STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

TRAFFIC & PARKING IMPACT ASSESSMENT

PROPOSED MIXED USE DEVELPOMENT
1 – 3 HOPE STREET
PENRITH

PREPARED FOR DA CONSULTANTS PTY. LTD.
OUR REF: 19-015-2

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1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by DA Consultants 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 existing site structures and the construction of a mixed use development including two medical suites situated at ground floor below five levels of residential apartments containing 24 dwellings at 1 – 3 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).

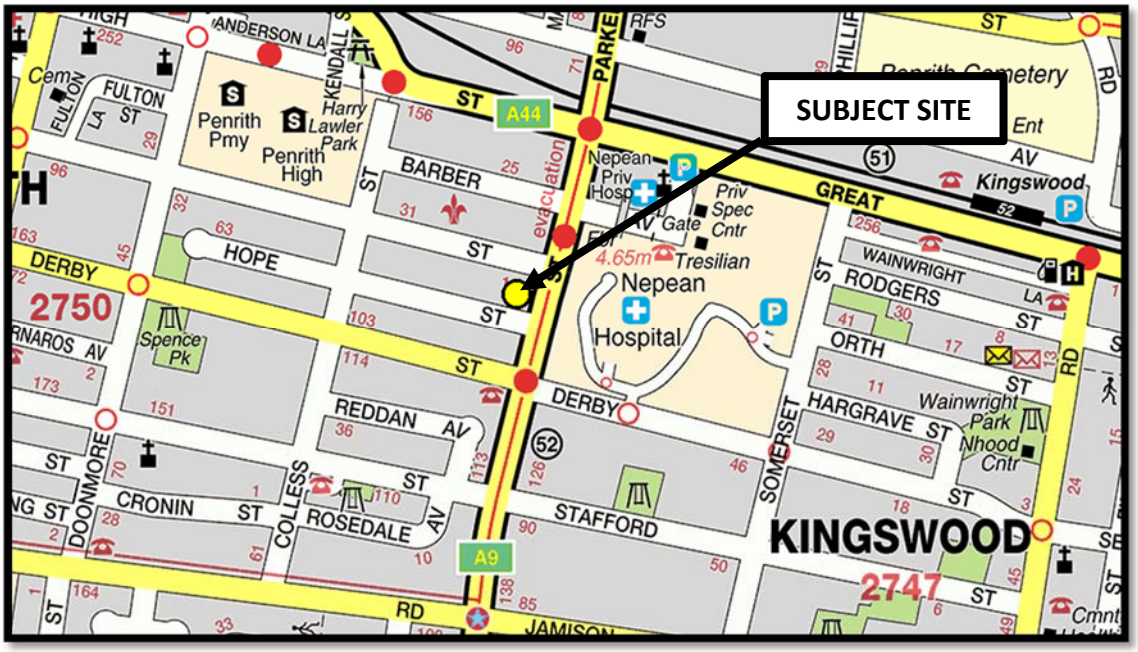
Architectural plans have been prepared by Morson Group and should be read in conjunction with this report, reduced copies of a selection of which are included as **Appendix 1** for reference.

1.3 Site Details

1.3.1 Site Location

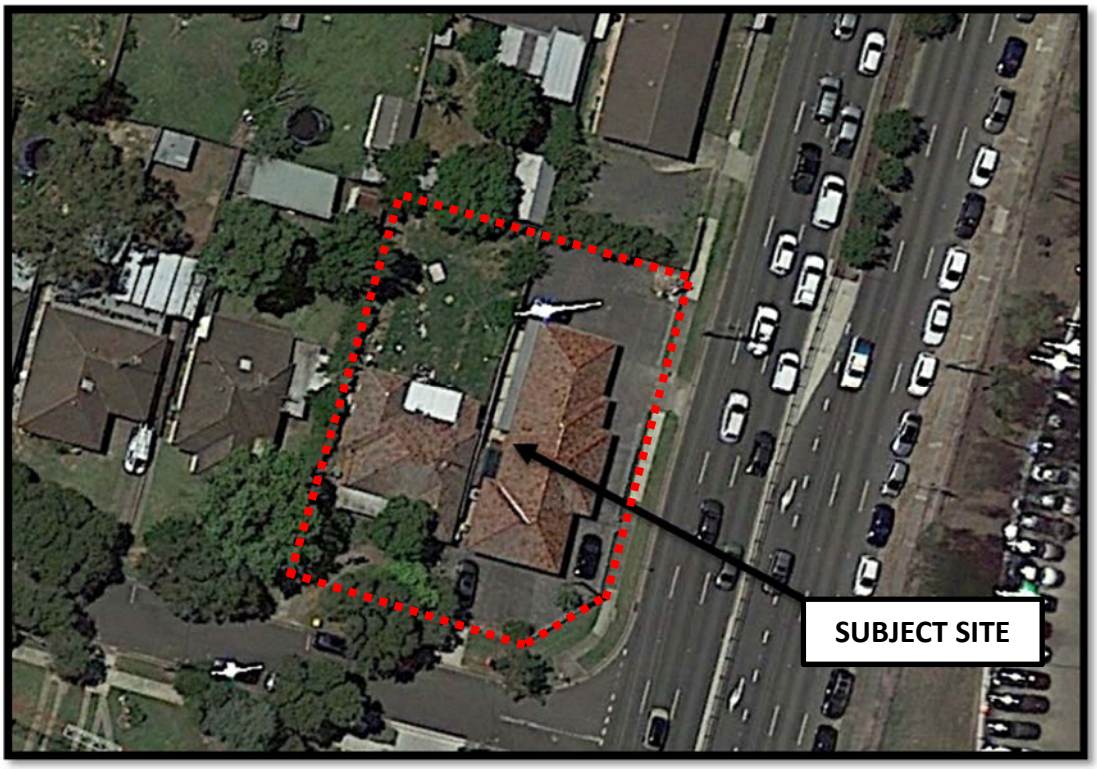
The subject site is situated on the north-western corner of the junction of Parker Street and Hope Street, Penrith. The site location is illustrated below and overleaf within a local and aerial context by **Figure 1** below and **Figure 2** overleaf, respectively.

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: Google Earth (accessed 26/09/18)

1.3.2 Site Description

The subject site provides a real property description of Lot 20 and 21 DP 31239 and a street address of 1 and 3 Hope Street, Penrith. Collectively, the allotments predominantly form a rectangular shaped parcel of land, providing approximate frontages of 34m and 24m to Parker Street and Hope Street, respectively. The site provides an area of 1,233m^2.

1.3.3 Existing Uses

The subject site currently accommodates the following:

- A dwelling house which has been converted to a medical consulting room business is situated within 1 Hope Street; and
- A detached dwelling occupies 3 Hope Street.

The medical consulting room business contained within 1 Hope Street, containing three consulting rooms, is serviced by two vehicular access driveways connecting separately with Parker Street and Hope Street, within the north-eastern and south-western corners of the lot, respectively. These driveway provide connectivity to passenger vehicle parking areas within the northern and southern portions of the site, capable of accommodating up to six passenger vehicles in an informal manner.

The detached dwelling house contained within 3 Hope Street is serviced by a single driveway connecting with Hope Street in the south-western corner of the site.

1.3.4 Surrounding Uses

The subject site is adjoined by the following land uses:

- The site is immediately adjoined to the north and west by low density residential dwellings;
- Land to the south of the site, on the opposite side of Hope Street, is occupied by a medical consulting facility similar to that currently contained within the site; and
- Nepean Hospital is located to the east, on the opposite side of Parker Street.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The subject application seeks Council's approval to demolish the existing site structures and the construction of a mixed use development comprising the following:

- Two medical suites, providing a combined total floor area of 215.3m^2, situated at ground floor level; and

- 24 residential apartments, situated at levels 1 – 5, comprising :

  - 4 one bedroom dwellings;
  - 18 two bedroom dwellings; and
  - 2 three bedroom dwellings

The development is proposed to be serviced by two levels of basement car parking accommodating 41 passenger vehicle spaces (including a single car wash / service bay, eight bicycle spaces and one motorcycle space. Further, an at-grade refuse collection / servicing area is proposed at-grade incorporating a mechanical turntable. A further two bicycle parking spaces are also proposed to be provided at-grade.

Vehicular access is proposed via a single combined ingress / egress driveway connecting with Hope Street in the south-western corner of the site.

No vehicular access between the site and Parker Street is proposed.

Pedestrian connectivity is proposed between the development and the western Parker Street footpath and the northern Hope Street footway, separate from the abovementioned vehicular access driveway.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Vehicular Access

Vehicular access between the development site and Hope Street is proposed to be provided via an 11m wide single combined ingress / egress driveway provided within the south-eastern corner of the site. The access driveway is proposed to provide connectivity to two separate but adjacent internal roadways facilitating access to the basement parking levels and the at-grade refuse collection / servicing area.

The internal roadway / ramp connecting the access driveway to the basement car parking levels provides a 3m wide ingress lane separated from a 3m wide egress lane by a 0.6m wide median for a length of 6m. The ramp then reduces in width to 5.5m to provide a single carriageway capable of accommodating two-way traffic, prior to connecting with the upper basement parking level.

Access to the at-grade refuse collection / servicing area is provided via a 4.5m wide roadway extending north into the site, adjacent to the abovementioned roadway / ramp connecting to the basement parking levels. The roadway facilitates access to the waste truck loading area, being serviced by a mechanical turntable allowing for forward ingress / egress movements of waste collection vehicles.

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 primarily residential land-use and the on-site passenger vehicle parking provision of less than 100 spaces. The proposed 11m wide combined ingress / egress driveway therefore exceeds the minimum AS2890.1-2004 specifications.

Swept path plans have been prepared in order to demonstrate the ability of passenger vehicles to enter and exit the site in combination, copies of which are included as **Appendix 2**.

It is further acknowledged that the driveway is also required to accommodate vehicles up to and including Council's 9.7m refuse collection vehicle. A series of swept paths have also been prepared and included within Appendix 2, which demonstrate that such vehicles are capable of entering and exiting the site via the proposed access driveway, with appropriate clearance to driveway extents, roadway kerb and gutter and potential on-street parking.

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 roads and the proposed site driveways, based on the prevailing 50km/h speed limit;
- No obstructions to visibility adjacent to the driveway facilitating appropriate sight distance between exiting motorists and pedestrians along the northern Hope Street footway; and
- The driveway is located at least 1.0m from any structures including power poles, street lighting, signs, road furniture etc.

3.2 On-Site Parking Provision

3.2.1 Vehicular Parking Provision

The development is serviced by a total of 41 off-street passenger vehicle parking spaces provided as follows:

Basement level 1	
Medical Disabled	1
Medical Patrons	6
Medical Staff	2
Residents	3
Resident Visitors	5
Carwash / Service Bay	1
Basement level 2	
Resident Disabled	3
Resident spaces	20
Total	41 spaces

3.2.2 Vehicular Parking Requirements

3.2.2.1 Residential Flat Buildings

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 below 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	22	22
3 bedroom dwellings	2 space per dwelling	2	4
Service vehicles	1 space per 40 dwellings	24	0.6 (adopt 1)
Visitor Parking	1 space per 5 dwellings	24	4.8 (adopt 5)
Car Washing	1 space per 50 units	24	0.48 (adopt 1)
		Total	33

Table 1 indicates that DCP 2014 requires the development provide a total of 33 passenger vehicle parking spaces to comply with Council requirements for residential flat buildings, comprising 26 resident, five visitor, one car wash and one service bay.

3.2.2.2 Health Service Facilities

Penrith City Council provide the following locally sensitive parking requirements for health consulting rooms and medical centres:

3 spaces per health care professional practicing at any one time, plus
1 space per receptionist / support staff, plus
1 space per associated dwelling

It is however noted that the operational characteristics and internal layout of the proposed medical suites were unknown at the time of writing this report. The use the abovementioned Council requirements for Health Consulting Rooms / Medical Centres is therefore not practical.

For the purposes of this assessment, the off-street parking rate of "4 spaces per 100m^2 GFA" nominated within the Roads & Maritime Services' *Guide to Traffic Generating Developments* for medical centres has been applied to the medical tenancies within the development. The following calculation is therefore provided:

4(215.3m^2 / 100m^2) = 8.62 (adopt 9) spaces

The medical tenancies are therefore projected to generate a parking demand of up to 9 spaces.

3.2.2.2 Summary of Parking Demand and Discussion

Table 2 below provides a summary of the traffic generating ability of the subject development with reference to the previous

TABLE 2 SUMMARY OF CAR PARKING DEMAND	
Use	**Parking Demand**
Residential Flat Building	-
Residents	26
Visitors	5
Carwash Bay	1
Service Bay	1
Medical Facility	9
Total	42

The development has therefore been projected to generate demand for up to 42 parking spaces.

The proposed parking provision of 41 spaces complies with the relevant requirements for resident, visitor and medical parking, however requires the sharing of the car wash and service bay. The combining of the service bay and wash bay is considered to be satisfactory given the sporadic nature of the use of such bays.

The proposed site-wide parking demand of 41 spaces is therefore considered to be satisfactory.

3.2.2 Bicycle Parking

The subject development is proposed to provide five bicycle storage racks capable of accommodating up to 10 bicycles within the basement parking levels and the ground floor 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:

Residential Housing

Resident
20% of units should provide a space

Resident Visitors
5% of units should provide a space

Health and Medical Centres

Staff
5% of staff

Visitors
5% of staff

As previously presented, the operational characteristics of the proposed medical tenancies are unknown at the time of writing of this report, however for the purposes of assessment, it is assumed that the tenancies could accommodate up to five staff.

TABLE 3
BICYCLE PARKING REQUIREMENTS
PENRITH DCP 2014

Item	Rate	No.	Spaces Required
Resident	20% of units	24	4.8 (adopt 5)
Resident Visitor	5% of units	24	1.2 (adopt 2)
Medical Staff	5% of staff	5	0.25 (adopt 1)
Medical Visitor	5% of staff	5	0.25 (adopt 1)
		Total	9

Based on 24 dwellings and five medical facility staff, the NSW Government's *Planning Guidelines for Walking and Cycling* recommends resident and visitor bicycle parking provision of 4.8 (adopt five) resident and 1.2 (adopt two) visitor parking spaces and 0.25 (adopt one) medical staff and 0.25 (adopt one) medical visitor parking spaces, for a total of site wide provision of nine spaces.

The proposed provision of 10 on-site bicycle parking spaces therefore exceeds with the requirement specified in the NSW Government's guidelines and accordingly, is considered to be satisfactory.

3.2.3 Motorcycle Parking

The development involves the provision of one motorcycle parking space provided within the upper basement parking level.

Penrith Council does not provide any minimum motorcycle parking rates, however the proposed provision of one motorcycle space, representing approximately one space per 40 car parking spaces, is considered to be satisfactory.

3.3 On-Street Parking Provision

3.3.1 Existing Parking Supply

Inspections have indicated that there are currently two marked unrestricted parallel parking spaces along the northern alignment of Hope Street, immediately adjacent to the subject site.

Parking within Parker Street adjacent to the subject site is prohibited.

3.3.2 Alterations to Existing Parking Supply

The proposed site access arrangements are expected to result in the removal of the existing two unrestricted parking spaces along the northern kerb alignment of Hope Street, immediately adjacent to the subject site.

3.2.3 Discussion of On-Street Parking Impacts

The previous analysis indicates that whilst the development is proposed to provide adequate off-street parking to accommodate development generated demand, the proposal will result in the loss of two prevailing unrestricted on-street parking spaces within Hope Street. The loss of on-street parking is however considered to be readily off-set by the removal of the existing medical facility within 1 Hope Street.

This facility, providing three consulting rooms and one support staff is required to provide 10 off-street parking spaces in accordance with DCP 2014 (three spaces per consulting room plus one space per support staff). Section 1.3.3 of this report presents that the facility is provided with passenger vehicle parking areas within the northern and southern portions of the site, capable of accommodating up to six passenger vehicles in an informal manner. The existing consulting room business within 1 Hope Street therefore results in an effective parking shortfall, and thus on-street parking demand, of four spaces.

The proposed development is therefore expected to result in a nett reduction in on-street parking demand of up to two spaces, thereby resulting in improved on-street parking amenity over and above that existing.

It should further be noted that the removal of existing on-street parking along the northern Hope Street kerb alignment on approach to Parker Street provides for improved overall vehicular safety desirably facilitating the accommodation of two-way traffic flow on approach / departure to / from the State Road.

3.4 Internal Circulation and Manoeuvrability

3.4.1 Passenger Vehicle Circulation

Passenger vehicles, upon entry to the site, will travel in a forward direction via a ramp running along the western site boundary to access Basement Level 1. Basement Level 1 is proposed to contain a series of standard 90 degree angled parking spaces serviced by an adjoining parking / circulation aisle, with spaces

being allocated to residents, residential visitors and medical centre staff and patrons.

A further access ramp is proposed to provide connectivity between Basement Level 1 and Basement Level 2, accommodating the remainder of the resident parking provision in a similar layout to that provided in Basement Level 1.

The passenger vehicle, bicycle and motorcycle parking spaces within both basement parking levels have been designed with the following minimum dimensions in accordance with the requirements of AS2890.1:2004, AS2890.3:2015 and AS2890.6:2009:

- Standard resident, residential visitor and medical patron vehicular parking space width = 2.4m;
- Standard medical visitor vehicular parking space width = 2.6m;
- Disabled vehicular parking space width = 2.4m (with adjoining 2.4m wide shared area);
- Additional vehicular space width where parking spaces adjoins an obstruction = 0.3m;
- Bicycle parking width = 0.5m;
- Motorcycle parking space width = 1.2m;
- Standard and disabled vehicular parking space length = 5.4m;
- Horizontal bicycle rack length (depth) = 1.8m;
- Vertical bicycle rack depth = 1.2m;
- Motorcycle parking space length = 2.5m;
- Vehicular parking aisle width adjoining parking spaces = 5.8m;
- Bicycle parking rack aisle width = 2.4m;
- Two-way straight roadway / ramp width = 5.8m;
- Parking aisle extension past dead end parking bays = 1.0m;
- Headroom = 2.2m;
- Headroom above disabled parking spaces and adjoining shared areas = 2.5m;
- Maximum ramp grade = 1 in 4;
- Maximum ramp grade for the first 6m inside the site and within parking module = 1 in 20; and

- Maximum change in grade = 1 in 8.

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 areas, this Practice has prepared a number of swept path plans which are included as **Appendix 2**. The turning paths provided on the plans have been generated using Autoturn software and derived from B85 and B99 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 AS 2890.1 - 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. The proposed site layout as it relates to passenger vehicle manoeuvrability is considered satisfactory.

3.4.2 Waste Collection

The subject site is anticipated to generate the requirement for regular waste collection vehicle servicing. Waste collection services are proposed to service the site within the north-western corner of the ground floor level.

The internal waste collection vehicle accommodation is proposed to be serviced by a mechanical turntable ensuring that all access / egress movements between the development site and Hope Street can occur in a forward direction.

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 2.** The turning paths provided on the plans have been generated utilising Autoturn software and manoeuvring specifications of Council's 9.7m long refuse collection vehicle.

The swept path plans illustrate the following:

- A 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 a mechanical turntable within the formalised

on-site servicing area, with reasonable clearance to public road or private development physical obstructions; and

- A 9.7m long refuse collection vehicle is capable of exiting the internal formalised servicing area (following rotation of the vehicle via the mechanical turntable) 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.

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. 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.

- **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.

4.2 Existing Traffic Volumes

Staff of Stanbury Traffic Planning have undertaken surveys of the junction of Parker Street northbound carriageway and Hope Street adjacent to 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** below 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

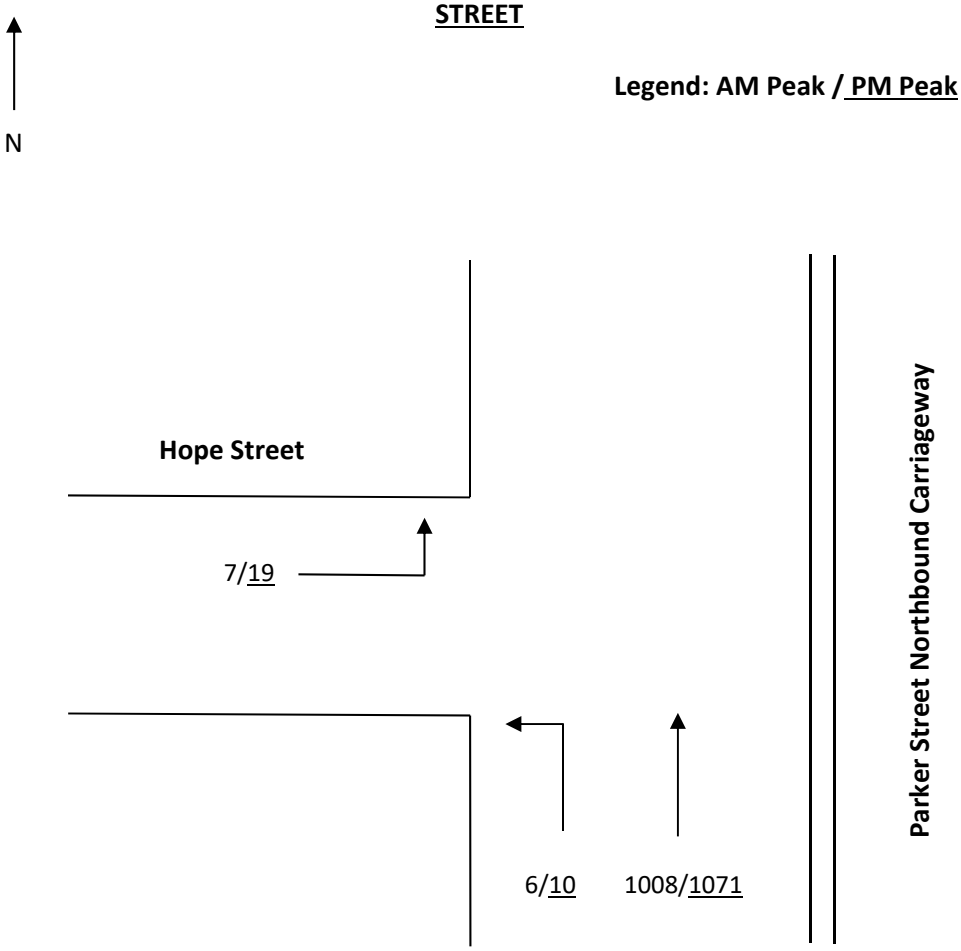


Figure 3 indicates the following:

- 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 3** (being the RMS NSW method of calculation of Level of Service).

TABLE 3
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 4** overleaf provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 3**.

TABLE 4 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 4 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 1.1km 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 the Roads & Maritime Services' *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 existing and proposed site uses with respect to those rates established by the Roads & Maritime Services.

5.1.1 Existing Site Uses

It has previously been presented that the subject site currently contains a medical consulting room business (providing an estimated floor area of 200m^2) in conjunction with an attached dwelling.

The Roads & Maritime Services provide the following peak hour traffic generation rates relevant to the existing site uses:

Medical Centres
8.8 vehicles per hour per 100m^2 gross floor area

Detached Dwellings
0.99 trips per dwelling

Application of the above traffic generation rates to the existing site uses results in the following peak hour traffic generation calculation:

8.8(200m^2 / 100m^2) + (0.99 x 1) = 18.6 (adopt 19) trips

The peak hour traffic generating ability of the existing development is accordingly estimated to be in the order of 19 trips.

5.1.2 Proposed Site Uses

The proposed development involves the following:

- Two medical suites combining to occupy 215.3m^2 total floor area; and
- 24 high density residential apartments.

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 residential component of the development is consistent with the definition of high density residential development contained within the Roads & Maritime Services' Guide to Traffic Generating Developments (containing more than 20 dwellings, being in excess of five storeys and being in close proximity to

high density residential development), Roads & Maritime Services officers have requested during pre-lodgement liaison that traffic generation for the residential component of the development 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.

Application of the above traffic generation rates to the proposed site uses results in the following peak hour traffic generation calculation:

$8.8(215.3m^2 / 100m^2) + (0.5 \times 22) + (0.65 \times 2) = 31.3$ (adopt 32) trips

The peak hour traffic generating ability of the proposed development is accordingly estimated to be in the order of 32 trips.

5.2 Traffic Impacts

The proposed development has been projected to generate up to 32 vehicle movements per hour during commuter peak periods, or 13 vehicle trips over and above that capable of being generated by the existing site development. Such a peak hour traffic generation equates to less than one additional vehicle movement every four minutes during commuter peaks, which is not projected to, in itself, result in any unreasonable impacts on the existing operational performance of the surrounding local road network. In this regard, the previous assessment contained within this report has revealed that traffic demands within the surrounding local road network are moderate and accordingly motorists are provided with a reasonable level of service with spare capacity.

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 improved level of safety afforded by the removal of kerb-side parking along the northern side of Hope Street adjacent to the site 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 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 mixed use development containing a ground floor medical tenancies below 24 residential apartments at 1 – 3 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 internal passenger vehicle circulation arrangements are capable of providing for safe and efficient internal manoeuvring;

- The proposed at-grade waste truck loading bay within the north-western corner of the site is projected to safely and efficiently accommodate refuse servicing of the site being assisted by the use of a mechanical turntable;

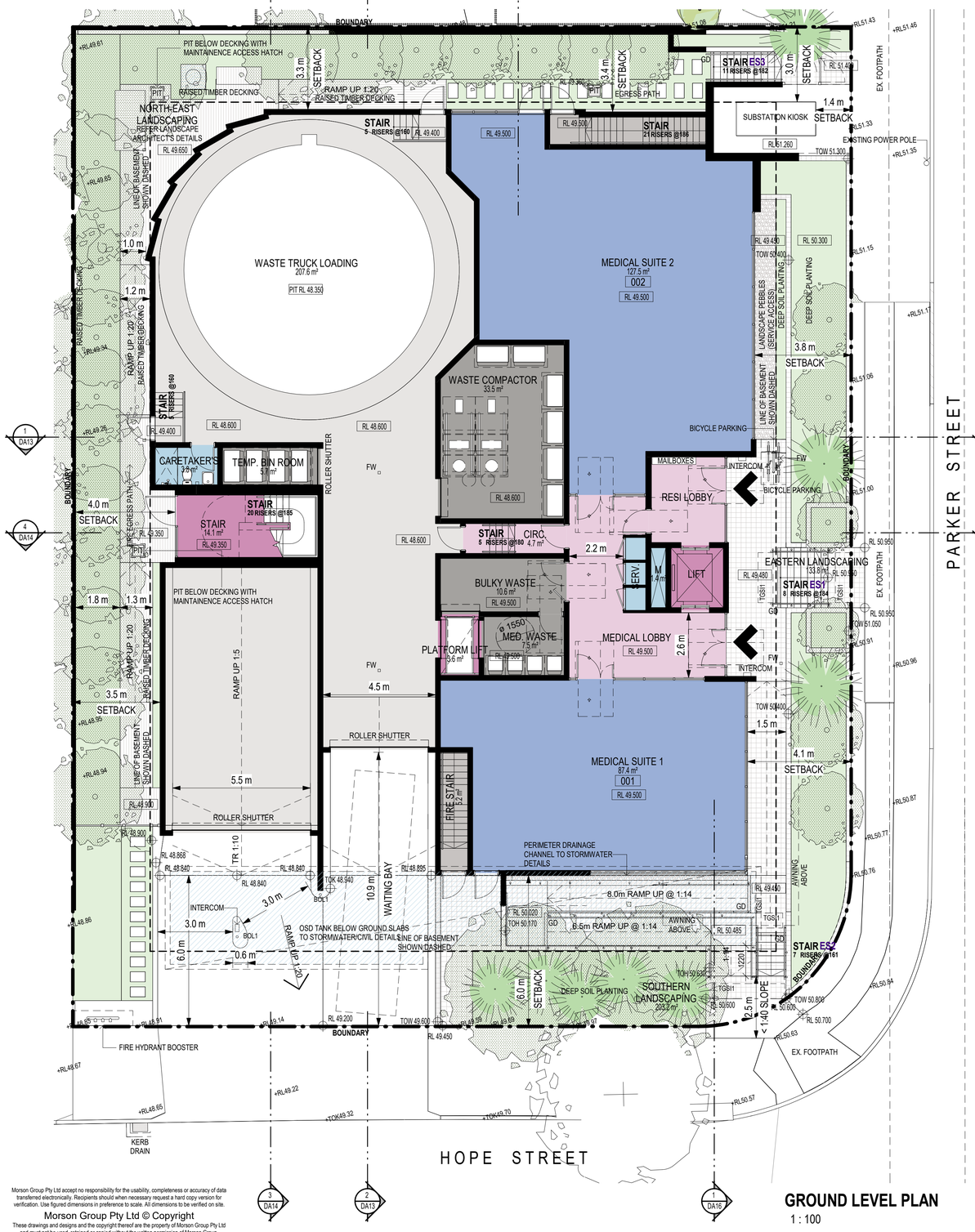
- The surrounding road network operates with a satisfactory level of service during peak periods;

- 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



GROUND LEVEL PLAN

1 : 100

LEVEL 1 PLAN

1 : 100

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

ISSUE	DATE	AMENDMENT
P1	23-09-2019	DRAFT FOR COORDINATION
P2	3-10-2019	DRAFT FOR COORDINATION
P3	15-10-2019	DRAFT FOR COORDINATION

GENERAL LEGEND:

(A)	Adaptable / Accessible	EDB	Electrical Distribution Board	RL	Relative Level
(L)	Liveable (Apartment)	FHR	Fire Hose Reel	RWO	Rainwater Outlet
BG	Box Gutter	GD	Grated Drain	ST	Storage (Cage)
BOL	Bollard	MBX	Mailbox	TOW	Top Of Wall
BR	Bedroom	NBN	Broadband Network	TGSI	Tactile Indicators

PROJECT NORTH

0 5 10 15 20m

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

PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT
ADDRESS
1-3 HOPE STREET, PENRITH NSW 2750

PROJECT No. **18014**

CLIENT
Dr AL KHAWAJA

MORSON GROUP
NOMINATED ARCHITECT - P F MORSON REGISTRATION NUMBER 8100
ACN 159 480 056, ABN 41 159 480 056
www.morsongroup.com.au
(02) 9360 4944
PO Box 170, Potts Point, NSW 1335

SHEET SIZE: A1

SCALE: 1 : 100

SHEET NAME: **FLOOR PLAN - GROUND & LEVEL 1**

DRAWING No. **DA08**

ISSUE No. **P3**

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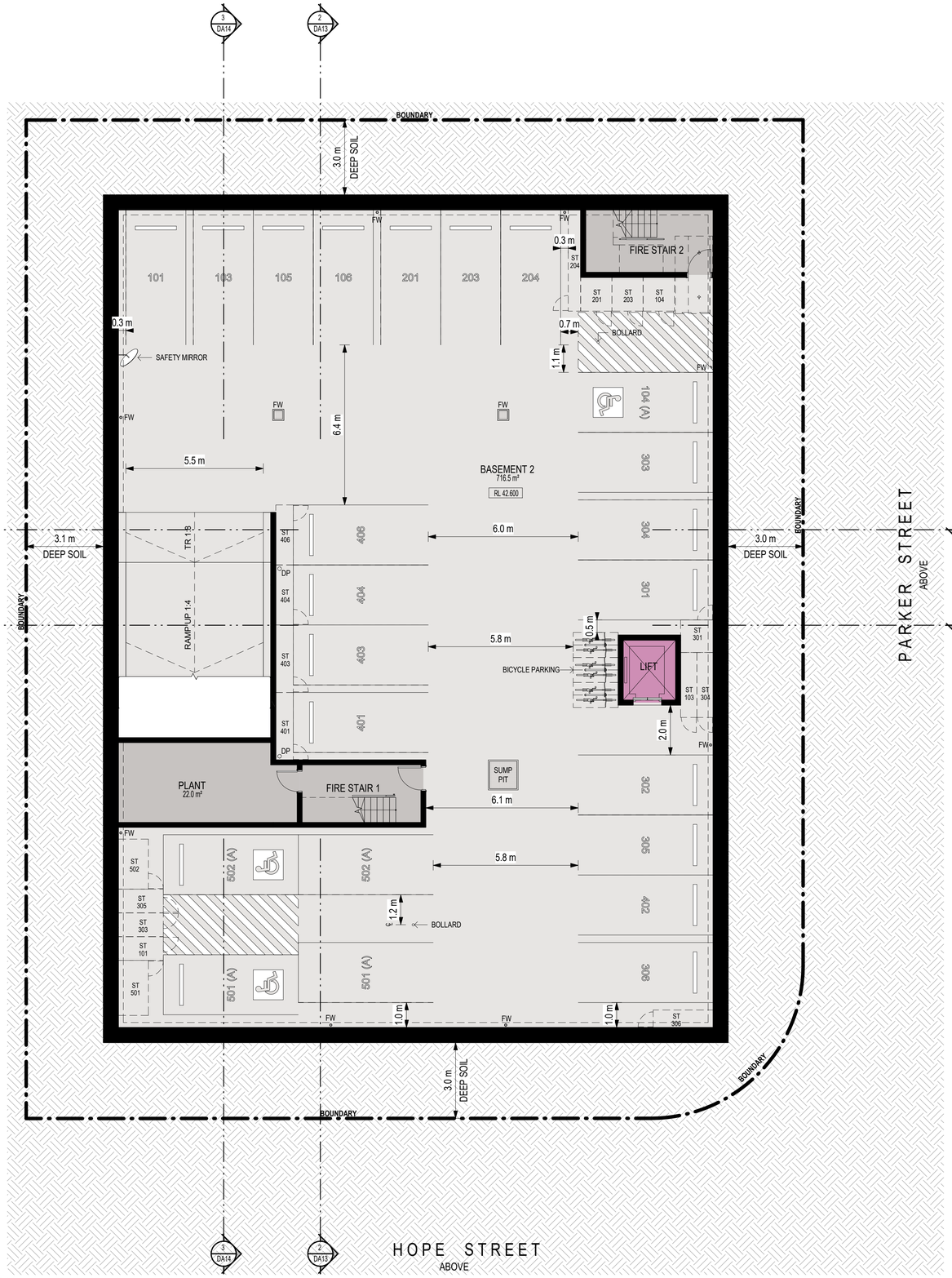
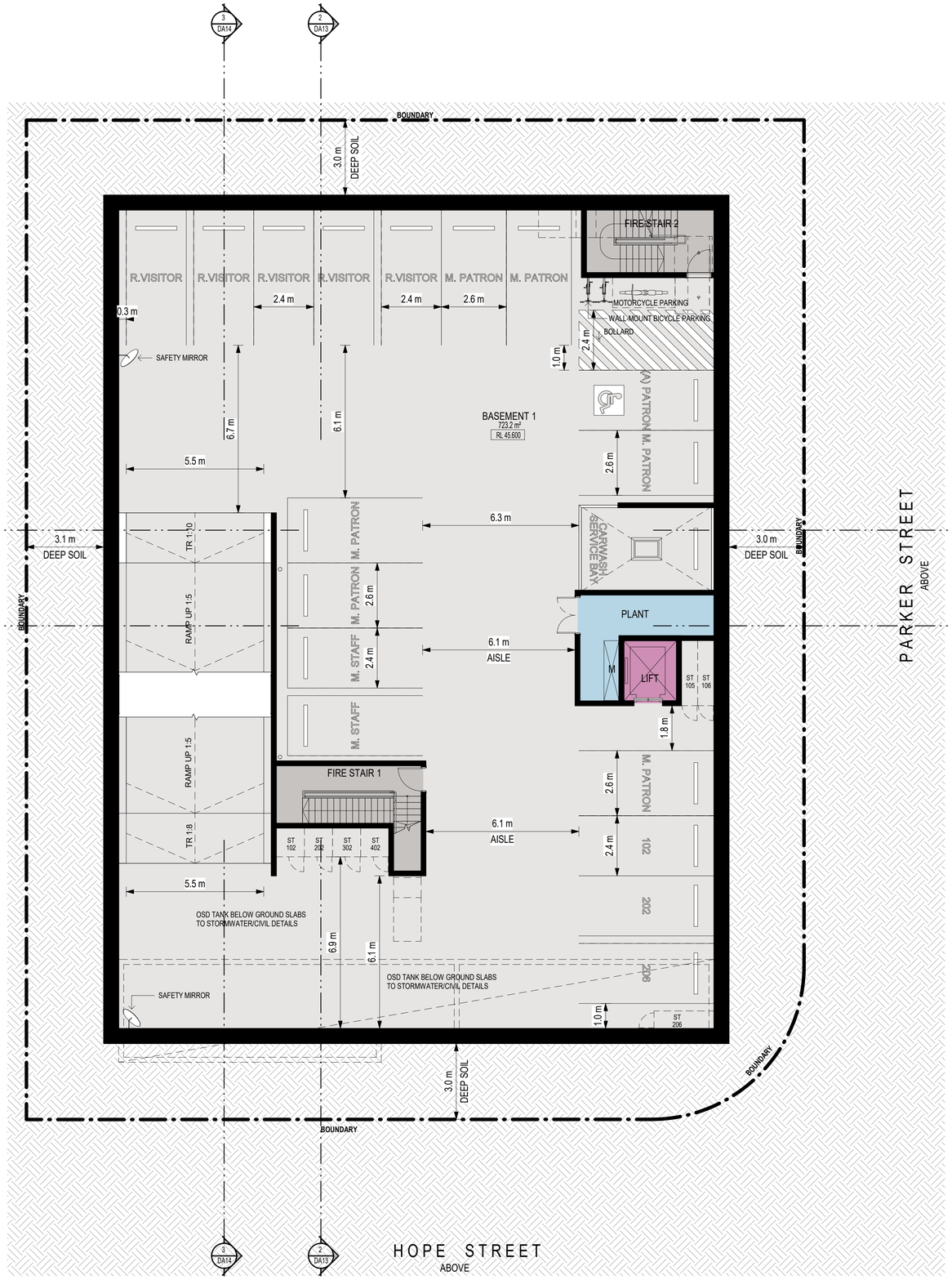


BASEMENT B2 FLOOR PLAN

1 : 100



BASEMENT B1 FLOOR PLAN

1 : 100

ISSUE	DATE	AMENDMENT
P1	23-09-2019	DRAFT FOR COORDINATION
P2	3-10-2019	DRAFT FOR COORDINATION
P3	15-10-2019	DRAFT FOR COORDINATION

GENERAL LEGEND:

(A)	Adaptable / Accessible	EDB	Electrical Distribution Board	RL	Relative Level
(L)	Liveable (Apartment)	FHR	Fire Hose Reel	RWO	Rainwater Outlet
BG	Box Gutter	GD	Grated Drain	ST	Storage (Cage)
BOL	Bollard	MBX	Mailbox	TOW	Top Of Wall
BR	Bedroom	NBN	Broadband Network	TGSI	Tactile Indicators

PROJECT NORTH

0 1 2 3 4 5 7 10m

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

PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT

ADDRESS
1-3 HOPE STREET, PENRITH NSW 2750

PROJECT No. **18014**

CLIENT
Dr AL KHAWAJA

MORSON GROUP

NOMINATED ARCHITECT - P F MORSON (REGISTRATION NUMBER 8100)
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(02) 9380 4946
PO Box 170, Ports Point, NSW 1335

SHEET SIZE: A1

SCALE: 1 : 100

SHEET NAME: **FLOOR PLANS - BASEMENT LEVELS**

DRAWING No. **DA07**

ISSUE No. **P3**

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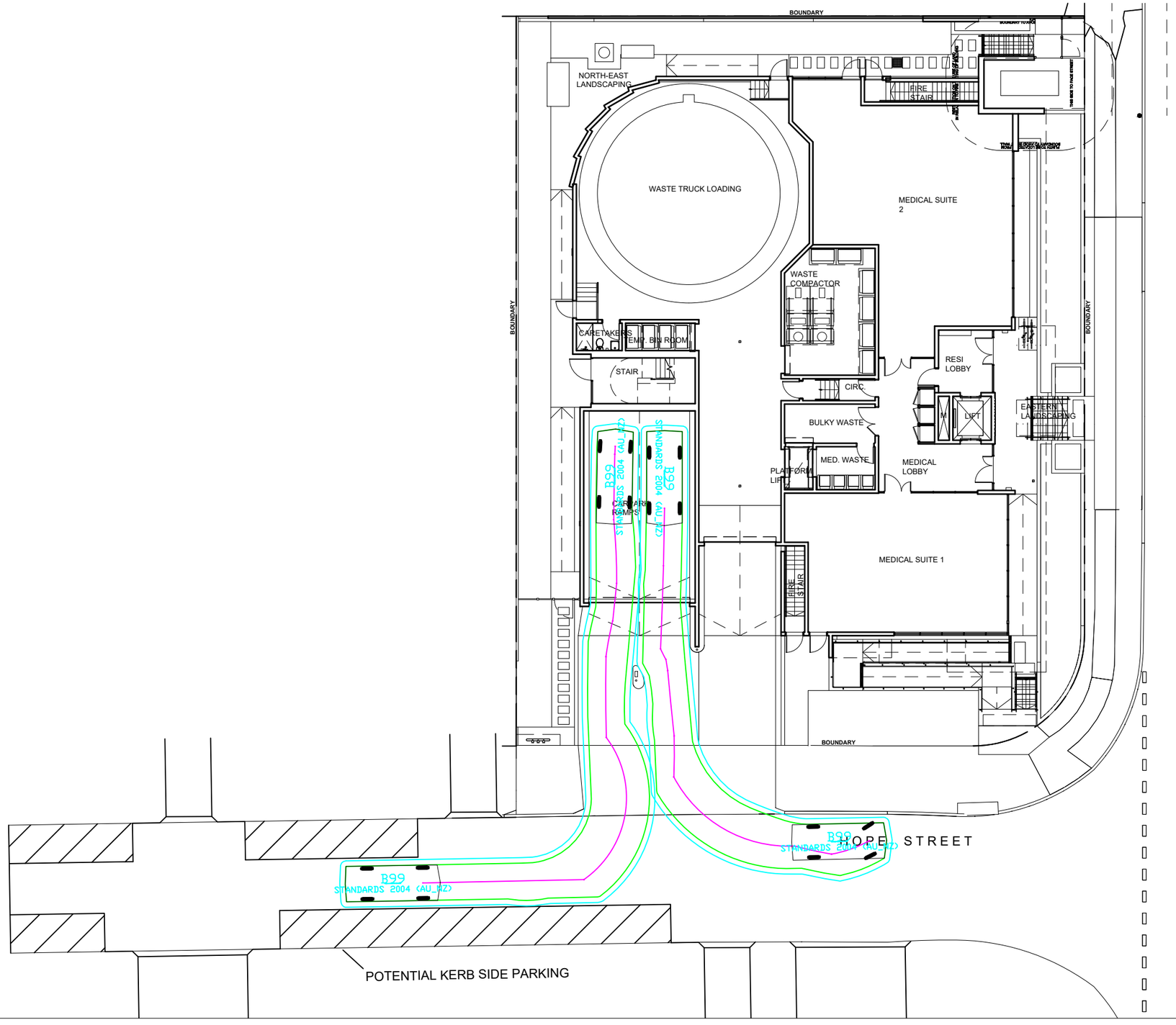
Version: 1, Version Date: 19/12/2019

APPENDIX 2



STANBURY TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

STANBURY TRAFFIC PLANNING
ADDRESS: 302/166 GLEBE POINT RD, GLEBE
PH: (02) 8971 8314
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WEBSITE: www.stanburytraffic.com.au

NOTES:

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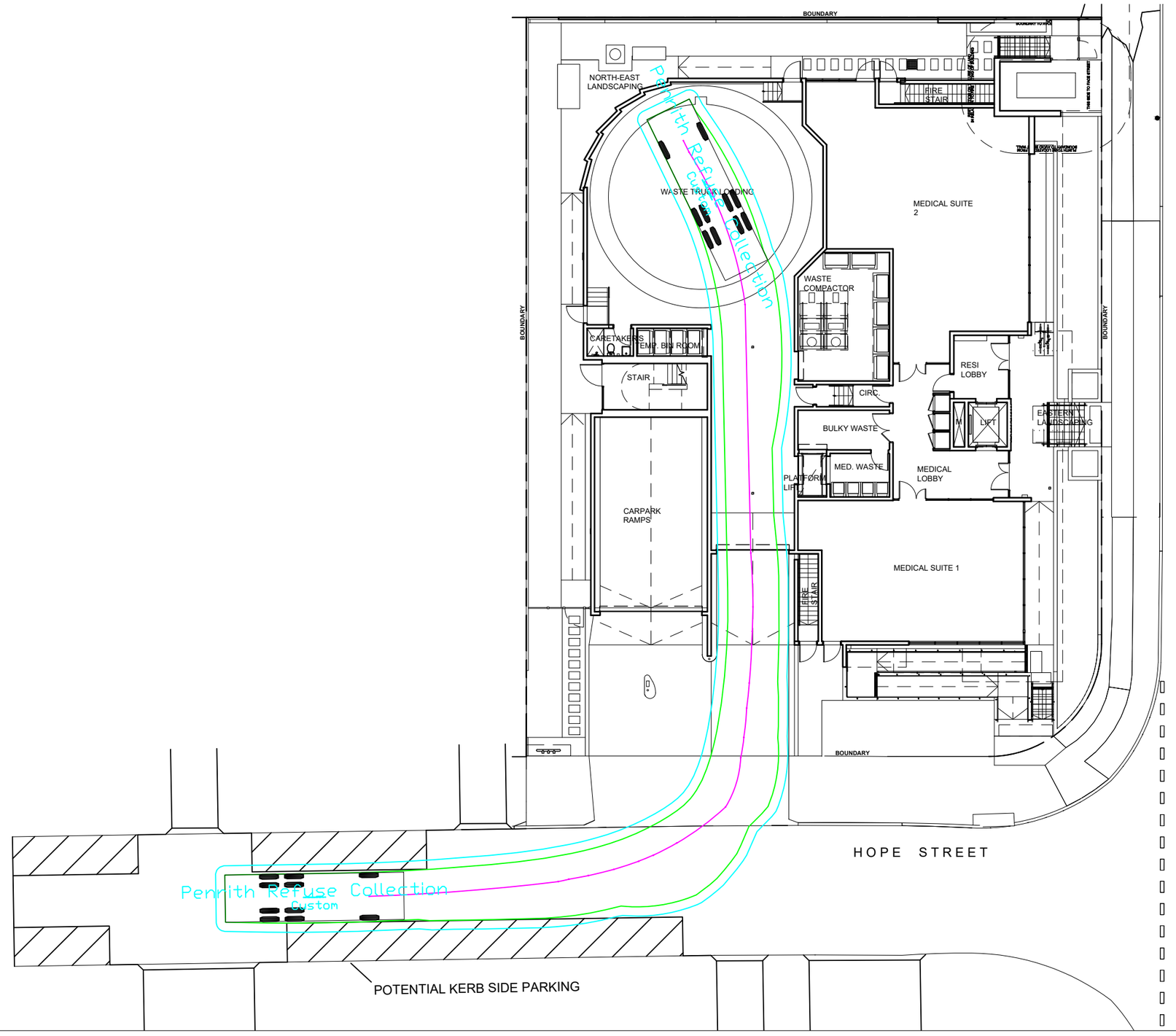
2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH B99 PASSENGER VEHICLE AND B85 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1: OFF-STREET CAR PARKING (AS2890.1:2004).

STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS
SITE INGRESS / EGRESS MOVEMENTS
PROPOSED MIXED USE DEVELOPMENT
1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3
FILE: 19-015-2
SUPERSEDES SHEET/ISSUE -
DATE: 21/10/2019
ISSUE A
SHEET 1



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STANBURY TRAFFIC PLANNING

COUNCIL'S 9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS

ON-SITE TURNTABLE ACCESS MOVEMENT

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

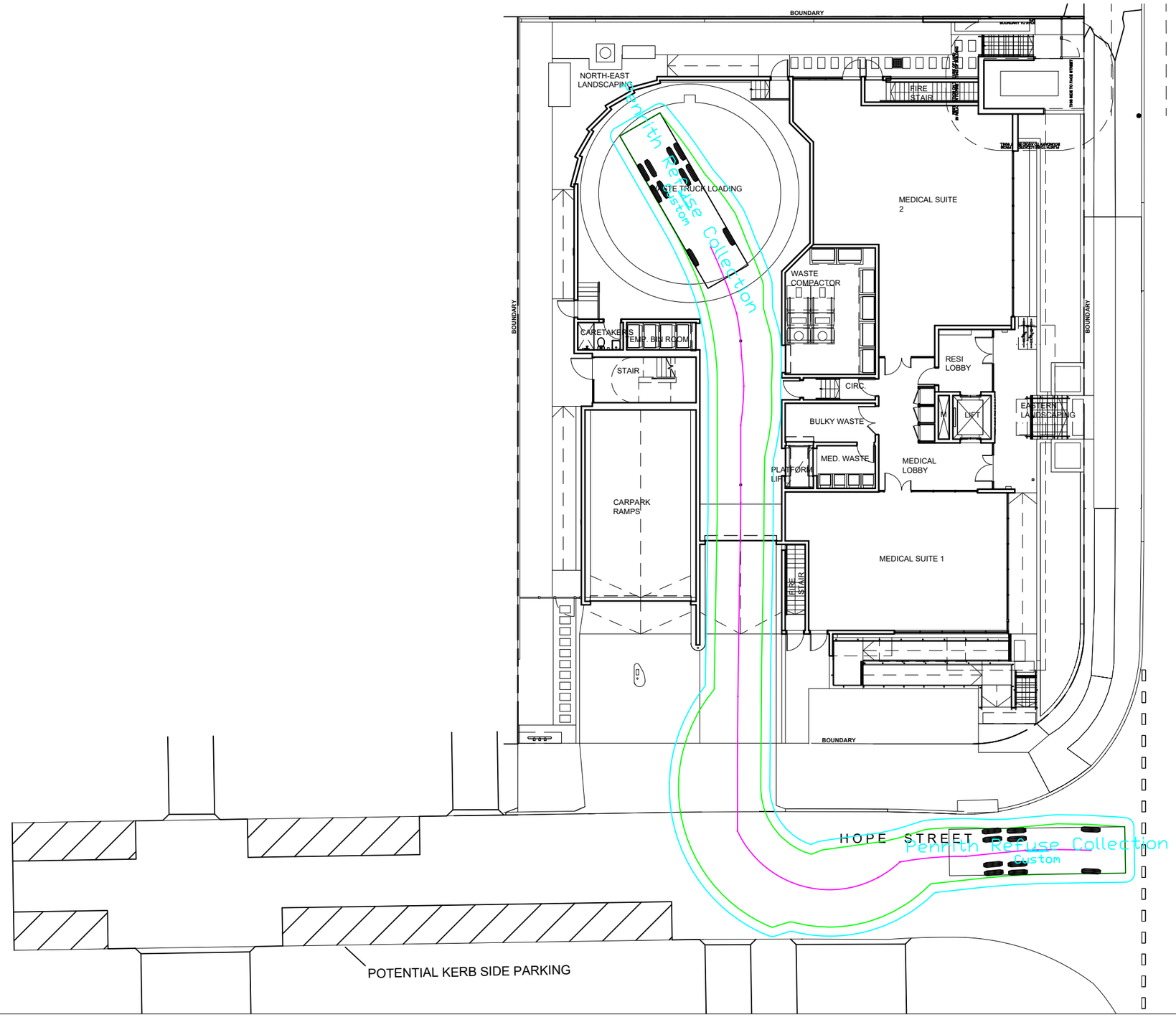
FILE: 19-015-2

SUPERSEDES SHEET/ISSUE -

ISSUE A

DATE: 21/10/2019

SHEET 2



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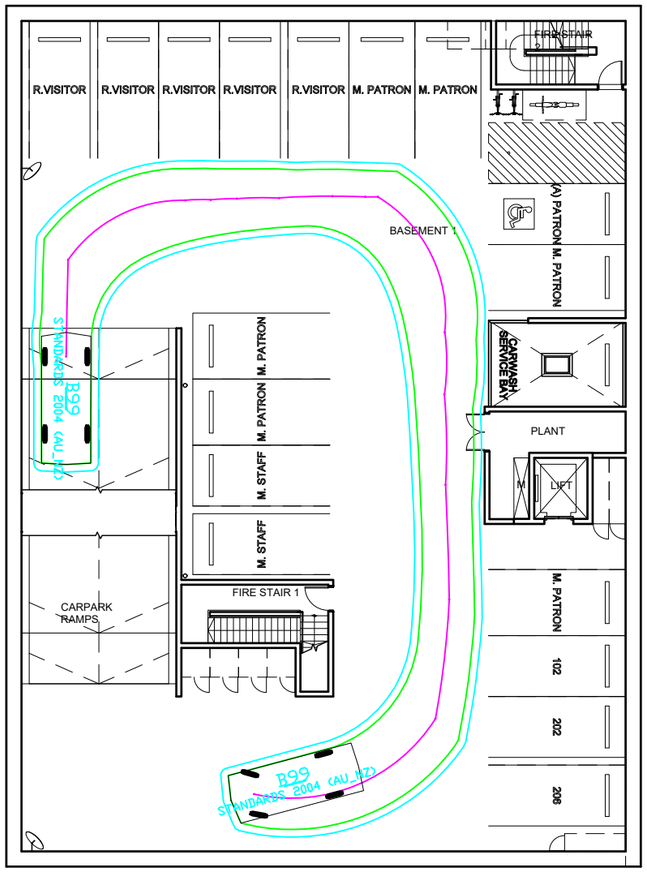
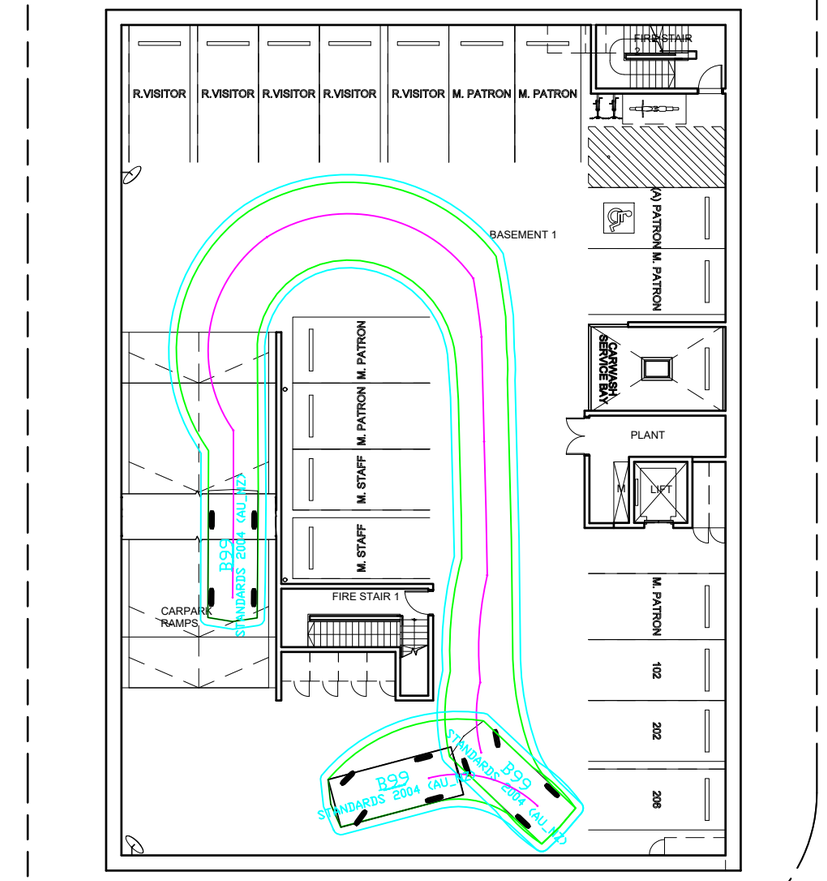
STANBURY TRAFFIC PLANNING

COUNCIL'S 9.7m LONG REFUSE COLLECTION VEHICLE SWEPT PATHS
ON-SITE TURNTABLE EGRESS MOVEMENT FOLLOWING ROTATION
PROPOSED MIXED USE DEVELOPMENT
1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3
FILE: 19-015-2
SUPERSEDES SHEET/ISSUE -
DATE: 21/10/2019
ISSUE A
SHEET 3





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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL SITE TURNAROUND MOVEMENTS WITHIN BASEMENT LEVEL 1

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-015-2

SUPERSEDES SHEET/ISSUE -

DATE: 21/10/2019

ISSUE A

SHEET 4

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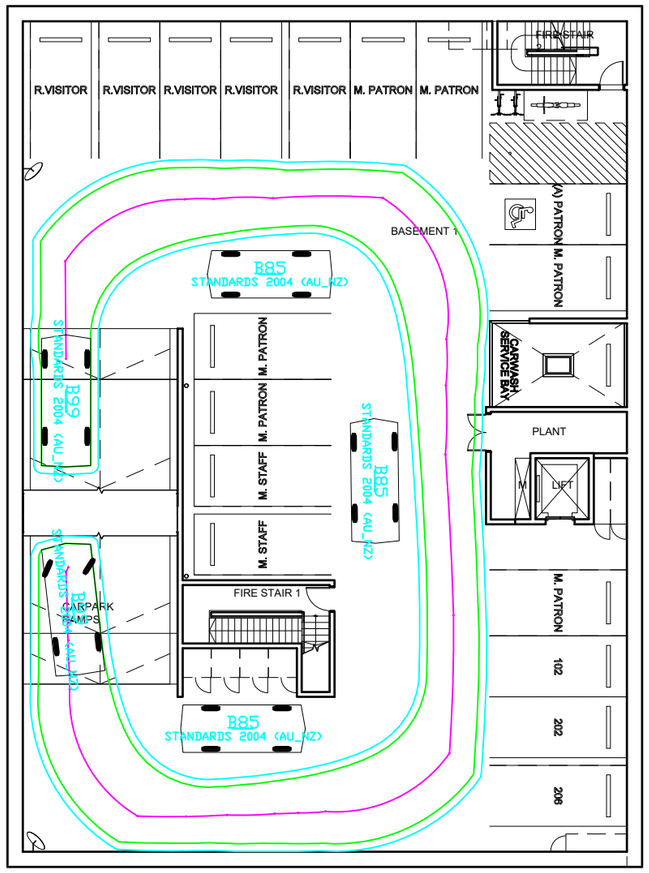

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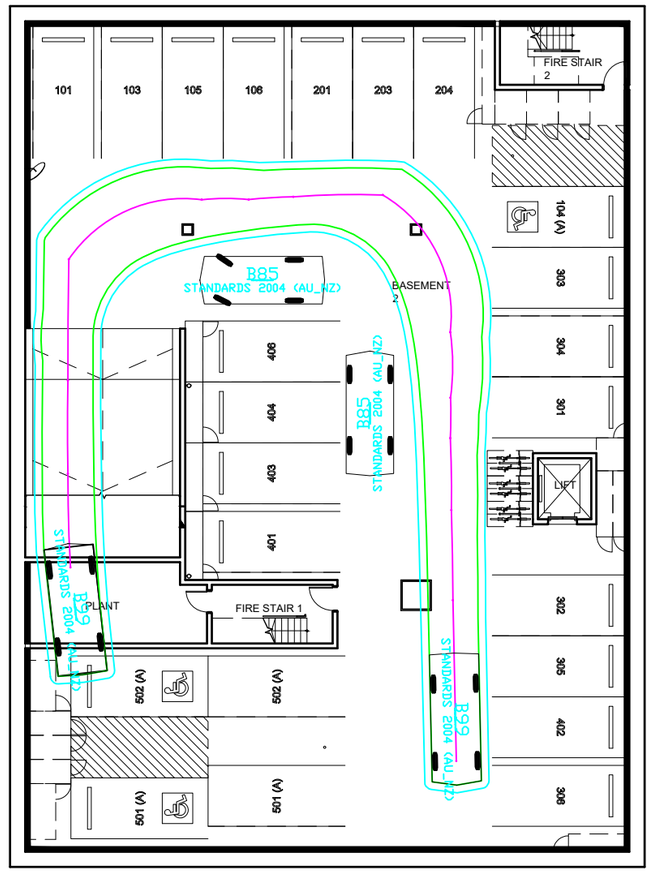

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL SITE ACCESS / EGRESS MOVEMENTS

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-015-2

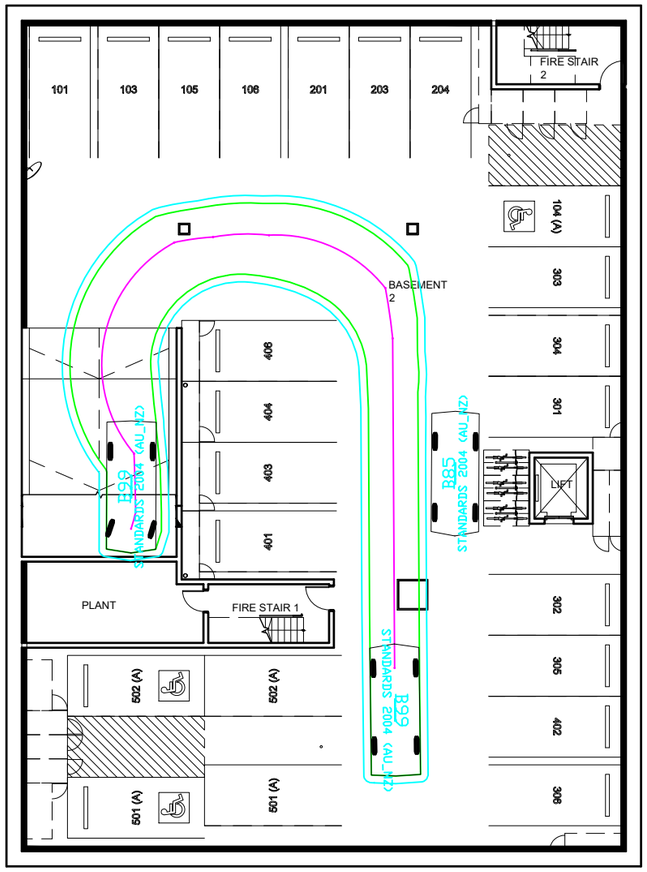
SUPERSEDES SHEET/ISSUE -

DATE: 21/10/2019

ISSUE A

SHEET 5

BASEMENT 2



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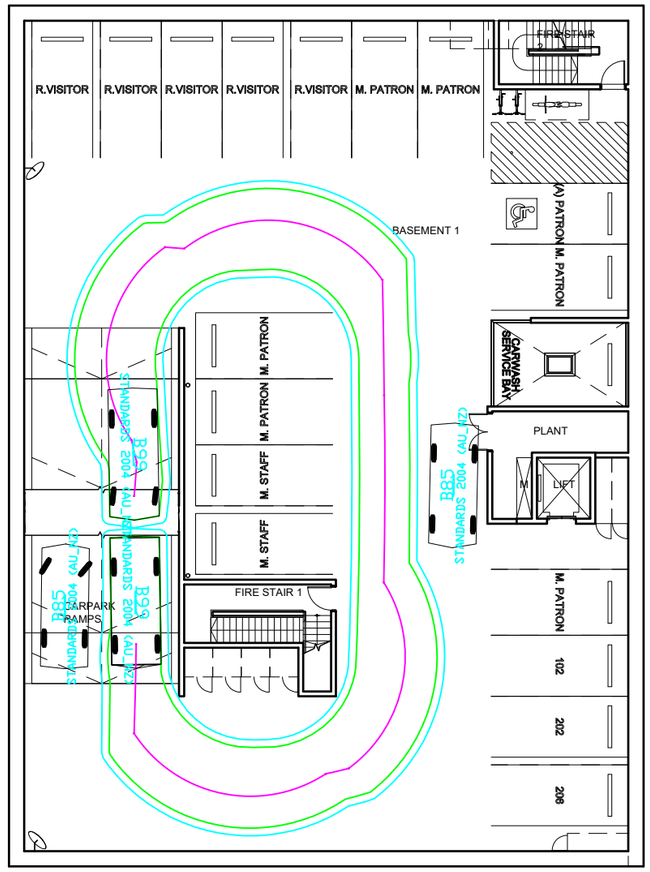

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL SITE ACCESS / EGRESS MOVEMENTS

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-015-2

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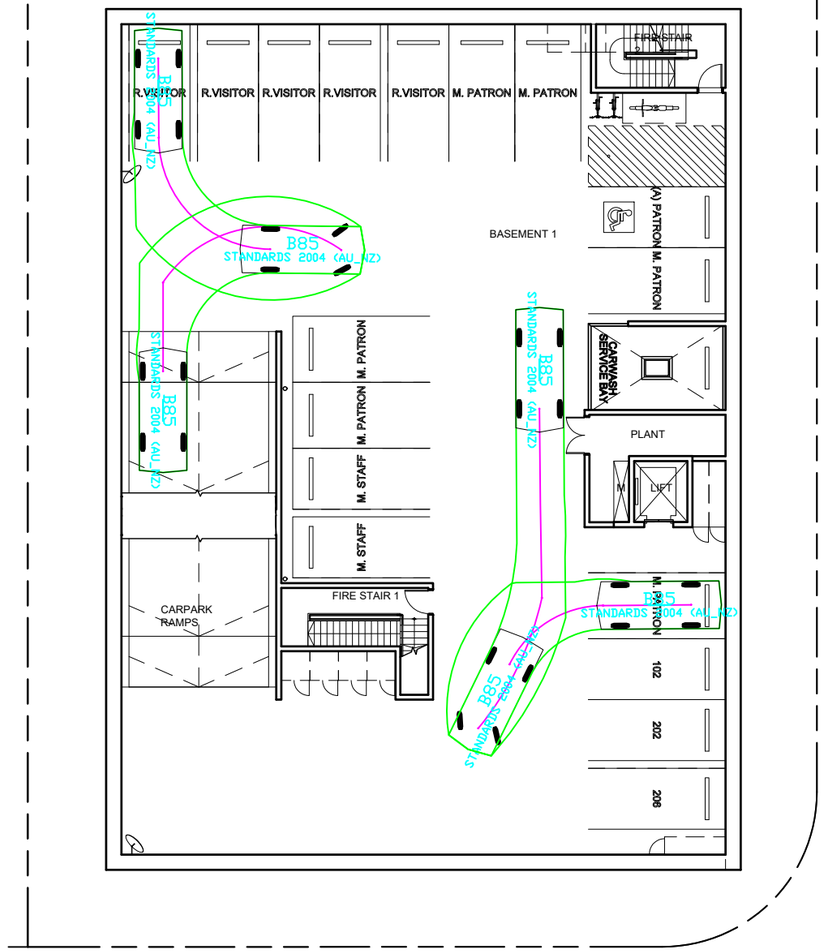
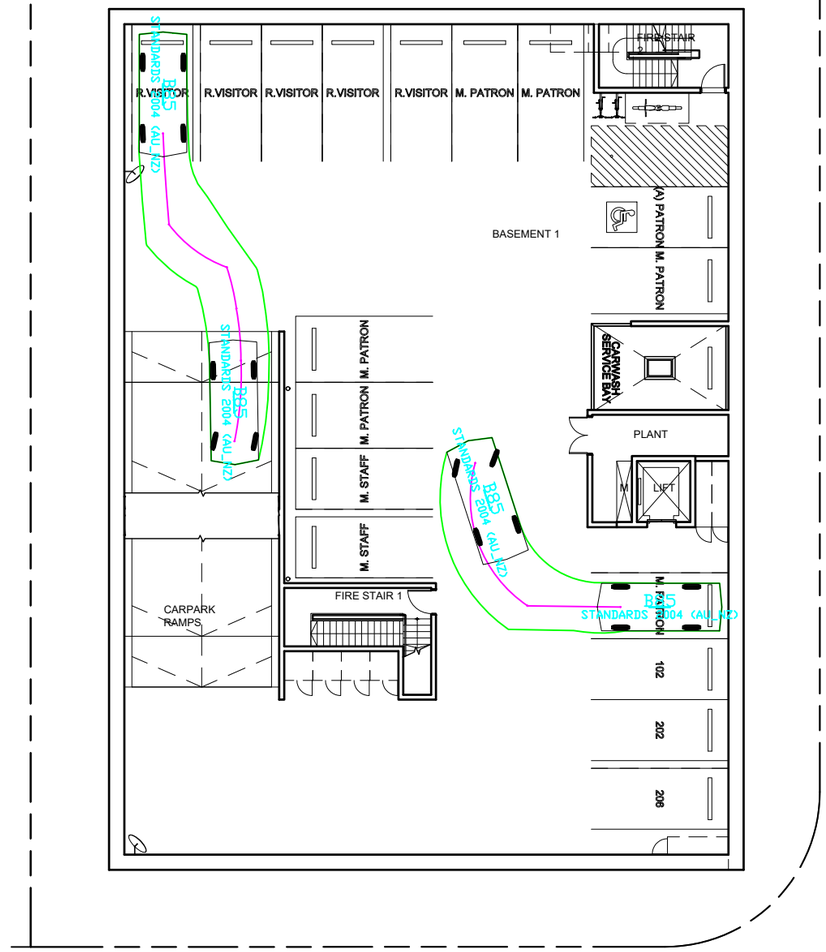
ISSUE A

DATE: 21/10/2019

SHEET 6





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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 PARKING SPACE MANOEUVRING

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-015-2

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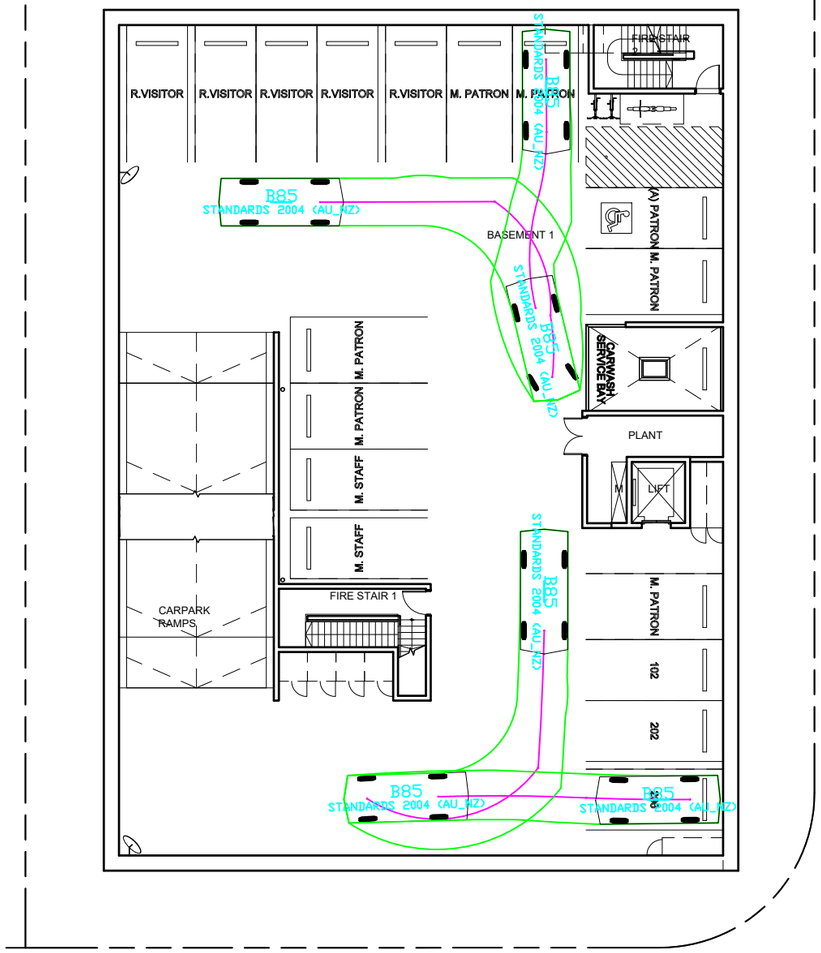
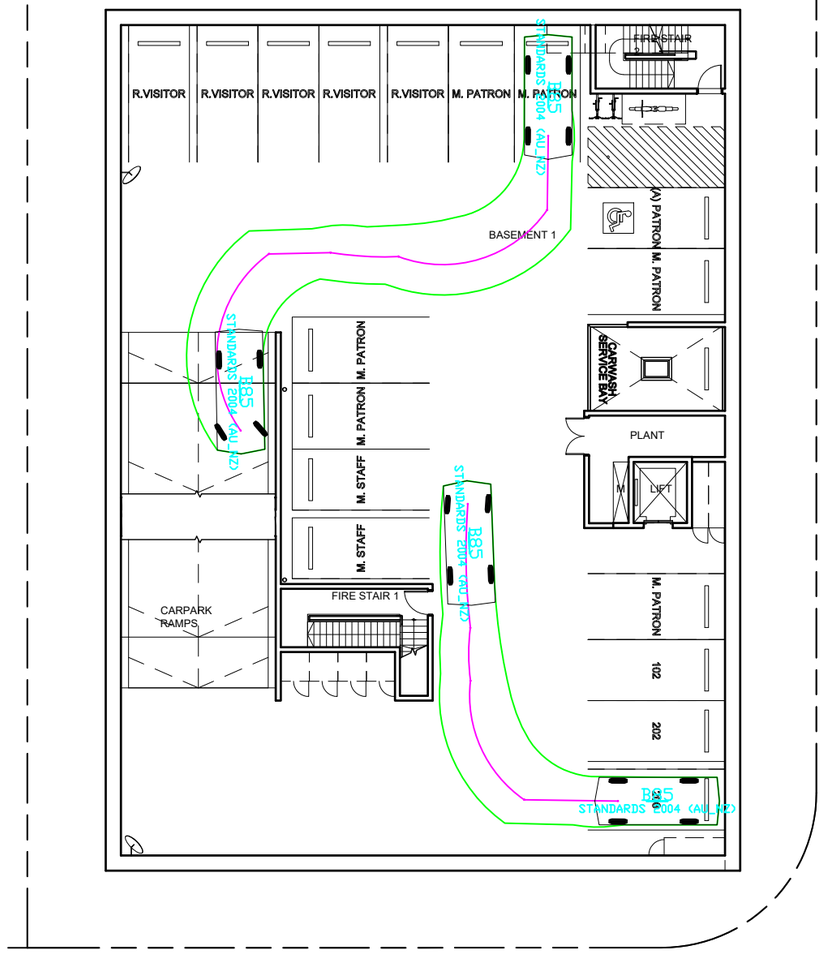
ISSUE A

DATE: 21/10/2019

SHEET 7





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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 PARKING SPACE MANOEUVRING

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

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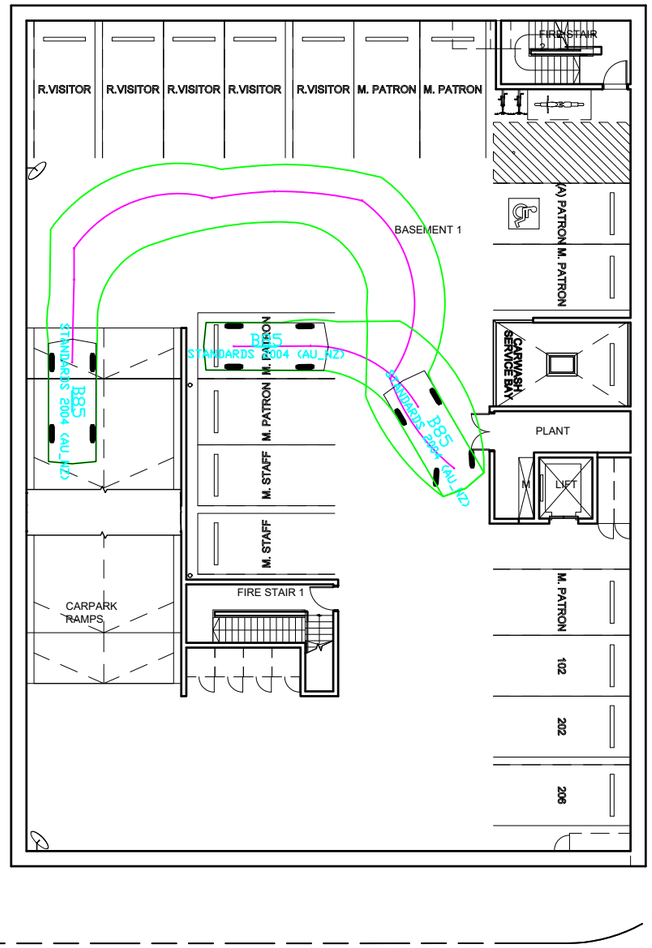
FILE: 19-015-2

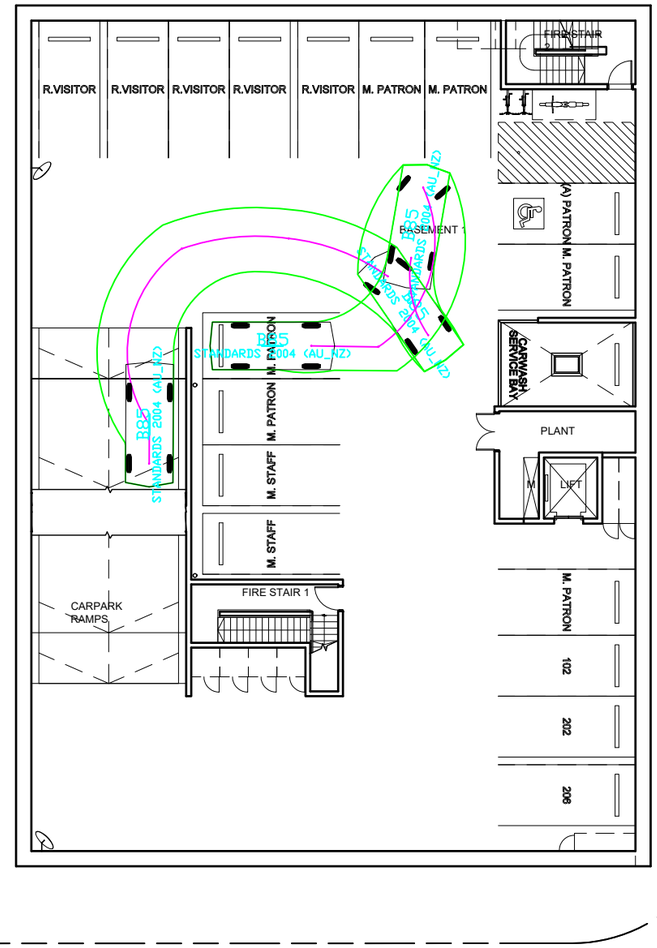
SUPERSEDES SHEET/ISSUE -

ISSUE A

DATE: 21/10/2019

SHEET 8





STANBURY TRAFFIC PLANNING
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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 1 PARKING SPACE MANOEUVRING

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

FILE: 19-015-2

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DATE: 21/10/2019

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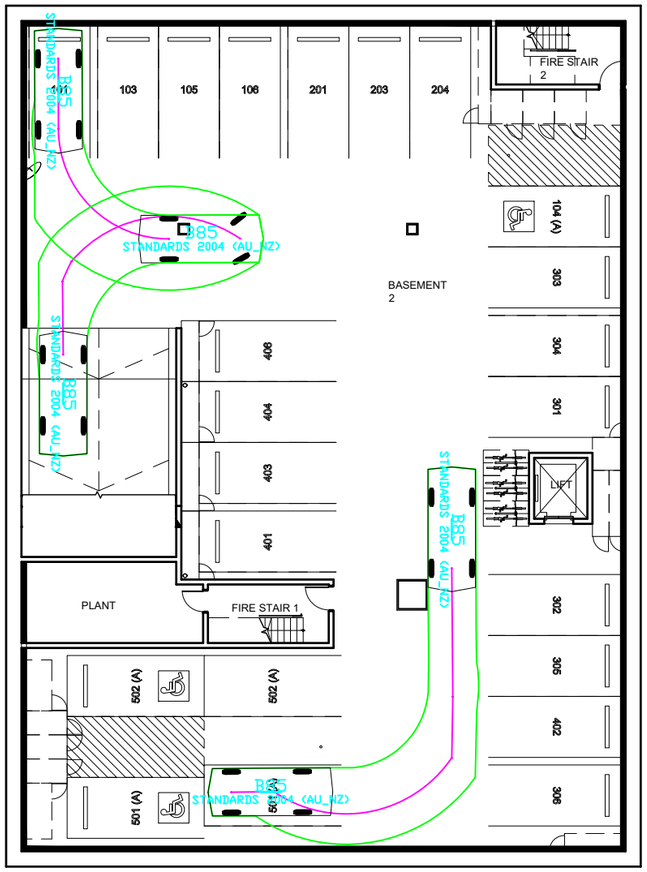

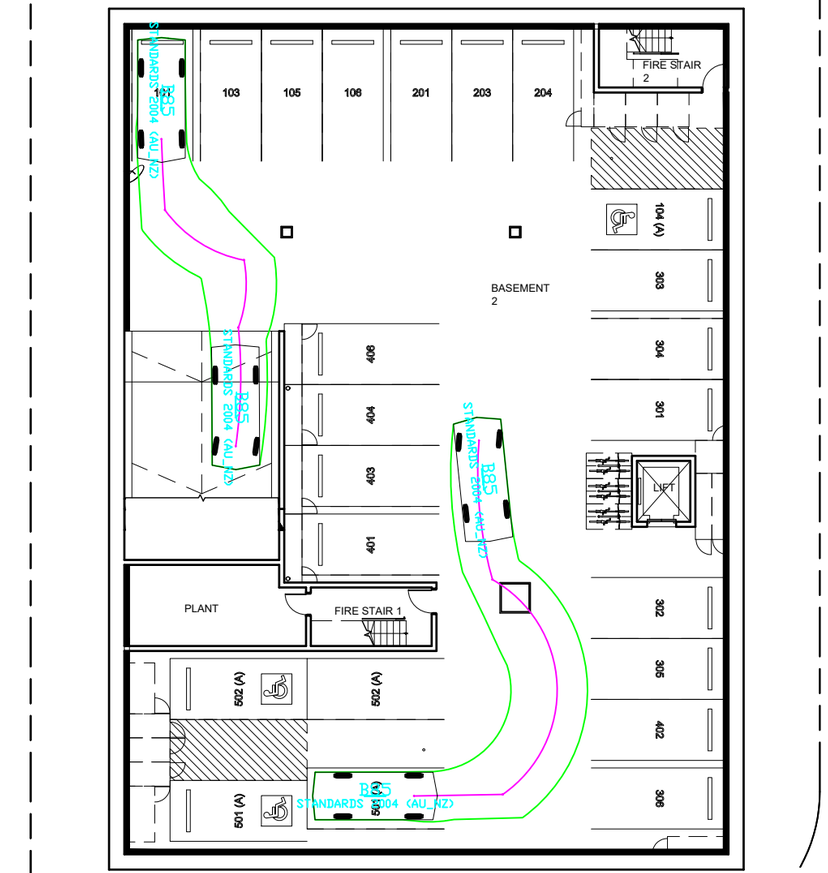

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2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH B85 PASSENGER VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD FOR PARKING FACILITIES PART 1: OFF-STREET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

STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 PARKING SPACE MANOEUVRING

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

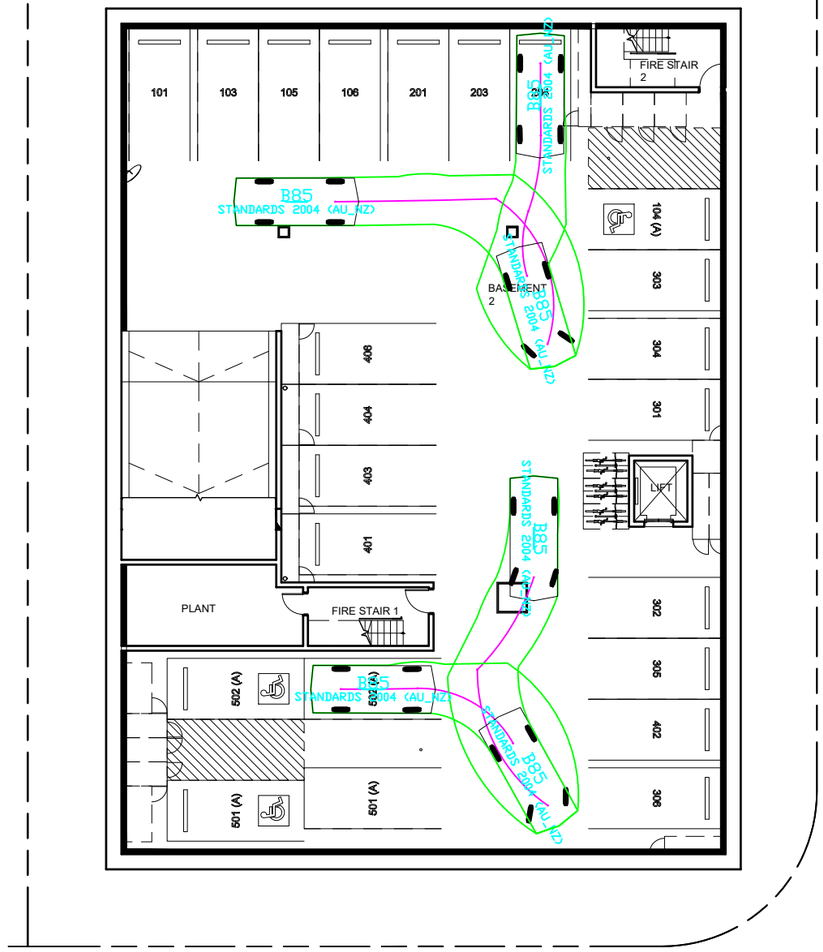
FILE: 19-015-2

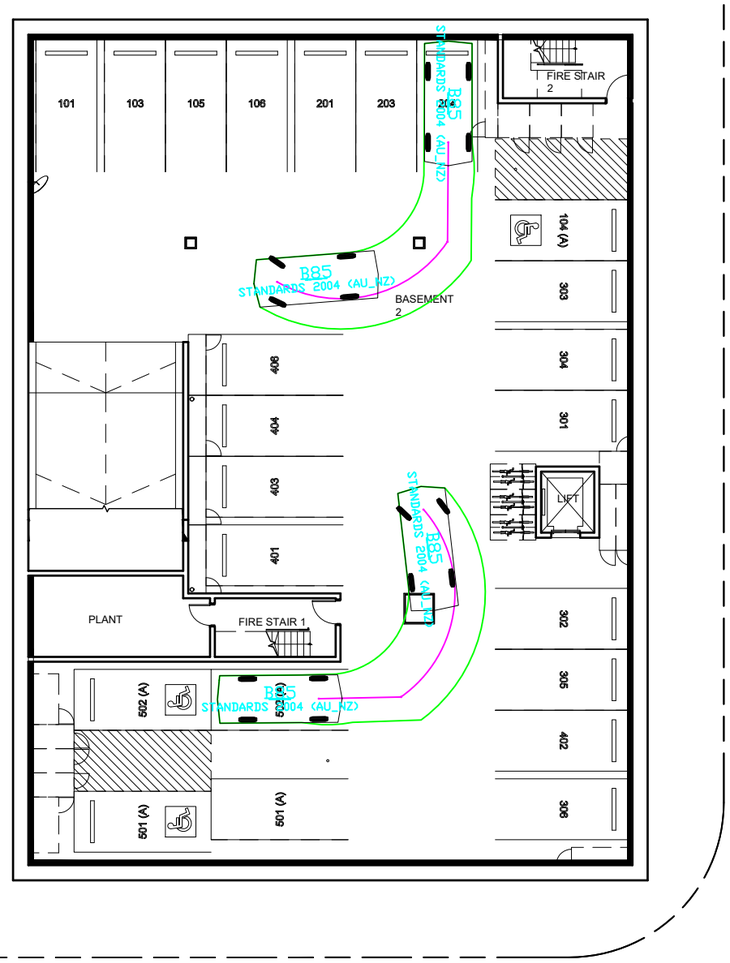
SUPERSEDES SHEET/ISSUE -

DATE: 21/10/2019

ISSUE A

SHEET 10





STANBURY TRAFFIC PLANNING
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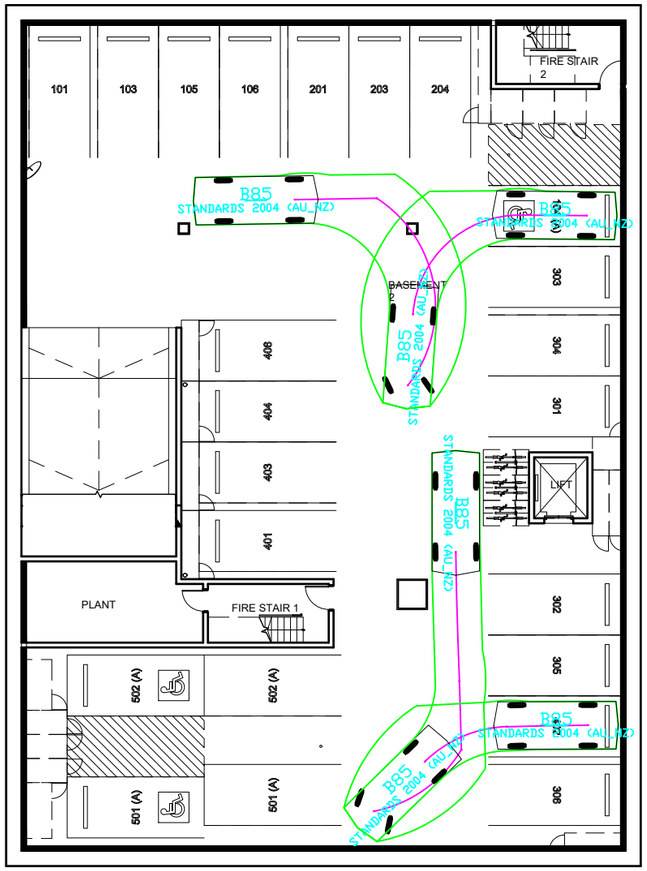

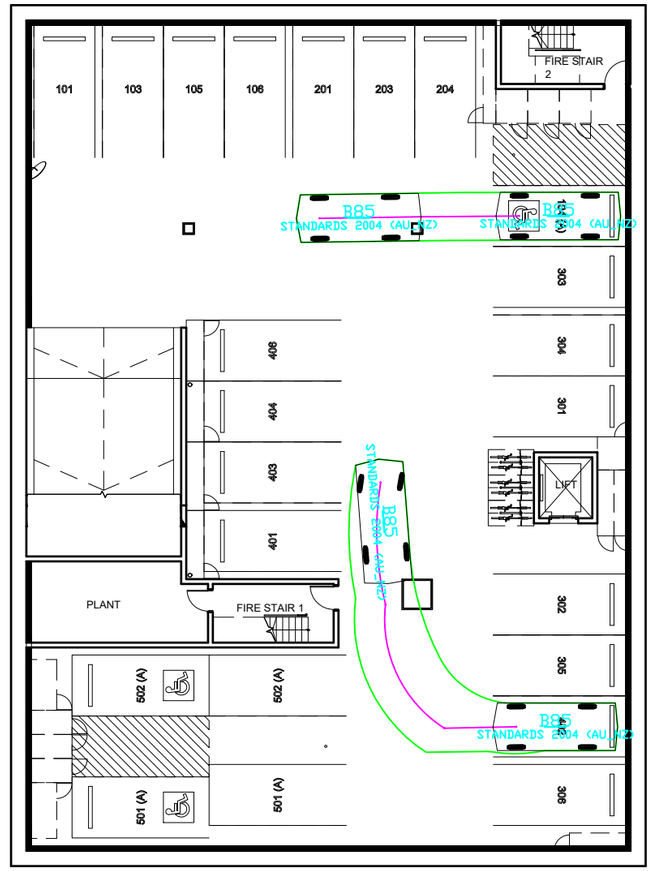

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT LEVEL 2 PARKING SPACE MANOEUVRING

PROPOSED MIXED USE DEVELOPMENT

1 - 3 HOPE STREET, PENRITH

SCALE: 1:250 AT A3

ISSUE: A

FILE: 19-015-2

SUPERSEDES SHEET/ISSUE: -

DATE: 21/10/2019

SHEET: 12

APPENDIX 3

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.
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HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.