision of less than 100 spaces. The proposed 10.0m wide combined ingress / egress driveway therefore exceeds the minimum AS2890.1-2004 specifications and is accordingly considered to be satisfactory.

Swept path plans have been prepared in order to demonstrate the ability of passenger vehicles to enter and exit the site, copies of which are included as **Appendix 3**. These swept paths also indicate that all vehicles are able to enter and exit the site in a forward direction.

The safety and efficiency of access / egress movements are also proposed to be assisted by the following:

- The provision of a relatively level (less than 1:20) grade within the first 6m inside the property boundary;
- The consistent horizontal and vertical alignment of Rodley Avenue in the vicinity of the subject site resulting in satisfactory sight distance between the frontage road and the proposed site driveway, based on the prevailing 50km/h speed limit; and
- No obstructions to visibility adjacent to the driveway facilitating appropriate sight distance between exiting motorists and pedestrians along the southern Rodley Avenue footway.

3.1.2 Heavy Vehicle Access

The subject site is anticipated to generate the requirement for regular waste collection vehicle servicing. Waste collection vehicles are proposed to service the site via a dedicated loading area within Basement Level 1.

Swept path plans demonstrating the movement of Council's 9.7m long waste collection vehicle between Rodley Avenue and the site access driveway are contained within **Appendix 3** for reference. The swept path plans illustrate that amended site access arrangements in conjunction with the movement of waste collection vehicles to and from the proposed site access driveway is expected to result in the removal of up to three on-street parking spaces along the southern side of Rodley Avenue. The impact or otherwise of the loss of on-street parking Rodley Avenue is discussed within subsequent sections of this report.

3.2 Pedestrian Access

Pedestrian connectivity is proposed between the development and the southern Rodley Avenue footway to the east and separate from the abovementioned vehicular access driveway.

3.3 Parking Provision

3.3.1 Vehicular Parking Provision

The development is serviced by a total of 38 off-street passenger vehicle parking spaces, provided as follows:

Visitor spaces	5
Visitor / wash / service space	1
Resident spaces	32 (including 3 adaptable)
Total	38 spaces

3.3.2 Council's Vehicular Parking Requirements

Penrith City Council provides the following locally sensitive parking requirements for residential flat building with DCP 2014:

1 space per 1 or 2 bedrooms
2 spaces per 3 or more bedrooms
1 space per 40 units for service vehicles

1 space per every 5 dwellings, or part thereof for visitors
1 space for car washing for every 50 units, up to a maximum of 4 spaces per building

Table 2 overleaf provides the off-street parking requirements based on the above Penrith City Council's car parking rate.

TABLE 2 OFF-STREET PARKING REQUIREMENTS PENRITH DCP 2014			
Item	**Rate**	**No.**	**Spaces Required**
1 or 2 bedroom dwellings	1 space per dwelling	26	26
3 bedroom dwellings	2 spaces per dwelling	3	6
Visitor Parking	1 space per 5 dwellings	29	5.8 (adopt 6)
Service vehicles	1 space per 40 dwellings	29	0.7 (adopt 1)
Car Washing	1 space per 50 units	29	0.6 (adopt 1)
		Total	40

Table 2 indicates that DCP 2014 requires the development provide a total of 40 passenger vehicle parking spaces, comprising 32 resident, six visitor, one service and one car wash space.

The proposed total passenger vehicle parking provision complies with Council's requirements for residents and residential visitors.

Notwithstanding the above, it is acknowledged that the service vehicle, car washing bay and a single visitor space have been combined in a single parking space. The combining of the service bay and car washing bay is considered to be satisfactory given the sporadic nature of the use of such bays and the fact that a further dedicated heavy vehicle servicing area is also proposed within the upper basement level. In consideration of this and the demonstrated compliance of the total passenger parking provision with DCP 2014, the proposed passenger vehicle parking provision and allocation is considered to be satisfactory.

3.3.3 Bicycle Parking

The subject development is to provide bicycle storage racks capable of accommodating up to eight bicycles within the basement parking levels.

Penrith Council refers to NSW Government's *Planning Guidelines for Walking and Cycling* 2004 with respect to the provision of bicycle parking. This publication provides the following recommendations relevant to the subject proposal:

Resident
20% of units should provide a space

Visitors
5% of units should provide a space

Based on 29 dwellings, the NSW Government's *Planning Guidelines for Walking and Cycling* recommends resident and visitor bicycle parking provision of 5.8 (adopt six) resident and 1.5 (adopt two) visitor parking spaces or a total of eight spaces.

The proposed provision of eight on-site bicycle parking spaces therefore complies with the requirement specified in the NSW Government's guidelines and accordingly, is considered to be satisfactory.

3.3 On-Street Parking Provision

It has previously been presented that the amended site access arrangement and the movement of waste collection vehicles to and from the proposed site access driveway is expected to result in the reduction of up to three existing parallel parking spaces along the southern side of Rodley Avenue (see **Appendices 2** and **3**).

Appendix 2 provides graphical representations of the existing and proposed modified on-street parking arrangements within Rodley Avenue. These figures illustrate that the proposed rationalisation development is expected to result in a net on-street parking supply reduction of three spaces.

The following is noted in respect of the above:

- Site observations by staff of this Practice both prior to and during the COVID-19 situation have indicated that whilst demand for parking within Rodley Avenue is notable, particularly towards Worth Street, capacity exists within the immediate vicinity of the subject site to accommodate additional demand (or loss of supply) if required;

- All development abutting Rodley Avenue provides off-street parking to accommodate demand generated by those uses; and

- The proposed development complies with Council's off-street resident and visitor parking requirements, thereby ensuring that it is not expected to result in additional on-street parking demand.

In consideration of the above, the proposed nett reduction in on-street parking provision of three spaces is not envisaged to result in unreasonable impacts on surrounding residential amenity. Conversely, it should be acknowledged that the removal of localised kerb-side parking along the southern kerb alignment will provide additional effective roadway carriageway width to assist in accommodating two-way traffic flow within Rodley Avenue.

3.5 Internal Circulation and Manoeuvrability

3.5.1 Upper Basement Access Ramp

Passenger vehicles, upon entry to the site via Rodley Avenue, will travel in a forward direction via an internal roadway / ramp running along the western site boundary connecting with the upper basement parking level.

The proposed configuration of the basement access ramp with the upper basement level is such that, under normal circumstances, opposed passenger vehicles are capable of manoeuvring between the development access driveway and the upper basement parking level simultaneously. Swept paths demonstrating this have been prepared and attached as **Appendix 3**.

Notwithstanding this, the development design incorporates an internal traffic signal system in order to govern the traffic flow between the development access driveway, the basement passenger vehicle parking area and the internal waste collection bay, with the intention of ensuring that Council's refuse collection vehicle can manoeuvre to, within and from the subject site, clear of passenger vehicle movements.

The traffic signal system is to utilise passenger vehicle and special truck only red / green traffic lanterns located at the access driveway, facing the waste collection bay and within the upper basement level. The lanterns within the access driveway and basement level one are to be supplemented with 'Stop Here on Red' signage and stop lines.

The default traffic signal position will display green movements both entering the site from Rodley Avenue and exiting the site from the upper basement parking level. Notwithstanding this, on arrival of Council's waste collection vehicle on site, the operator of the vehicle is to put in a call to the traffic signal system via the intercom contained within the access ramp. Upon activation of the signal system, red lanterns will be displayed to the signals situated within the access ramp and the upper basement parking level. Following a short delay to allow any vehicles already in internal access ramp to complete its journey to the site access driveway, the lantern within the access ramp will then display a special green truck only lantern, whilst the passenger vehicle lanterns within the access ramp and the upper basement parking area will remain red. This will ensure that Council's waste collection vehicle will be able to safely travel from the site access driveway to the dedicated loading bay adjacent to the upper basement parking level clear of any potential passenger vehicle movements.

Swept path plans demonstrating the movement of Council's waste collection vehicle from Rodley Avenue into the site access driveway and thence into the designated waste collection bay, via the development access ramp, are contained within **Appendix 3** for reference.

After Council's waste collection vehicle has completed its reverse entry ingress movement into the upper basement level loading bay, the operating system will thence signal for all of the on-site passenger vehicle lanterns to revert back to the default position, being green.

Following completion of loading / unloading activities, the operator of Council's waste collection vehicle will once again signal to the site operating system via activation of a push button within the waste collection area. Upon activation of this button, the operating system will again display a red to the passenger vehicle lanterns within the access ramp and the basement parking area. Following a short delay to allow a passenger vehicle already within the ramp system to complete its journey between the driveway and the basement parking level, the truck only lantern facing the loading bay will change from red to green thereby allowing Council's waste collection vehicle to safely exit the loading area and travel in an unimpeded fashion towards the site access driveway. Swept path plans demonstrating the movement of Council's waste collection vehicle from the waste collection bay to Rodley Avenue via the development access ramp and driveway are contained within **Appendix 3** for reference.

When the directional sensitive radar unit located at the driveway is activated by the exiting vehicle, the system returns to the default position.

The indicative location of the entrance stop line, vehicle detector, lanterns and push buttons are illustrated on the amended architectural plans.

Traffic signal systems such as that described are typically fitted with a battery powered back up system to ensure that they continue to operate during power black outs.

The specific details of the internal traffic signal system are typically specified by traffic signal contractors at construction certificate stage, the requirement for which could reasonably be imposed by Council as a condition of development consent. Incorporating such an internal traffic signal system, the proposed traffic management measure facilitating the safe ingress and egress movements of Council's waste collection vehicle, is envisaged to be satisfactory.

3.5.2 Passenger Vehicle Parking / Circulation Areas

The basement passenger vehicle areas are proposed to comprise a series of 90 degree angled parking spaces, being serviced by adjoining circulation aisles. The basement parking area has been designed to accord with the minimum requirements of AS2890.1:2004, AS2890.3:2015 and AS2890.6:2009, providing the following minimum dimensions:

- Standard 90 degree passenger vehicle parking space width = 2.5m;
- Disabled vehicular parking space width = 2.4m (with adjoining 2.4m wide shared area);
- Vertically hung and staggered bicycle parking space width = 0.5m;
- Standard and disabled parking space width = 5.4m;
- Vertical bicycle rack depth = 1.2m;
- Aisle width servicing vehicular and bicycle parking spaces = 5.8m;
- Parking aisle extension past dead end 90 degree parking spaces = 1.0m;
- Headroom = 2.2m;
- Headroom above disabled parking spaces and adjoining shared areas = 2.5m;
- Maximum grade = 1:4;
- Maximum change in grade = 1:8; and
- Maximum grade within 6m of the property boundary = 1:20.

Safe and efficient internal manoeuvring and parking space accessibility is anticipated to result, taking into consideration the above compliance with the relevant AS2890.1:2004, AS2890.3:2015 and AS2890.6:2009 specifications.

In order to demonstrate the internal passenger vehicle manoeuvrability within the vicinity of these areas and generally throughout the overall parking area, this Practice has prepared a number of swept path plans which are included as **Appendix 3**. The turning paths provided on the plans have been generated using Autoturn software and derived from B99 and B85 vehicle specifications provided within AS2890.1:2004.

Section B4.4 of AS2890.1:2004 states the following with regard to the use of templates to assess vehicle manoeuvring:

'Constant radius swept turning paths, based on the design vehicle's minimum turning circle are not suitable for determining the aisle width needed for manoeuvring into and out of parking spaces. Drivers can manoeuvre vehicles within smaller spaces than swept turning paths would suggest.'

It would therefore appear that whilst the turning paths provided within AS2890.1:2004 can be utilised to provide a 'general indication' of the suitability or otherwise of internal parking and manoeuvring areas, vehicles can generally manoeuvre more efficiently than the paths indicate. Notwithstanding this, the swept path plans illustrate that passenger vehicles can manoeuvre throughout and enter and exit the most difficult passenger vehicle parking spaces within the parking areas.

3.5.3 Site Servicing

It is expected that the subject development will generate the requirement for minor deliveries and weekly refuse collection.

It is expected that minor deliveries associated with the development are expected to be undertaken by vans and utilities. Such servicing activities are proposed to be accommodated within the designated service bay located within the upper basement parking level.

Waste collection vehicles are proposed to service the site via a single dedicated loading zone situated adjacent to the southern boundary of the upper basement parking level. The waste collection area provides the following minimum dimensions, according with Council's waste collection policy:

- Refuse collection bay width = 5.3m;
- Refuse collection bay length = 20.6m; and
- Minimum clearance throughout area required to accommodate refuse collection vehicle = 3.5m.

In order to demonstrate the internal service vehicle manoeuvrability within the amended development design, this Practice has prepared a number of swept

path plans which are included as **Appendix 3**. The swept path plans illustrate the following:

- Council's 9.7m long refuse collection vehicle is capable of entering the site from Rodley Avenue via a left turn movement in a forward direction and thence continuing in a forward direction to access the upper basement parking level, with reasonable clearance to public road or private development physical obstructions (incorporating the previously presented removal of four on-street parking spaces along the northern side of Rodley Avenue); and

- Upon accessing the upper basement parking level, the above 9.7m long refuse collection vehicle is thence capable of performing a reverse entry movement into the dedicated loading zone clear of any potential passenger vehicle movements; and

- Following completion of loading / unloading activities, the 9.7m long refuse collection vehicle is capable of exiting the internal formalised servicing area and the site in a forward direction to Rodley Avenue via a left turn, with reasonable clearance to private development or public road physical obstructions (once again, incorporating the previously presented removal of four on-street parking spaces along the northern side of Rodley Avenue).

In consideration of the above, the proposed waste collection arrangements are therefore considered to be satisfactory.

4. EXISTING TRAFFIC CONDITIONS

4.1 Surrounding Road Network

The following provides a description of the road network surrounding the subject site:

- **Rodley Avenue** performs a local access road function under the care and control of Penrith City Council. It provides an east-west alignment connecting the southbound Mulgoa Road carriageway in the west with Worth Street approximately 115m to the east of the site. Rodley Avenue extends a further 160m to the east of Worth Street, at which point it forms a terminating cul-de-sac.

  Rodley Avenue provides an approximate pavement width of 7m providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. Traffic flow is governed by a sign posted speed limit of 50km/h.

  Rodley Avenue provides a half road closure to the west on immediate approach to the Mulgoa Road southbound carriageway, from which left turn entry movements only are facilitated.

  Rodley Avenue forms a T-junction with Worth Street to the east, operating under major / minor priority control with Rodley Avenue performing the through route.

- **Worth Street** provides a north-south collector function, also under the care and control of Penrith City Council. It provides a connection between High Street and Penrith Plaza in the north, intersecting with which under traffic signal control, and Rodley Avenue in the south. Worth Street also intersects with Union Road under traffic signal control, some 150m to the north of Rodley Avenue.

  Worth Street, between Rodley Avenue and Union Road, provides a 7m wide pavement providing one through lane of traffic in each direction, in conjunction with indented parallel passenger vehicle parking bays. To the north of Union Road, Worth Street forms a 13m wide pavement providing two though lanes of traffic in each direction.

- **Union Road** provides an east-west collector function, linking Station Street in the east with Mulgoa Road in the west. Union Road provides a 13m wide pavement, primarily providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. Parking restrictions apply on immediate approach to and departure from Worth Street, facilitating two through lanes on approach and departure from the signalised intersection.

Union Road intersects with Station Street (and The Broadway) under single lane circulating roundabout control to the east. To the west, Union Road intersects with Mulgoa Road under major / minor priority control with Mulgoa Road performing the priority route. Whilst a dedicated right turn lane and break is provided within the Mulgoa Road central median, facilitating right turn movements to Union Road, right turn egress movements from Union Road are prohibited.

4.2 Existing Traffic Volumes

Staff of Stanbury Traffic Planning have undertaken surveys of the intersection of Union Road and Worth Street in order to accurately ascertain the traffic demands. Surveys were undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm on the 28th of May 2018. Whilst it is acknowledged that these surveys are now two years old, observations undertaken in early 2020 indicate that the survey results remain valid. Furthermore, in light of current COVID-19 traffic implications, it was not considered appropriate at the time of writing this report to conduct further surveys, as present surveys would potentially not be reflective of normal traffic demands.

Figure 3 below provides a summary of the surveyed commuter peak hour (8:00am – 9:00am and 4:00pm – 5:00pm) traffic flows at the intersections whilst full details are contained within **Appendix 4** for reference.

FIGURE 3
EXISTING WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
INTERSECTION OF UNION ROAD & WORTH STREET

Legend: AM Peak / PM Peak

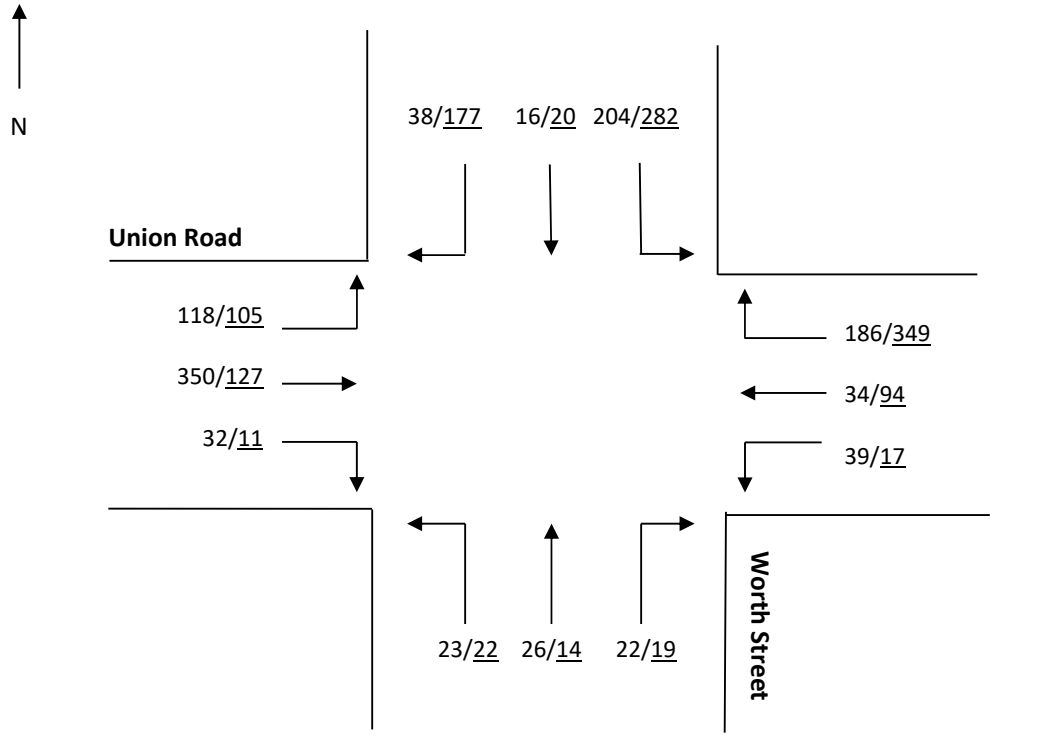


Figure 3 illustrates the following:

- Worth Street, to the south of Union Road, accommodates directional traffic demands of less than 100 vehicles per hour;
- Worth Street, to the north of Union Road, accommodates directional traffic demands of 300 – 500 vehicles per hour; and
- Union Road accommodates directional traffic demands of 300 – 500 vehicles per hour.

4.3 Existing Road Network Operation

4.3.1 Intersection Operation

The surveyed intersection of Union Road and Worth Street has been analysed utilising the SIDRA computer intersection analysis program in order to objectively assess the operation of the surveyed intersections. SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the Roads and Maritime Services.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 3** (being the TfNSW NSW method of calculation of Level of Service).

TABLE 3
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS
SIGNALISED INTERSECTIONS

Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
SIGNALISED INTERSECTIONS AND ROUNDABOUTS		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory but near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**. **Table 4** provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 5**.

TABLE 4 SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE INTERSECTION OF UNION ROAD & WORTH STREET		
	AM	**PM**
Average Vehicular Delay (seconds)	26.7	29.9
Degree of Saturation	0.54	0.71
Level of Service	B	C

Table 4 indicates that the intersection of Union Road and Worth Street currently operates with a satisfactory level of service with spare capacity.

4.3.2 Rodley Avenue Performance

Rodley Avenue accommodates low traffic demands commensurate with its access function within the local road hierarchy. In this regard, directional traffic demands have been observed to be less than one vehicle every minute. TfNSW's *Guide to Traffic Generating Developments* specifies that a two-way two-lane roadway accommodating directional traffic demands of less than 200 vehicles per hour provides a level of service 'A' during peak periods, representing free flow where drivers are virtually unaffected by others in the traffic stream.

Notwithstanding the above, the 7m width of the Rodley Avenue pavement in conjunction with the prevalence of kerb side parking along both alignments results in one direction of traffic flow being permitted at any one time. Opposing traffic flow therefore has been observed to occur under courtesy conditions whereby a vehicle will utilise a break in kerb side parking, generally associated with a driveway, to stop and allow a vehicle travelling in the opposite direction to pass. The low traffic demands combined with general diligence displayed by motorists has been observed to ensure that two way traffic flow within Rodley Avenue occurs in a reasonably safe and efficient manner.

4.3.3 Abutting Site Access Movements

Traffic movements from abutting development sites and Rodley Avenue have been observed to occur in a safe and efficient manner. These movements are assisted by the low traffic demands within Rodley Avenue resulting in regular and extended gaps in traffic flow, allowing motorists to undertake turning movements from abutting development driveways without unreasonable delay.

The proliferation of driveways servicing abutting development sites in the immediate vicinity result in trailing through traffic movements within Rodley Avenue being aware of the potential for vehicles to decelerate to access private properties. This situation, combined with the consistent vertical and horizontal alignment of Rodley Avenue in the immediate vicinity, results in vehicles being able to undertaken entry and egress movements between private abutting development sites and the public road in a safe and efficient manner.

4.3.4 Arterial Road Network Connectivity

The local road network provides connectivity to the surrounding regional road network as follows:

- Worth Street intersects with High Street to the north under traffic signal control with all movements being facilitated;
- High Street intersects with Mulgoa Road to the north-west under traffic signal control with all movements being facilitated;
- High Street intersects with The Northern Road and Great Western Highway to the east under traffic signal control with all movements being facilitated;
- Both Ransley Street and Jamison Road (accessed via Station Street) intersect with Mulgoa Road, to the south-west under traffic signal with all movements being facilitated;
- Union Road intersects with Mulgoa Road under major / minor control to the north-west, albeit with right turn movements from Union Road being prohibited; and
- Rodley Avenue intersects with the southbound Mulgoa Road carriageway under major / minor priority control to the west, whereby left turn movements to the local road are facilitated.

Whilst traffic demands within the surrounding state road network (High Street, Mulgoa Road, The Northern Road and Great Western Highway) are considerable, commensurate with their functional hierarchy in the road network, the abovementioned precinct access controls provide motorists with safe and efficient connectivity to the surrounding regional and state road network.

4.4 Public Transport

4.4.1 Heavy Rail

The site is located approximately 1km walking distance to the south-west of Penrith Railway Station. Penrith Railway Station provides access to train services which operate along the T1 (North Shore, Northern & Western) Line.

The T1 Line provides regular services between Penrith and the remainder of the Sydney Trains network, servicing The Blue Mountains to the west and Blacktown, Parramatta and The City to the east.

4.4.2 Buses

The following bus routes operate along High Street, with the closest stop being located approximately 500m walking distance from the site:

- Route 688 between Penrith and Emu Heights;

- Route 689 between Penrith and Leonay;
- Route 691 between Penrith and Mount Riverview; and
- Route 690P between Penrith and Springwood.

Further, the following bus routes operate along Station Street, with the closest stop being located approximately 600m walking distance from the site:

- Route 770 between Penrith and Mount Druitt;
- Route 774 between Penrith ad Mount Druitt via Nepean Hospital;
- Route 775 between Penrith and Mount Druitt via Erskine Park;
- Route 776 between Penrith and Mount Druitt via St Clair;
- Route 781 between Penrith and St Marys via Glenmore Park;
- Route 791 between Penrith and Jamisontown via South Penrith;
- Route 793 between Penrith and Jamisontown;
- Route 794 between Penrith and Glenmore via The Northern Road;
- Route 795 between Penrith and Warragamba;
- Route 797 between Penrith and Glenmore Park;
- Route 799 between Penrith and Glenmore Park via Regentville; and
- Route S13 between Penrith and Mountainview Village.

It is acknowledged that at the time of writing this report, bus services and hours may be affected due to COVID-19.

4.4.3 Pedestrians / Cyclists

Pedestrians and cyclists are provided with the following access and mobility infrastructure within the immediate vicinity of the subject site:

- A footpath is provided along the northern side of Rodley Avenue;
- A footpath is provided along the western side of Worth Street between Rodley Avenue and Union Road;
- Signalised pedestrian crossings are provided over all approaches of the intersection of Union Road and Worth Street;
- Footpaths are provided along both sides of Worth Street to the north of Union Road and along both sides of Union Road;

- A shared path is provided along the eastern side of Mulgoa Road; and
- Signalised pedestrian crossings are provided over all approaches of the intersection of High Street and Worth Street.

5. PROJECTED TRAFFIC CONDITIONS

5.1 Traffic Generation

Traffic generation rates for various land-uses have been established through extensive surveys undertaken throughout NSW and published within TfNSW's *Guide to Traffic Generating Developments* and the more recently released *Technical Direction TDT 203/04a*. The following sub-sections provide a summary of the traffic generating potential of the previous and proposed site uses with respect to those rates established by TfNSW.

5.1.1 Existing Site Uses

Section 1.3.3 of this report presented that the subject site currently contains three detached residential dwellings.

TfNSW's *Technical Direction TDT 203/04a* specifies average traffic generation rates of 0.95 peak hour vehicle movements per dwelling during the morning peak and 0.99 peak hour vehicle movements per dwelling during the evening peak.

For the purposes of this assessment and for reasons of simplicity, a traffic generation rate of 1 peak hour vehicle trip per dwelling has been applied to detached residential dwellings. The current site development is therefore capable of generating up to three vehicle trips to and from the site during weekday commuter peaks periods.

5.1.2 Proposed Development

Technical Direction TDT 203/04a specifies a maximum weekday peak hour traffic generation rate of 0.19 trips per dwelling for high density residential dwellings.

Whilst the development is consistent with the definition of high density residential development contained within TfNSW's *Guide to Traffic Generating Developments* (containing more than 20 dwellings, being five storeys and in close proximity to high density residential development), it is the experience of this Practice that Council officers prefer that traffic generation for the residential apartment developments within the Penrith area be calculated based on medium density generation rates. The *Guide to Traffic Generating Developments* provides the following peak hour generation rates for medium density residential development:

Medium Density Residential Dwellings
0.5 trips per one and two bedroom dwelling
0.65 trips per three bedroom dwelling.

The peak hour traffic generating ability of the proposed development is accordingly estimated to be in the order of 15 trips.

5.2 Traffic Impacts

The proposed development has been projected to generate up to 15 peak hour trips to and from the site, or 12 peak hour trips over and above that currently capable of being generated by the existing three detached dwellings provided on-site. This equates to approximately one vehicle movements every 4 minutes during commuter peaks, or one additional vehicle movement every 5 minutes over and above that capable of being generated by existing site uses. Such a level of additional traffic is not projected to, in itself, result in any unreasonable impacts on the existing operational performance of the surrounding local road network. The previous assessment contained within this report has revealed that traffic demands within the surrounding local road network are reasonably low and accordingly motorists are provided with a good level of service with space capacity.

Whilst it is acknowledged that traffic demands within the surrounding arterial road network are considerable, the positive intersection control servicing connection to / from the surrounding regional and state road network allows motorist to access and egress the local precinct in a safe and efficient manner.

In consideration of the above, the impact of the development is most likely to be a result of the safety and efficiency with which motorists are capable of entering and exiting the development. The low traffic demands within Rodley Avenue combined with the good sight distance provisions is such that it is envisaged that motorists will be capable of entering and exiting the site in a safe and efficient manner.

5.3 Transport Impacts

The subject site is located within reasonably close walking distance to a number of bus services and a 10 minute walk to train services. It is accordingly expected that a proportion of the future residents within the subject development will utilise the surrounding public transport infrastructure to access destinations throughout the Sydney metropolitan area. The capacity of the existing public transport system is however not envisaged to be measurably affected by any additional demand associated with the development, given its limited scale.

6. CONCLUSION

This report assesses the potential traffic and parking implications associated with a residential development containing 29 dwellings at 44 - 48 Rodley Avenue, Penrith. Based on this assessment, the following conclusions are now made:

- The proposed site access arrangements are projected to result in motorists being capable of entering and exiting the subject site in a safe and efficient manner;
- The proposed off-street vehicular parking provision is considered to be satisfactory, given the requirements of DCP 2014;
- The internal passenger vehicle circulation arrangements are capable of providing for safe and efficient internal manoeuvring;
- The proposed site access arrangements are projected to result in a nett reduction in surrounding on-street parking supply of three spaces;
- Recent observations have indicated that there is capacity to accommodate the abovementioned reduction in on-street parking supply without unreasonable impacts on surrounding residential amenity;
- The internal passenger vehicle circulation arrangements are capable of providing for safe and efficient internal manoeuvring;
- The proposed dedicated refuse collection area within the upper basement parking level is projected to safely and efficiently accommodate refuse servicing of the site being governed by an internal traffic signal system;
- The surrounding road network operates with a satisfactory level of service during peak periods;
- The subject development has been projected to generate up to 12 additional peak hour vehicle trips to and from the subject site over and above that capable of being generated by the existing site dwellings; and
- It is considered that the adjoining road network is capable of accommodating the traffic projected to be generated by the subject development.

It is considered, based on the contents of this report and the conclusions contained herein, there are no traffic or parking related issues that should prevent approval of the subject application. This action is therefore recommended to Council.

APPENDIX 1

PROPOSED RESIDENTIAL FLAT BUILDING

44-48 Rodley Avenue, Penrith, NSW, 2750

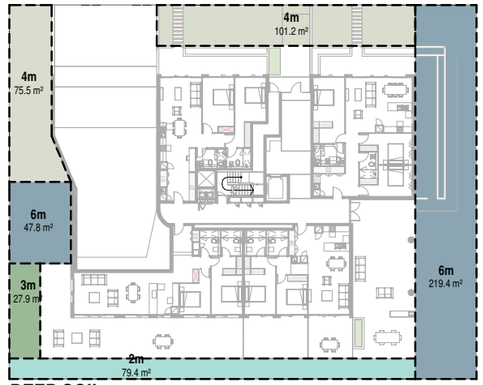
DEVELOPMENT DETAILS		
Site Area		1672m²
Gross Floor Area (GFA)		2958m²
Zoning	R4 High Density Residential	
	Allowable	Proposed
Floor Space Ratio (FSR)*	n/a	1.77:1
Total Storeys	5	5

Communal Open Space	25%	446.8m² 26%
Deep Soil Zones	7%	271.5m² 16%

*LEP REQUIREMENT
^SEPP 65 REQUIREMENT
REFER SHEET DA02 FOR DETAILS

UNITS TYPES	
Type	Count
2 BED	
2 BED Adaptable	
3 BED	2
3 BED Adaptable	1

TOTAL APARTMENTS: 29



DEEP SOIL
1 : 300

GROSS FLOOR AREA	
Level	Area
GROUND LEVEL	482.1 m²
LEVEL 1	678.5 m²
LEVEL 2	678.5 m²
LEVEL 3	678.5 m²
LEVEL 4	440.9 m²
	2958.4 m²

LANDSCAPE AREA
1 : 300

COMMON OPEN SPACE		
Name	Area	% of Site
COS	257.4 m²	15.40
	257.4 m²	15.40

DEEP SOIL AREA		
Name	Area	% the Site
6m	267.2 m²	15.98
4m	176.7 m²	10.57
3m	27.9 m²	1.67
2m	79.4 m²	4.75
	551.3 m²	32.97

LANDSCAPE SCHEDULE	
Area	% the Site
495.3 m²	29.62
495.3 m²	29.62

COS AREA
1 : 300

CAR SPACES REQUIRED	
2 Bed units: 25	25
3 Bed units: 4	8
Visitors (1/5)	6
Service vehicles (1/40)	1
Washing bay (1/50)	
Grand total	40

CAR SPACES - TYPES	
Type	Number
Class 1a - 2500w x 5400d (Resident)	30
Class 1a - 2500w x 5400d (Visitor)	5
Class 4 - 2400w x 5400d (Disabled)	3
	38

ABN 41 159 480 056 NOMINATED ARCHITECT: P Morson(8100)

ISSUE	DATE	AMENDMENT
P2	13-05-2020	CLIENT REVISION
P3	04-08-2020	UDRP + Pre-Da Meetings
P4	07-10-2020	CONSULTANTS
P5	01-12-2020	CONSULTANTS

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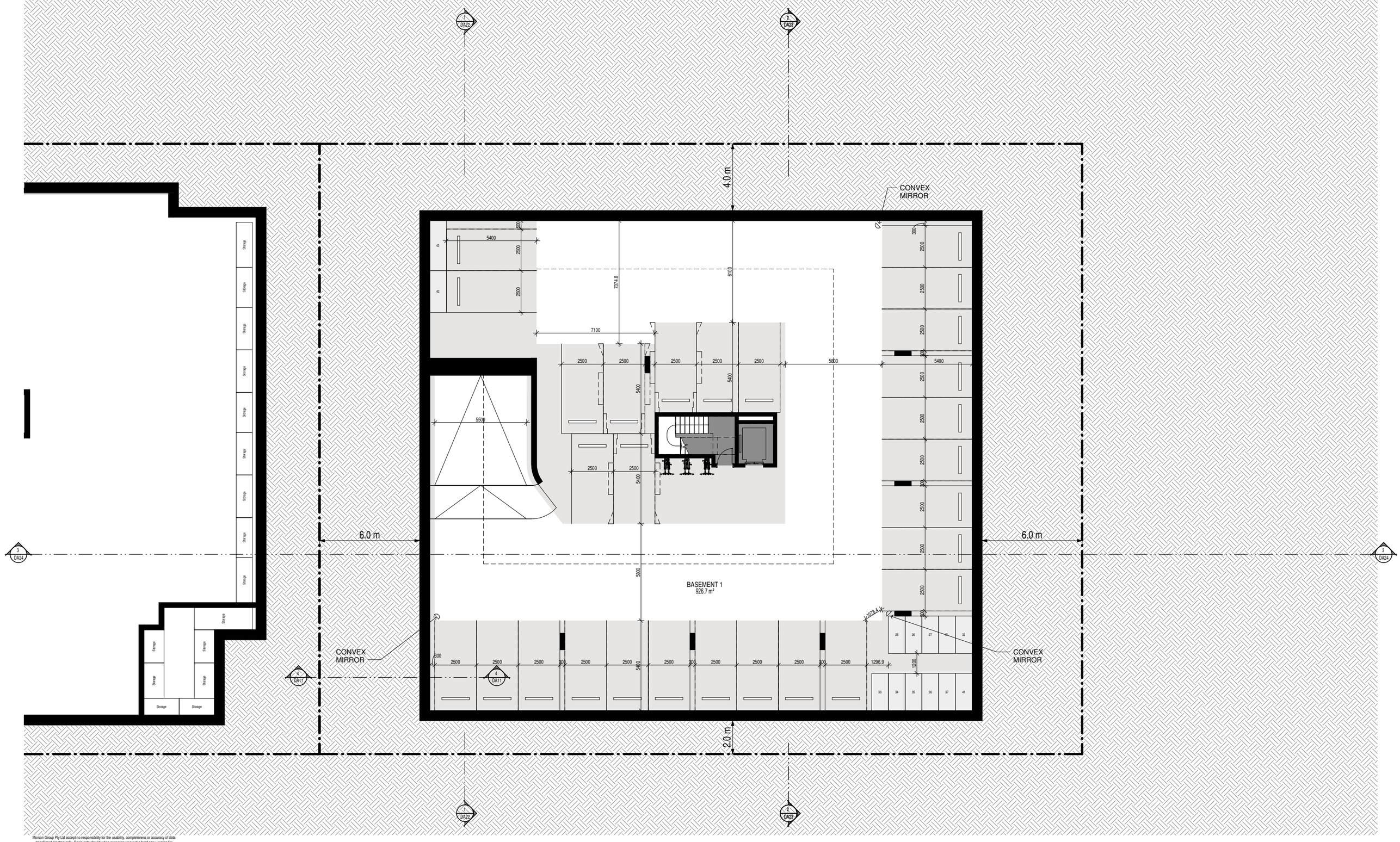
PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING
ADDRESS
44-48 Rodley Avenue, Penrith, NSW, 2750

PROJECT No. **19043**
CLIENT
Inglow Investments Two

MORSON GROUP
NOMINATED ARCHITECT - P F MORSON REGISTRATION NUMBER 8100
ACN 159 480 056, ABN 41 159 480 056
www.morsongroup.com.au
(02) 9380 4946
PO Box 170, Potts Point, NSW 1335

SHEET SIZE: A1
SCALE: As indicated
SHEET NAME: **VIEW AND SCHEDULES**
DRAWING No. **DA01**
ISSUE No. **P5**



ABN 41 159 480 056 NOMINATED ARCHITECT: P Morson(8100)

ISSUE	DATE	AMENDMENT
P2	13-05-2020	CLIENT REVISION
P3	04-08-2020	UDRP + Pre-Da Meetings
P4	07-10-2020	CONSULTANTS
P5	01-12-2020	CONSULTANTS

NORTH

0 1 2 3 4 5 7 10m

SCALE 1:100@A1 (1:200@A3)

PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING
ADDRESS
44-48 Rodley Avenue, Penrith, NSW, 2750

PROJECT No. **19043**

CLIENT
Inglow Investments Two

MORSON GROUP
NOMINATED ARCHITECT - P F MORSON REGISTRATION NUMBER 8100
ACN 159 480 056, ABN 41 159 480 056
www.morsongroup.com.au
(02) 9380 4946
PO Box 170, Potts Point, NSW 1335

SHEET SIZE: A1

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SHEET NAME: **BASEMENT 2**

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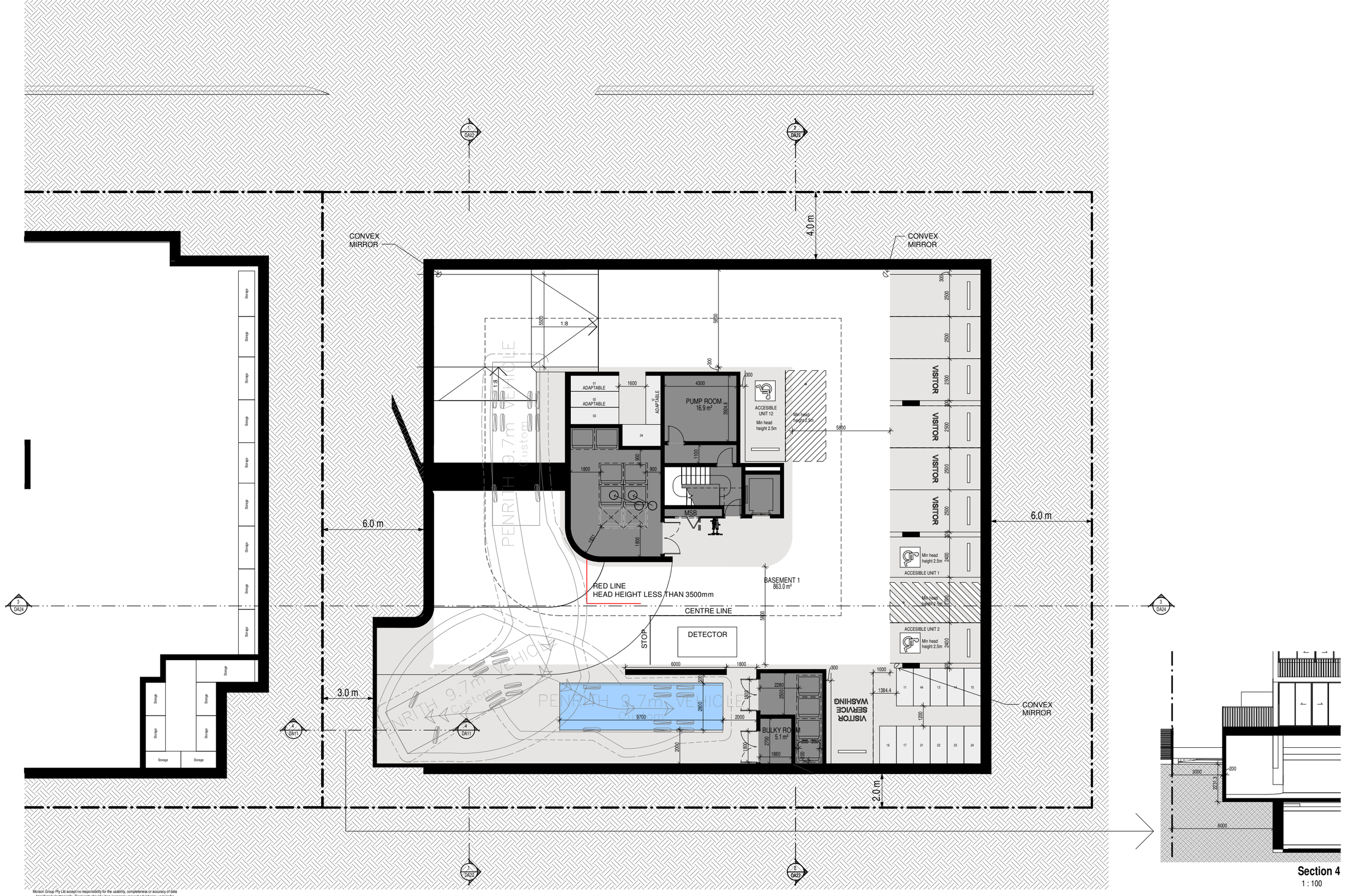
ISSUE No. **P5**



Section 4
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ABN 41 159 480 056 NOMINATED ARCHITECT: P Morson(8100)

ISSUE	DATE	AMENDMENT
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P4	01-10-2020	COUNCIL REVISION
P5	07-10-2020	CONSULTANTS
P6	01-12-2020	CONSULTANTS

NORTH

0 1 2 3 4 5 7 10m
SCALE 1:100@A1 (1:200@A3)

PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING
ADDRESS
44-48 Rodley Avenue, Penrith, NSW, 2750

PROJECT No. **19043**

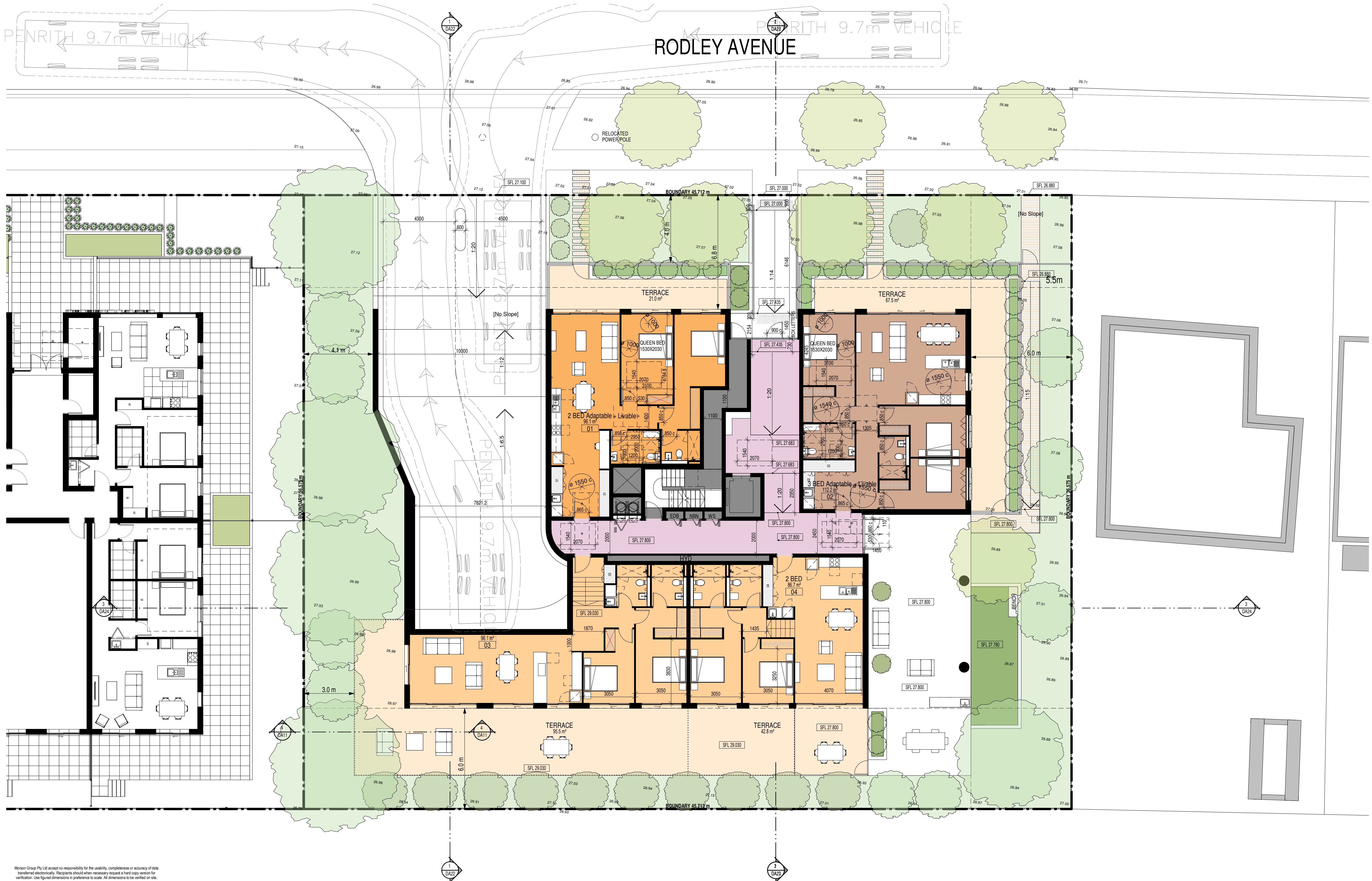
CLIENT
Inglow Investments Two

MORSON GROUP
NOMINATED ARCHITECT - P.F. MORSON REGISTRATION NUMBER 8100
ACN 159 480 056, ABN 41 159 480 056
www.morsongroup.com.au
(02) 9380 4946
PO Box 170, Potts Point, NSW 1335

SHEET SIZE: A1
SCALE: 1 : 100

SHEET NAME: **BASEMENT 1**

DRAWING No. **DA11**
ISSUE No. **P6**



ISSUE	DATE	AMENDMENT
P3	04-08-2020	UDRP + Pre-Da Meetings
P4	01-10-2020	COUNCIL REVISION
P5	07-10-2020	CONSULTANTS
P6	01-12-2020	CONSULTANTS

NORTH

0 1 2 3 4 5 7 10m
SCALE 1:100@A1 (1:200@A3)

PROJECT
PROPOSED RESIDENTIAL FLAT BUILDING
ADDRESS
44-48 Rodley Avenue, Penrith, NSW, 2750

PROJECT No. 19043
CLIENT
Inglow Investments Two

MORSON GROUP

SHEET SIZE: A1
SHEET NAME: **GROUND LEVEL**
SCALE: 1 : 100

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ISSUE No. **P6**

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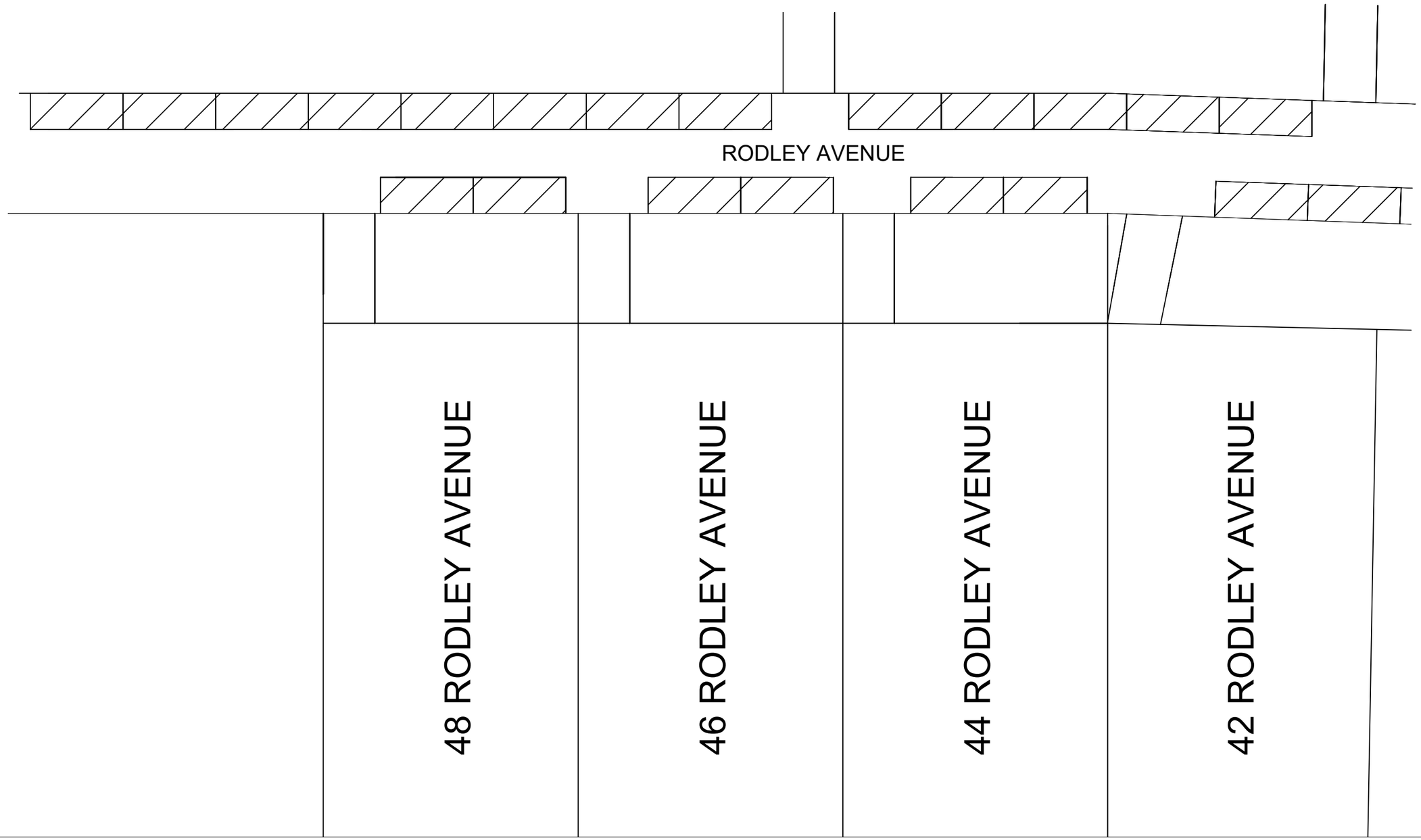
Document Set ID: 9507447
Version: 1, Version Date: 11/03/2021

APPENDIX 2

ON-STREET CAR PARKING SPACE	NUMBER OF EXISTING ON-STREET CAR PARKING SPACES WITHIN THE VICINITY OF THE SITE = 21



STANBURY TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

STANBURY TRAFFIC PLANNING
ADDRESS: 302/166 GLEBE POINT RD, GLEBE
PH: (02) 8971 8314
MOB: 0410 561 848
EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

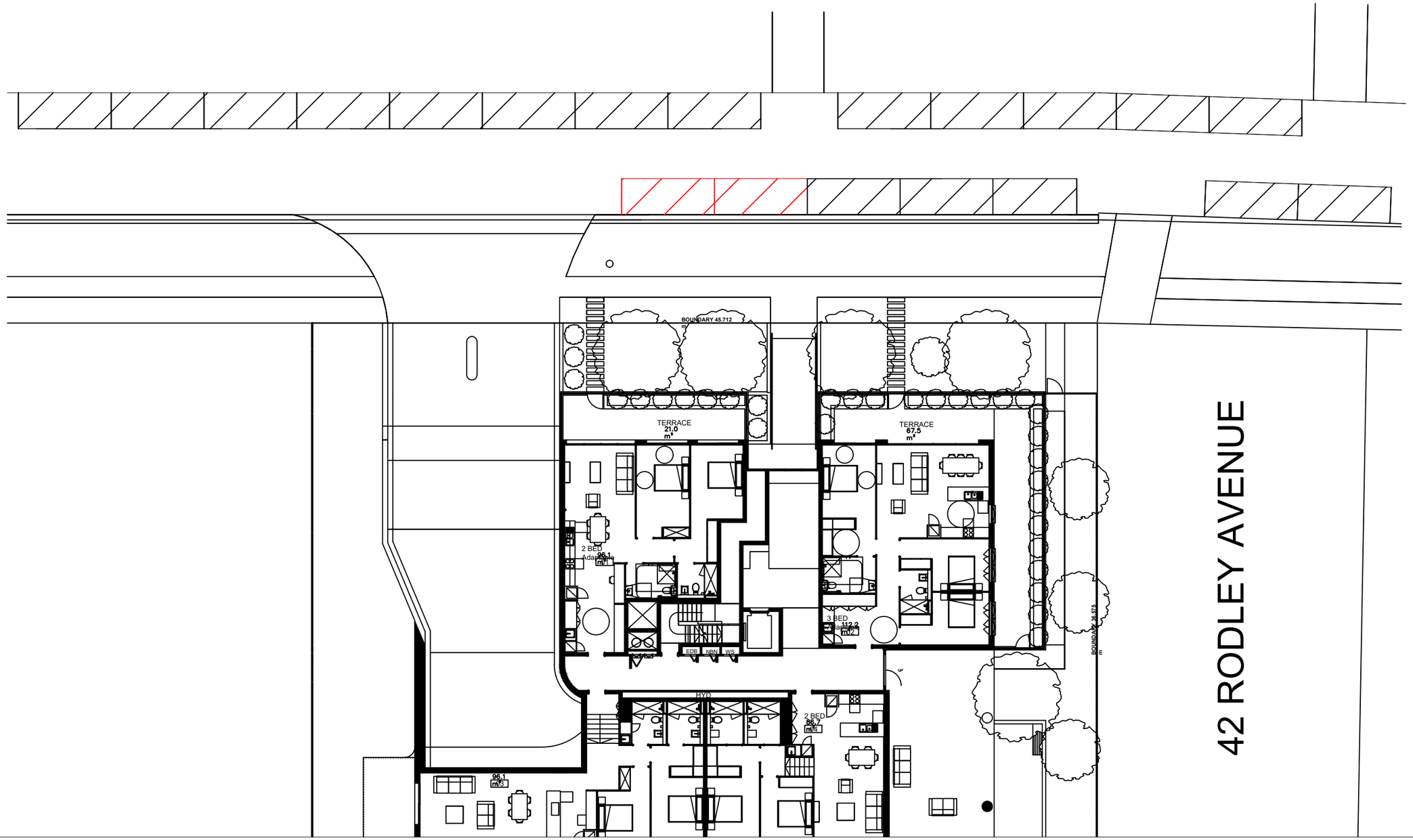
NOTES:
1. THIS PLAN IS BASED ON ARCHITECTURAL PLANS PREPARED BY MORSON GROUP.

STANBURY TRAFFIC PLANNING

EXISTING ON-STREET PARKING PROVISION
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
44 - 48 RODLEY AVENUE
PENRITH

SCALE: 1:250 AT A3
ISSUE: A
FILE: 20-066
SUPERSEDES SHEET/ISSUE: -
DATE: 20/02/2021
SHEET: 1

ON-STREET CAR PARKING SPACE	NUMBER OF PROPOSED ON-STREET CAR PARKING SPACES WITHIN THE VICINITY OF THE SITE = 18	REMOVAL OF ON-STREET PARKING SPACES REQUIRED TO ACCOMMODATE ON-SITE REFUSE COLLECTION



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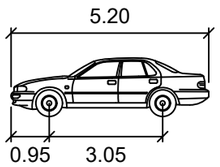
STANBURY TRAFFIC PLANNING

PROPOSED ON-STREET PARKING PROVISION ASSOCIATED WITH
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
44 - 48 RODLEY AVENUE
PENRITH

SCALE: 1:250 AT A3
FILE: 20-066
SUPERSEDES SHEET/ISSUE -
DATE: 20/02/2021
ISSUE A
SHEET 2

APPENDIX 3



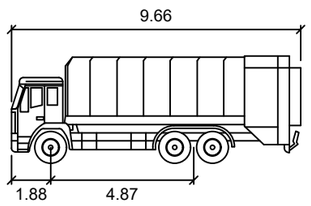
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



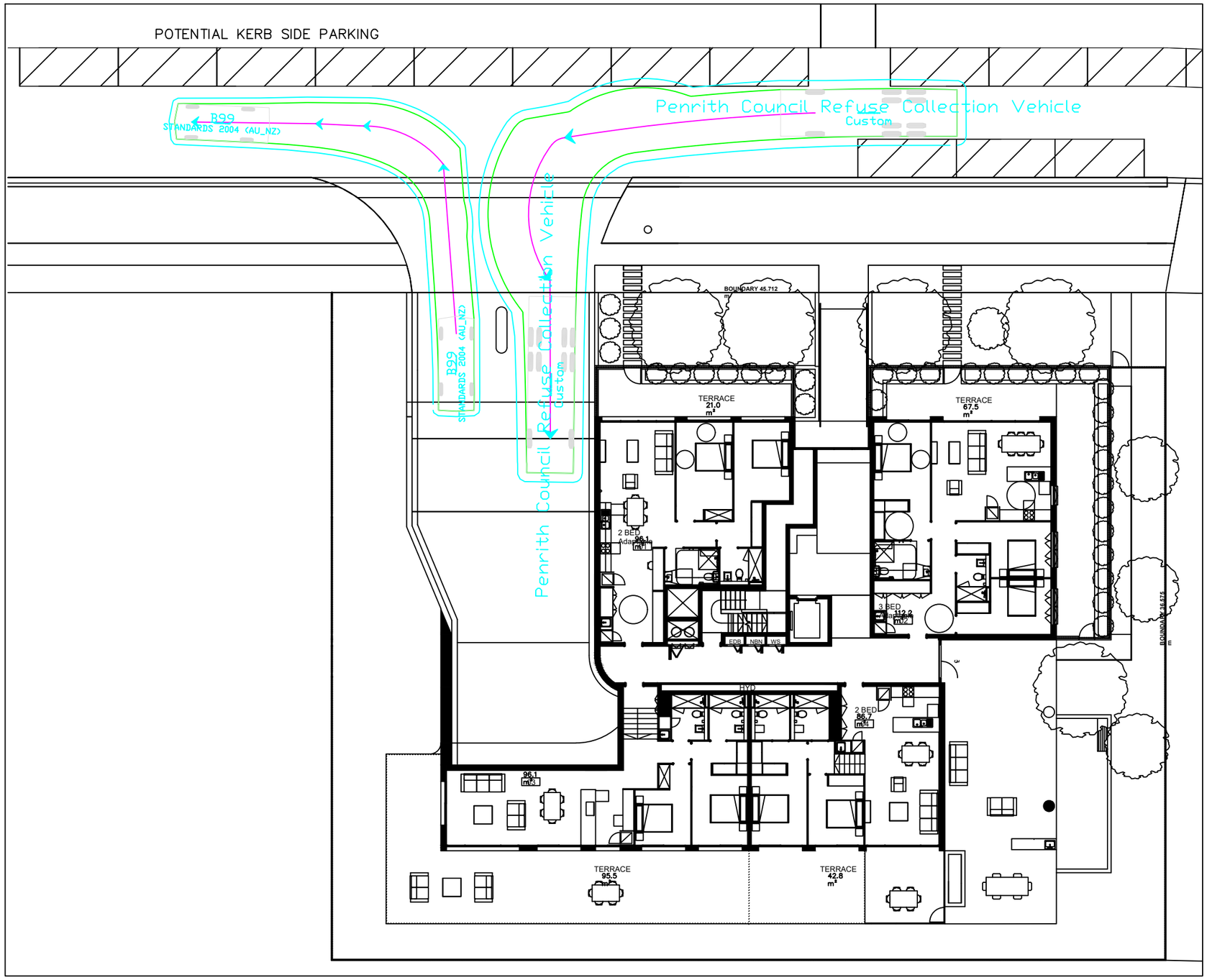
Penrith Council Refuse Collection Vehicle

	meters
Width	: 2.55
Track	: 2.55
Lock to Lock Time	: 6.0
Steering Angle	: 42.0

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (500mm)



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STANBURY TRAFFIC PLANNING

PASSENGER & 9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS

SITE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

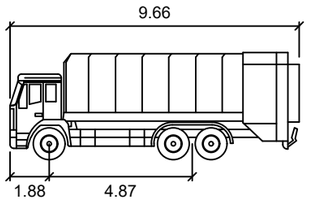
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

DATE: 20/02/2021

ISSUE A

SHEET 1



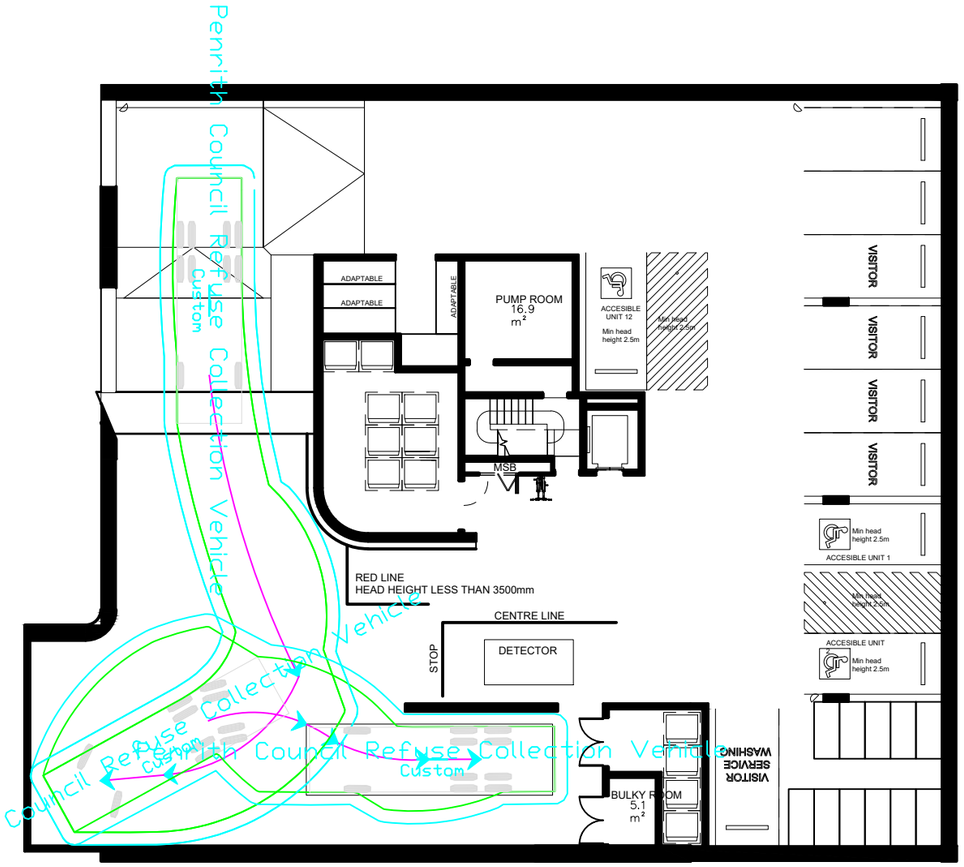
Penrith Council Refuse Collection Vehicle

	meters
Width	: 2.55
Track	: 2.55
Lock to Lock Time	: 6.0
Steering Angle	: 42.0

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (500mm)



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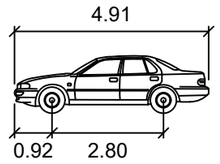
STANBURY TRAFFIC PLANNING

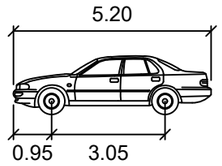
9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS
SITE INGRESS MOVEMENT TO BASEMENT LEVEL LOADING BAY
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT
44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3
FILE: 20-066
SUPERSEDES SHEET/ISSUE -
DATE: 20/02/2021
ISSUE A
SHEET 2



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



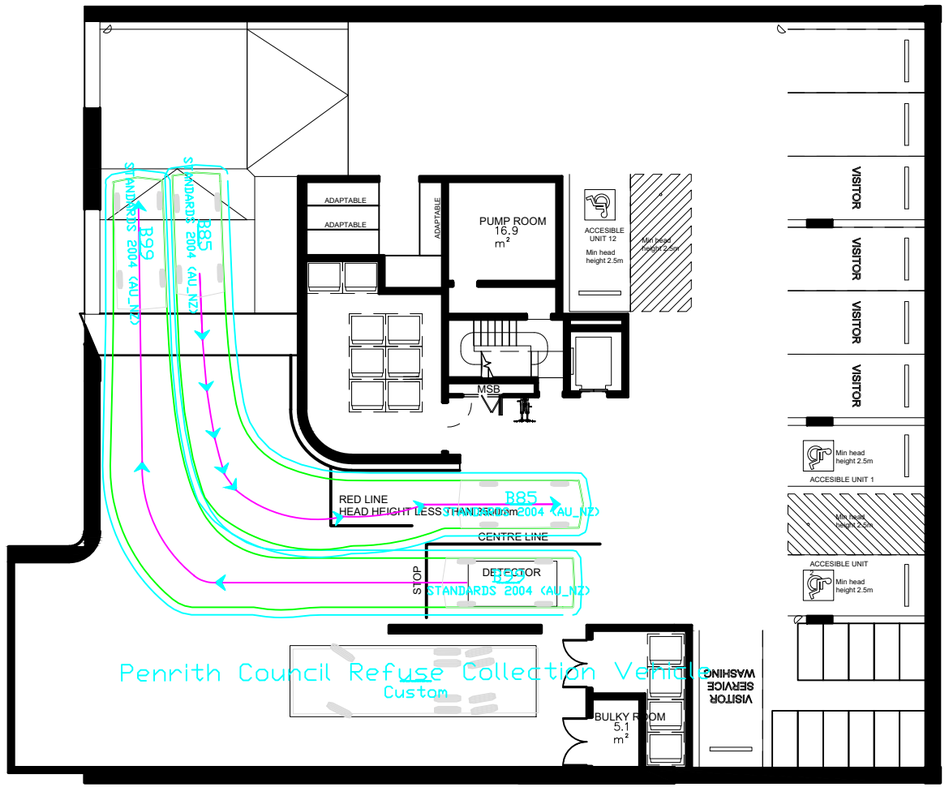
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

SITE INGRESS / EGRESS MOVEMENTS PAST OCCUPIED LOADING BAY

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

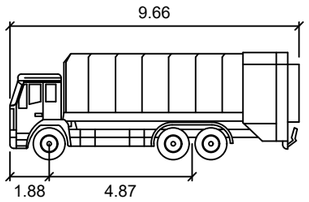
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

ISSUE A

DATE: 20/02/2021

SHEET 3



Penrith Council Refuse Collection Vehicle

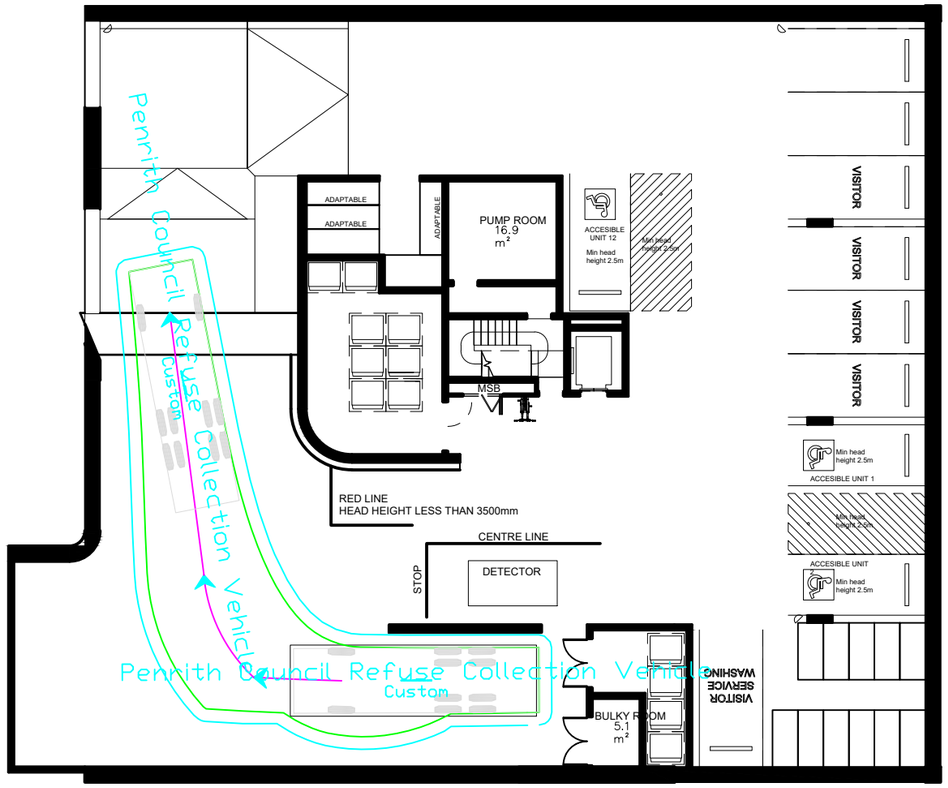
meters

Width	:	2.55
Track	:	2.55
Lock to Lock Time	:	6.0
Steering Angle	:	42.0

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (500mm)



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STANBURY TRAFFIC PLANNING

9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS

LOADING BAY EGRESS MOVEMENT

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

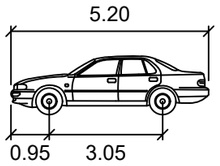
ISSUE: A

FILE: 20-066

SUPERSEDES SHEET/ISSUE: -

SHEET: 4

DATE: 20/02/2021



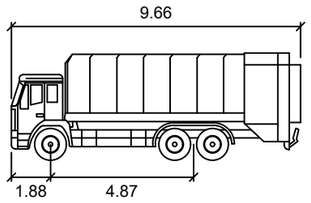
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



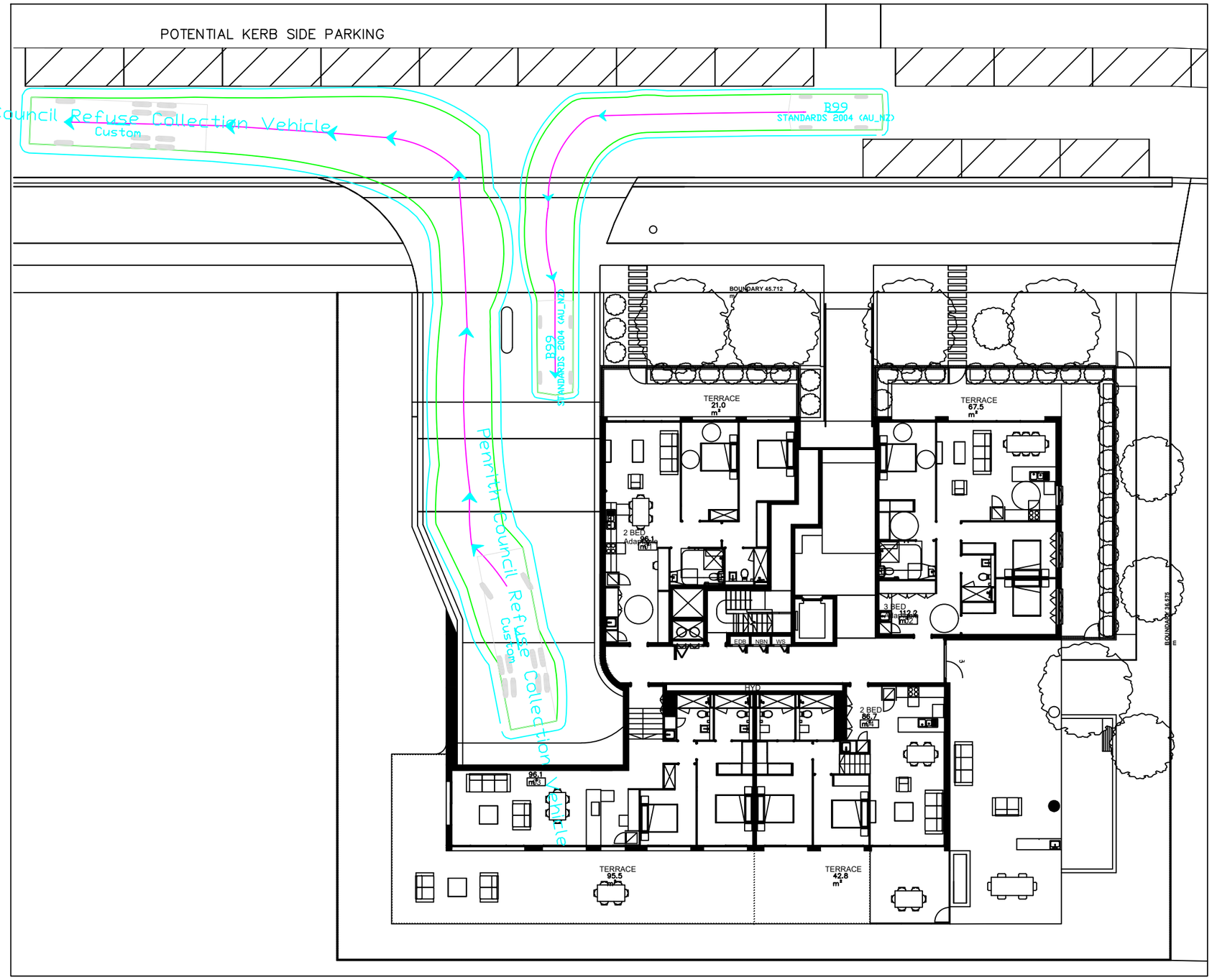
Penrith Council Refuse Collection Vehicle

	meters
Width	: 2.55
Track	: 2.55
Lock to Lock Time	: 6.0
Steering Angle	: 42.0

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (500mm)



STANBURY TRAFFIC PLANNING

TRAFFIC, PARKING & TRANSPORT CONSULTANTS

STANBURY TRAFFIC PLANNING

ADDRESS: 302/166 GLEBE POINT RD, GLEBE

PH: (02) 8971 8314

MOB: 0410 561 848

EMAIL: info@stanburytraffic.com.au

WEBSITE: www.stanburytraffic.com.au

NOTES:

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STANBURY TRAFFIC PLANNING

PASSENGER & 9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS

SITE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

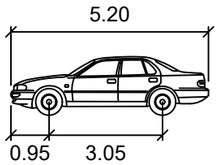
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

DATE: 20/02/2021

ISSUE A

SHEET 5

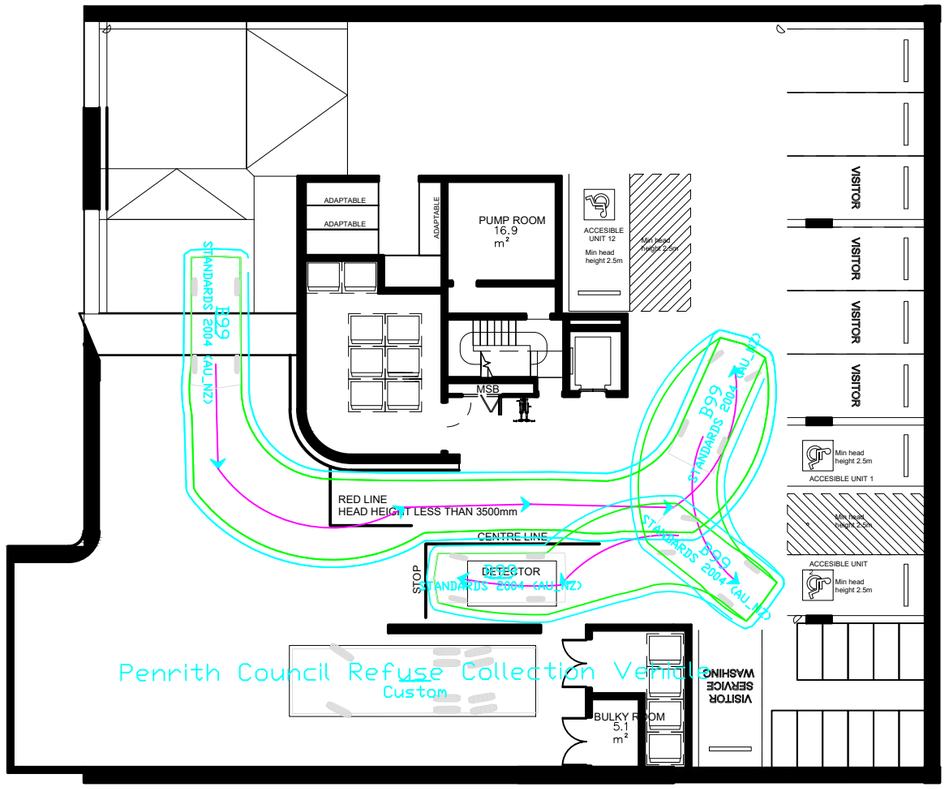


B99

		meters
Width	:	1.94
Track	:	1.84
Lock to Lock Time	:	6.0
Steering Angle	:	33.9

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL ONE INTERNAL TURNAROUND MOVEMENTS

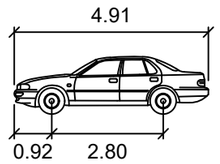
PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3 | ISSUE: A

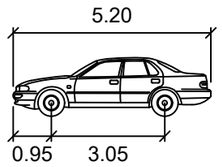
FILE: 20-066 | SUPERSEDES SHEET/ISSUE: -

DATE: 20/02/2021 | SHEET: 6



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



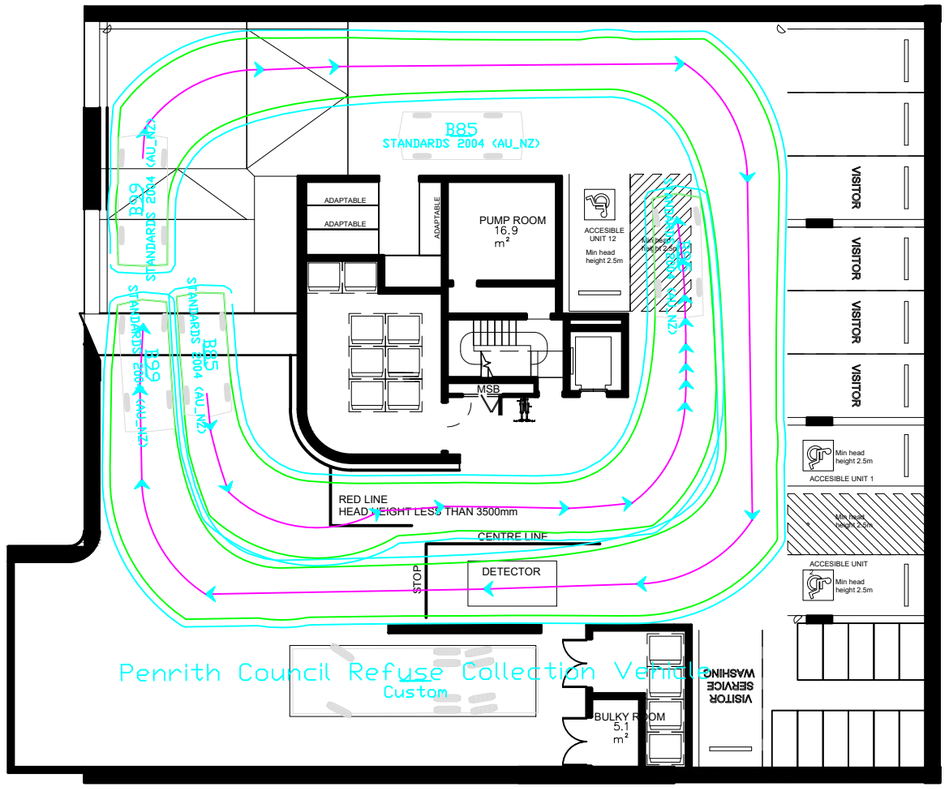
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 INTERNAL MANOEUVRING

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

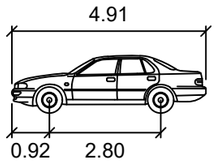
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

DATE: 20/02/2021

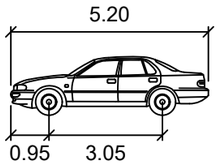
ISSUE A

SHEET 7



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1



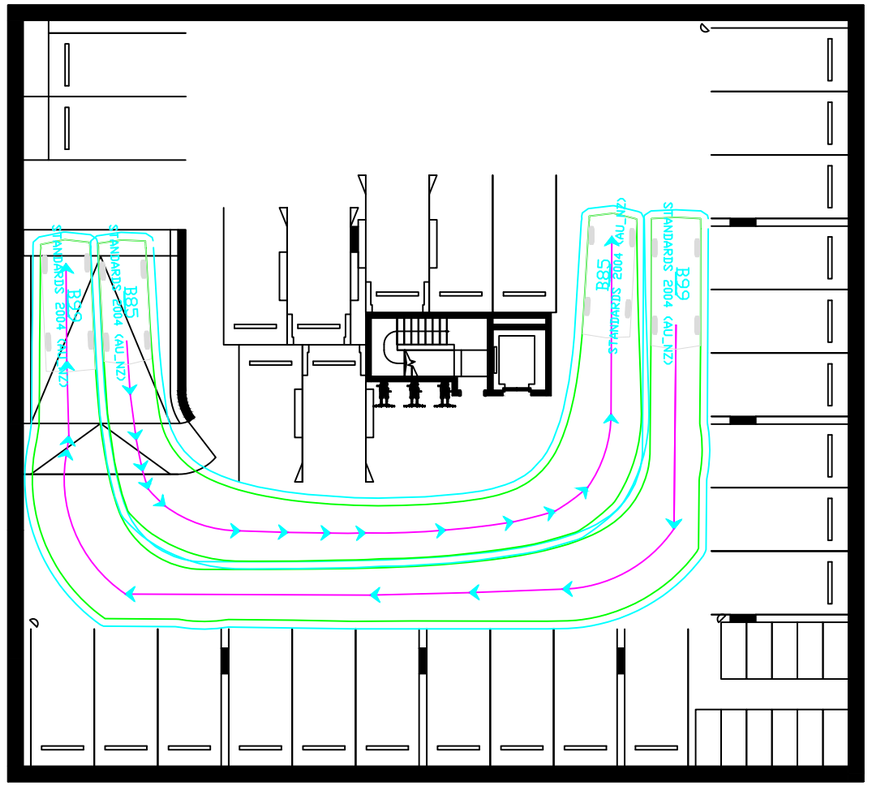
B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL MANOEUVRING

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:250 AT A3

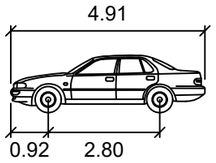
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

DATE: 20/02/2021

ISSUE A

SHEET 8

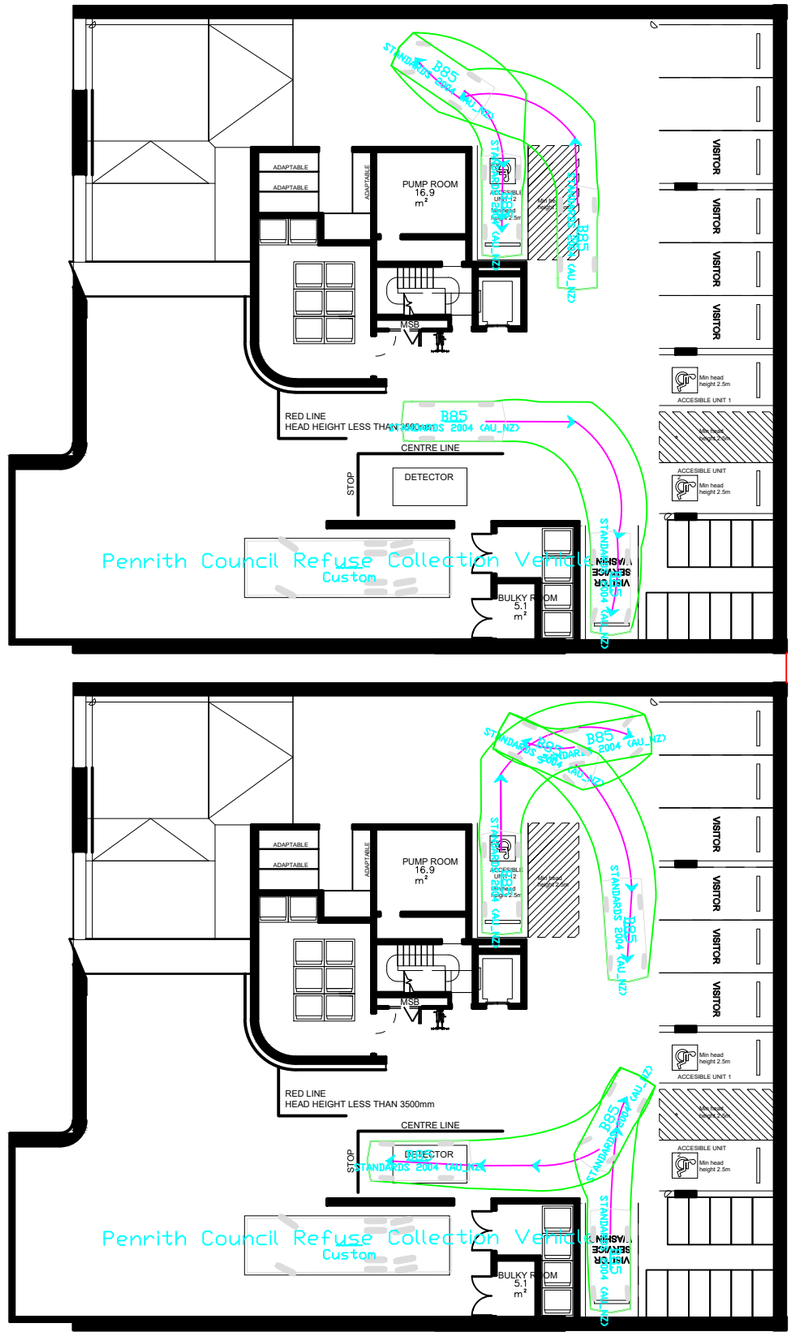


B85

		meters
Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	34.1

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL PARKING SPACE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:300 AT A3

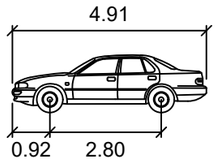
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

ISSUE A

DATE: 20/02/2021

SHEET 9

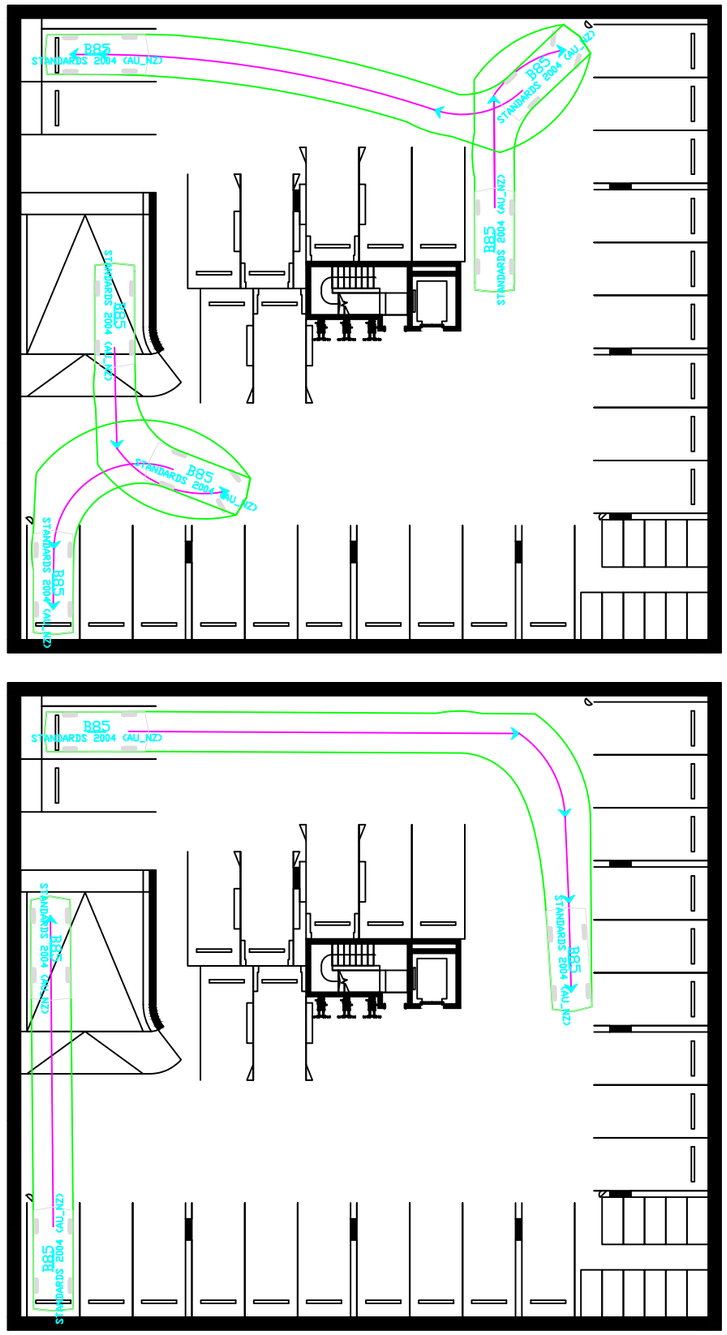


B85

		meters
Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	34.1

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL PARKING SPACE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:300 AT A3

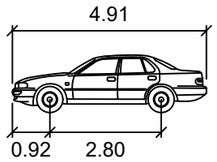
FILE: 20-066

SUPERSEDES SHEET/ISSUE -

DATE: 20/02/2021

ISSUE A

SHEET 10

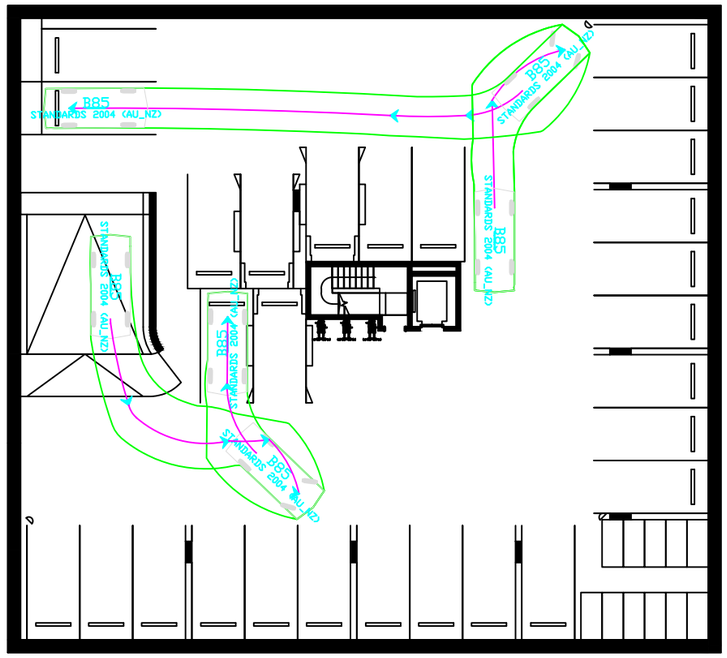


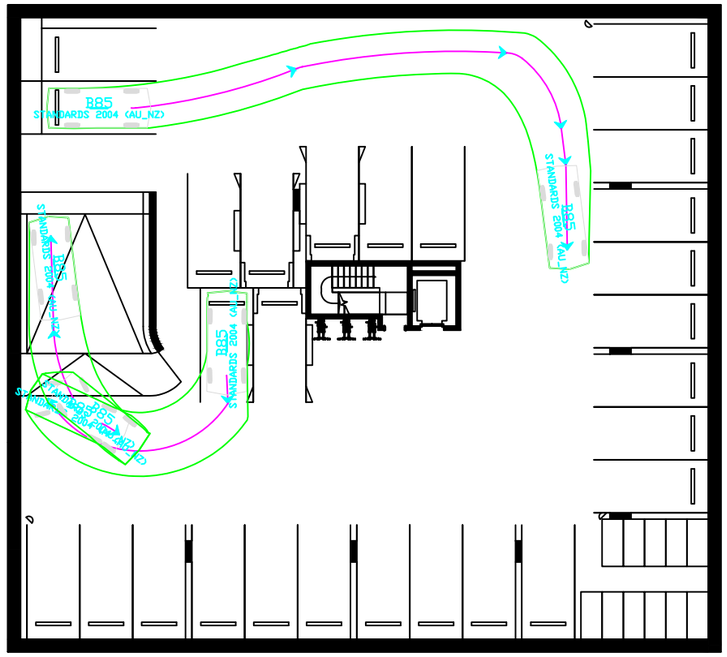
B85

		meters
Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	34.1

LEGEND

VEHICLE BODY PATH (INCLUDING OVERHANG)





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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL PARKING SPACE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL APARTMENT DEVELOPMENT

44 - 48 RODLEY AVENUE, PENRITH

SCALE: 1:300 AT A3

FILE: 20-066

SUPERSEDES SHEET/ISSUE -

ISSUE A

DATE: 20/02/2021

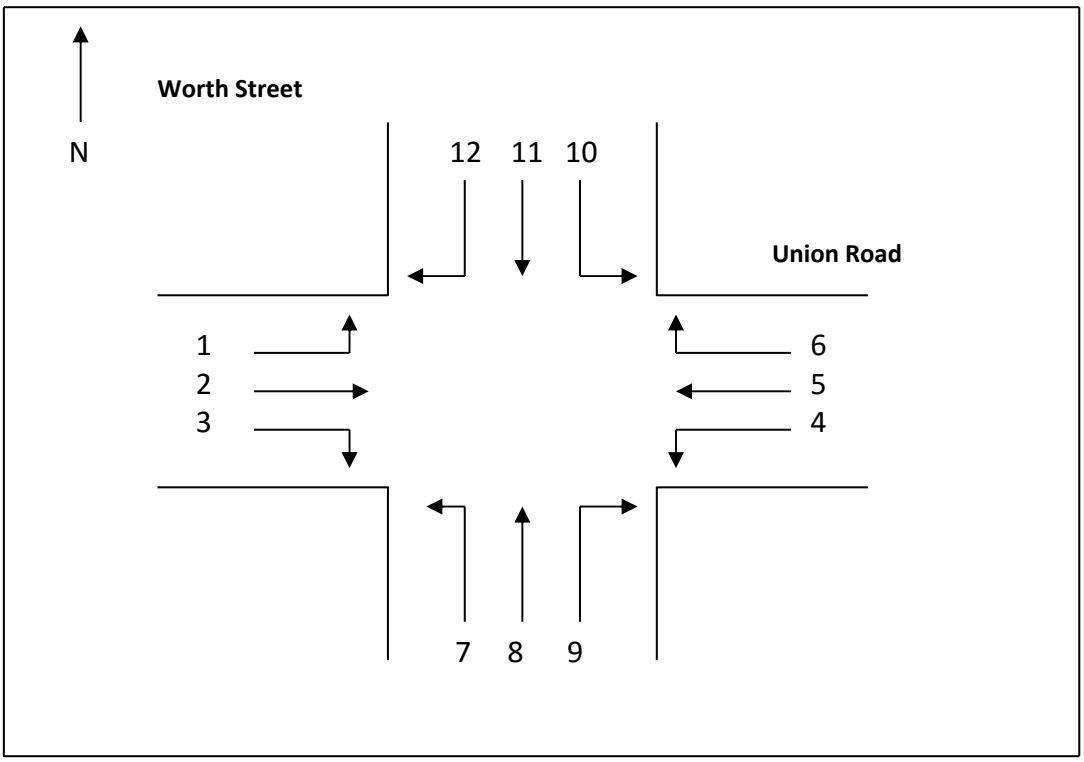
SHEET 11

APPENDIX 4

STANBURY TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

TRAFFIC COUNTS AT: Union Road & Worth Street, Penrith
DATE: 28th May 2018
TIME: Fine

Time	Direction of Vehicular Traffic											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
7.00 – 7.15pm	19	98	4	4	8	35	3	2	3	39	3	9
7.15 – 7.30pm	20	90	3	5	7	25	7	5	5	49	2	8
7.30 – 7.45pm	15	101	2	2	9	30	5	3	3	45	1	6
7.45 – 8.00pm	18	108	4	4	8	22	2	6	4	44	1	10
TOTAL	**72**	**397**	**13**	**15**	**32**	**112**	**17**	**16**	**15**	**177**	**7**	**33**
8.00 – 8.15pm	28	110	5	6	10	37	6	8	7	55	5	9
8.15 – 8.30pm	22	90	6	12	9	45	5	5	8	51	3	6
8.30 – 8.45pm	35	85	9	9	10	49	7	7	5	57	5	12
8.45 – 9.00pm	33	65	12	12	5	55	5	6	2	41	3	11
TOTAL	**118**	**350**	**32**	**39**	**34**	**186**	**23**	**26**	**22**	**204**	**16**	**38**
4.00 – 4.15pm	25	29	3	5	25	95	5	1	5	67	5	40
4.15 – 4.30pm	24	35	2	5	29	80	6	3	5	75	4	38
4.30 – 4.45pm	34	34	2	4	23	91	8	3	6	57	7	45
4.45 – 5.00pm	22	29	4	3	17	83	3	7	3	83	4	54
TOTAL	**105**	**127**	**11**	**17**	**94**	**349**	**22**	**14**	**19**	**282**	**20**	**177**
5.00 – 5.15pm	29	25	5	6	25	101	8	5	5	79	5	55
5.15 – 5.30pm	25	30	7	5	30	84	5	2	6	80	3	55
5.30 – 5.45pm	20	36	4	4	17	99	5	1	7	71	5	35
5.45 – 6.00pm	8	30	4	4	10	90	8	2	6	50	2	28
TOTAL	**82**	**121**	**20**	**19**	**82**	**374**	**26**	**10**	**24**	**280**	**15**	**173**



APPENDIX 5

MOVEMENT SUMMARY

Site: [Union Road & Worth Street]

Existing AM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street South												
1	L2	23	5.0	0.350	47.3	LOS D	3.0	22.1	0.96	0.75	0.96	33.8
2	T1	26	5.0	0.350	41.7	LOS C	3.0	22.1	0.96	0.75	0.96	34.4
3	R2	22	5.0	0.350	47.3	LOS D	3.0	22.1	0.96	0.75	0.96	33.7
Approach		71	5.0	0.350	45.3	LOS D	3.0	22.1	0.96	0.75	0.96	34.0
East: Union Road East												
4	L2	39	5.0	0.079	17.5	LOS B	1.6	11.7	0.54	0.57	0.54	47.0
5	T1	34	5.0	0.079	11.9	LOS A	1.6	11.7	0.54	0.57	0.54	48.2
6	R2	186	5.0	0.529	30.6	LOS C	6.7	48.6	0.84	0.81	0.84	39.1
Approach		259	5.0	0.529	26.2	LOS B	6.7	48.6	0.75	0.74	0.75	41.2
North: Worth Street North												
7	L2	204	5.0	0.539	40.5	LOS C	8.2	59.7	0.94	0.81	0.94	35.4
8	T1	16	5.0	0.141	31.5	LOS C	2.0	14.3	0.85	0.71	0.85	38.0
9	R2	38	5.0	0.141	37.1	LOS C	2.0	14.3	0.85	0.71	0.85	37.2
Approach		258	5.0	0.539	39.4	LOS C	8.2	59.7	0.92	0.79	0.92	35.8
West: Union Road West												
10	L2	118	5.0	0.135	19.5	LOS B	2.9	21.2	0.59	0.71	0.59	44.5
11	T1	350	5.0	0.441	16.7	LOS B	11.0	80.3	0.71	0.63	0.71	46.8
12	R2	32	5.0	0.441	22.2	LOS B	11.0	80.3	0.71	0.63	0.71	45.5
Approach		500	5.0	0.441	17.7	LOS B	11.0	80.3	0.68	0.65	0.68	46.2
All Vehicles		1088	5.0	0.539	26.7	LOS B	11.0	80.3	0.77	0.71	0.77	41.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: [Union Road & Worth Street]

Existing PM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Worth Street South												
1	L2	22	5.0	0.272	46.9	LOS D	2.3	16.9	0.95	0.74	0.95	33.8
2	T1	14	5.0	0.272	41.3	LOS C	2.3	16.9	0.95	0.74	0.95	34.4
3	R2	19	5.0	0.272	46.8	LOS D	2.3	16.9	0.95	0.74	0.95	33.7
Approach		55	5.0	0.272	45.4	LOS D	2.3	16.9	0.95	0.74	0.95	33.9
East: Union Road East												
4	L2	17	5.0	0.126	19.5	LOS B	2.7	19.6	0.59	0.51	0.59	47.1
5	T1	94	5.0	0.126	13.9	LOS A	2.7	19.6	0.59	0.51	0.59	48.3
6	R2	349	5.0	0.704	29.4	LOS C	13.0	94.9	0.86	0.85	0.90	39.6
Approach		460	5.0	0.704	25.8	LOS B	13.0	94.9	0.80	0.77	0.82	41.4
North: Worth Street North												
7	L2	282	5.0	0.708	42.4	LOS C	12.0	87.7	0.98	0.86	1.04	34.7
8	T1	20	5.0	0.492	33.7	LOS C	7.7	56.4	0.92	0.80	0.92	36.7
9	R2	177	5.0	0.492	39.3	LOS C	7.7	56.4	0.92	0.80	0.92	36.0
Approach		479	5.0	0.708	40.9	LOS C	12.0	87.7	0.96	0.84	0.99	35.3
West: Union Road West												
10	L2	105	5.0	0.077	8.6	LOS A	1.2	8.5	0.27	0.64	0.27	51.2
11	T1	127	5.0	0.164	14.8	LOS B	3.5	25.3	0.61	0.52	0.61	48.0
12	R2	11	5.0	0.164	20.4	LOS B	3.5	25.3	0.61	0.52	0.61	46.6
Approach		243	5.0	0.164	12.4	LOS A	3.5	25.3	0.47	0.57	0.47	49.3
All Vehicles		1237	5.0	0.708	29.9	LOS C	13.0	94.9	0.80	0.76	0.82	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P2	East Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P3	North Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
P4	West Full Crossing	53	39.3	LOS D	0.1	0.1	0.94	0.94
All Pedestrians		211	39.3	LOS D			0.94	0.94

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.