STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

TRAFFIC & PARKING IMPACT ASSESSMENT

PROPOSED RESIDENTIAL DEVELOPMENT
16 – 24 HOPE STREET
PENRITH

PREPARED FOR PRESTIGE DEVELOPMENT GROUP (NSW) PTY. LTD.
OUR REF: 19-201-2

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APPENDICES

1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by Prestige Development Group (NSW) Pty. Ltd. to prepare a 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 five existing residential dwellings and the construction of a residential development containing 60 dwellings, contained within two buildings, each providing six storeys at 16 – 24 Hope Street, 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, 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 the Roads & Maritime Services under this Instrument.

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- The Roads & Maritime Services' *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);

- Penrith City Council's *Residential Flat Building Developments Waste Management Guidelines*;
- 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 (ground and basement plans only) are included as **Appendix 1** for reference.

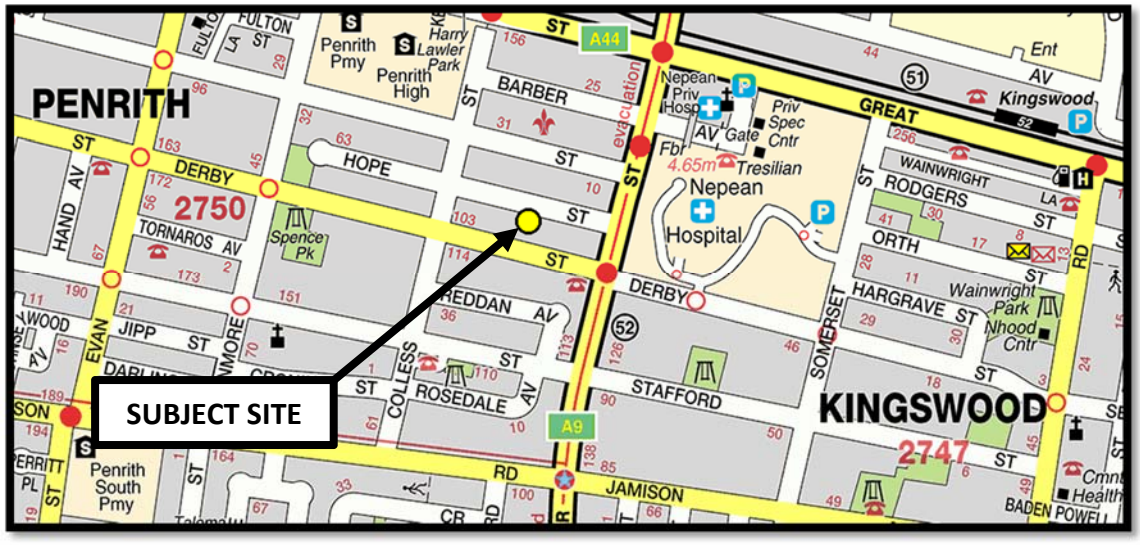
1.3 Site Details

1.3.1 Site Location

The subject site is situated on the southern side of Hope Street, approximately midway between Parker Street and Colless Street, Penrith. The site location is illustrated below and 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 4

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT

Source: Six Maps (accessed 20/01/20)

1.3.2 Site Description

The site comprises five allotments, providing real property descriptions of Lots 29, 30, 31, 32 and 33 within DP 31239 and a street address of 16 – 24 Hope Street, Penrith. The allotments form a rectangularly shaped parcel of land, providing an approximate frontage of 80m to Hope Street. The site extends to the south away from Hope Street some 40m, providing a total area of approximately 2,400m^2.

1.3.3 Existing Site Use

The subject site currently accommodates five detached residential dwellings and associated outbuildings. Each dwelling is serviced by a vehicular access driveway connecting with Hope Street in the north-western corner of each lot.

1.3. Surrounding Uses

The site is surrounded by the following:

- Land to the west and south is occupied by single detached residential dwellings similar to that currently contained within the subject site;
- Land to the north of the site, on the opposite side of Hope Street, is largely occupied by detached residential dwellings similar to that currently contained within the subject site, although a multi-level residential flat building is situated to the north-west of the site;
- A multi-level residential flat building adjoins the site directly east; and
- Nepean Hospital is situated to the east.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The subject application seeks Council's approval to demolish the existing dwellings and the construction of residential apartment flat building development comprising a total of 60 dwellings, made up of the following:

- 48 two bedroom dwellings; and
- 12 three bedroom dwellings.

The dwellings are proposed to be contained within two buildings, each providing six storeys.

The development is to be serviced by two levels of basement parking accommodating 97 car parking spaces, a dedicated waste collection area and 24 bicycle parking spaces. Vehicular access is proposed via a single combined ingress / egress driveway connecting with Hope Street in the north-western corner of the site.

Pedestrian connectivity is proposed between the development and the southern Hope Street 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 five redundant driveway connections to Hope Street, servicing the existing five dwellings situated within the site;
- The construction of the proposed single access driveway connecting with Hope Street in the north-western corner of the site;
- A reconfiguration of the existing marked parallel parking bays adjoining the southern Hope Street kerb alignment, associated with the abovementioned removal of redundant driveways and the construction of a new access driveway, resulting in the provision of three additional parking spaces; and
- The removal of three existing marked parallel parking bays adjoining the northern Hope Street kerb alignment, 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).

Appendix 2 provides graphical representations of the existing and proposed modified on-street parking arrangements within Hope Street. These figures illustrate that the proposed development is projected to result in a nett neutral on-street parking yield.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Vehicular Access

3.1.1 Passenger Vehicle Access

Vehicular access between the development site and Hope Street is proposed to be provided via a 9.2m wide combined ingress / egress driveway located within the north-western corner of the site. The access driveway provides direct connectivity to separated but adjacent 4m 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 Hope Street, the residential land-use and the on-site passenger vehicle parking provision of less than 100 spaces. The proposed 9.2m 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 Hope Street 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 Hope Street footway.

3.1.1 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 Hope Street and the site access driveway are contained within **Appendix 3** for reference. The swept path plans illustrate that 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 existing marked parallel parking spaces along the northern side of Hope Street. The impact or otherwise of the loss of on-street parking on the northern side of Hope Street is discussed within subsequent sections of this report.

3.2 Pedestrian Access

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

3.3 On-Site Parking Provision

3.3.1 Vehicular Parking Provision

The development is serviced by a total of 97 off-street passenger vehicle parking spaces provided as follows:

Basement level 1	
Visitor spaces	12
Wash spaces	2
Service spaces	2
Resident spaces	24 (including 2 adaptable)
Basement level 2	
Resident spaces	57 (including 3 adaptable)
Total	97 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 1 overleaf provides the off-street parking requirements based on the above Penrith City Council's car parking rate.

TABLE 1 OFF-STREET PARKING REQUIREMENTS PENRITH DCP 2014			
Item	**Rate**	**No.**	**Spaces Required**
1 or 2 bedroom dwellings	1 space per dwelling	48	48
3 bedroom dwellings	2 space per dwelling	12	24
Service vehicles	1 space per 40 dwellings	59	1.5 (adopt 2)
Visitor Parking	1 space per 5 dwellings	59	11.8 (adopt 12)
Car Washing	1 space per 50 units	59	1.2 (adopt 2)
		Total	88

Table 1 indicates that DCP 2014 requires the development provide a total of 88 passenger vehicle parking spaces, comprising 7 resident, 12 visitor, two service and two car wash spaces.

The proposed total passenger vehicle parking provision of 97 spaces, comprising 81 resident, 12 visitor, two service and two car wash spaces, therefore complies with the numerical requirements of DCP 2014.

3.3.3 Bicycle Parking

The subject development is to provide 12 bicycle storage racks capable of accommodating up to 24 bicycles within the upper basement parking level.

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 60 dwellings, the NSW Government's *Planning Guidelines for Walking and Cycling* recommends resident and visitor bicycle parking provision of 12 resident and three visitor parking spaces or a total of 15 spaces.

The proposed provision of 24 on-site bicycle parking spaces therefore exceeds the minimum requirement specified in the NSW Government's guidelines and accordingly, is considered to be satisfactory.

3.4 On-Street Parking Provision

It has previously been presented that 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 existing marked parallel parking spaces along the northern side of Hope Street (see **Appendices 2** and **3**).

The expected loss of three spaces along the northern kerb alignment of Hope Street are however projected to be off-set by the proposed rationalisation of the

site access driveways, whereby an additional three parallel parking spaces are to be provided along the southern Hope Street kerb alignment adjacent to the site.

Appendix 2 provides graphical representations of the existing and proposed modified on-street parking arrangements within Hope Street. These figures illustrate that the proposed rationalisation development is expected to result in a net-neutral on-street parking supply, thereby ensuring the development does not result in any unreasonable impacts on surrounding on-street parking amenity.

3.5 Internal Circulation and Manoeuvrability

3.5.1 Upper Basement Access Ramp

Passenger vehicles, upon entry to the site via Hope Street, 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 a green movements both entering the site from Hope Street 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 Hope Street 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 Hope Street 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 = 2.5m (with adjoining 2.5m 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;
- One-way straight roadway / ramp width = 4.0m;
- Two-way straight roadway / ramp width = 5.5m;
- 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 bays located within the upper basement parking level.

Waste collection vehicles are proposed to service the site via a single dedicated loading zone situated within the south-western corner 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 = 5.5m;
- Refuse collection bay length = 11.5m; 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 Hope Street 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 three on-street parking spaces along the northern side of Hope Street); 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 Hope Street via a left turn, with reasonable clearance to private development or public road physical obstructions (once again, incorporating the previously presented removal of three on-street parking spaces along the northern side of Hope Street).

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:

- **Hope Street** forms a carriageway width of 7.3m within an overall road reservation in the order of 15m. It provides an east-west alignment and performs a local function in the road hierarchy, primarily serving the adjacent low and medium density residential development. Traffic flow is governed by a speed limit of 50km/h consistent with State Government policy for local residential roads.

  Parallel parking along both kerb alignments within Hope Street is formalised through the provision of line marking, in the interest of maintaining access to adjoining driveways and overall traffic management. Observations have indicated that demand for on-street parking is generally considerable, most likely attributed to employee parking associated with Nepean Hospital situated to the east of the subject site.

  The prevailing 7.3m carriageway width of Hope Street in conjunction with the abovementioned on-street parallel parking effectively limits traffic flow to one lane at any one time. Traffic flow within Hope Street primarily occurs under curtesy conditions, whereby one vehicle retreats to either an unoccupied parking space or, more likely, momentarily blocks an adjoining driveway to allow oncoming vehicle/s to pass.

  Hope Street forms a 'T' intersection with Parker Street at its eastern extremity, operating under 'Give Way' signage control with Parker Street performing the priority route. The provision of a concrete median within Parker Street restricts turning movements at the junction of Parker Street and Hope Street to left in/left out.

  To the west, Hope Street forms a cross intersection with Colless Street operating under 'Give Way' signage control with Colless Street performing the priority route.

- **Parker Street** performs an important State Road function under the care and control of the Roads & Maritime Services. It provides, with The Northern Road, a connection between Windsor in the north and Camden in the south.

  Parker Street, in the vicinity of the site, essentially provides a divided carriageway providing three lanes in each direction whilst widening is provided on approach to major junctions such as Great Western Highway, Derby Street and Jamieson Road to accommodate exclusive turning lanes, under traffic signal control. A signalised mid-block pedestrian crossing is provided over Parker Street to the north of Lethbridge Street.

Traffic flow within Parker Street is governed by a sign posted speed limit of 60km/h. Kerb-side parking is prohibited along both the western kerb alignments in the immediate vicinity of the subject site.

- **Colless Street** performs a local access function under the care and control of Penrith City council. It provides a north-south route terminating just south of High Street in the north (movements between Colless Street and High Street are physically restricted) and extends to Jamison Road in the south. Colless Street forms a carriageway width of approximately 13m providing one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments.

  Colless Street intersects with Lethbridge Street to the north under 'Stop' sign control with Lethbridge Street performing the priority route. Short channelisation islands (doubling as pedestrian refuges) are provided within all intersection approaches. Colless Street forms similar intersections with Derby Street, Stafford Street and Jamison Road to the south, with Colless Street performing the minority route in each instance.

  Traffic flow within Colless Street is governed by a sign posted speed limit of 50km/h however a 40km/h school zone speed limit applies during prescribed school start and finish periods to the north of Lethbridge Street associated with Penrith High School abutting to the west.

4.2 Existing Traffic Volumes

Staff of Stanbury Traffic Planning have undertaken surveys of the junction of Parker Street northbound carriageway and Hope Street to the east of the site in order to accurately ascertain the traffic demands. Surveys were undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm on the 25th of September 2019. **Figure 3** overleaf provides a summary of the surveyed peak hour (8:00am – 9:00am and 4:00pm – 5:00pm) traffic demands, whilst full details are available upon request.

FIGURE 3
EXISTING WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
JUNCTION OF PARKER STREET NORTHBOUND CARRIAGEWAY AND HOPE STREET

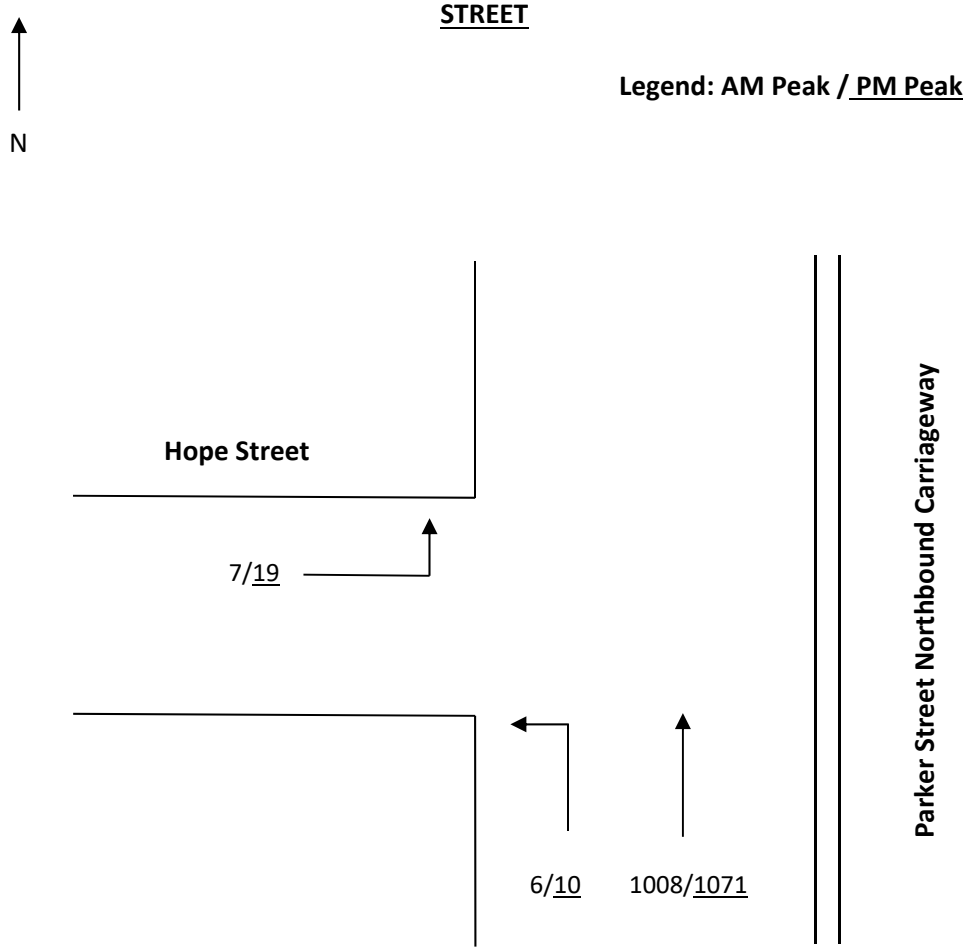


Figure 3 indicates the following:

- Hope Street accommodates two directional peak hour traffic demands of less than 20 vehicles; and
- Parker Street northbound carriageway accommodates peak hour traffic demands in the order of approximately 1,000 – 1,100 vehicles.

4.3 Existing Road Network Operation

4.3.1 Intersection Operation

The surveyed intersection of Parker Street northbound carriageway and Hope 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 2** (being the RMS NSW method of calculation of Level of Service).

TABLE 2
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS
PRIORITY CONTROLLED JUNCTIONS

Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
A	Less than 14	Good
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Near capacity
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

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

TABLE 3
SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE
JUNCTION OF PARKER STREET NORTHBOUND CARRIAGEWAY & HOPE STREET

	AM	PM
PARKER STREET NORTHBOUND APPROACH		
Delay	5.1	5.1
Degree of Saturation	0.18	0.19
Level of Service	A	A
HOPE STREET APPROACH		
Delay	6.7	6.8
Degree of Saturation	0.01	0.02
Level of Service	A	A
TOTAL INTERSECTION		
Delay	6.7	6.8
Degree of Saturation	0.18	0.19
Level of Service	A	A

Table 3 indicates that the signage controlled junction of the northbound Parker Street carriageway and Hope Street provides a good level of service with spare capacity during weekday commuter peak periods.

Left turn movements to and from Hope Street are significantly assisted by the punctuation of northbound Parker Street traffic flows resulting from the operation of the traffic signals at Derby Street, resulting in regular and extended gaps.

4.3.2 Hope Street Performance

The previous traffic surveys indicates that Hope Street currently accommodates directional traffic demands during weekday commuter peak hours of less than 20 vehicles per hour.

Reference is made to the Roads & Maritime Services' *Guide to Traffic Generating Developments* in order to undertake an assessment of the operational performance of Hope Street. This publication indicates that a two lane two way carriageway accommodating peak hour directional traffic volumes less than 200 vehicles per hour provides a level of service 'A'. Such a level service indicates free flow where drivers are virtually unaffected by others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is high, and the general level of comfort and convenience provided is excellent.

Traffic flow within Hope Street is however highly influenced by the prevalence of on-street parallel parking along both alignments. Two-way traffic flow primarily occurs under cutesy conditions within breaks in kerb-side parking. The low traffic demands however still ensure that motorists are provided with a reasonably good level of service and accordingly, vehicles are able to enter and exit abutting sites with a good level of safety and efficiency.

4.4 Public Transport

4.4.1 Heavy Rail

The subject site is located approximately 1.2km walking distance to the south-west of Kingswood Railway Station. Kingswood Railway Station provides access to train services which operate long the T1 (North Shore, Northern & Western) and T3 (Bankstown) 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.

The T3 Line also links with numerous other lines servicing the greater Sydney metropolitan area and beyond via interchanges at Cabramatta, Sydenham and Redfern.

4.4.2 Buses

Busways operate a number of bus services in the Penrith region, with the following routes in the immediate vicinity of the subject site:

- Route 774 between Mount Druitt and Penrith train station, via Oxley Park;
- Route 775 between Mount Druitt and Penrith train station, via Erskine Park;
- Route 776 between Mount Druitt and Penrith train station, via Colyton; and
- Route 789 between Luddenham and Penrith train station.

Routes 774, 775 and 776 operate along Derby Street located some 180m to the south of Hope Street. Route 789 operates along Lethbridge Street, Parker Street and High Street, which are located in close proximity to the subject site.

4.4.3 Pedestrians / Cyclists

Pedestrians are provided with the following access and mobility infrastructure in the vicinity of the subject site:

- A footpath is provided along the southern side of Hope Street;
- Footpaths are provided along both sides of Colless Street to the south of Hope Street;
- A footpath is provided along the western side of Colless Street to the north of Hope Street;
- Footpaths are provided along both sides of Derby Street;
- Footpaths are provided along both sides of Parker Street;
- Signalised pedestrian crossings are provided over all approaches at the intersection of Parker Street and Derby Street;
- A signalised pedestrian crossing is provided over Parker Street approximately 150m to the north of Hope Street; and
- Pedestrian refuges are provided over the northern, southern and western approaches at the intersection of Derby Street and Colless 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 their *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 the Roads & Maritime Services.

5.1.1 Existing Site Uses

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

The Roads & Maritime Services' *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 five peak hour vehicle trip per dwelling has been applied to detached residential dwellings. The current site development is therefore capable of generating up to five vehicle trips to and from the site during weekday commuter peaks periods.

5.1.2 Proposed Development

The proposed development involves the provision of a high density residential apartment building, accommodating 60 dwellings.

The Roads & Maritime Services' *Technical Direction TDT 203/04a* provides trip generation advice for high-density residential developments, specifying average weekday morning and evening peak hour trip generation of 0.19 and 0.15 trips per unit respectively. It is however considered that the traffic generation rates provided within the Roads & Maritime Services' *Guide to Traffic Generating Developments* of 0.29 trips per dwelling are more likely to be relevant to apartments within the subject locality.

The proposed development is therefore projected to be capable of generating in the order of 18 vehicular trips during weekday peak hours

5.2 Traffic Impacts

The proposed development has been projected to generate up to 18 peak hour trips to and from the site, or 13 peak hour trips over and above that currently capable of being generated by the existing five detached dwellings provided on-site. This equates to approximately one vehicle movement every three to four minutes during commuter peaks, or one additional vehicle movement every five

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 spare 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 Hope Street 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 proposed site is located within reasonably close walking distance to a number of bus services and Kingswood Railway Station. 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 60 dwellings at 16 – 24 Hope Street, 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 PDCP 2014;

- The proposed site access arrangements are projected to result in a nett neutral on-street parking yield, thereby not resulting in any unreasonable impacts to surrounding on-street parking 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 south-western corner of 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 13 peak hour vehicle trips to and from the subject site over and above that capable of being generated by the existing site development; 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

18006 - PROPOSED RESIDENTIAL DEVELOPMENT

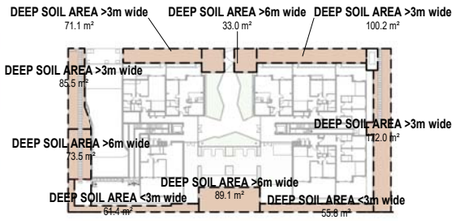
16-24 HOPE STREET, PENRITH 2750

Development Details		
Site Area		3182m²
Gross Floor Area (GFA)		6067m²
Zoning		R4 High Density Residential
	Allowable	Proposed
Floor Space Ratio (FSR)*	2.00:1	1.91:1
Total Storeys		6

Communal Open Space % of Site Area^	25%	1027.3m² 32%
Deep Soil Zones % of Site Area^	7%	774.5m² 24%

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

COS - GROUND
1 : 750



DEEP SOIL DIAGRAM
1 : 750

UNITS TYPES		
Type		Count
2 BED		36
2 BED	Livable	6
2 BED	Adaptable	6
3 BED		12
		60

GROSS FLOOR AREA	
Level	Area
GROUND LEVEL	827.4 m²
LEVEL 1	1223.2 m²
LEVEL 2	1223.2 m²
LEVEL 3	1223.2 m²
LEVEL 4	784.9 m²
LEVEL 5	784.9 m²
Grand total: 12	6066.8 m²

COMMON OPEN SPACE		
Name	Area	% of Site
C.O.S AREA	1027.3 m²	0.32

DEEP SOIL AREA		
Name	Area	% of Site
DEEP SOIL AREA <3m wide	117.2 m²	0.04
DEEP SOIL AREA >3m wide	428.7 m²	0.13
DEEP SOIL AREA >6m wide	228.6 m²	0.07
	774.5 m²	0.24

CAR SPACES REQUIRED	
3 Bed units: 12	24
2 Bed units: 42	42
2 Bed units Adaptable: 6	6
Visitors (1/5)	12
Service vehicles (1/40)	2
Washing bay (1/50)	2
Grand total	88

CAR SPACES - TYPES	
Type	Number
Disabled - 2500w x 5400d	6
Service - 2500w x 5400d	2
Standard - 2500w x 5400d	75
Visitor - 2500w x 5400d	12
Washing - 3400w x 5400d	2
Grand total: 97	97

Bike	24

ISSUE	DATE	AMENDMENT
A	17-03-2020	DA SUBMISSION

SCALE BAR | NORTH POINT

PROJECT
18006 - PROPOSED RESIDENTIAL DEVELOPMENT
ADDRESS
16-24 HOPE STREET, PENRITH 2750
CLIENT
PRESTIGE DEVELOPMENTS GROUP (NSW) PTY LTD

MORSON GROUP

NOMINATED ARCHITECT - P F MORSON REGISTRATION NUMBER 6100
ACN 100 480 056, ABN 41 100 480 056
www.morsongroup.com.au
(02) 9380 4946
PO Box 170, Potts Point, NSW 1335

SHEET SIZE: A1 | DAT E
SCALE: As indicated | JULY 2018

SHEET NAME: COVER SHEET

DRAWING NUMBER: DA01
ISSUE NO.: A

HOPE STREET
POWER LINES
POWER POLE
EXISTING PIT
POWER POLE
BOUNDARY79.250 m
OSD TANK
[No Slope]
BALCONY 36.4 m²
BALCONY 29.5 m²
2 BED 80.0 m² 02
2 BED Adaptable 03
BALCONY 29.5 m²
2 BED Adaptable 34
2 BED 80.0 m² 33
BALCONY 36.1 m²
BALCONY 46.6 m²
2 BED 87.6 m² 32
20 Air-con Units
CIRCULATION
2 BED 86.1 m² 01
CIRCULATION
2 BED 87.6 m² 31
2 BED 80.0 m² 30
FFL 46.870
24 Air-con Units
BBQ
BBQ
PLAYGROUND
BALCONY 46.2 m²
BALCONY 58.5 m²
BALCONY 70.3 m²
CARPARK BELOW

ISSUE	DATE	AMENDMENT
A	17-03-2020	DA SUBMISSION

LEGENDS / NOTES:

BR BEDROOM	GAS GAS CUPBOARD	RWO RAINWATER OUTLET
COM COMMS CUPBOARD	GD GRATED DRAIN	SWP STORM WATER PIT
DP DOWNPIPE	GEX GARBAGE EXHAUST	TOH TOP OF HOB
E ELECTRICAL CUPBOARD	MBX MAILBOX	TOW TOP OF WALL
FHR FIRE HOSE REEL	RL RELATIVE LEVEL	TTI TACTILE INDICATORS

SCALE BAR

NORTH POINT

PROJECT
18006 - PROPOSED RESIDENTIAL DEVELOPMENT

ADDRESS
16-24 HOPE STREET, PENRITH 2750

CLIENT
PRESTIGE DEVELOPMENTS GROUP (NSW) PTY LTD

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

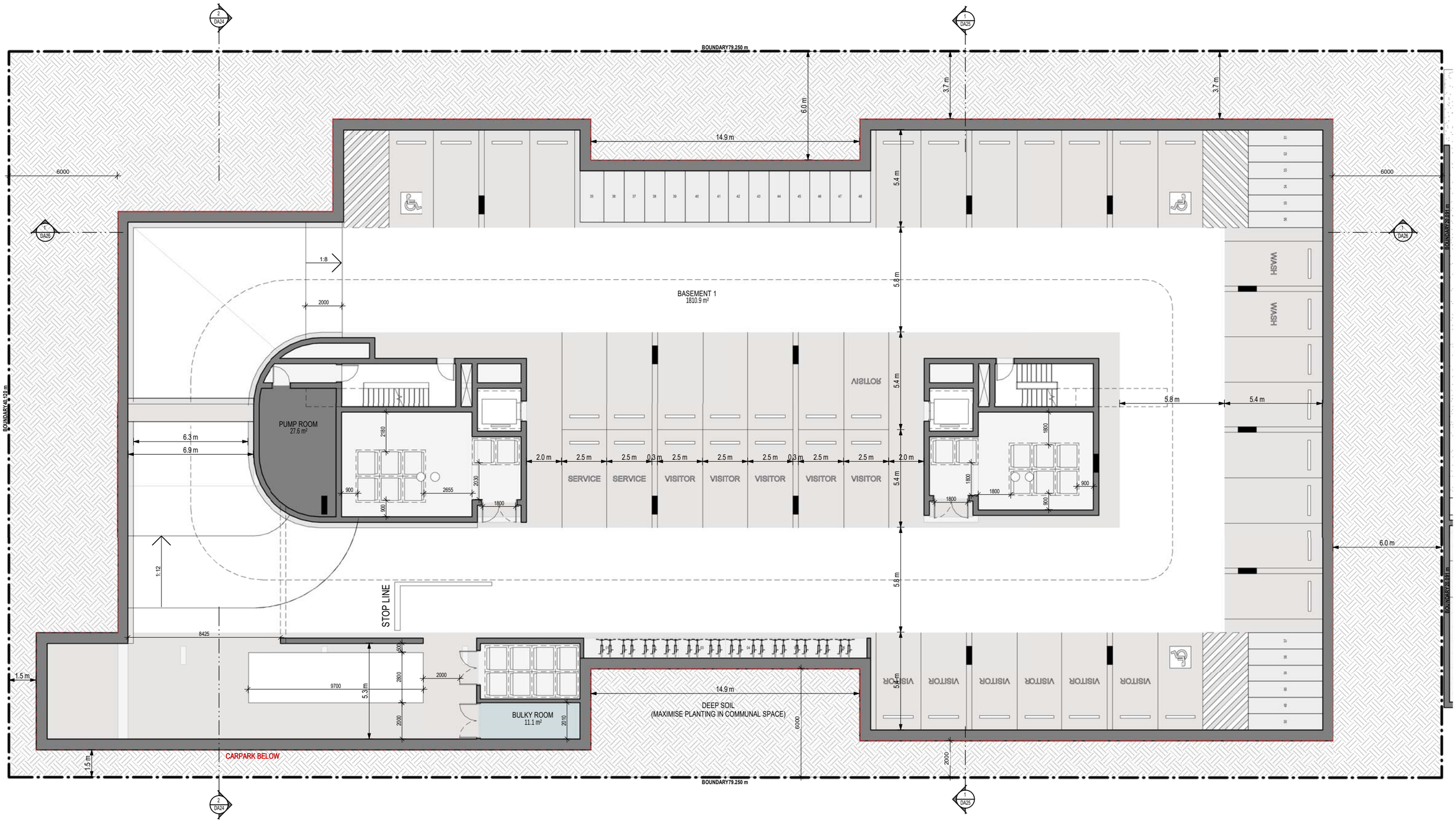
SHEET SIZE: A1
SCALE 1 : 100
DATE JULY 2018

SHEET NAME **FLOOR PLAN - GROUND**

DRAWING NUMBER **DA12**

ISSUE NO. **A**

HOPE STREET



ISSUE	DATE	AMENDMENT
A	17-03-2020	DA SUBMISSION

LEGENDS / NOTES:

BR	BEDROOM	GAS	GAS CUPBOARD	RWO	RAINWATER OUTLET
COM	COMMS CUPBOARD	GD	GRATED DRAIN	SWP	STORM WATER PIT
DP	DOWNPIPE	GEX	GARBAGE EXHAUST	TOH	TOP OF HOB
E	ELECTRICAL CUPBOARD	MBX	MAILBOX	TOW	TOP OF WALL
FHR	FIRE HOSE REEL	RL	RELATIVE LEVEL	TTI	TACTILE INDICATORS

SCALE BAR

NORTH POINT

PROJEC T
18006 - PROPOSED RESIDENTIAL DEVELOPMENT

ADDRESS
16-24 HOPE STREET, PENRITH 2750

CLIENT
PRESTIGE DEVELOPMENTS GROUP (NSW) PTY LTD

MORSON GROUP

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www.morsongroup.com.au
(02) 9380 4946
PO Box 370, Potts Point, NSW 1335

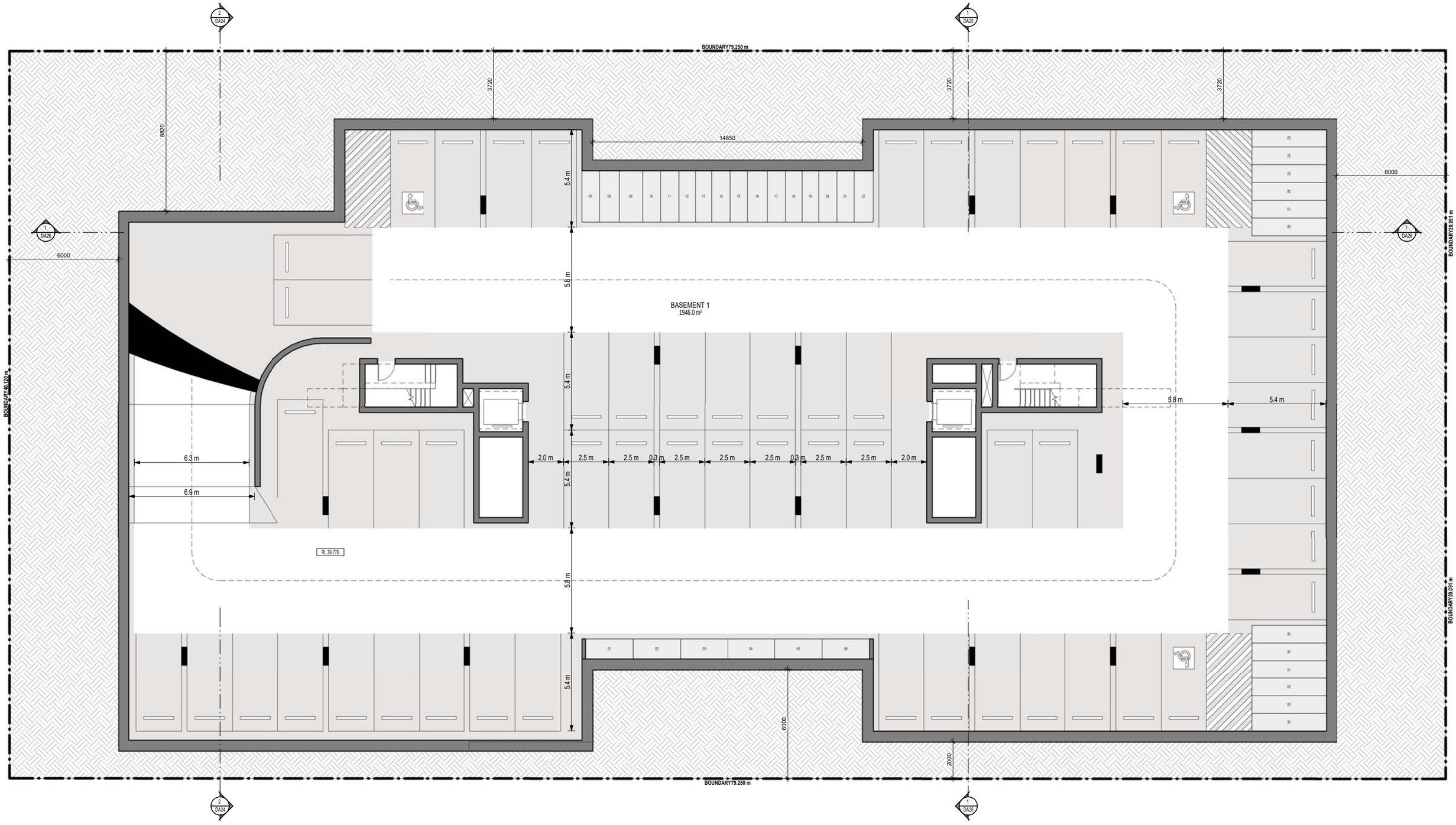
SHEET SIZE- A1
SCALE 1 : 100
DAT E JULY 2018

SHEET NAME **FLOOR PLAN - BASEMENT 1**

DRAWING NUMBER **DA11**

ISSUE NO. **A**

HOPE STREET



ISSUE	DATE	AMENDMENT
A	17-03-2020	DA SUBMISSION

LEGENDS / NOTES:

BR	BEDROOM	GAS	GAS CUPBOARD	RWO	RAINWATER OUTLET
COM	COMMS CUPBOARD	GD	GRATED DRAIN	SWP	STORM WATER PIT
DP	DOWNPIPE	GEX	GARBAGE EXHAUST	TOH	TOP OF HOB
E	ELECTRICAL CUPBOARD	MBX	MAILBOX	TOW	TOP OF WALL
FHR	FIRE HOSE REEL	RL	RELATIVE LEVEL	TTI	TACTILE INDICATORS

SCALE BAR

NORTH POINT

PROJEC
T
18006 - PROPOSED RESIDENTIAL DEVELOPMENT

ADDRESS
16-24 HOPE STREET, PENRITH 2750

CLIENT
PRESTIGE DEVELOPMENTS GROUP (NSW) PTY LTD

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ACN 159 480 056, ABN 41 159 480 056
www.morsongroup.com.au
(02) 9380 4946
PO Box 370, Point Point, NSW 1335

SHEET SIZE: A1
SCALE 1 : 100
DAT E JULY 2018

SHEET NAME **FLOOR PLAN - BASEMENT 2**

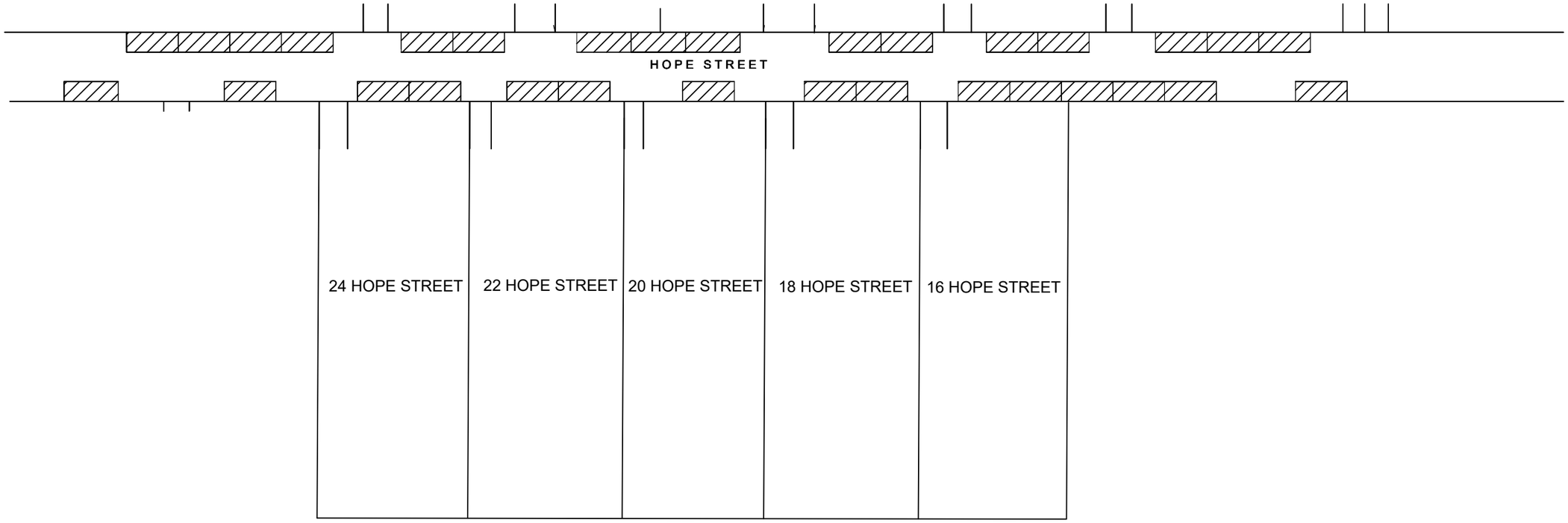
DRAWING NUMBER **DA10**

ISSUE NO. **A**

APPENDIX 2

ON-STREET CAR PARKING SPACE

NUMBER OF ON-STREET CAR PARKING SPACES WITHIN THE VICINITY OF THE SITE = 31



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

EXISTING ON-STREET PARKING PROVISION

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET

PENRITH

SCALE: 1:500 AT A3

FILE: 19-201

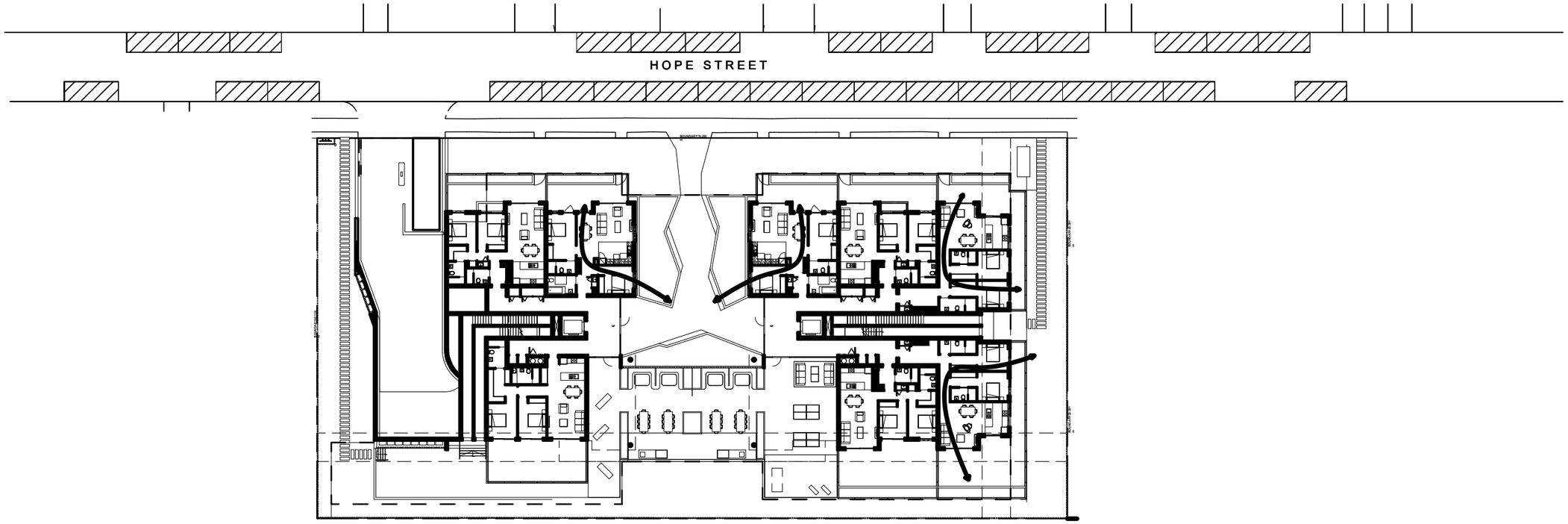
SUPERSEDES SHEET/ISSUE -

DATE: 18/03/2020

ISSUE A

SHEET 1

ON-STREET CAR PARKING SPACE	NUMBER OF ON-STREET CAR PARKING SPACES WITHIN THE VICINITY OF THE SITE = 31



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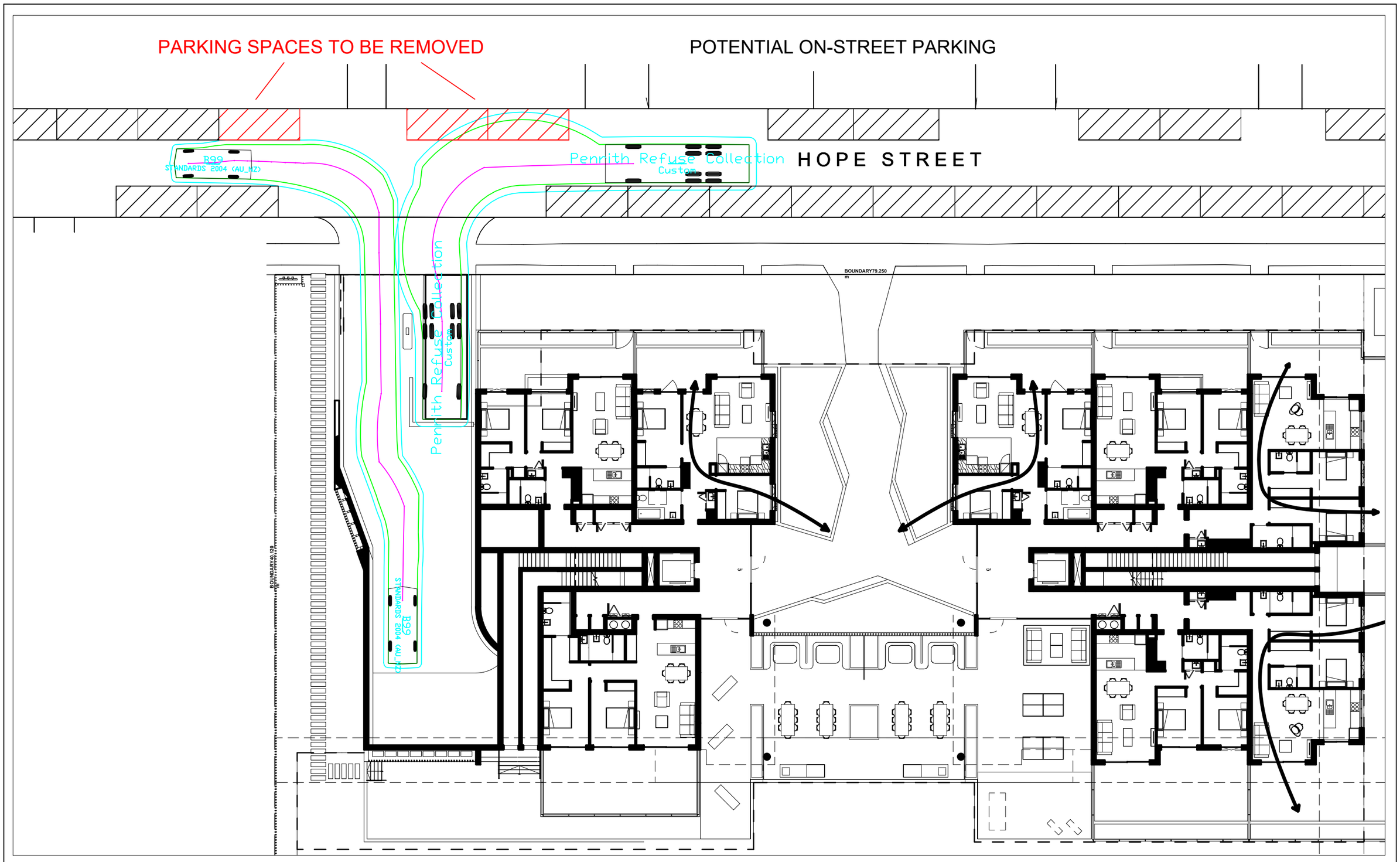
STANBURY TRAFFIC PLANNING

PROPOSED ON-STREET PARKING PROVISION ASSOCIATED WITH
PROPOSED RESIDENTIAL DEVELOPMENT
16 - 24 HOPE STREET
PENRITH

SCALE: 1:500 AT A3
FILE: 19-201
SUPERSEDES SHEET/ISSUE -
DATE: 18/03/2020
ISSUE A
SHEET 2

APPENDIX 3



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STANBURY TRAFFIC PLANNING

10.5m LONG REFUSE COLLECTION VEHICLE AND PASSENGER VEHICLE

SWEPT PATHS - SITE INGRESS / EGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

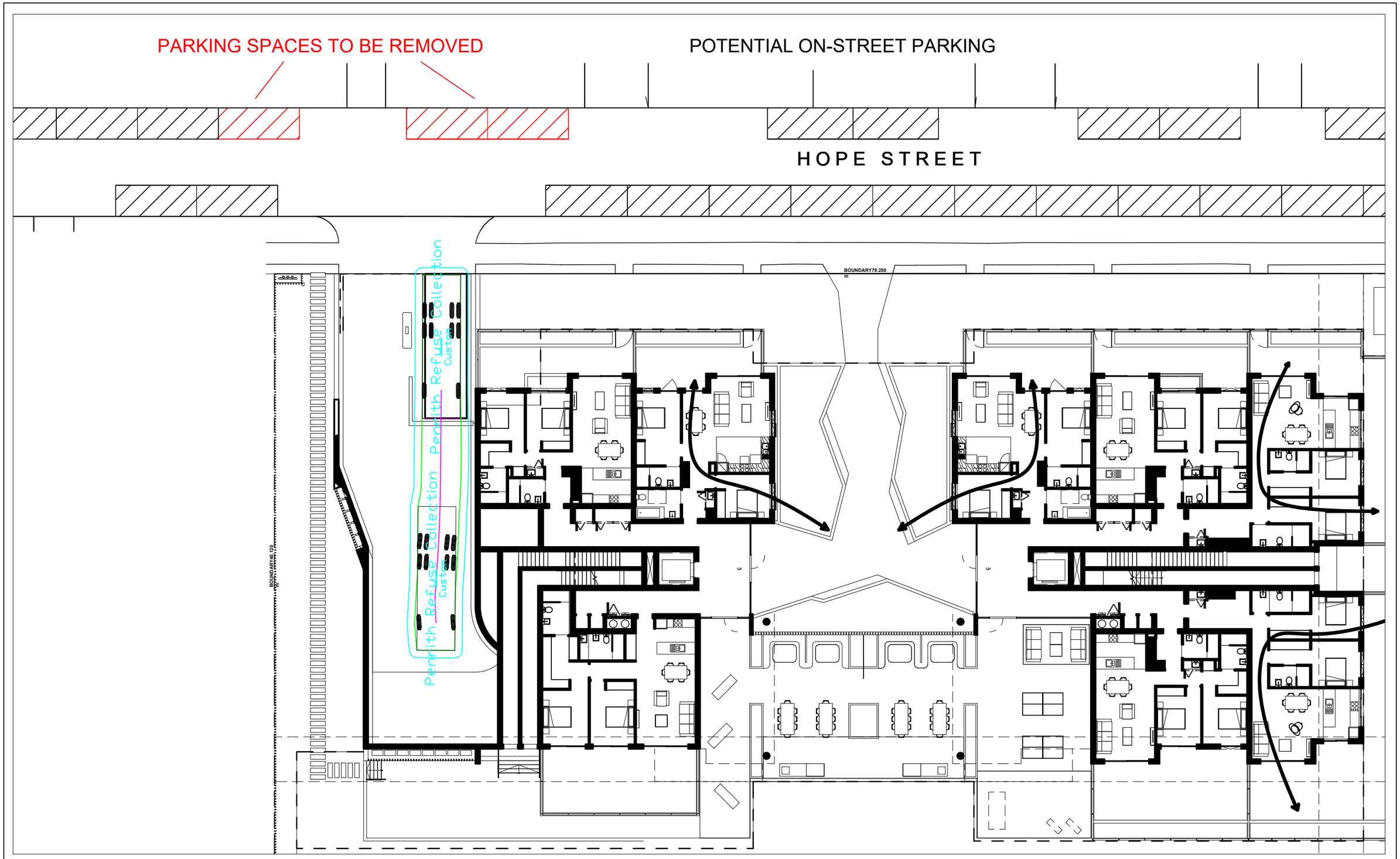
ISSUE: A

FILE: 19-201

SUPERSEDES SHEET/ISSUE: -

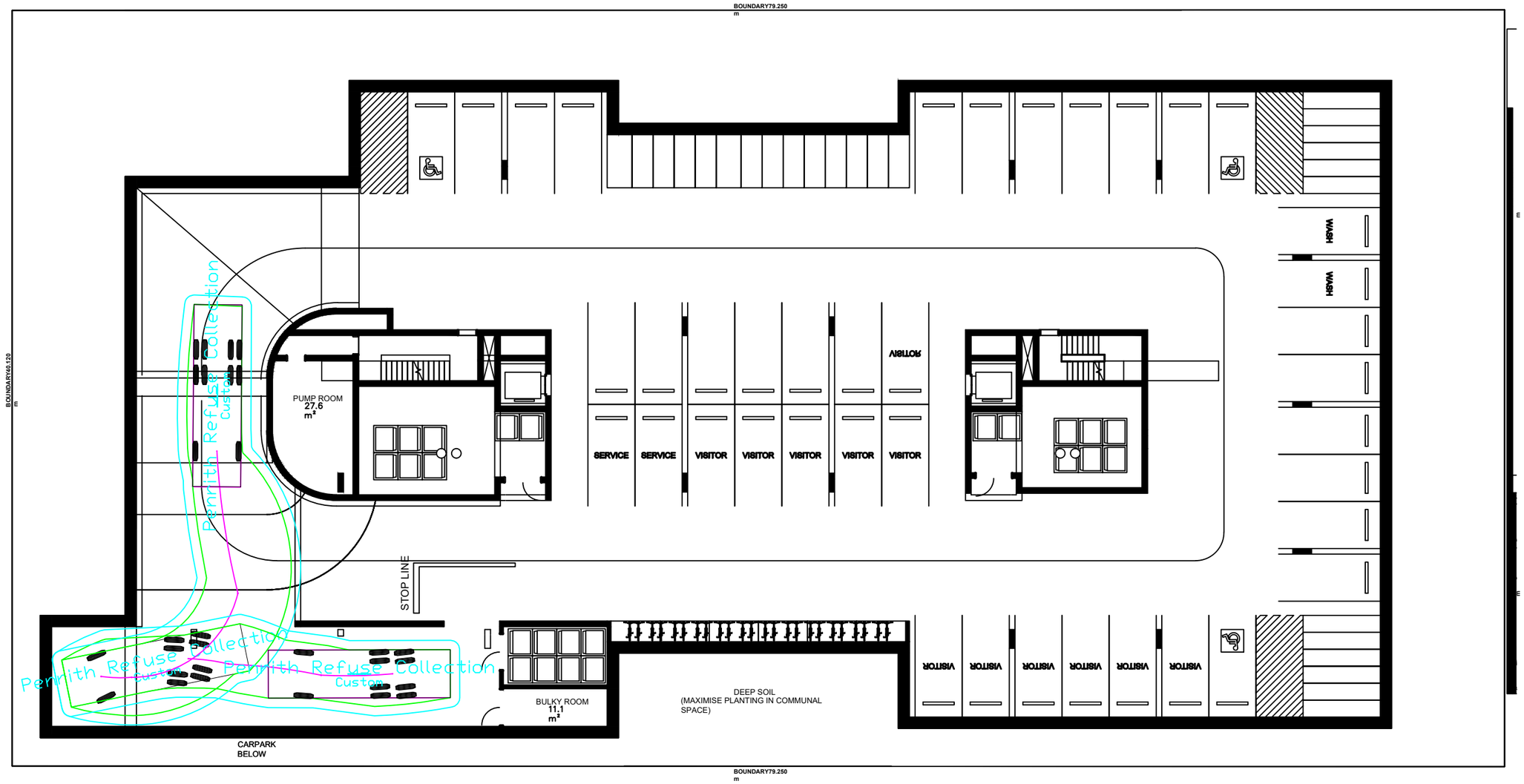
SHEET: 1

DATE: 18/03/2020



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. 2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH MANOEUVRING SPECIFCATIONS FOR A 9.7m LONG REFUSE COLLECTION VEHICLE.	STANBURY TRAFFIC PLANNING 10.5m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS BASEMENT LEVEL 1 INGRESS MOVEMENT FROM WAITING BAY PROPOSED RESIDENTIAL DEVELOPMENT 16 - 24 HOPE STREET, PENRITH	SCALE: 1:250 AT A3 FILE: 19-201 SUPERSEDES SHEET/ISSUE - DATE: 18/03/2020 ISSUE A SHEET 2

BASEMENT LEVEL 1



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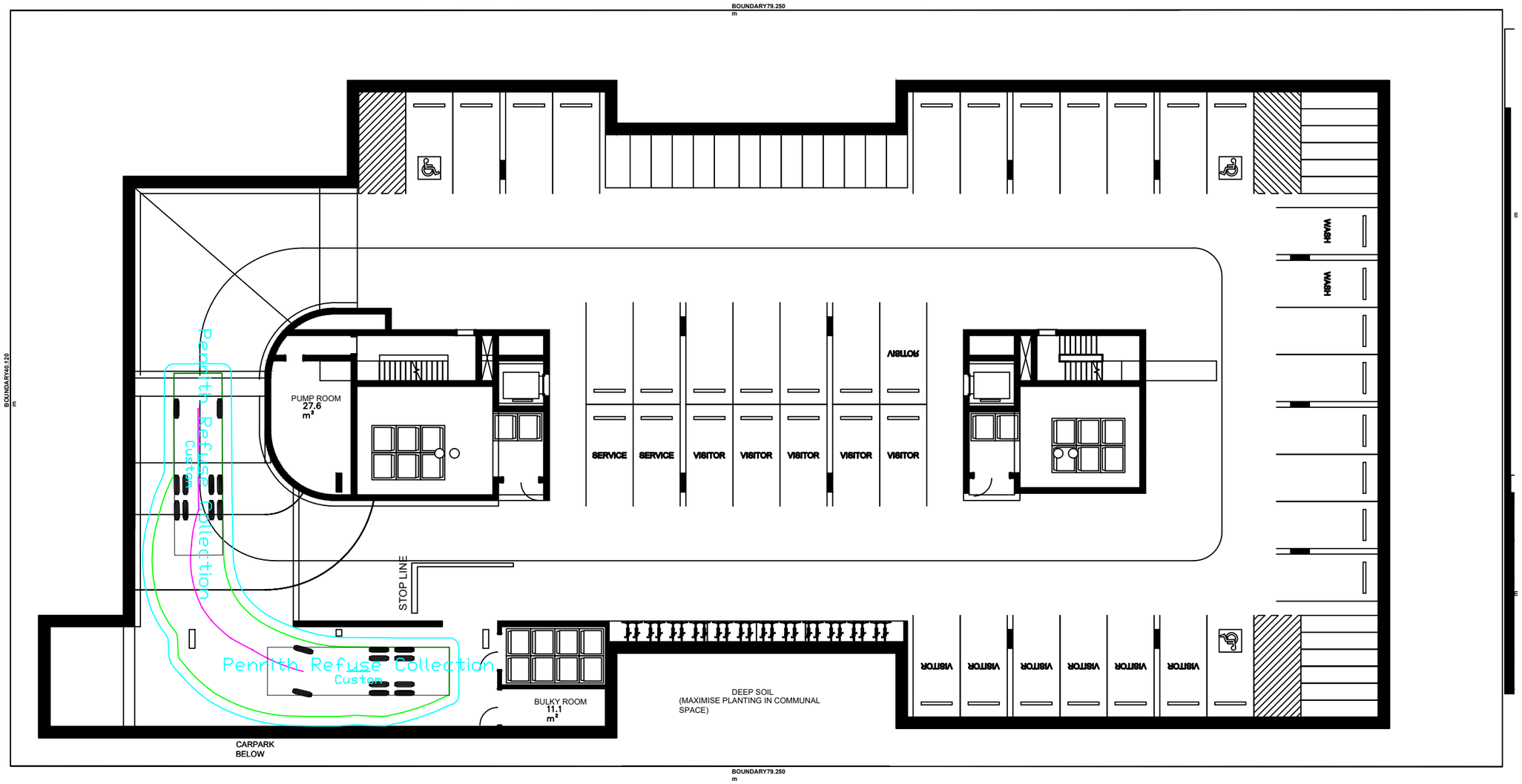
STANBURY TRAFFIC PLANNING

10.5m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS
BASEMENT LEVEL 1 INGRESS MOVEMENT TO ON-SITE LOADING AREA
PROPOSED RESIDENTIAL DEVELOPMENT
16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3
ISSUE: A
FILE: 19-201
SUPERSEDES SHEET/ISSUE: -
SHEET: 3
DATE: 18/03/2020

BASEMENT LEVEL 1



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STANBURY TRAFFIC PLANNING

10.5m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 EGRESS MOVEMENT FROM ON-SITE LOADING AREA

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3 | ISSUE: A

FILE: 19-201 | SUPERSEDES SHEET/ISSUE: -

DATE: 18/03/2020 | SHEET: 4

PARKING SPACES TO BE REMOVED

POTENTIAL ON-STREET PARKING

HOPE STREET

Penrith Refuse Collection
Custom

B99
STANDARDS 2004 (AU_NZ)

B99
STANDARDS 2004 (AU_NZ)

Penrith Refuse Collection
custom

BOUNDARY79.250
m

BOUNDARY79.250
m

STANBURY TRAFFIC PLANNING	
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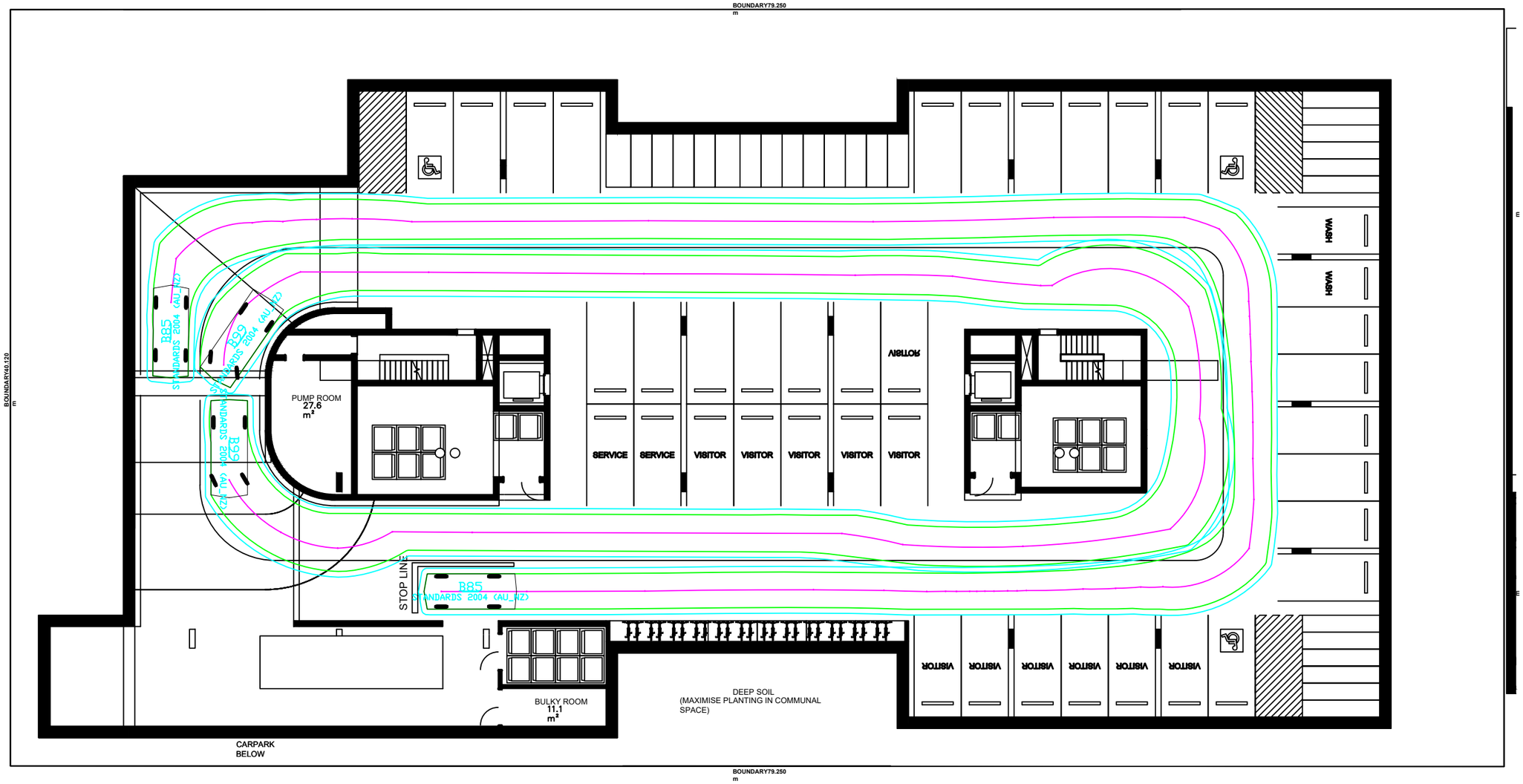
STANBURY TRAFFIC PLANNING

10.5m LONG REFUSE COLLECTION VEHICLE AND PASSENGER VEHICLE
SWEPT PATHS - SITE INGRESS / EGRESS MOVEMENTS
PROPOSED RESIDENTIAL DEVELOPMENT
16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3		ISSUE A
FILE: 19-201	SUPERSEDES SHEET/ISSUE -	
DATE: 18/03/2020		SHEET 5

BASEMENT LEVEL 1



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 INTERNAL MANOEUVRING

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-201

SUPERSEDES SHEET/ISSUE -

DATE: 18/03/2020

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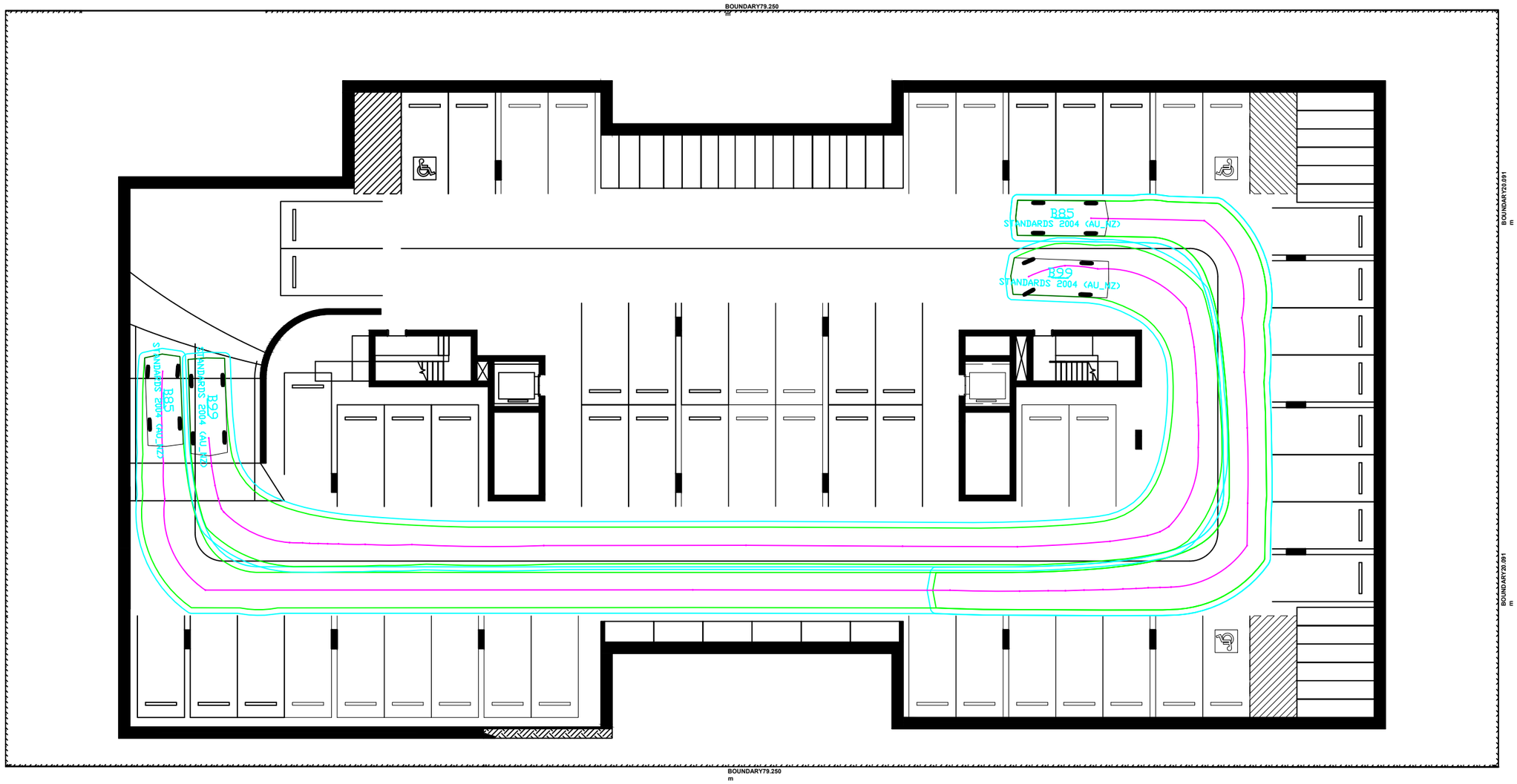
SHEET 6

BASEMENT LEVEL 2



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL MANOEUVRING

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-201

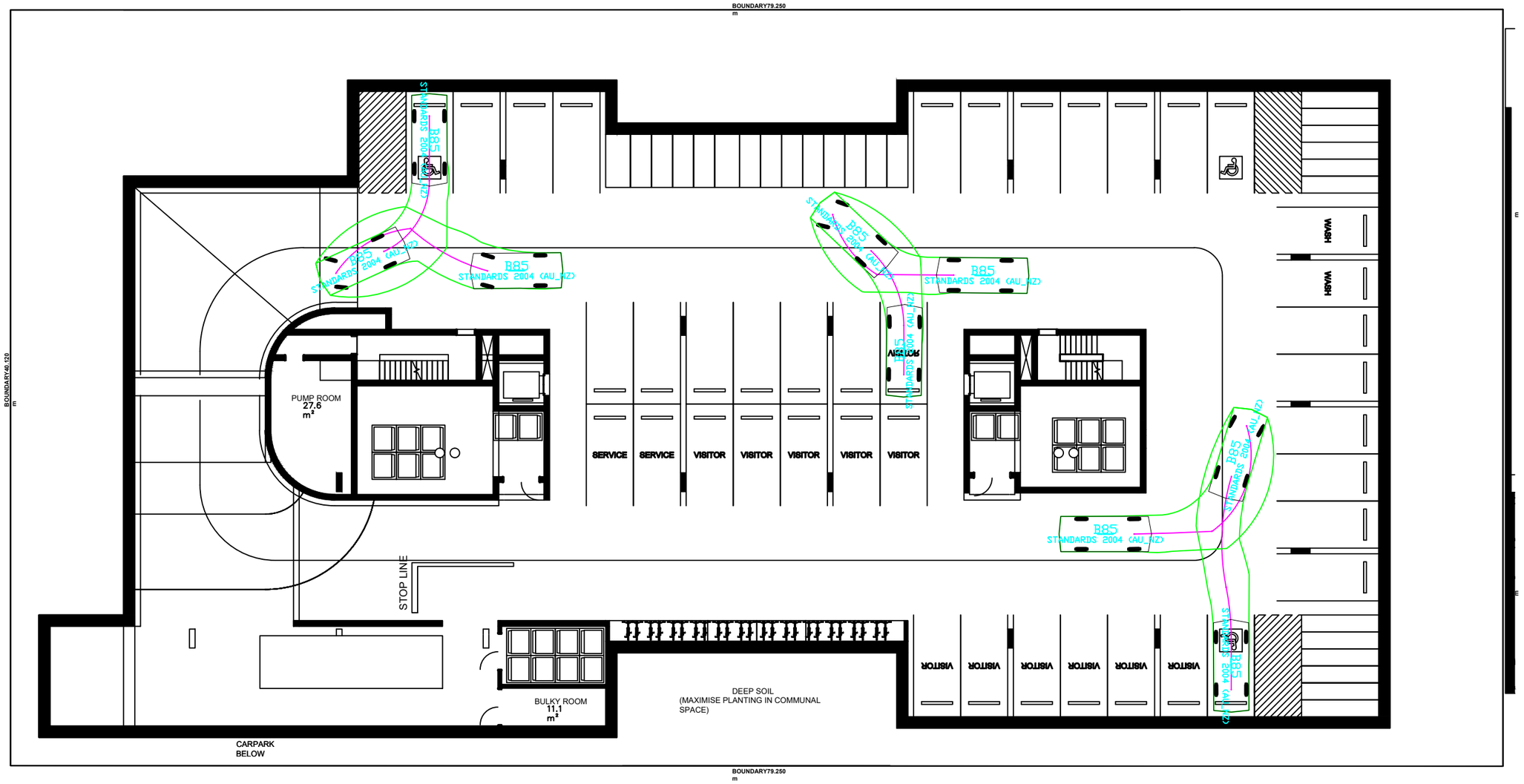
SUPERSEDES SHEET/ISSUE -

DATE: 18/03/2020

ISSUE A

SHEET 7

BASEMENT LEVEL 1



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TRAFFIC, PARKING & TRANSPORT CONSULTANTS

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EMAIL: info@stanburytraffic.com.au
WEBSITE: www.stanburytraffic.com.au

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2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH B85 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1: OFF-STREET CAR PARKING (AS2890.1:2004).

STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 INTERNAL PARKING SPACE INGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

ISSUE: A

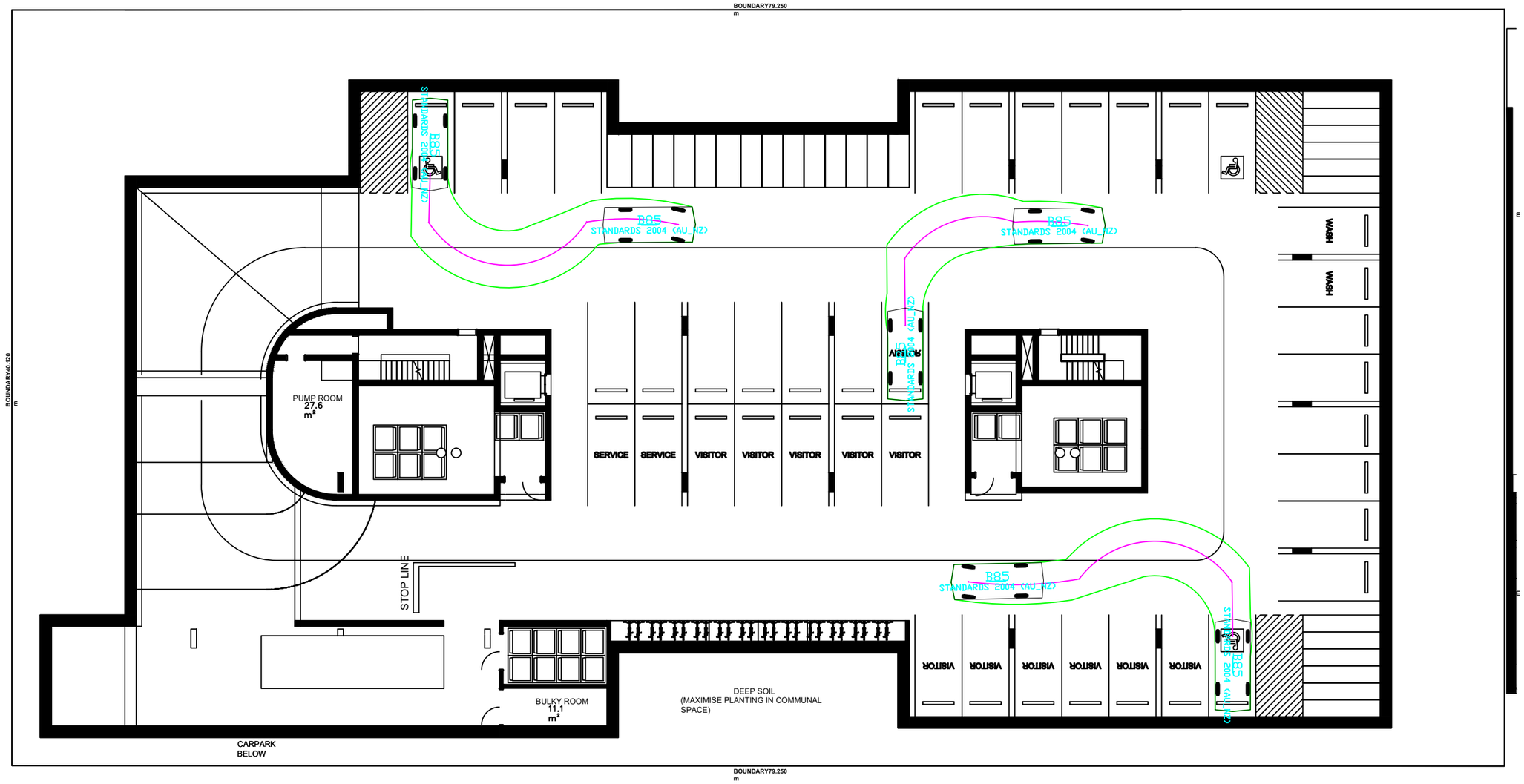
FILE: 19-201

SUPERSEDES SHEET/ISSUE: -

DATE: 18/03/2020

SHEET: 8

BASEMENT LEVEL 1



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 INTERNAL PARKING SPACE EGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-201

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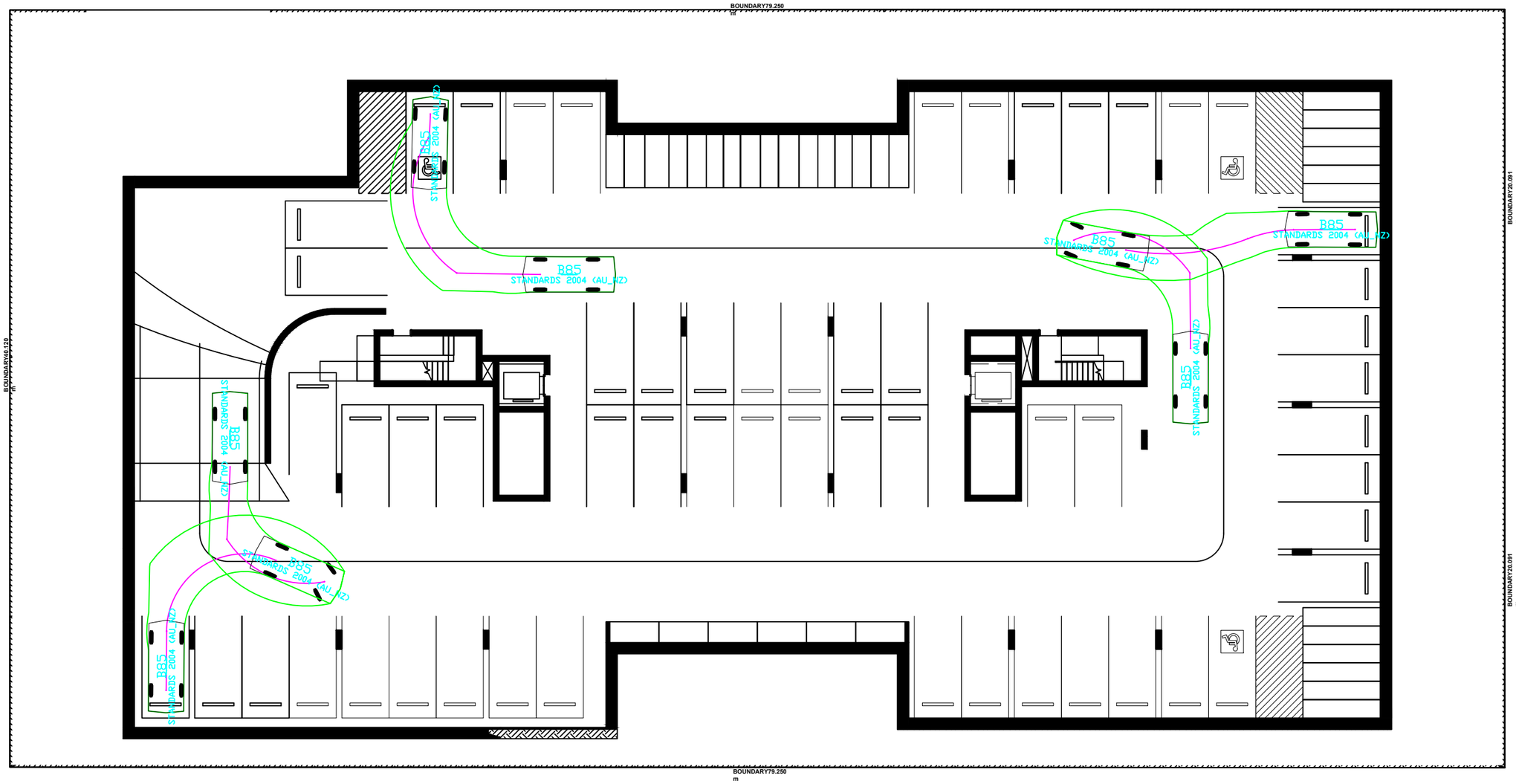
ISSUE A

DATE: 18/03/2020

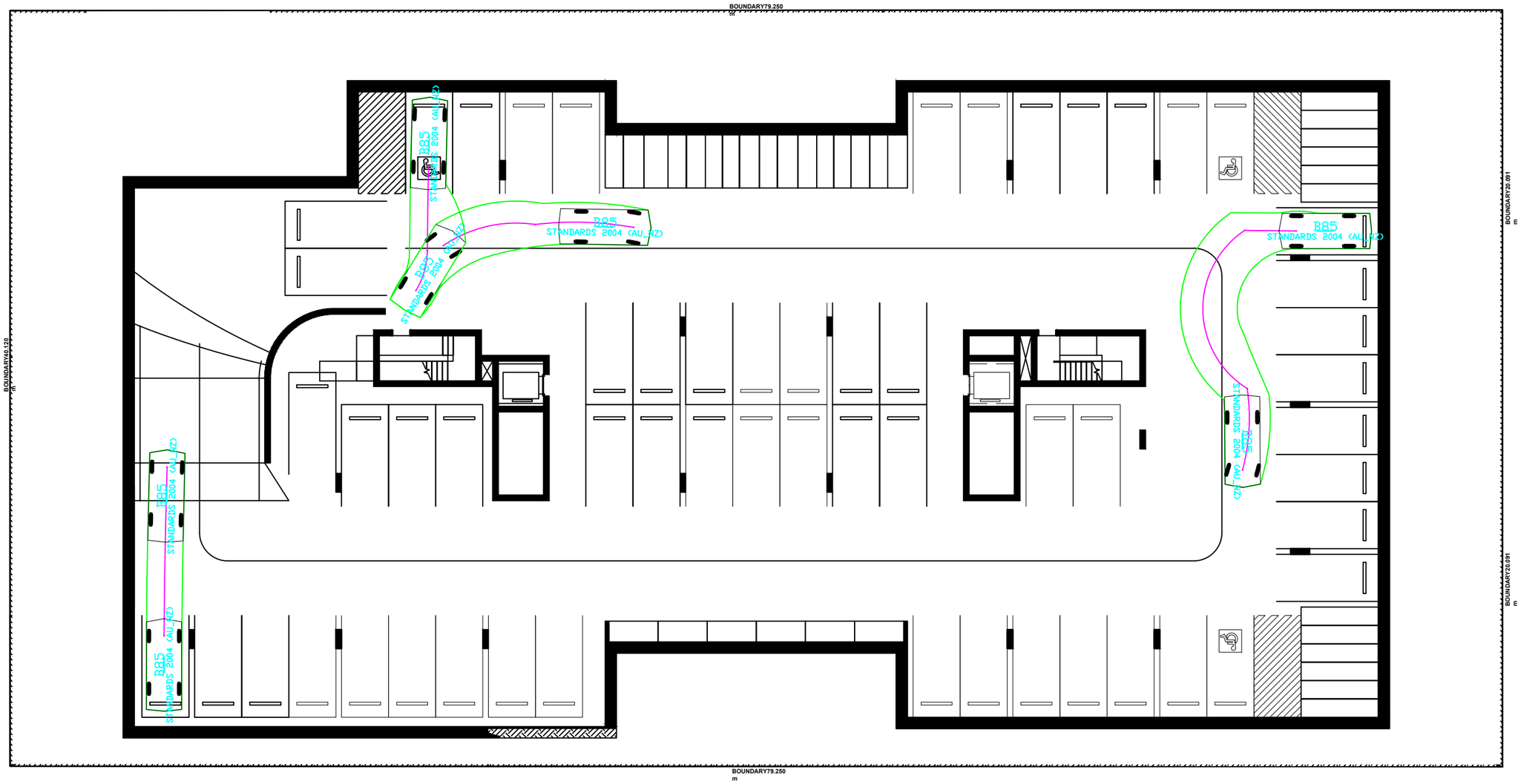
SHEET 9

BASEMENT LEVEL 2



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. 2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH B85 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1: OFF-STREET CAR PARKING (AS2890.1:2004).	STANBURY TRAFFIC PLANNING PASSENGER VEHICLE SWEPT PATHS BASEMENT LEVEL 2 INTERNAL PARKING SPACE INGRESS MOVEMENTS PROPOSED RESIDENTIAL DEVELOPMENT 16 - 24 HOPE STREET, PENRITH	SCALE: 1:250 AT A3 FILE: 19-201 SUPERSEDES SHEET/ISSUE - DATE: 18/03/2020	ISSUE A SHEET 10

BASEMENT LEVEL 2



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL PARKING SPACE EGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

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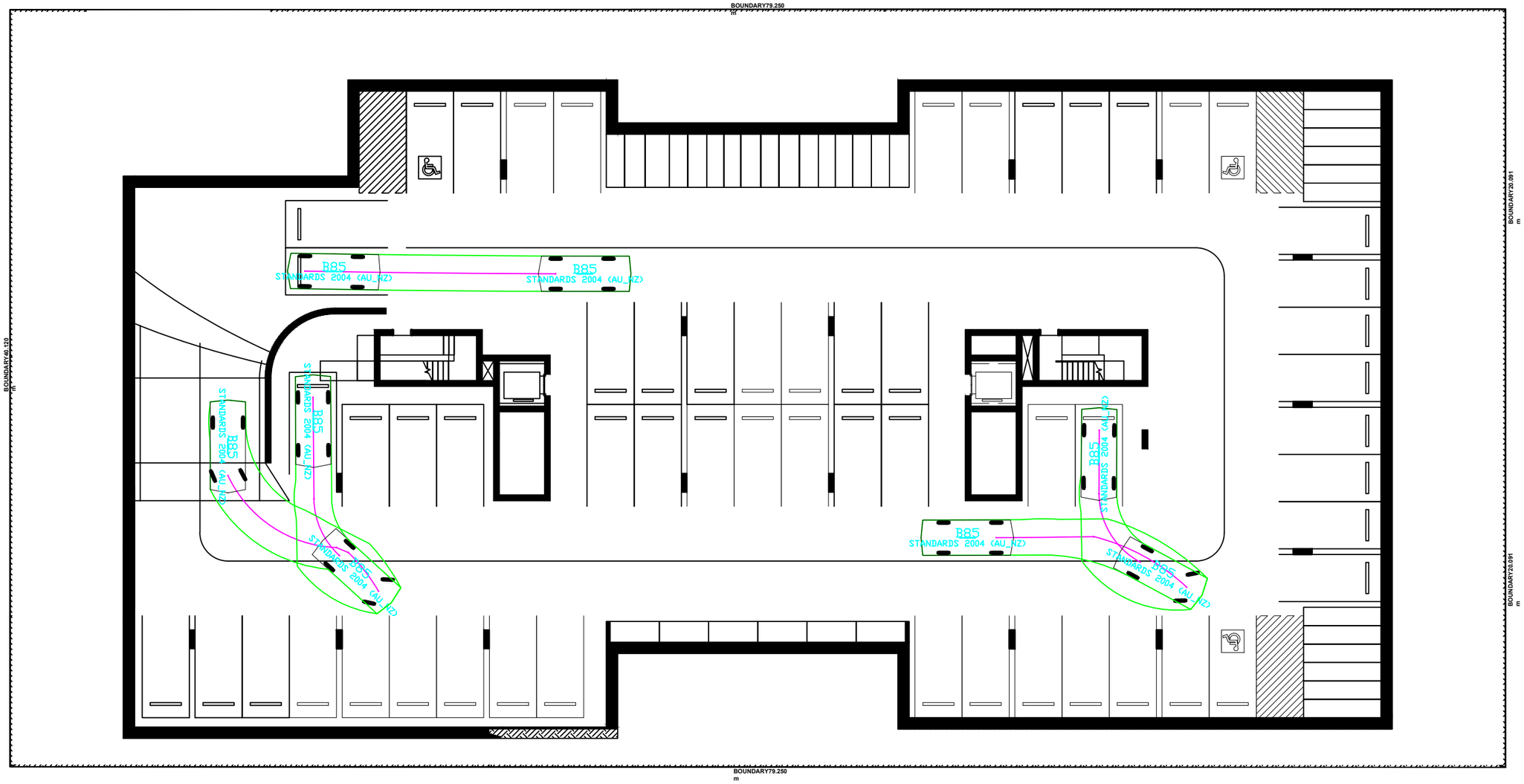
DATE: 18/03/2020

BASEMENT LEVEL 2



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL PARKING SPACE INGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

ISSUE: A

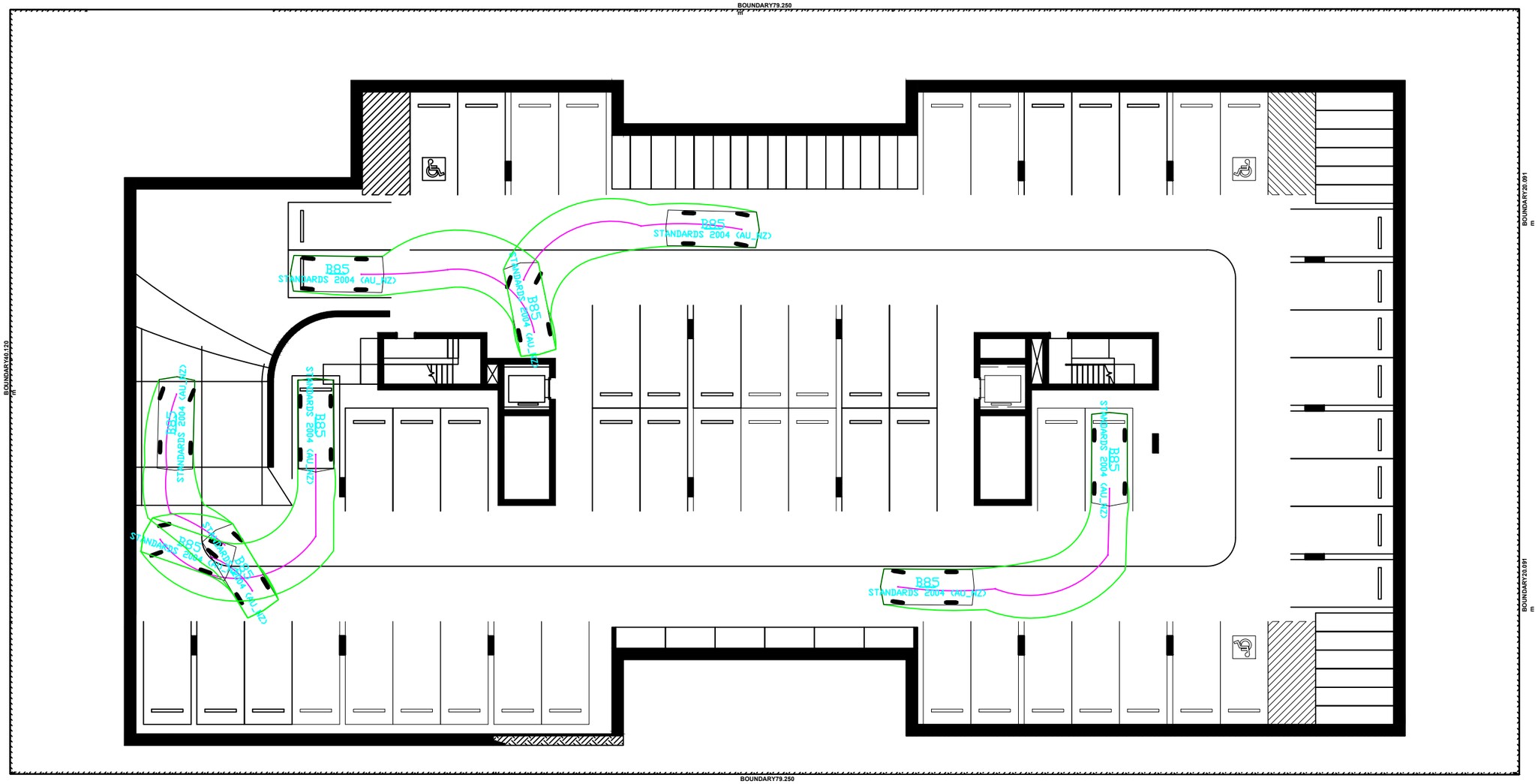
FILE: 19-201

SUPERSEDES SHEET/ISSUE: -

DATE: 18/03/2020

SHEET: 12

BASEMENT LEVEL 2



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL PARKING SPACE EGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

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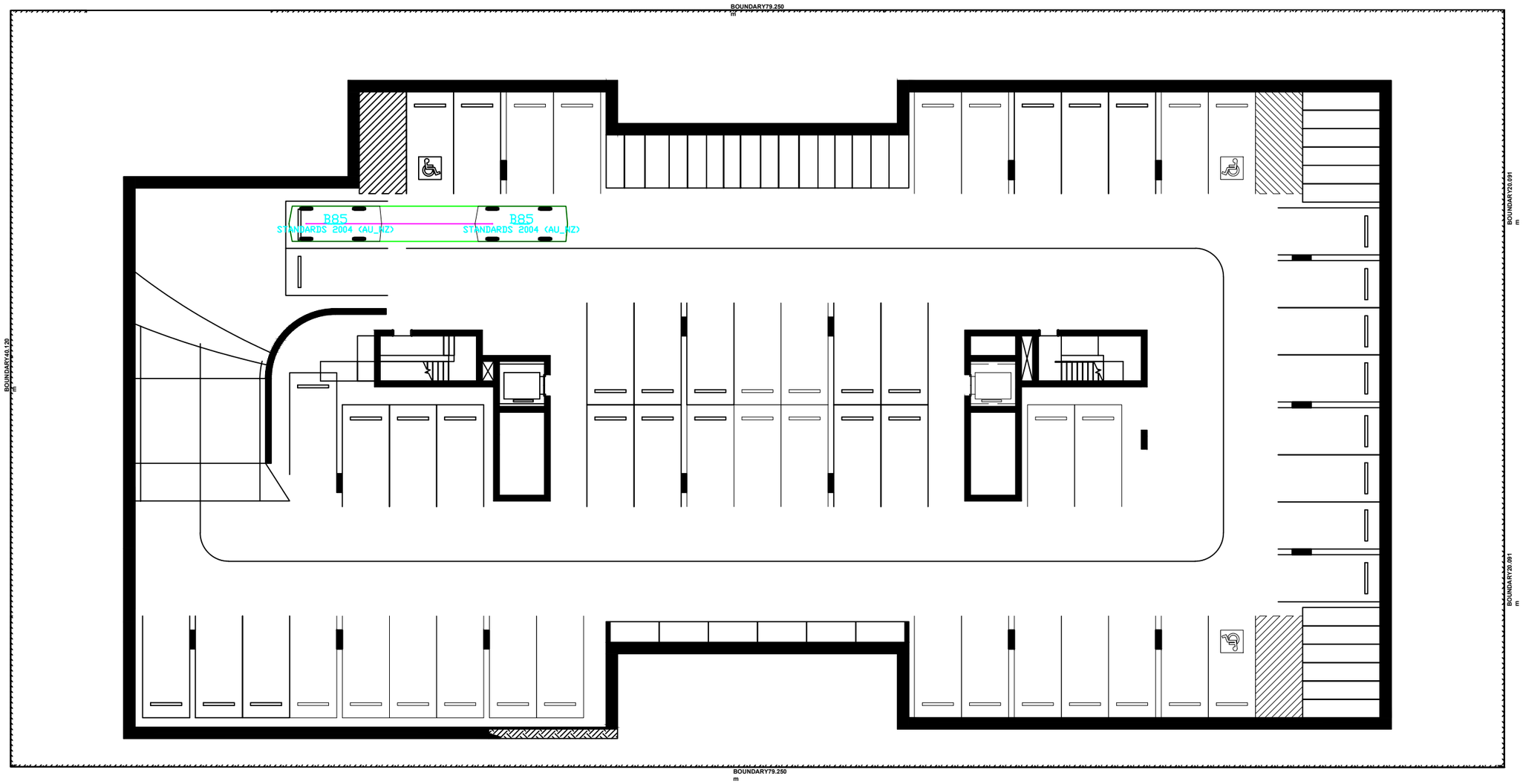
SHEET: 13

BASEMENT LEVEL 2



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 INTERNAL PARKING SPACE INGRESS MOVEMENTS

PROPOSED RESIDENTIAL DEVELOPMENT

16 - 24 HOPE STREET, PENRITH

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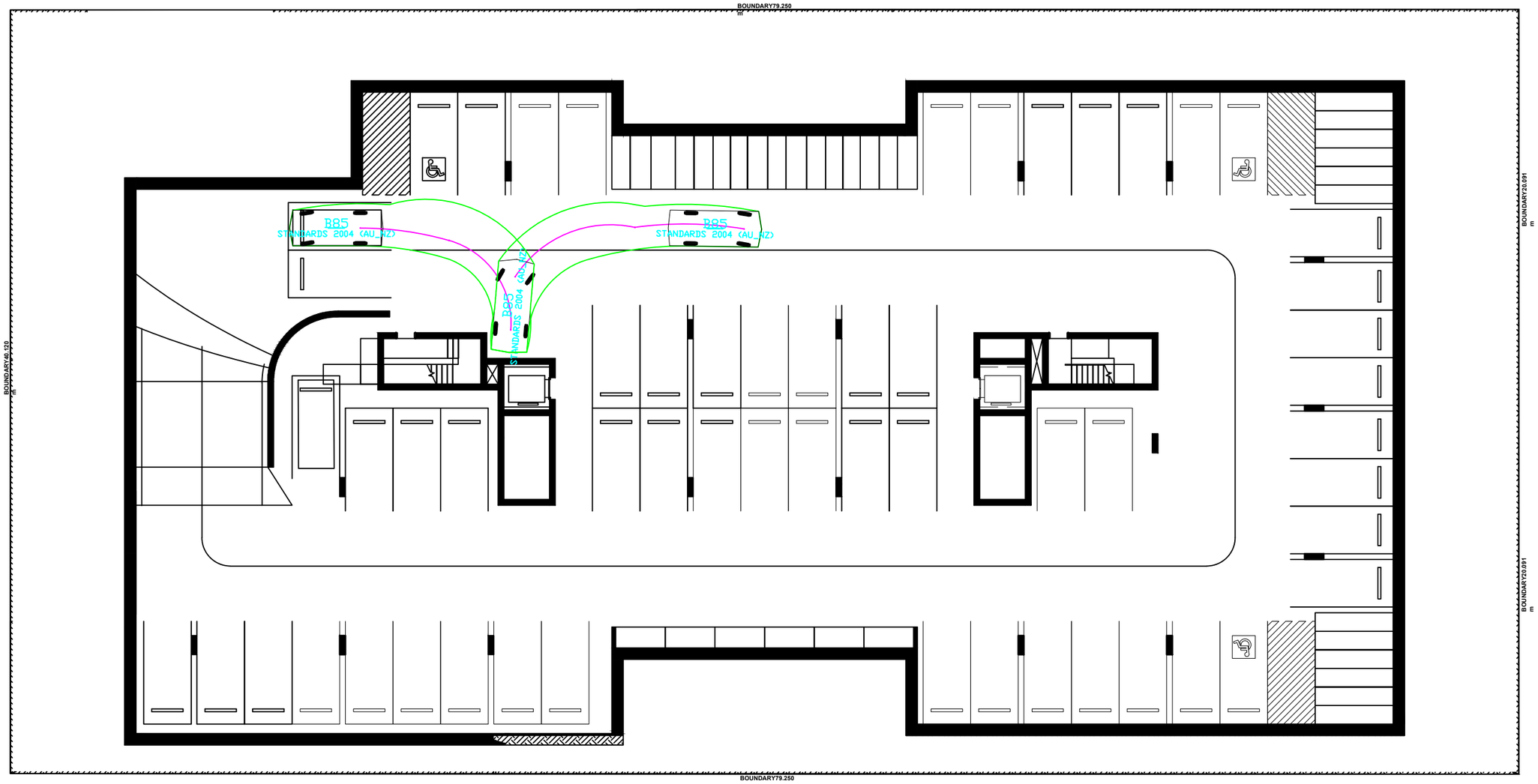
SUPERSEDES SHEET/ISSUE: -

SHEET: 14

DATE: 18/03/2020

BASEMENT LEVEL 2



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PASSENGER VEHICLE SWEPT PATHS

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APPENDIX 4

MOVEMENT SUMMARY

Site: [Parker Street and Hope Street]

EXISTING AM
Site Category: (None)
Giveway / Yield (Two-Way)

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: Parker Street south												
1	L2	6	5.0	0.179	5.1	LOS A	0.0	0.0	0.00	0.01	0.00	55.3
2	T1	1008	5.0	0.179	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1014	5.0	0.179	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
West: Hope Street west												
10	L2	7	5.0	0.006	6.7	LOS A	0.0	0.2	0.38	0.56	0.38	50.8
Approach		7	5.0	0.006	6.7	LOS A	0.0	0.2	0.38	0.56	0.38	50.8
All Vehicles		1021	5.0	0.179	0.1	NA	0.0	0.2	0.00	0.01	0.00	59.8

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

MOVEMENT SUMMARY

Site: [Parker Street and Hope Street]

EXISTING AM
Site Category: (None)
Giveway / Yield (Two-Way)

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: Parker Street south												
1	L2	10	5.0	0.191	5.1	LOS A	0.0	0.0	0.00	0.02	0.00	55.2
2	T1	1071	5.0	0.191	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1081	5.0	0.191	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
West: Hope Street west												
10	L2	19	5.0	0.017	6.8	LOS A	0.1	0.5	0.39	0.59	0.39	50.8
Approach		19	5.0	0.017	6.8	LOS A	0.1	0.5	0.39	0.59	0.39	50.8
All Vehicles		1100	5.0	0.191	0.2	NA	0.1	0.5	0.01	0.02	0.01	59.6

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.