STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

PARKING & TRAFFIC IMPACT ASSESSMENT

PROPOSED CHILD CARE CENTRE DEVELOPMENT
97 – 99 VICTORIA STREET
WERRINGTON

PREPARED FOR LORD N' LADY PTY. LTD.
OUR REF: 21-109-3

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1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by Lord N' Lady Pty. Ltd. to prepare a Parking & Traffic Impact Assessment to accompany a Development Application to be lodged with Penrith City Council. The Development Application seeks consent for the demolition of an existing residence at 97 – 99 Victoria Street, Werrington (hereafter referred to as the 'subject site'), and the construction of a purpose-built child care centre.

The child care centre is proposed to be capable of accommodating up to 78 children and be serviced by a single level of basement parking, providing a total of 20 off-street parking spaces. Vehicular connectivity between Victoria Street, the basement parking area is proposed via a combined ingress / egress driveway situated in the south-eastern corner of the site.

The aim of this assessment is to investigate and report upon the potential parking and traffic 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, internal circulation and servicing arrangements with reference to relevant Council, Transport for New South Wales (TfNSW, formerly known as 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.

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1:2004);
- Australian Standard for *Parking Facilities Part 3: Bicycle Parking (*AS2890.3:2015);
- Australian Standard for *Parking Facilities Part 6: Off-Street Parking for People with Disabilities* (AS2890.6:2009);
- NSW Government's *Children (Education and Care Services) Supplementary Provisions Regulation 2012*;
- NSW Government's *Planning Guidelines for Walking and Cycling 2004*;
- NSW Government's *State Environmental Planning Policy (Educational Establishment and Child Care Facilities) 2017*;
- NSW Government's *Child Care Planning Guideline*;
- Penrith City Council's *Penrith Development Control Plan 2014* (DCP 2014); and
- TfNSW's *Guide to Traffic Generating Developments*;

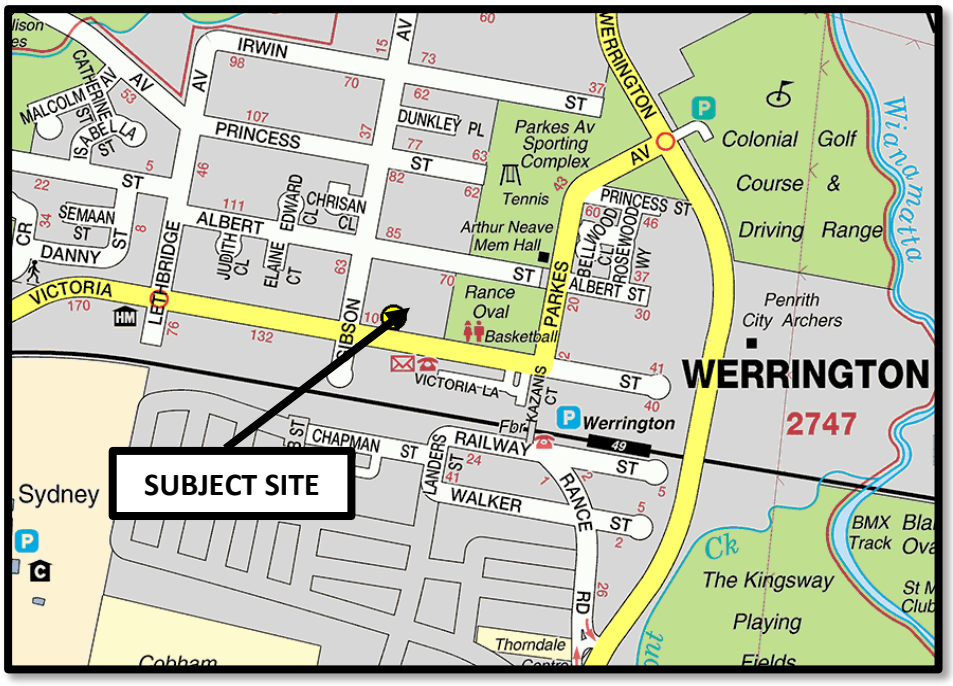
Architectural plans have been prepared by ArtMade Architects and should be read in conjunction with this report, reduced copies of which are included as **Appendix 1** for reference.

1.3 Site Details

1.3.1 Site Location

The subject site is located on the northern side of Victoria Street, approximately 40m to the east of Gibson Avenue, Werrington. The site location is illustrated overleaf within a local and aerial context by **Figure 1** and **Figure 2**, respectively.

FIGURE 1
SITE LOCATION WITHIN A LOCAL CONTEXT



Source: UBD Australian City Streets – Version 8

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT

Source: Nearmap (image date: 20/05/2021)

1.3.2 Site Description

The subject site provides a real property description of Lots 16 and 17 within DP 32158, providing a street address of 97 – 99 Victoria Street, Werrington. The site forms an irregular shaped parcel of land providing an approximate frontage of 28m to Victoria Street. The site provides a total site area in the order of 1,260m^2.

1.3.3 Existing Site Use

The subject site currently contains two detached residential dwellings and associated outbuildings at 97 and 99 Victoria Street, each dwelling providing a single combined ingress / egress vehicular access driveway connecting with Victoria Street in the south-eastern corner of each lot.

1.3.4 Surrounding Uses

The subject site is surrounded by the following land-uses:

- The site is adjoined to the east and west by detached residential dwellings fronting and being serviced by Victoria Street;
- The site is adjoined to the north by a medium-density residential development fronting and being serviced by Albert Street; and
- A mixture of detached residential dwellings and small businesses occupy land to the south of the site, on the opposite side of Victoria Street.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The Development Application seeks consent for the demolition of the existing detached residential dwellings and the construction of a purpose-built child care centre capable of accommodating up to 78 children.

The child care centre is proposed to be contained within a one-storey building situated centrally within the site, above one level of basement parking containing a total of 20 passenger vehicle parking spaces and two bicycle parking spaces.

The child care centre building is proposed to contain eight separate indoor playrooms, three outdoor play areas, a staff room, an entrance lobby and ancillary amenities.

Vehicular access between Victoria Street and the basement parking area is provided via a combined ingress / egress driveway in the south-eastern corner of the site.

Pedestrian access is proposed via a pedestrian path connecting with the northern Victoria Street footpath, to the west and separate from the abovementioned vehicular access driveway.

2.2 Proposed Operation

The child care centre is proposed to accommodate up to 78 children as follows:

- 8 children aged between zero and two years of age;
- 30 children aged between two and three years of age; and
- 40 children aged between three and five years of age.

The centre is required to employ a minimum of 12 staff in accordance with the current *Children (Education and Care Services) National Law (NSW)* requirements, as follows:

- Two staff associated with the children aged between zero and two years of age;
- Six staff associated with the children aged between two and three years of age; and
- Four staff associated with the children aged between three and five years of age.

The centre is proposed to operate between 7:00am and 6:00pm Monday to Friday.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Access Arrangements

3.1.1 Vehicular Access

Vehicular access to the basement parking area is proposed to be facilitated via a 6.6m combined ingress / egress driveway connecting with Victoria Street in the south-eastern corner of the site.

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, at minimum, a Category 1 type driveway is required, providing an ingress / egress driveway width of between 3m and 5.5m based on the local (non-arterial) functional order of Victoria Street, the proposed child care centre land-use and the passenger vehicle parking provision the driveway is to service of less than 25 spaces. The proposed 6.6m wide combined ingress / egress driveway therefore exceeds the minimum AS2890.1:2004 specifications and accordingly, is 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 2**. 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 of the egress driveway inside the property boundary;

- No obstructions to visibility adjacent to the egress side of the driveway facilitating appropriate sight distance between exiting motorists and potential pedestrians travelling along the southern Victoria Street footpath; and

- The consistent horizontal and vertical alignment of Victoria Street in the vicinity of the subject site facilitates appropriate sight distance between the driveway and approaching public road traffic flow.

Notwithstanding the above, the driveway is proposed to be situated within approximately 60m to the east of the roundabout controlled intersection of Victoria Street and Gibson Avenue. Recent observations and indeed, SIDRA intersection analysis associated with this assessment (see Sections 4 and 5 of this report), have indicated that vehicle queuing within Victoria Street on the eastern approach to Gibson Avenue is not projected to extend past the proposed driveway location.

Additionally, as stated above, the proposed driveway location is situated at approximately 60m from the intersection of Victoria Street and Gibson Avenue. It is accordingly considered that Figure 3.2 of AS2890.1:2004 requires a desirable

sight distance of 55m, based on an estimated travelling speed of 40km/h as vehicles will be required to reduce speed in order to negotiate the roundabout control intersection, is required between a driveway and public road therefore concludes that an appropriate extent of sight distance is expected to be afforded in accordance with the requirements of AS2890.1:2004. Motorists are accordingly expected to be able to exit the driveway in a safe manner, with respect to the extent of sight distance afforded along Victoria Street.

3.1.2 Pedestrian Access

Pedestrian access is proposed via a pedestrian path connecting with the northern Victoria Street footpath, separate and to the west of the abovementioned vehicular access driveway.

3.2 Passenger Vehicle Parking

3.2.1 Parking Provision

The development is proposed to be serviced by 20 on-site passenger vehicle parking spaces (including one disabled space).

NSW Government's *Child Care Planning Guideline* specifies that parking should be provided in accordance with DCP 2014, which provides the following minimum vehicular parking rates for child care centres:

One space per 10 children plus
One space per employee

Application of the abovementioned parking rates and discussion, the proposed centre capacity of 12 staff and 78 children therefore results in a minimum passenger vehicle parking requirement of 19.8 (adopt 20) spaces, comprising 12 staff spaces and eight visitor / parent spaces.

The proposed parking provision of 20 spaces therefore complies with the requirements of DCP 2014 and is accordingly, considered to be satisfactory.

3.2.2 Passenger Vehicle Parking Allocation

The on-site passenger vehicle parking spaces are proposed to be allocated as follows:

- 12 staff parking spaces; and
- Eight visitor / parent / guardian parking spaces (including one disabled space).

The following sub-sections of this report provide assessment of the suitability or otherwise of the proposed parking provision and allocation.

3.2.2.1 Staff Parking

It has been presented that the centre is understood to be required to accommodate up to 12 staff on-site any one time. The provision of 12 parking spaces, representing one space per staff member, is accordingly considered to be satisfactory.

3.2.2.2 Parent / Guardian Parking

To undertake an assessment of the suitability of the proposed visitor parking provision of eight spaces, reference is made to the TfNSW's *Guide to Traffic Generating Developments*. This publication specifies that the average length of stay of parents / guardians when setting-down / picking-up children at child care centres is 6.8 minutes. On the basis of all children being set-down and picked-up with an even distribution over a period of two hours (say, 7:00am – 9:00am and 4:00pm – 6:00pm), the arrival rate of parents / guardians will be one parent / guardian every 1.54 minutes (120 minutes / 78 children).
The above length of stay and arrival rate results in an average of 4.4 (6.8/1.54) parents / guardians being on-site at any time during the peak set-down / pick-up periods (adopt five for a worst-case scenario). The average parent / guardian parking demand during peak pick-up / set-down periods is therefore projected to be five spaces.

However, it should be noted that the above analysis represents an absolute worst-case scenario for the following reasons:

- It assumes that all parents / guardians will drive their children to and from the centre, when the TfNSW's survey suggest 93% of children are driven to and from centres;

- It assumes a zero-sibling rate, when our experience suggests a sibling rate of at least 10% commonly prevails;

- It assumes a 100% attendance rate, when our experiences suggest a maximum of 90% is more likely; and

- It assumes that all children will be set-down and picked-up within a two-hour period, when children can be set-down / picked-up at any time during the operational hours.

The above analysis, indicating an instantaneous parent / guardian parking demand of five spaces has however been retained in order to account for variations in average demand associated with short term peak influxes of parents / guardians during set-down / pick-up periods. In consideration of this and the above discussion, the proposed parent / guardian parking allocation of eight spaces is considered to be readily capable of accommodating peak operational demand.

3.2.2.3 Neighbourhood Parking Policy

The previous analysis concludes that the on-site parking provision and allocation is appropriate in accordance with the locally sensitive parking requirements and the projected operational characteristics of the site. In this regard, it is not expected that the proposed development will result in any unreasonable impacts on surrounding amenity.

Notwithstanding the above, it is desirable that the child care centre formulate and implement a Neighbourhood Parking Policy, which provides a series of operational initiatives with the objective of minimising the potential impacts of the development on the adjoining public parking infrastructure and thus the surrounding residential amenity. This Policy should include, but not be limited to, the following:

- Staff members whom drive to the site are to occupy designated on-site staff parking spaces, in preference to parking on-street;

- Parent / visitors whom drive to the site are to occupy designated on-site visitor parking spaces, in preference to parking on-street;
- In the unlikely event that staff or parent / visitors are required to park on-street, parking should occur on the northern side of Victoria Street, directly adjacent to the site.

The Neighbourhood Parking Policy should be provided to all staff and parents / guardians at the time of employment and enrollment, respectively.

If considered necessary, the requirement for a Neighbourhood Parking Policy could reasonably be imposed by Council as a condition of development consent.

3.3 Bicycle Parking

DCP 2014 specifies that bicycle parking should be provided in accordance with the suggested bicycle parking provision rates for different land use types as provided within the 2004 *Planning Guidelines for Walking and Cycling* as published by the NSW Government. This publication states that child care centres should provide staff bicycle parking at a rate of 3 – 5% of the number of required staff, and visitor parking at a rate of 5 – 10% of the number of required staff.

According to the above, as previously presented, the proposed child care centre requires 12 staff; therefore, the development is required to provide between 0.36 – 0.6 staff bicycle parking spaces and between 0.6 – 1.2 (adopt one space) visitor bicycle parking spaces. Accordingly, a total bicycle parking provision of one visitor bicycle parking space is required.

The proposed bicycle parking provision of two bicycle parking spaces therefore complies with the requirements of DCP 2014 and is accordingly, considered to be satisfactory.

3.4 Site Servicing

The child care centre is likely to necessitate regular servicing with respect to the collection of refuse. Refuse is proposed to be contained within bins accommodated within an at-grade storage area. These bins are to be wheeled to the Victoria Street frontage for collection, in a similar manner to the adjoining residential developments.

Minor deliveries associated with the centre operation are expected to be undertaken by vans and utilities. Such servicing activities are proposed to be accommodated within single visitor passenger vehicle parking spaces located within the at-grade under-croft visitor car park. These activities are to be undertaken between 10:00am and 2:00pm, thereby being outside of the peak child set-down / pick-up periods of the centre.

3.5 Internal Circulation and Manoeuvrability

Passenger vehicles upon entry to the site, will travel in a forward direction from the ingress driveway and connecting ramp running along the eastern boundary to connect with the basement parking area. The basement parking area contains a series of standard 90-degree angled parking rows, being serviced by a single adjacent parking aisle, forming an extension of the site access driveway and connecting ramp.

The northern wall of the basement parking area is proposed to provide eight parking spaces (in a tandem arrangement), specifically allocated to staff.

The western periphery wall of the basement comprises 11 parking spaces, with four spaces being allocated to staff and seven spaces allocated to visitor parking. A disabled visitor parking space and dedicated turning bay is situated in the south-eastern corner of the basement parking area.

The basement parking area and connecting access roadway / ramp have generally been designed to accord with the minimum requirements of AS2890.1:2004 and AS2890.6:2014, providing the following minimum dimensions:

- Staff vehicle parking space width = 2.4m;
- Standard visitor vehicle parking space width = 2.6m;
- Disabled visitor vehicle parking space width = 2.4m (with adjoining 2.4m wide shared area);
- Vehicle parking space length = 5.4m;
- Parking aisle width = 5.8m;
- Minimum clearance = 2.2m;
- Minimum clearance above disabled parking space = 2.5m;

- Maximum ramp grade = 1:5; and
- Minimum two-way ramp width = 6.0m.

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 specifications.

In order to further demonstrate the suitability of the abovementioned arrangement and internal passenger vehicle manoeuvrability within the visitor parking area, 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 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 the basement parking area and enter and exit the most difficult passenger vehicle parking spaces.

It is further acknowledged that the northern portion of the basement parking area contains a total of eight parking spaces provided in a tandem arrangement. These spaces are proposed to be specifically allocated to child care centre staff in order to ensure no unreasonable impacts on visitor manoeuvring / circulation occurs with respect to parking space accessibility.

In consideration of the abovementioned general compliance of the development design with the relevant requirements of the Australian Standards, the proposed internal passenger vehicle circulation arrangements are considered to be satisfactory.

3.6 Internal Pedestrian Circulation

Pedestrian access between the building and the northern Victoria Street footpath is proposed via a pedestrian walkway, located separately and to the west of the abovementioned vehicular access driveway. This pedestrian walkway provides connectivity to the entrance lobby of the child care centre building. Further to this access, pedestrian connectivity between the basement parking area and the building is proposed via pedestrian pathways provided adjacent to visitor parking

spaces that provide pedestrian access along the basement periphery walls to the lift and staircase in the south-eastern corner of the basement.

4. EXISTING TRAFFIC CONDITIONS

4.1 Surrounding Road Network

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

- **Victoria Street**, in the vicinity of the subject site, performs a collector road function, providing an east-west alignment between Parkes Avenue in the east and Richmond Road and Copeland Street in the west.

  In the vicinity of the site, Victoria Street provides a 12.8m wide pavement providing one through lane of traffic in each direction in conjunction with marked parallel parking along both kerb alignments. Traffic flow within Victoria Street is governed by a sign posted speed limit of 50km/h.

  Victoria Street intersects with Gibson Avenue to the west of the site operating under single lane circulating roundabout control, allowing for all turning movements.

  Victoria Street forms a T-junction with Parkes Avenue to the east of the site, operating under sign posted 'Give Way' priority control with Parkes Road forming the priority route.

- **Gibson Avenue**, in the vicinity of the subject site, performs a local access function providing a north-south alignment between Reid Street in the north and terminates in a cul-de-sac to the south of Victoria Street.

  Gibson Avenue primarily provides a 20m wide pavement providing one through lane of traffic in each direction, being separated by a wide marked median, with marked parallel parking along both kerb alignments. Traffic flow within Gibson Avenue is governed by a sign posted speed limit of 50km/h.

4.2 Existing Traffic Volumes

4.2.1 Intersection of Victoria Street and Gibson Avenue

This Practice has commissioned peak hour traffic surveys to be completed of the intersection of Victoria Street and Gibson Avenue, in order to accurately ascertain existing traffic demands within the immediate precinct.

Surveys were undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm on Tuesday the 23rd of February, 2021.

Figure 3 overleaf provides a summary of the surveyed peak hour intervals of traffic flows at the subject intersection including a morning peak hour which has been identified as 8:00am — 9:00am (AM Peak) and 5:00pm – 6:00pm (PM Peak), whilst full details are contained within **Appendix 3**.

FIGURE 3
EXISTING WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
INTERSECTION OF VICTORIA STREET AND GIBSON AVENUE

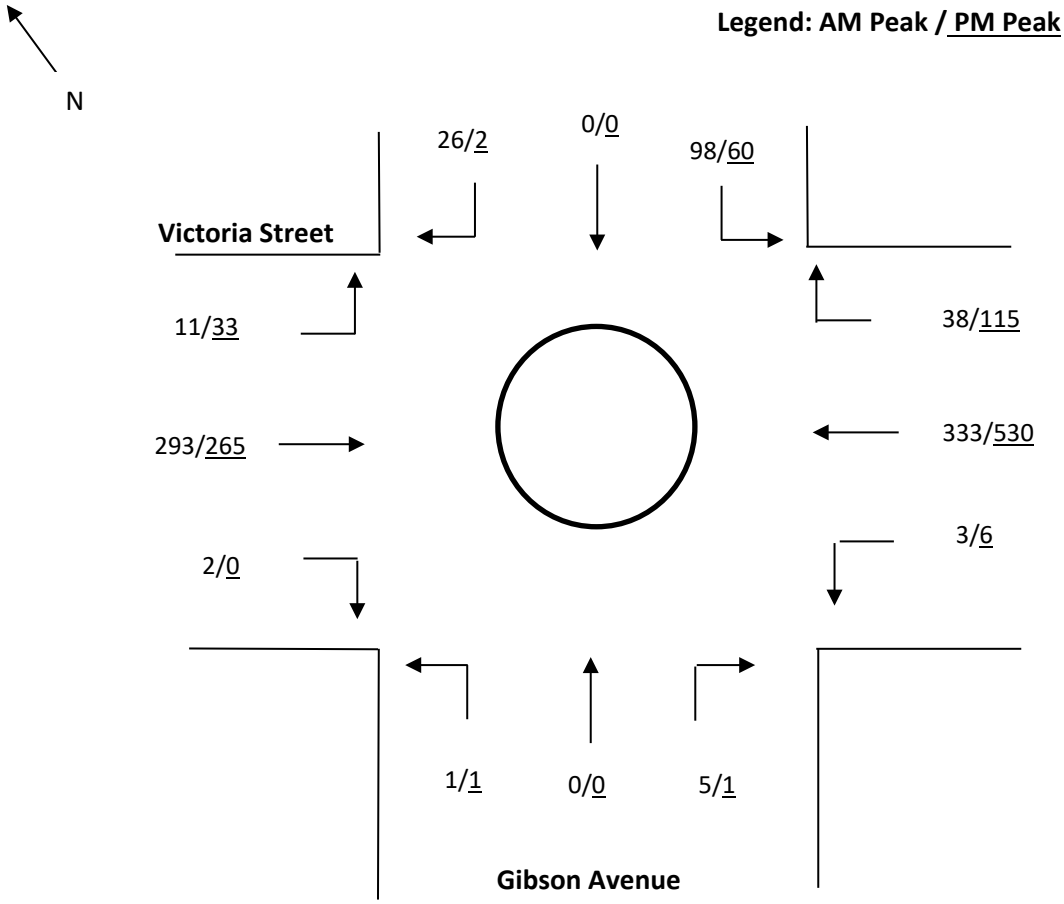


Figure 3 indicates the following:

- Victoria Street accommodates directional traffic demands of between approximately 300 and 650 vehicles during weekday peak hours;

- Gibson Avenue, to the north of Victoria Street, accommodates directional traffic demands of between approximately 50 and 150 vehicles during weekday peak hours; and

- Gibson Avenue, to the south of the Victoria Street, accommodates low traffic demands commensurate with its reduced functional order, with peak hourly directional traffic demands of less than 10 vehicles.

4.3 Existing Road Network Operation

The surveyed intersection of Victoria Street and Gibson Avenue has been analysed utilising the SIDRA computer intersection analysis program in order to objectively assess the operation of the nearby public road network.

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 TfNSW.

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 1** below (being Transport for NSW method calculation of Level of Service).

TABLE 1
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS
ROUNDABOUT CONTROLLED INTERSECTIONS

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

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3**.

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

TABLE 2 SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE INTERSECTION OF VICTORIA STREET AND GIBSON AVENUE		
	AM PEAK (8:00AM-9:00AM)	**PM PEAK (5:00PM-6:00PM)**
Gibson Avenue North Approach		
Delay (seconds / vehicle)	6.6	6.7
Degree of Saturation	0.12	0.08
Level of Service	A	A
Gibson Avenue South Approach		
Delay (seconds / vehicle)	8.6	8.5
Degree of Saturation	0.01	0.004
Level of Service	A	A
Victoria Street East Approach		
Delay (seconds / vehicle)	4.7	5.1
Degree of Saturation	0.25	0.42
Level of Service	A	A
Victoria Street West Approach		
Delay (seconds / vehicle)	4.4	4.8
Degree of Saturation	0.22	0.24
Level of Service	A	A
Total Intersection		
Delay (seconds / vehicle)	4.9	5.2
Degree of Saturation	0.25	0.42
Level of Service	A	A

Table 2, in conjunction with more detailed output contained within **Appendix 4**, indicates that the intersection of Victoria Street and Gibson Avenue provides all movements with a level of service 'A' during peak periods, representing good operation with spare capacity.

4.4 Public Transport

4.4.1 Buses

The following bus services operate in the immediate vicinity of the site:

- Route 782 – St Marys to Penrith via Werrington;
- Route 783 – Penrith to Werrington via Jordan Springs; and
- Route 785 – Werrington to Penrith via Cambridge.

Routes 782, 783 and 785 provides a bus stop at approximately 33m walking distance to the west of the site providing a collective service frequency of approximately 30 minutes on weekdays and an hourly service on weekends and public holidays.

4.4.2 Heavy Rail

The site is located approximately 380m to the north-west of Werrington Railway Station. Werrington Railway Station provides access to train services which operate along the T1 North Shore & Western Line, the T3 Bankstown Line and the Central Coast & Newcastle Line.

The T1 Line provides regular services between the Richmond, Penrith (and beyond) and the City as well as Hornsby (and beyond) linking with numerous other lines servicing the greater Sydney metropolitan area and beyond via interchanges at Blacktown, Parramatta, Granville, Clyde, Lidcombe, Strathfield and the City.

The T3 Line provides regular services between Liverpool or Lidcombe to City via Bankstown, also linking with numerous other lines servicing the greater Sydney metropolitan area and beyond.

The Central Coast & Newcastle Line provides regular services between Blacktown Station, Newcastle and Central station.

4.4.3 Pedestrians / Cyclists

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

- Footpaths are provided along both sides of Victoria Street;
- A footpath is provided along the western side of Gibson Avenue between Victoria Street and Albert Street;
- Pedestrian refuges are provided across all approaches to the roundabout controlled intersection between Victoria Street and Gibson Avenue; and
- A mid-block raised pedestrian crossing is provided across Victoria Street to the east of the site.

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

- Gibson Road and Victoria Street provides an on-road bicycle-friendly route in the vicinity of the site.

5. PROJECTED TRAFFIC CONDITIONS

5.1 Traffic Generation

Traffic generation rates for various land-uses have been established through extensive surveys undertaken throughout NSW and published within TfNSW's *Guide to Traffic Generating Developments*. This publication specifies the following traffic generation rates for child care centres:

0.8 vehicle trips per child during the morning commuter peak hour
0.7 vehicle trips per child during the evening commuter peak hour

Application of the above traffic generation rates to the proposed capacity of 78 children, the child care centre results in an estimated development traffic generation of approximately 62 vehicle trips per hour during the morning peak and 54 vehicle trips per hour during the evening peak.

5.2 Traffic Distribution

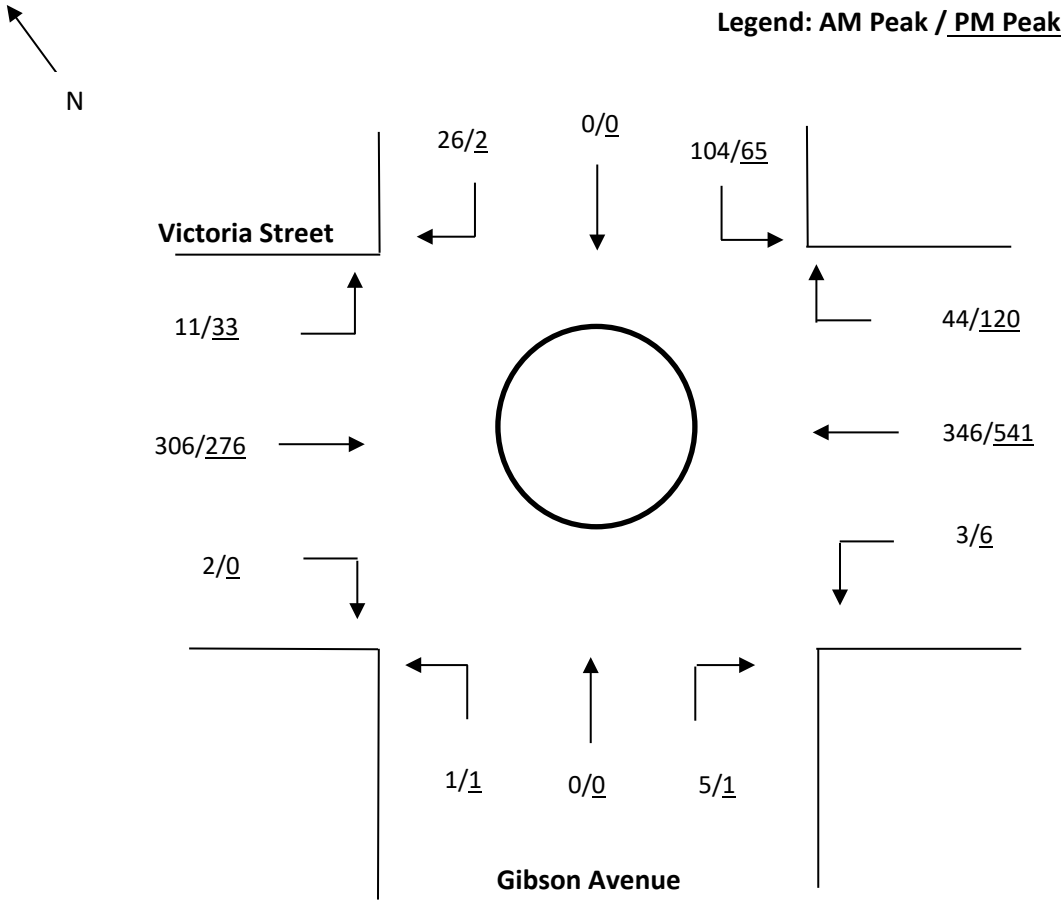
The development-generated trips are likely to be evenly distributed between inbound and outbound movements associated with the setting down and picking up of children during the morning and evening peak periods, respectively. The development is therefore projected to generate 31 ingress and 31 egress movements during the morning peak hour and 27 ingress and 27 egress movements during the evening peak hour.

For the purposes of this assessment, it has been assumed that the egress and ingress trips have been assigned with a proportional distribution to the existing traffic volumes throughout the possible approaches to the site. Further, development generated traffic has been assigned as follows:

- 40% to / from the east along Victoria Street;
- 20% to / from the north along Gibson Avenue; and
- 40% to / from the west along Victoria Street.

On this basis, the projected peak hour traffic volumes at the intersection of Victoria Street and Gibson Avenue have been formulated by adding the abovementioned traffic generation and trip assignment to the existing demands presented within **Figure 3**. **Figure 4** below provides an estimation of the future traffic demands at the nearby public road intersection.

FIGURE 4
PROJECTED WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
INTERSECTION OF VICTORIA STREET AND GIBSON AVENUE



5.3 Traffic Impacts

The intersection of Victoria Street and Gibson Avenue has been modelled in order to estimate the likely impact on traffic safety and efficiency utilising the projected traffic volumes illustrated within **Figure 4**. A summary of the most pertinent results are indicated below within **Table 3** whilst more detailed summaries are provided within **Appendix 5**.

TABLE 3 SIDRA OUTPUT – EXISTING AND PROJECTED WEEKDAY PEAK HOUR PERFORMANCE				
	Existing		Projected	
	AM	PM	AM	PM
Gibson Avenue North Approach				
Delay (seconds / vehicle)	6.6	6.7	6.6	6.7
Degree of Saturation	0.12	0.08	0.13	0.09
Level of Service	A	A	A	A
Gibson Avenue South Approach				
Delay (seconds / vehicle)	8.6	8.5	8.7	8.6
Degree of Saturation	0.01	0.004	0.01	0.004
Level of Service	A	A	A	A
Victoria Street East Approach				
Delay (seconds / vehicle)	4.7	5.1	4.8	5.1
Degree of Saturation	0.25	0.42	0.26	0.43
Level of Service	A	A	A	A
Victoria Street West Approach				
Delay (seconds / vehicle)	4.4	4.8	4.4	4.8
Degree of Saturation	0.22	0.24	0.23	0.25
Level of Service	A	A	A	A
Total Intersection				
Delay (seconds / vehicle)	4.9	5.2	5.0	5.2
Degree of Saturation	0.25	0.42	0.26	0.43
Level of Service	A	A	A	A

Table 3 indicates that the additional traffic generated by the proposed development is not projected to result in significant impacts on the existing operational performance of the intersection of Victoria Street and Gibson Avenue. In this regard, whilst it is expected that the additional traffic will result in some minor increases to the average vehicle delay and the degree of saturation, the prevailing level of service 'A' is projected to remain unaltered.

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. Whilst traffic demands within Victoria Road are notable, site access / egress movements are expected to be assisted by the following:

- Directional traffic flow within Victoria Street is punctuated by the operation of the roundabout and signage controlled intersections within Gibson Avenue and Parkes Avenue to the west and east, respectively, resulting in regular gaps thereby allowing motorists to undertake turning movements to and from abutting properties with a reasonable level of efficiency;

- The proliferation of abutting properties with direct access to Victoria Street ensures that trailing through motorists are aware of the propensity of vehicles to decelerate and / or stop within the directional travel lanes to undertaken turning movements; and

- The consistent horizontal and vertical alignment of the alignment of Victoria Road results in an acceptable level of sight distance being afforded between the proposed access driveway location and approaching traffic flow within the frontage road to the east and west.

5.4 Transport Impacts

The subject site is located within reasonably close walking distance to a number of bus services and a 10-minute walk to train services. It is accordingly expected that a portion 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.

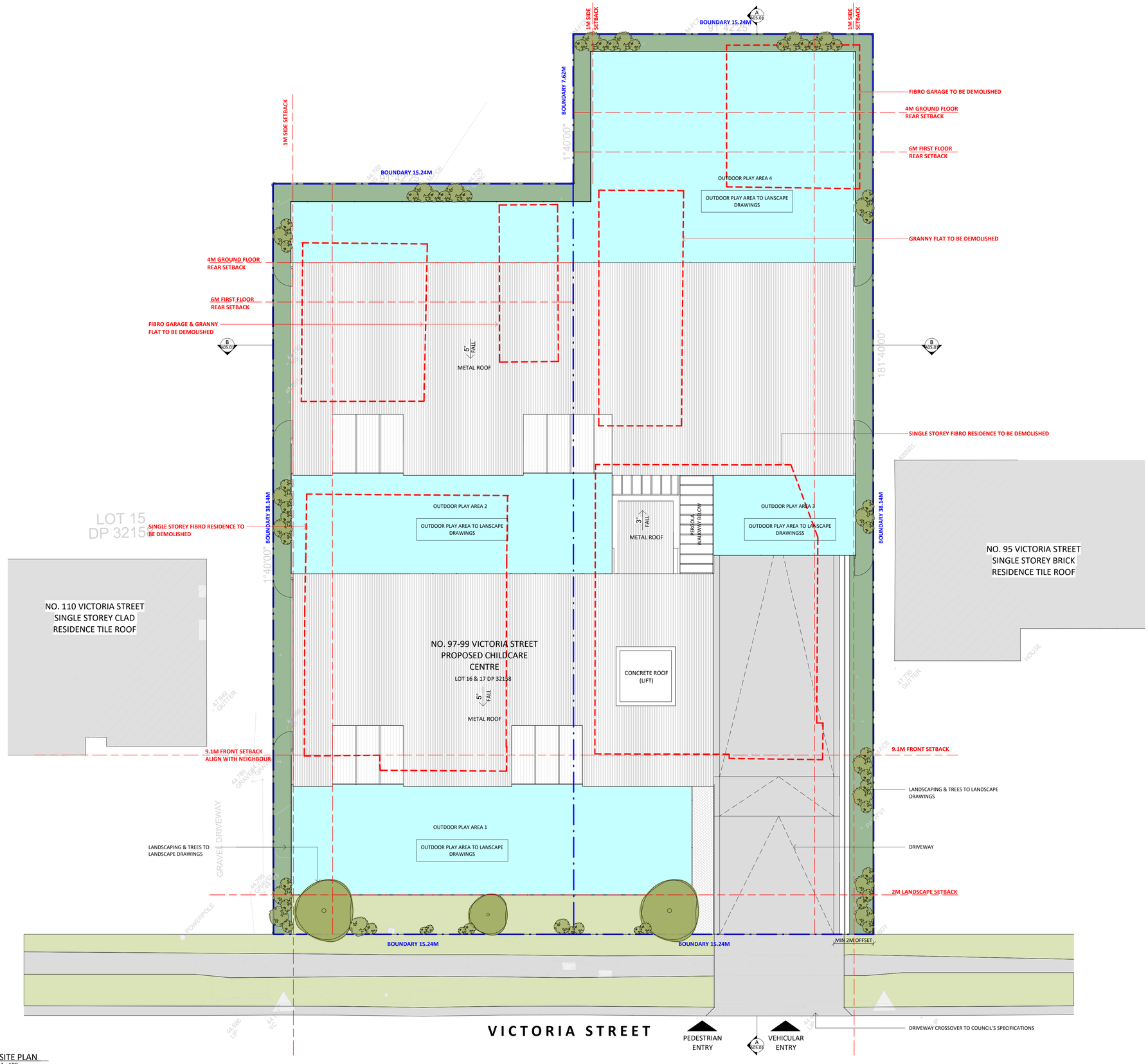
6. CONCLUSION

This report assesses the potential parking and traffic implications associated with a proposed child care centre at 97 – 99 Victoria Street, Werrington. Based on this assessment, the following conclusions are now made:

- The 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 parking provision accords with the requirements of Penrith DCP 2014, thereby indicating that there should not be any increased on-street parking demand as a result of the development;
- The internal passenger vehicle circulation arrangements are envisaged to provide for safe and efficient internal manoeuvring;
- The surrounding road network operates with a reasonable level of service during peak periods;
- The subject development has been projected to generate up to 62 vehicle movements to and from the site during weekday peak hours; and
- The surrounding road network is considered to be capable of accommodating the additional 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 parking or traffic related issues that should prevent approval of the subject application. This action is therefore recommended to Council.

APPENDIX 1



1 SITE PLAN
1 : 100

0 1 2 3 4 5
1 : 100

WORK IN PROGRESS

DRAWING NOT FOR FINAL ISSUE

1 JUNE 2021

SITE CALCULATIONS

TOTAL SITE AREA:	1,277.4 M²
PERMITTED BUILDING HEIGHT	= 8.5 M
MIN REQUIRED LANDSCAPE	= 40% (510.96M²)
PROPOSED LANDSCAPE	= 46.7% (596.2M²)

LANDSCAPE LEGEND

- EXISTING TREE / TREE TO BE RETAINED
- TREE TO BE REMOVED
- NEW TREE
- LANDSCAPING
- LANDSCAPE BUFFER
- TURF
- PAVING
- LINE OF STRUCTURAL ROOT ZONE (SRZ)
- LINE OF TREE EXCLUSION ZONE (TEZ)
- LINE OF TREE PROTECTION ZONE (TPZ)

NOTE: REFER TO ARBORIST REPORT FOR FURTHER DETAILS

ABBREVIATIONS

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FSL	- FINISH SURFACE LEVEL
GLZ	- GLAZING
NGL	- NATURAL GROUND LEVEL
REQ.	- REQUIREMENTS
XX.XX	- PROPOSED LEVEL
XX.XX	- EXISTING LEVEL
XX.XX	- SPOT LEVEL (PLAN)
XX.XX	- SPOT LEVEL (ELEVATION)

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ISSUE	DATE	DESCRIPTION
A	XX.XX.XX	ISSUED FOR DEVELOPMENT APPLICATION

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PROJECT

CHILDCARE CENTRE

PROJECT ADDRESS

97-99 VICTORIA STREET, WERINGTON 2747

SHEET NAME

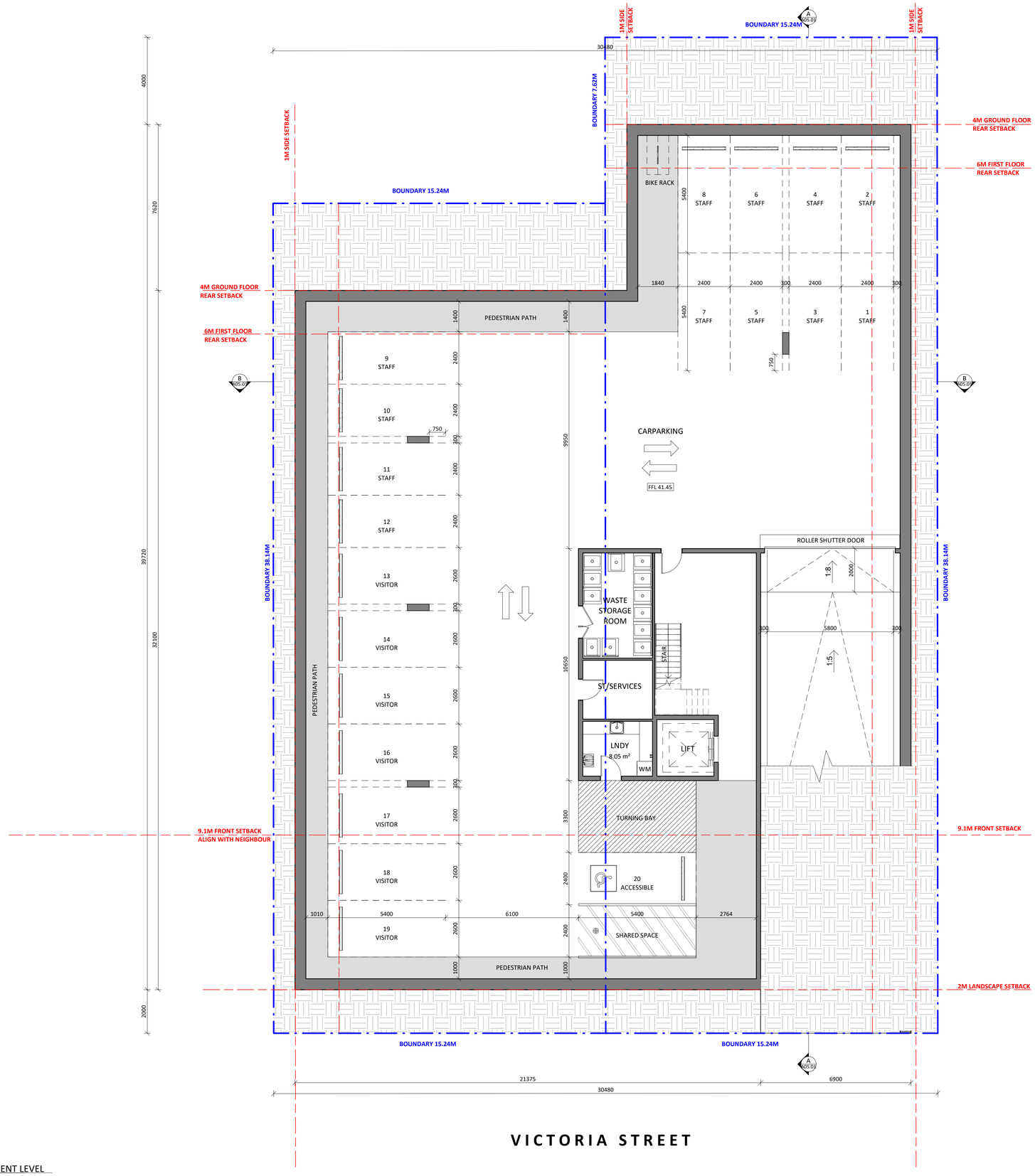
SITE PLAN / DEMOLITION

ISSUED FOR DEVELOPMENT APPLICATION

Project Number	Sheet No.	Issue	Phase
21621	A02.01	A	DA

Sheet Size	Scale	L.G.A.
A1	As indicated	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX



1 BASEMENT LEVEL
1 : 100

0 1 2 3 4 5
1 : 100

WORK IN PROGRESS

DRAWING NOT FOR FINAL ISSUE

1 JUNE 2021

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XX.XX	- PROPOSED LEVEL
XX.XX	- EXISTING LEVEL
XX.XX	- SPOT LEVEL (PLAN)
XX.XX	- SPOT LEVEL (ELEVATION)

GENERAL NOTES

- DEMOLITION IN ACCORDANCE WITH AUSTRALIAN STANDARDS AND TO BE CARRIED OUT BY A LICENCED CONTRACTOR.
- REFER TO SW ENG. DRAWINGS FOR DRAINAGE DESIGN.
- KITCHEN AREA TO COMPLY IN ACCORDANCE WITH NSW FOOD ACT 2003, FOOD REGULATION 2015 AND FOOD STANDARD CODES 3.2.2 AND 3.2.3.

INDOOR PLAYROOM SCHEDULE

ROOM	AGE	NO. CHLDRN	NO. STAFF	UNENCUMBERED REQ AREA	UNENCUMBERED AREA
PLAYROOM 1	AGE 2-3	10	2	32.5 m²	33.05 m²
PLAYROOM 2	AGE 2-3	10	2	32.5 m²	33.40 m²
PLAYROOM 3	AGE 2-3	10	2	32.5 m²	33.05 m²
PLAYROOM 4	AGE 3-5	10	1	32.5 m²	33.00 m²
PLAYROOM 5	AGE 3-5	10	1	32.5 m²	35.10 m²
PLAYROOM 6	AGE 3-5	10	1	32.5 m²	33.40 m²
PLAYROOM 7	AGE 3-5	10	1	32.5 m²	32.95 m²
PLAYROOM 8	AGE 0-2	8	2	26 m²	26.55 m²
TOTAL		78	12	253.5 m²	260.50 m²

OUTDOOR PLAY AREA SCHEDULE

AREA	AGE	NO. CHLDRN	UNENCUMBERED REQ AREA	UNENCUMBERED AREA
OUTDOOR PLAY AREA 1	AGE 2-3	22	154 m²	154.70 m²
OUTDOOR PLAY AREA 2	AGE 2-5	19	133 m²	133.10 m²
OUTDOOR PLAY AREA 3	AGE 0-2	8	56 m²	56.25 m²
OUTDOOR PLAY AREA 4	AGE 3-5	29	203 m²	204.20 m²
TOTAL		78	546 m²	548.25 m²

PARKING SCHEDULE

PARKING	NO. SPACES
ACCESSIBLE	1
STAFF	12
VISITOR	7
TOTAL	20

NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
A	XX.XX.XX	ISSUED FOR DEVELOPMENT APPLICATION

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PROJECT
CHILDCARE CENTRE

PROJECT ADDRESS
97-99 VICTORIA STREET, WERINGTON 2747

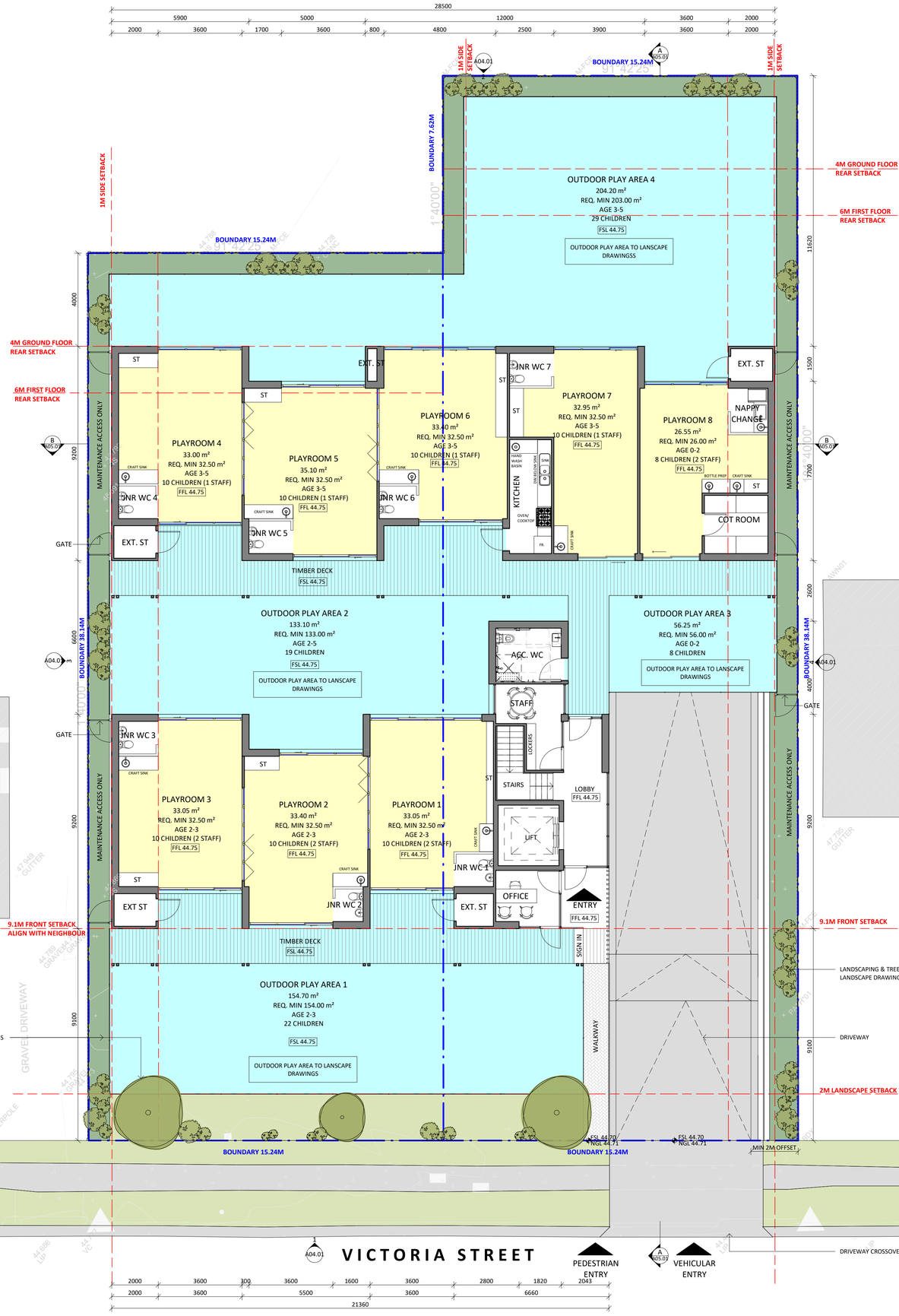
SHEET NAME
BASEMENT FLOOR PLAN

ISSUED FOR DEVELOPMENT APPLICATION

Project number	Sheet No.	Issue	Phase
21621	A03.01	A	DA

Sheet Size	Scale	L.G.A.
A1	As indicated	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX



1 GROUND FLOOR PLAN
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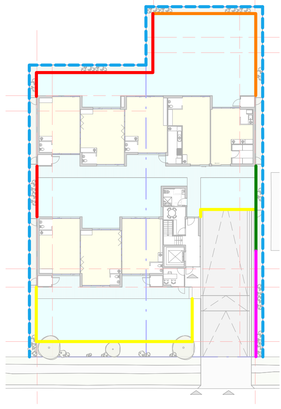

2 GROUND FLOOR FENCE/BARRIER DIAGRAM
1 : 400

LEGEND

- 1.2M HT BALUSTRADE
- 1.5M HT ACOUSTIC BARRIER
- 1.8M HT BOUNDARY FENCE LAPPED & CAPPED
- 2.1M HT ACOUSTIC BARRIER
- : BARRIER
- tbc : BARRIER

NOTE:
- ALL ACOUSTIC BARRIERS IN ACCORDANCE WITH ACOSUTIC REPORT.
- REFER TO SHEET A05.01 FOR FENCE DETAILS.

0 1 2 3 4 5
1 : 100

WORK IN PROGRESS

DRAWING NOT FOR FINAL ISSUE

1 JUNE 2021

SITE CALCULATIONS

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ISSUE	DATE	DESCRIPTION
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PROJECT
CHILDCARE CENTRE

PROJECT ADDRESS
97-99 VICTORIA STREET, WERINGTON 2747

SHEET NAME
GROUND FLOOR PLAN & FENCE/BARRIER DIAGRAM

ISSUED FOR DEVELOPMENT APPLICATION

Project number	Sheet No.	Issue	Phase
21621	A03.02	A	DA

Sheet Size	Scale	L.G.A.
A1	As indicated	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX

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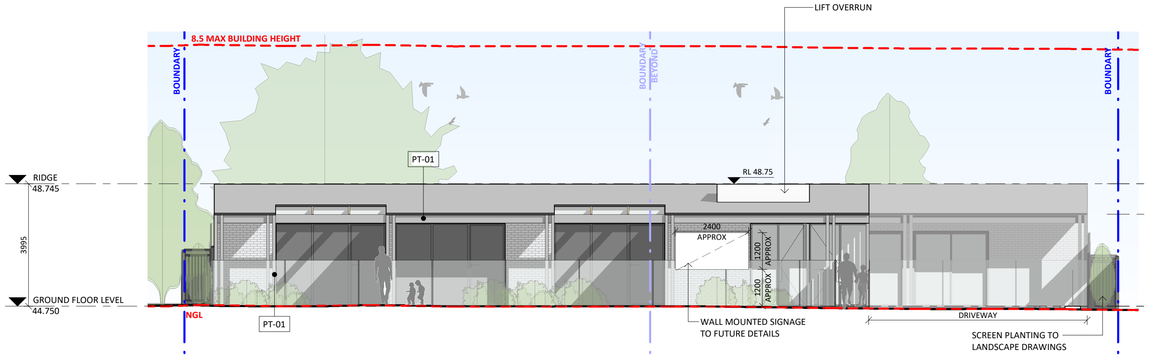
WORK IN PROGRESS
DRAWING NOT FOR FINAL ISSUE

1 JUNE 2021



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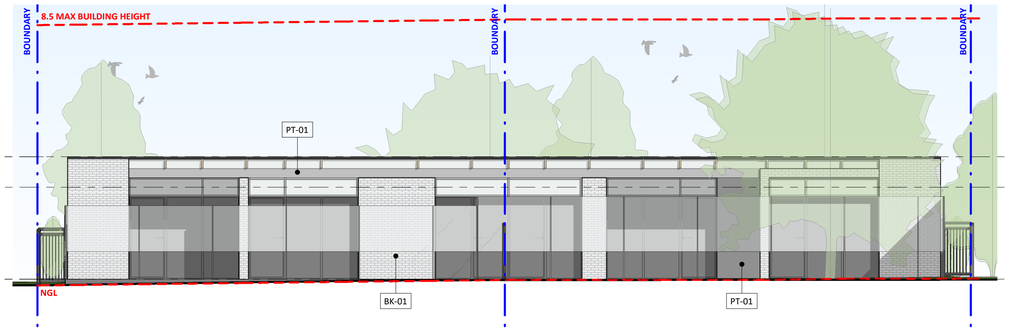

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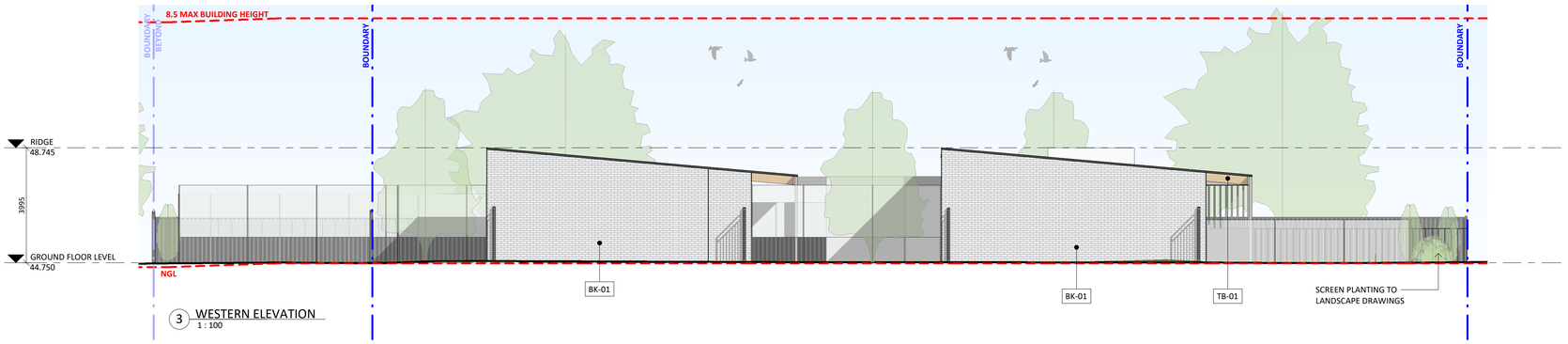

3 WESTERN ELEVATION
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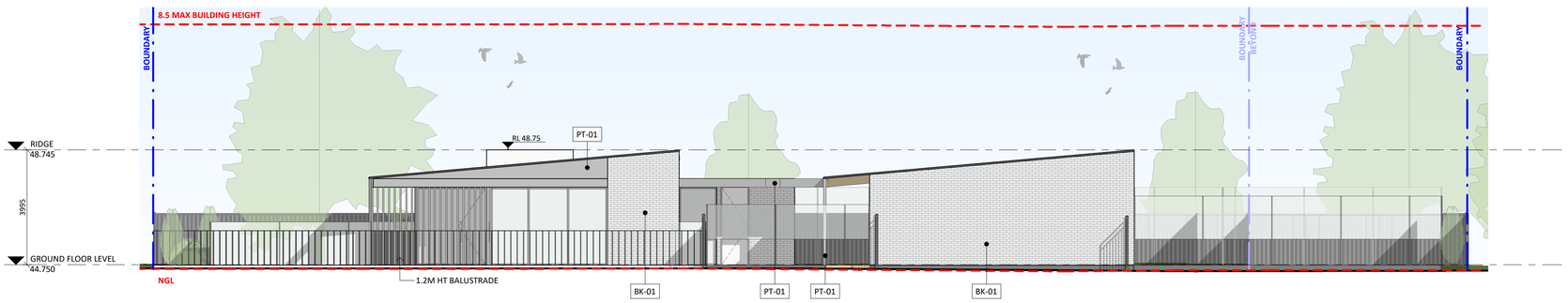

4 EASTERN ELEVATION
1 : 100

EXTERNAL FINISHES

BK-01	BRICK BAGGED DULUX COLOUR: TBC OR SIMILAR
CB-01	GARAGE DOOR COLORBOND COLOUR: SHALE GREY OR SIMILAR
CB-02	ROOF,GUTTER, DOWNPIPES COLORBOND COLOUR: SHALE GREY OR SIMILAR
PC-01	ALUMINIUM WINDOW & DOOR FRAMES DURALLOY POWDERCOAT COLOUR: OYSTER OR SIMILAR
PT-01	RENDER & PAINT DULUX COLOUR: SHALE GREY OR SIMILAR
TB-01	EXPOSED TIMBER RAFTERS COLOUR: LIGHT TIMBER OR SIMILA

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ISSUE	DATE	DESCRIPTION
A	XX.XX.XX	ISSUED FOR DEVELOPMENT APPLICATION

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PROJECT
CHILDCARE CENTRE

PROJECT ADDRESS
97-99 VICTORIA STREET, WERINGTON 2747

SHEET NAME
EXTERNAL ELEVATIONS

ISSUED FOR DEVELOPMENT APPLICATION

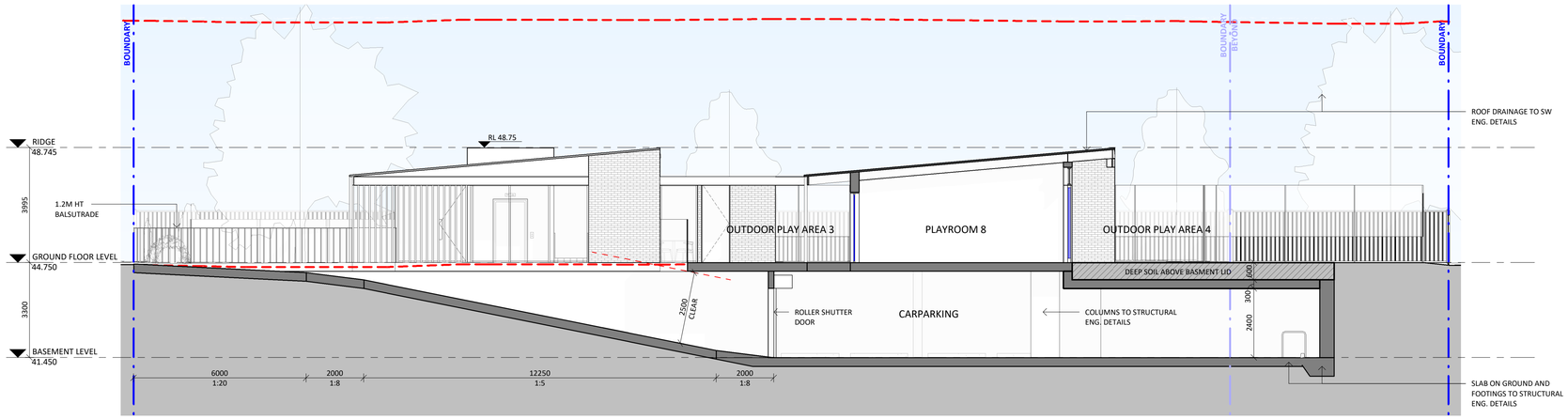
Project number	Sheet No.	Issue	Phase
21621	A04.01	A	DA

Sheet Size	Scale	L.G.A.
A1	1 : 100	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX

0 1 2 3 4 5
1 : 100

WORK IN PROGRESS
DRAWING NOT FOR FINAL ISSUE
1 JUNE 2021



A SECTION A-A
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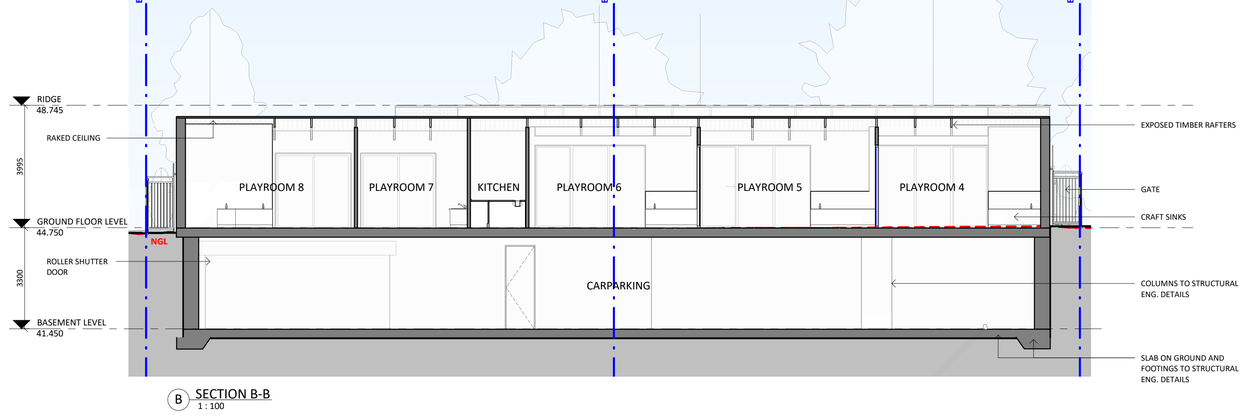

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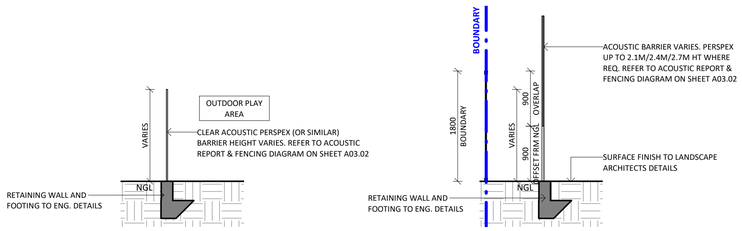

TYP ACOUSTIC BARRIER

TYP INSET ACOUSTIC BARRIER

EXTERNAL FINISHES

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	CB-01	GARAGE DOOR COLORBOND COLOUR: SHALE GREY OR SIMILAR
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	PT-01	RENDER & PAINT DULUX COLOUR: SHALE GREY OR SIMILAR
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ARTIST IMPRESSION

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A	XX.XX.XX	ISSUED FOR DEVELOPMENT APPLICATION
ISSUE	DATE	DESCRIPTION

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PROJECT
CHILDCARE CENTRE

PROJECT ADDRESS
97-99 VICTORIA STREET, WERINGTON 2747

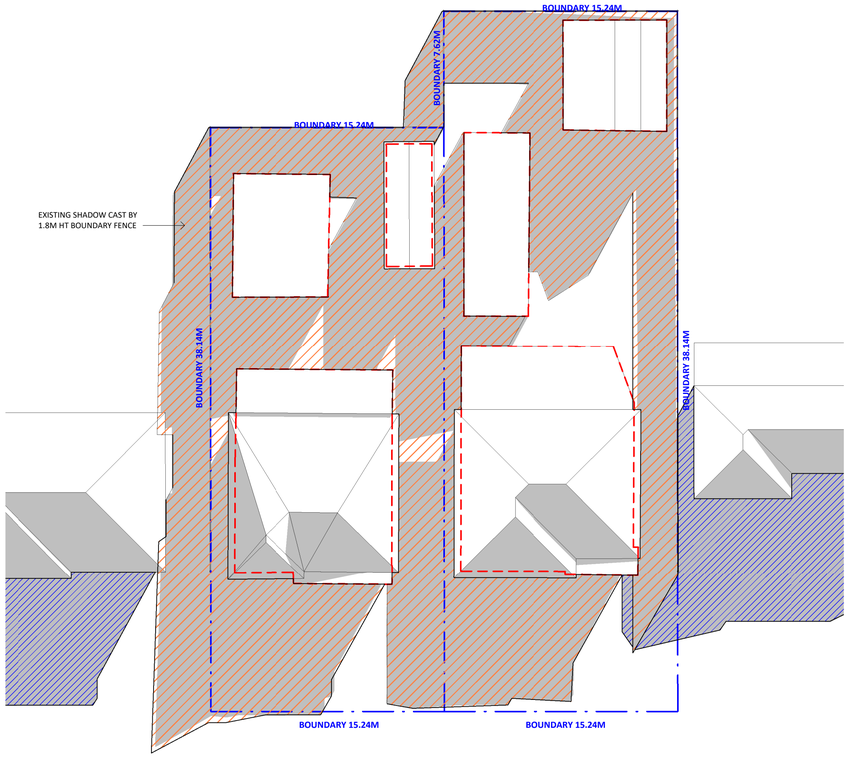
SHEET NAME
SECTIONS, EXTERNAL FINISHES & FENCE DETAILS

ISSUED FOR DEVELOPMENT APPLICATION

Project number	Sheet No.	Issue	Phase
21621	A05.01	A	DA

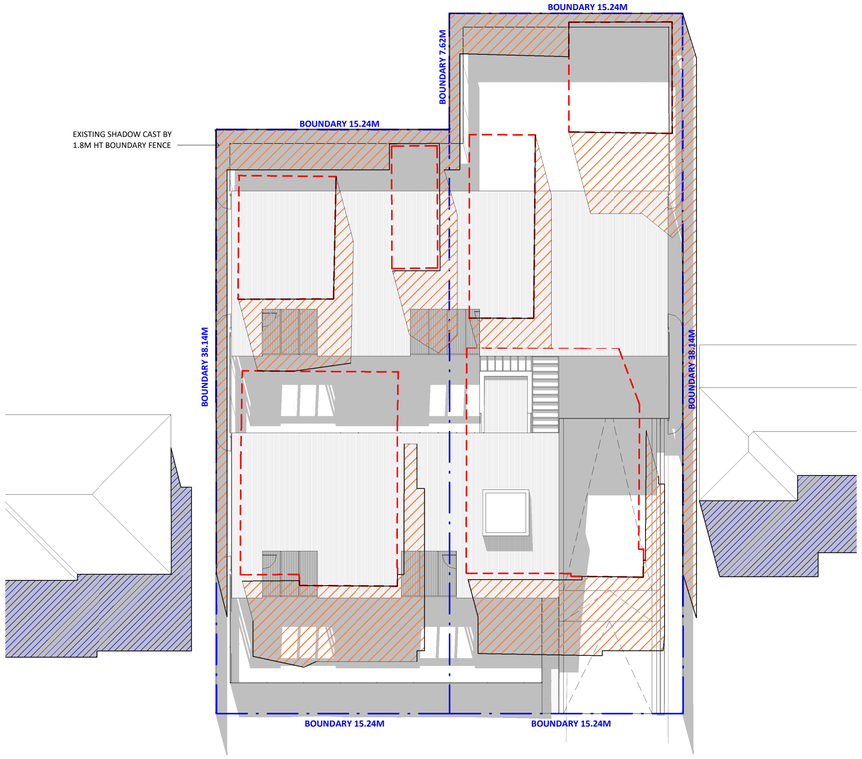
Sheet Size	Scale	L.G.A.
A1	As indicated	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX



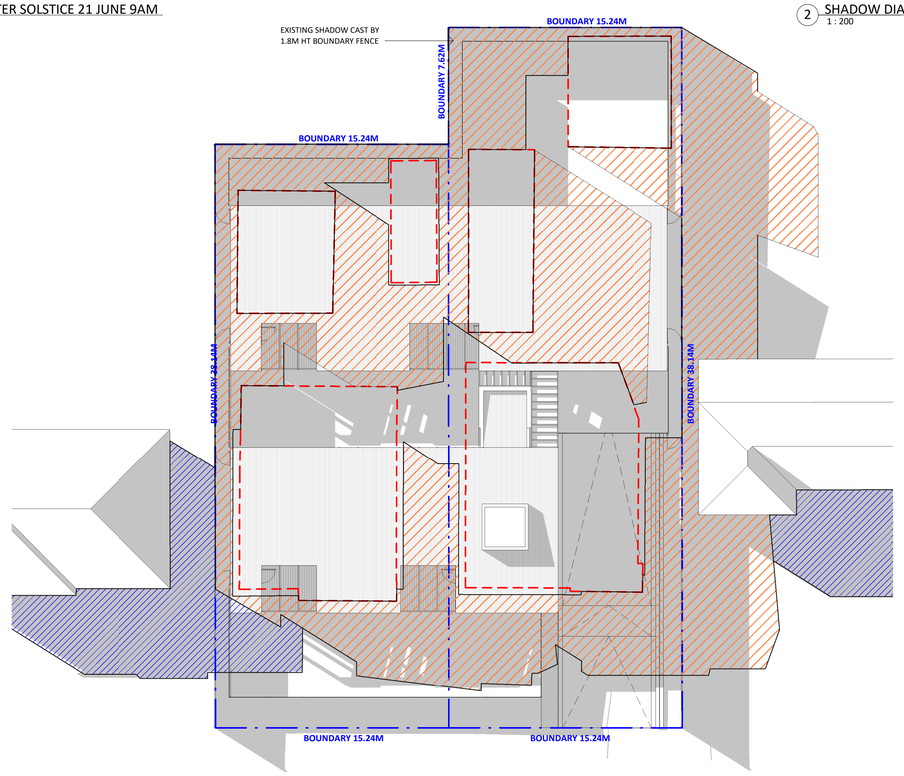
VICTORIA STREET

1 SHADOW DIAGRAM WINTER SOLSTICE 21 JUNE 9AM
1 : 200



VICTORIA STREET

2 SHADOW DIAGRAM WINTER SOLSTICE 21 JUNE 12PM
1 : 200



VICTORIA STREET

3 SHADOW DIAGRAM WINTER SOLSTICE 21 JUNE 3PM
1 : 200

0 1 2 4 6 8 10
1 : 200

WORK IN PROGRESS

DRAWING NOT FOR FINAL ISSUE

1 JUNE 2021

SHADOW LEGEND

- EXISTING SHADOW
- EXISTING NEIGHBOUR SHADOW
- NEW SHADOW

NOT FOR CONSTRUCTION

ISSUE	DATE	DESCRIPTION
A	XX.XX.XX	ISSUED FOR DEVELOPMENT APPLICATION

ASSOCIATED CONSULTANTS

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ARCHITECT

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PROJECT

CHILDCARE CENTRE

PROJECT ADDRESS

97-99 VICTORIA STREET, WERINGTON 2747

SHEET NAME

SHADOW DIAGRAMS

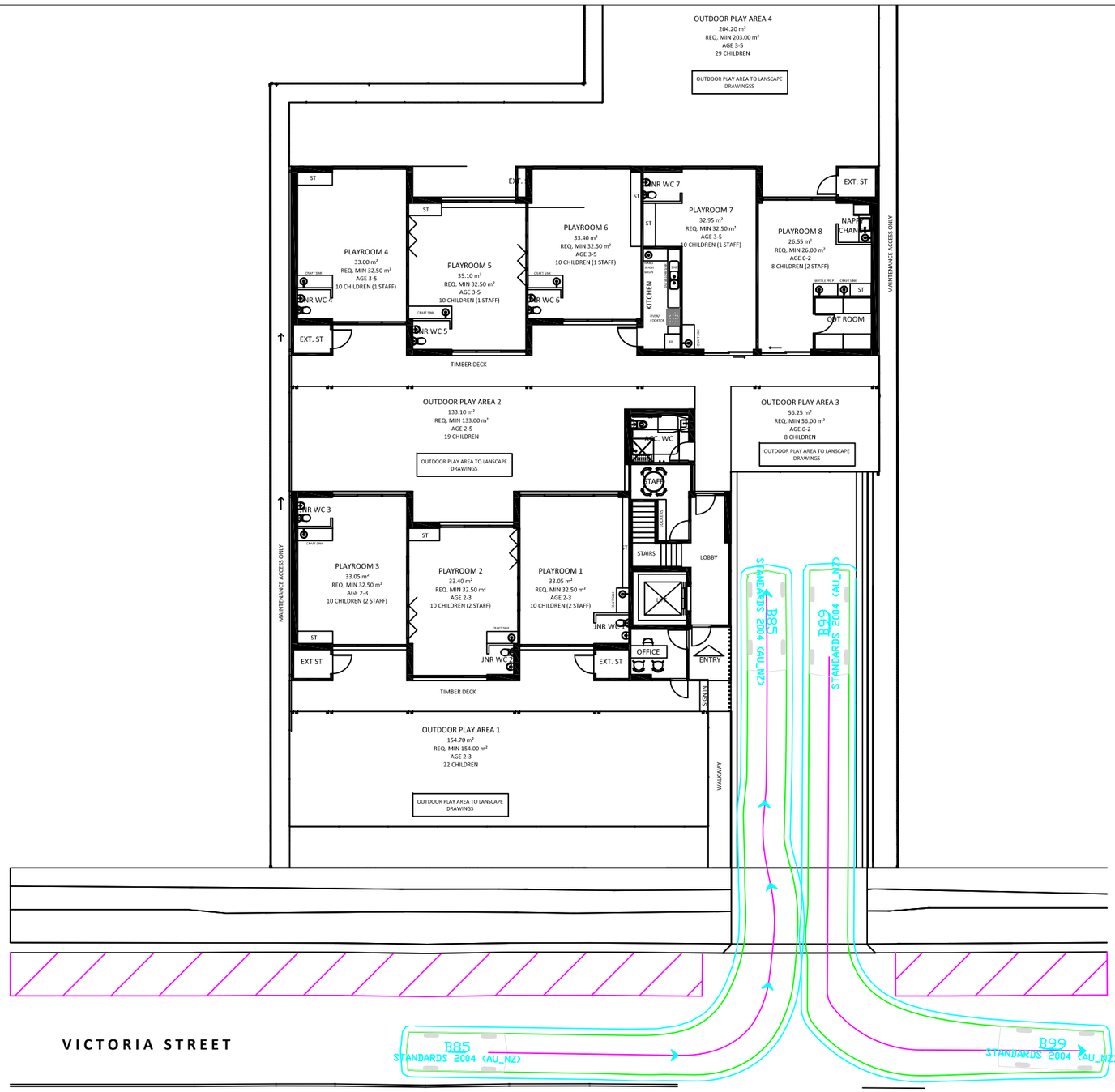
ISSUED FOR DEVELOPMENT APPLICATION

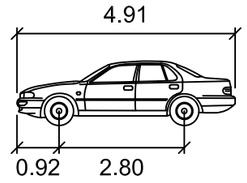
Project number	Sheet No.	Issue	Phase
21621	A06.02	A	DA

Sheet Size	Scale	L.G.A.
A1	1 : 200	PENRITH

Drawn By	Checked By	Date
SH	AS/SS	XX.XX.XX

APPENDIX 2





B85

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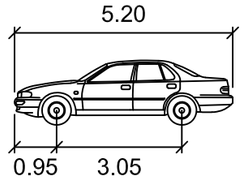
Steering Angle	: 34.1



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Steering Angle	: 33.9

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

POTENTIAL KERB-SIDE PARKING

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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2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 10 IN CONJUNCTION WITH B99 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 CHILD CARE CENTRE DEVELOPMENT

97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3

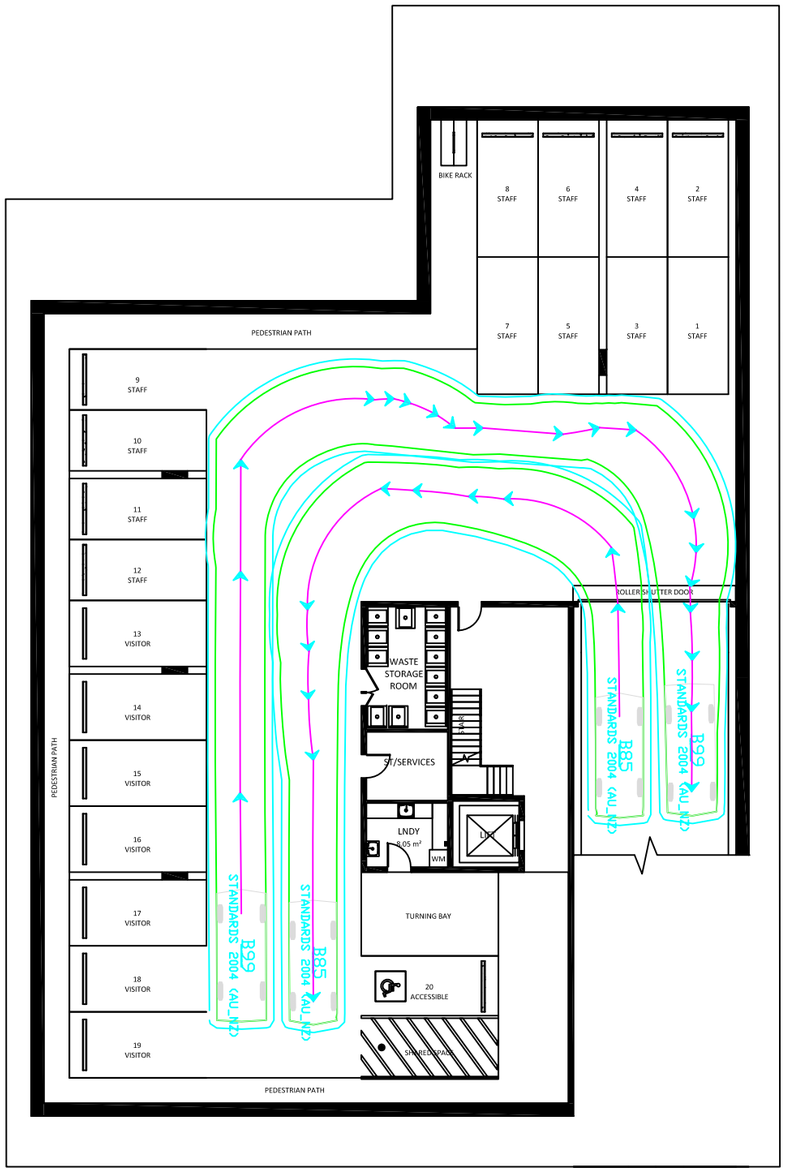
FILE: 21-109

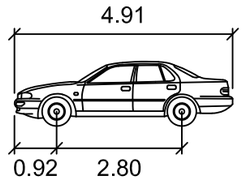
SUPERSEDES SHEET/ISSUE -

DATE: 08/06/2021

ISSUE A

SHEET 1





B85

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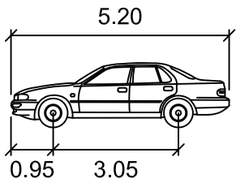

B99

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Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

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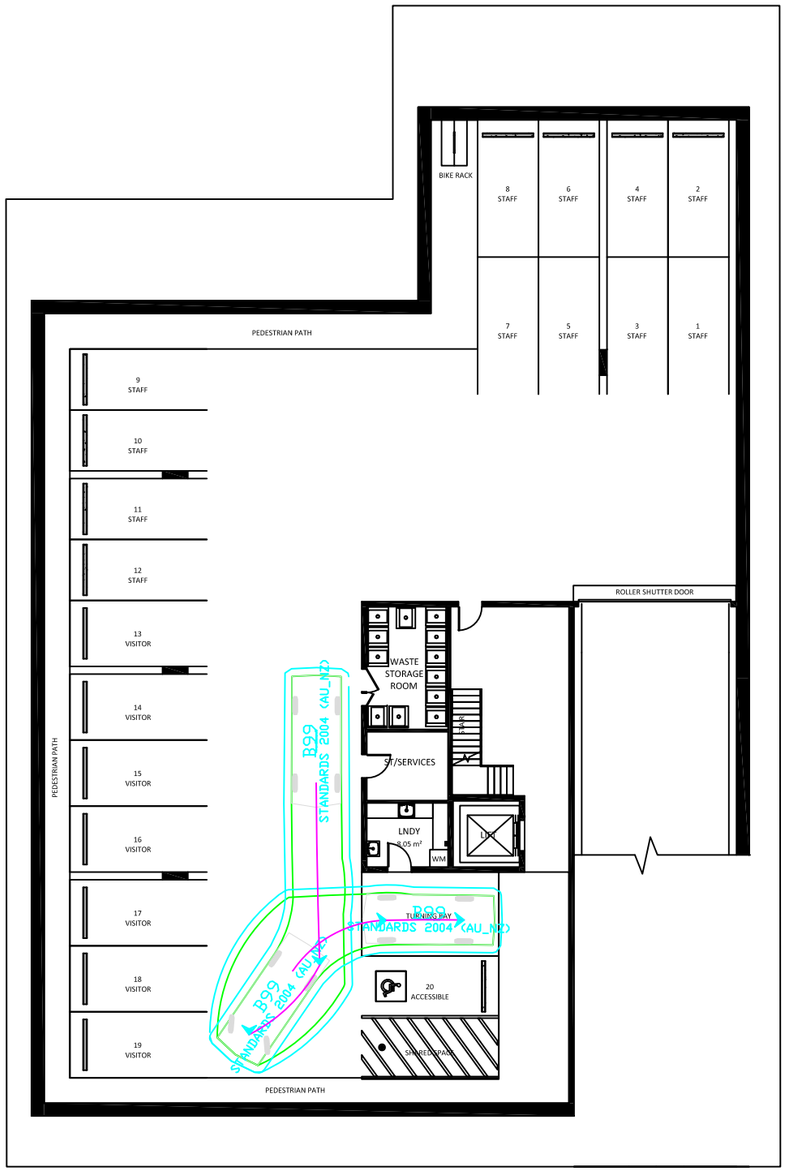
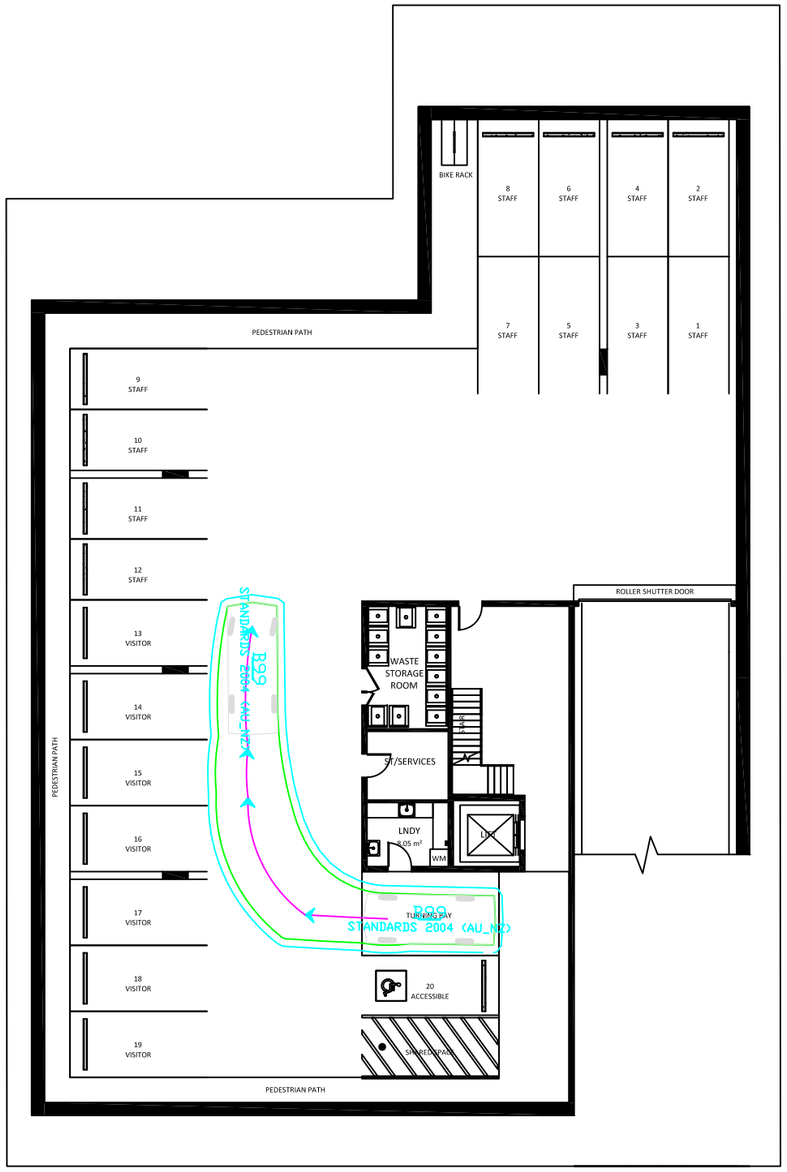
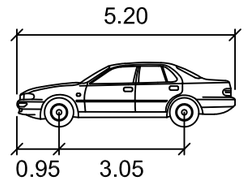
STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS
INTERNAL CIRCULATION PASSING MOVEMENTS
PROPOSED CHILD CARE CENTRE DEVELOPMENT
97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3
FILE: 21-109
SUPERSEDES SHEET/ISSUE -
DATE: 08/06/2021
ISSUE A
SHEET 2







B99

	meters
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Lock to Lock Time	: 6.0
Steering Angle	: 33.9

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

TURNING BAY INGRESS AND EGRESS MANOEUVRING

PROPOSED CHILD CARE CENTRE DEVELOPMENT

97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3

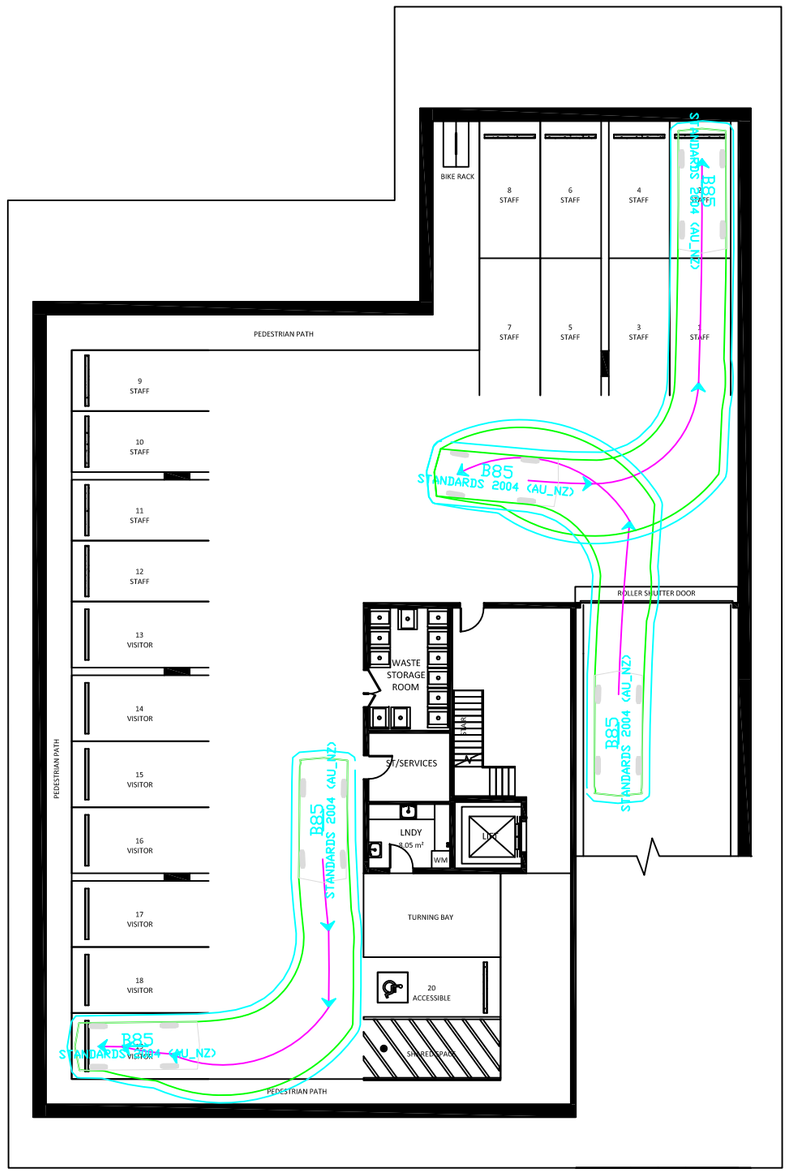
FILE: 21-109

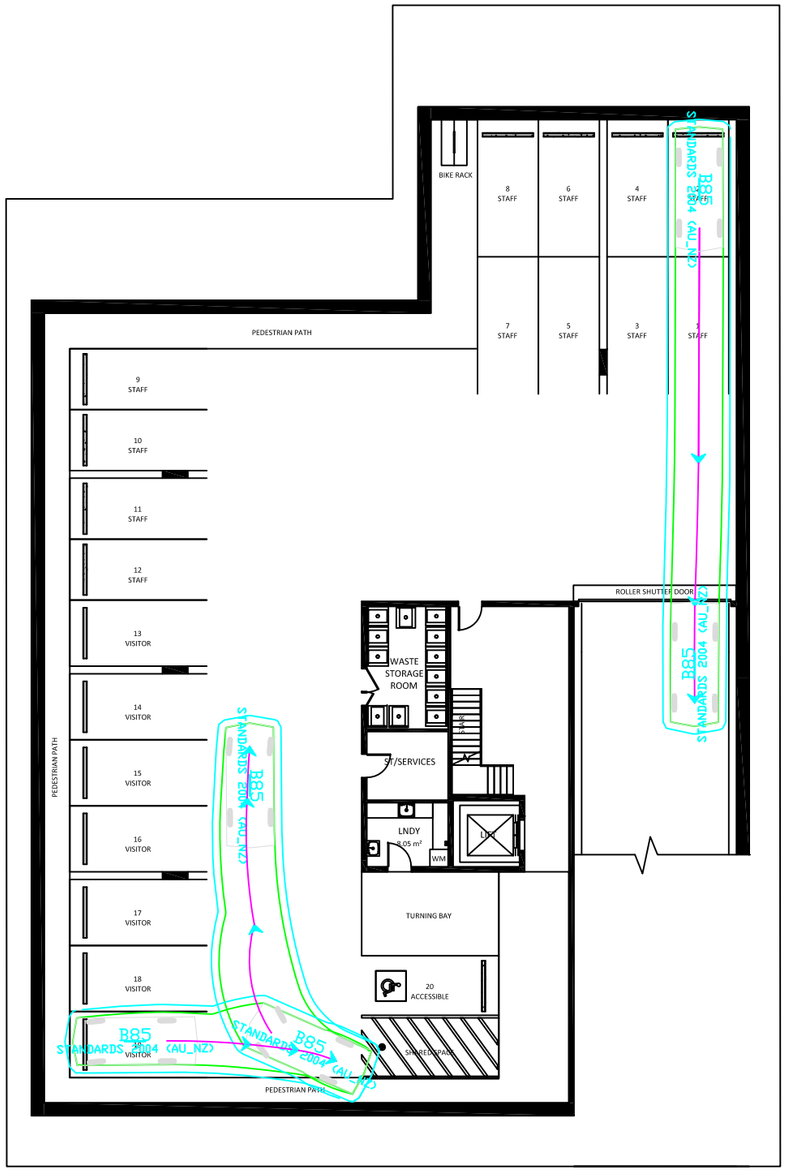
SUPERSEDES SHEET/ISSUE -

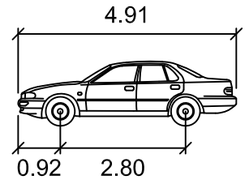
DATE: 08/06/2021

ISSUE A

SHEET 3







B85

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

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE INGRESS AND EGRESS MANOEUVRING

PROPOSED CHILD CARE CENTRE DEVELOPMENT

97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3

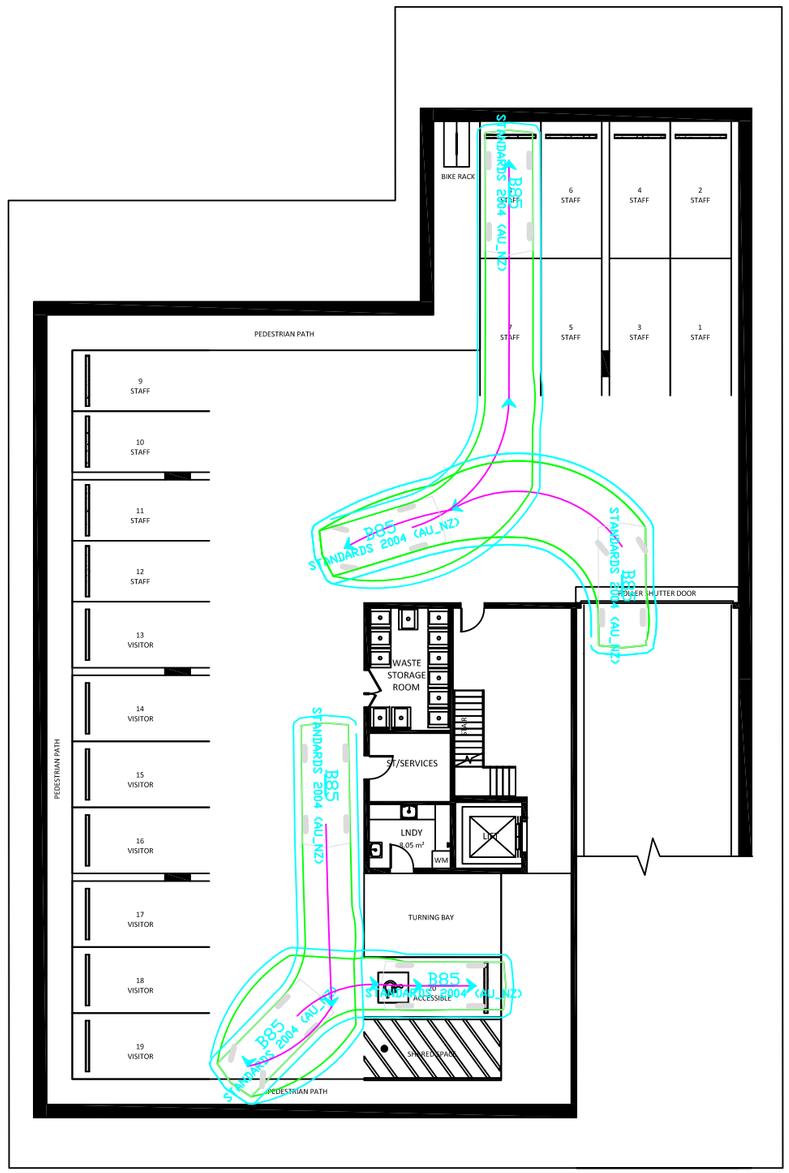
FILE: 21-109

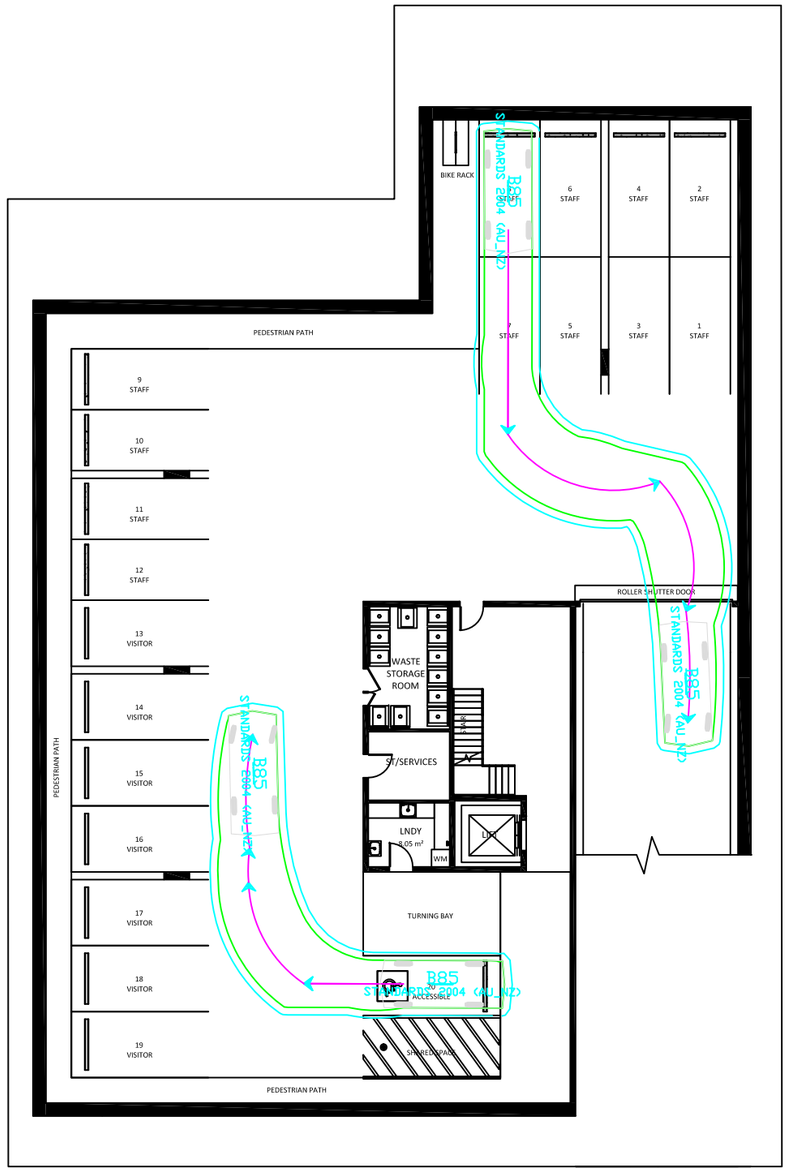
SUPERSEDES SHEET/ISSUE -

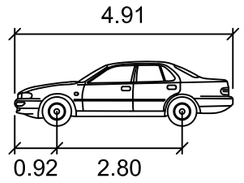
DATE: 08/06/2021

ISSUE A

SHEET 4







B85

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

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE INGRESS AND EGRESS MANOEUVRING

PROPOSED CHILD CARE CENTRE DEVELOPMENT

97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3

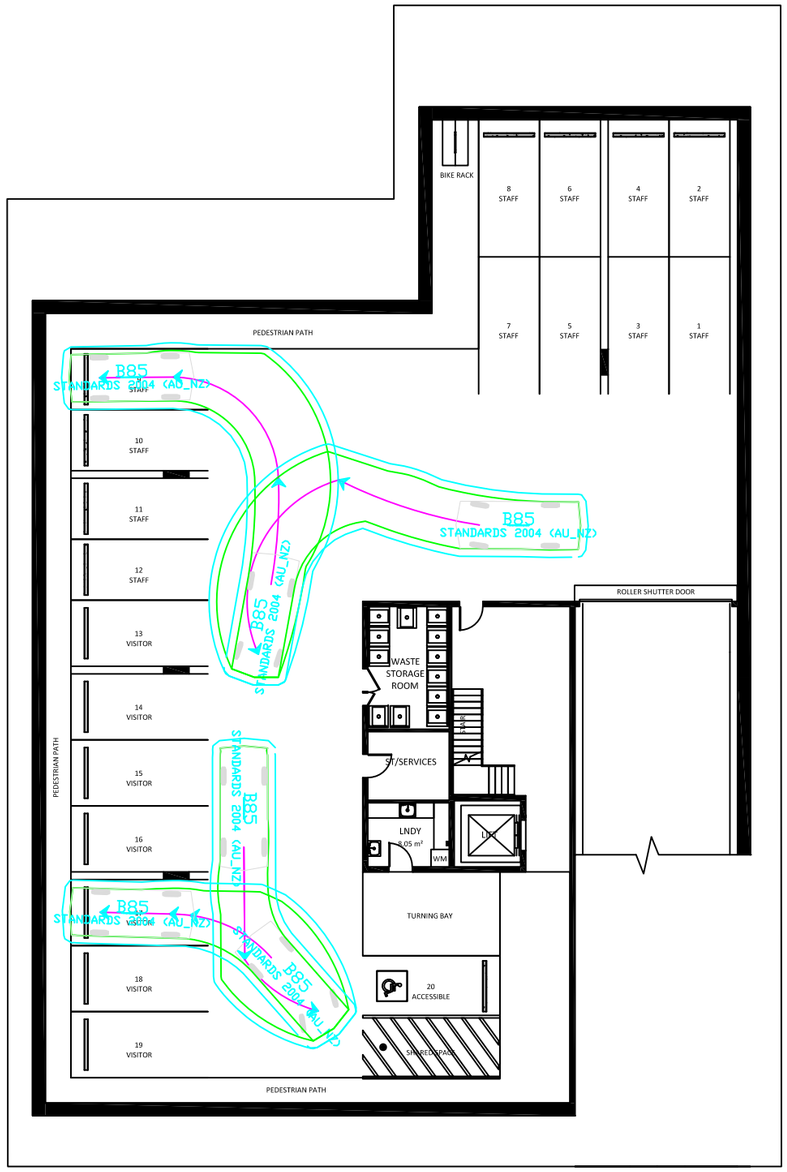
FILE: 21-109

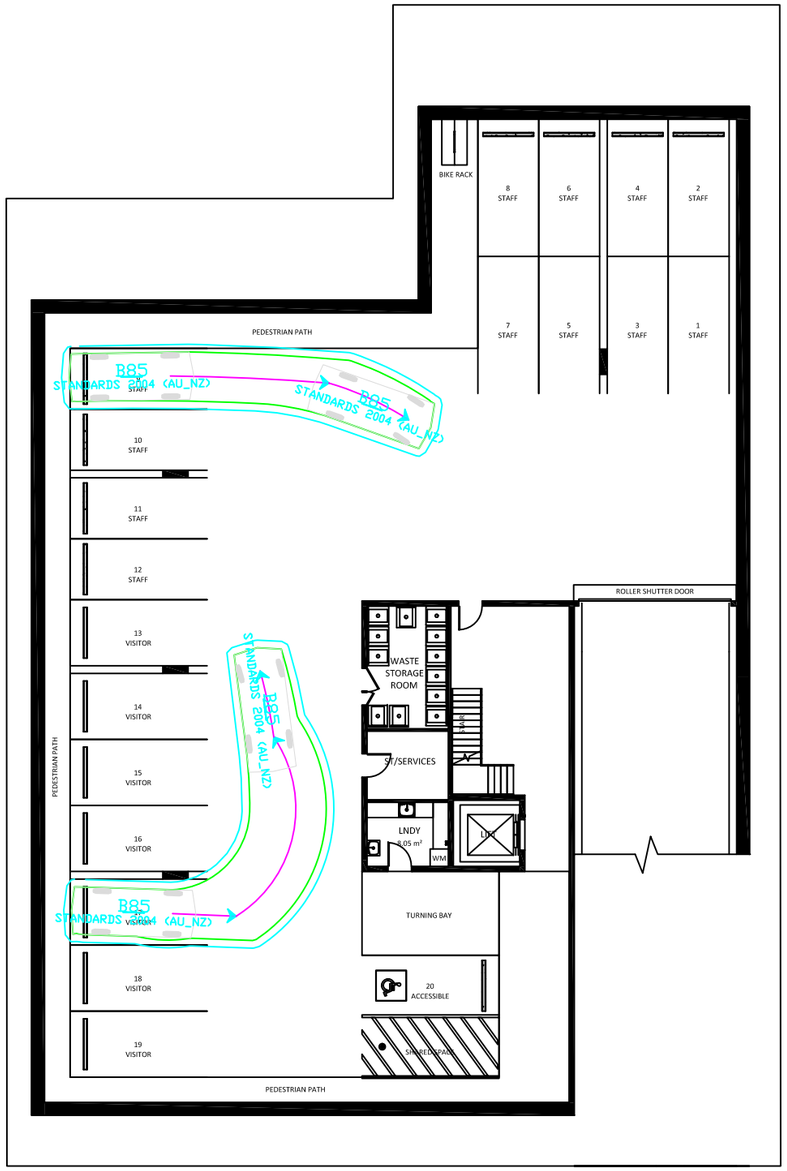
SUPERSEDES SHEET/ISSUE -

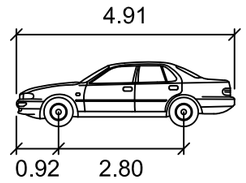
DATE: 08/06/2021

ISSUE A

SHEET 5







B85

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

VEHICLE BODY PATH (INCLUDING OVERHANG)

MANOEUVRING CLEARANCE (300mm)

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE INGRESS AND EGRESS MANOEUVRING

PROPOSED CHILD CARE CENTRE DEVELOPMENT

97 - 99 VICTORIA STREET, WERRINGTON

SCALE: 1:250 AT A3

FILE: 21-109

SUPERSEDES SHEET/ISSUE -

DATE: 08/06/2021

ISSUE A

SHEET 6

APPENDIX 3

R.O.A.R. DATA

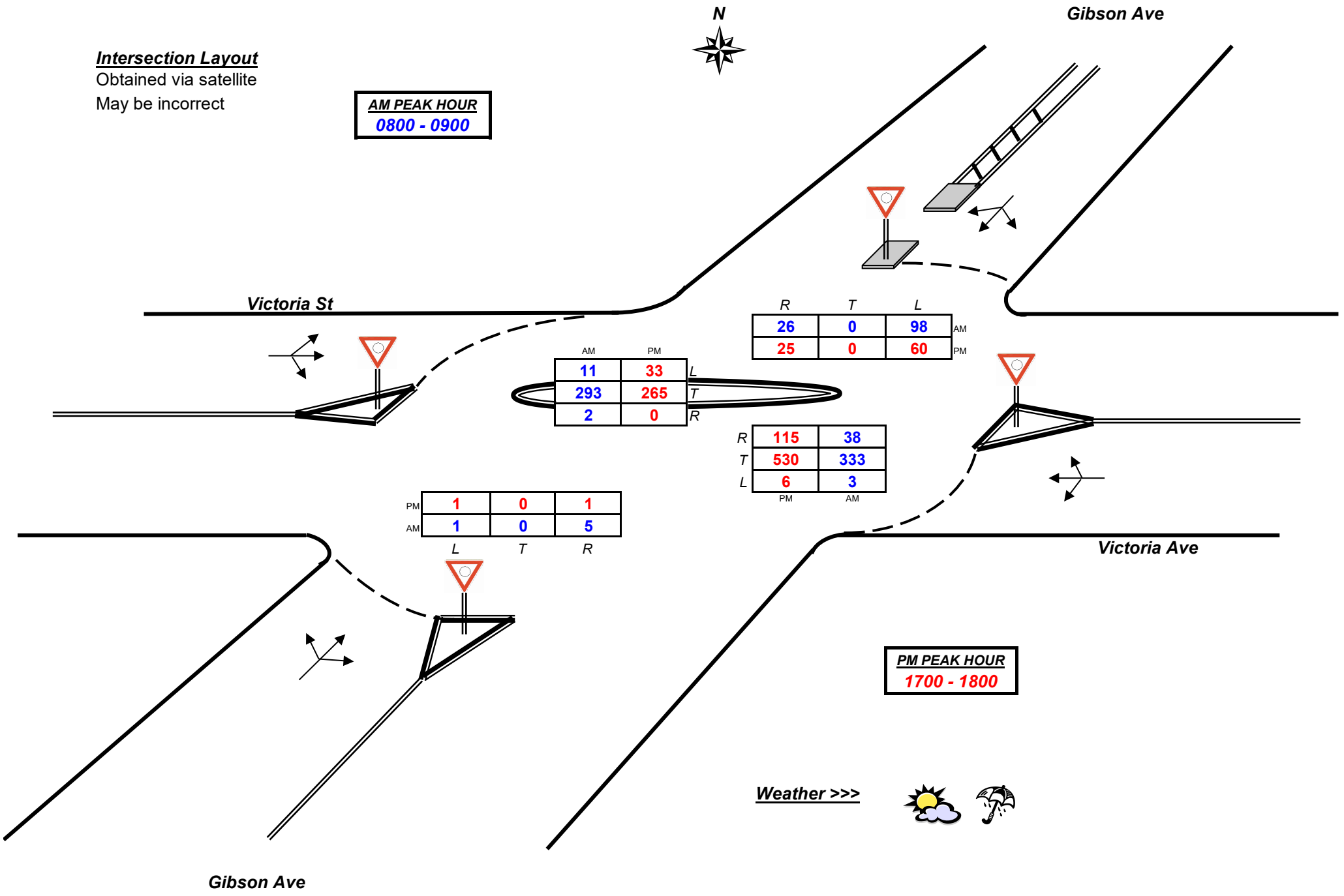
Reliable, Original & Authentic Results

Ph. Mob.0418-239019

Client : Stanbury Traffic Planning
Job No/Name : 7529 WERRINGTON Gibson Ave
Day/Date : Wednesday 5th May 2021

Intersection Layout
Obtained via satellite
May be incorrect

AM PEAK HOUR
0800 - 0900



PM PEAK HOUR
1700 - 1800

Weather >>>

APPENDIX 4

MOVEMENT SUMMARY

Site: 101 [Victoria Street and Glbson Avenue (Site Folder: General)]

AM Peak Existing
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gibson Ave South														
1	L2	1	5.0	1	5.0	0.007	5.1	LOS A	0.0	0.3	0.48	0.59	0.48	44.3
2	T1	1	5.0	1	5.0	0.007	5.4	LOS A	0.0	0.3	0.48	0.59	0.48	49.3
3	R2	5	5.0	5	5.0	0.007	9.9	LOS A	0.0	0.3	0.48	0.59	0.48	46.5
Approach		7	5.0	7	5.0	0.007	8.6	LOS A	0.0	0.3	0.48	0.59	0.48	46.7
East: Victoria Rd East														
4	L2	3	5.0	3	5.0	0.248	4.1	LOS A	1.6	11.7	0.15	0.42	0.15	47.6
5	T1	333	5.0	333	5.0	0.248	4.3	LOS A	1.6	11.7	0.15	0.42	0.15	54.0
6	R2	38	5.0	38	5.0	0.248	8.9	LOS A	1.6	11.7	0.15	0.42	0.15	54.9
Approach		374	5.0	374	5.0	0.248	4.7	LOS A	1.6	11.7	0.15	0.42	0.15	54.1
North: Gibson Ave North														
7	L2	98	5.0	98	5.0	0.119	5.6	LOS A	0.6	4.5	0.47	0.60	0.47	52.2
8	T1	1	5.0	1	5.0	0.119	5.8	LOS A	0.6	4.5	0.47	0.60	0.47	49.0
9	R2	26	5.0	26	5.0	0.119	10.4	LOS A	0.6	4.5	0.47	0.60	0.47	53.5
Approach		125	5.0	125	5.0	0.119	6.6	LOS A	0.6	4.5	0.47	0.60	0.47	52.4
West: Victoria Rd West														
10	L2	11	5.0	11	5.0	0.222	4.1	LOS A	1.3	9.1	0.17	0.40	0.17	53.6
11	T1	293	5.0	308	5.0	0.222	4.4	LOS A	1.3	9.1	0.17	0.40	0.17	54.3
12	R2	2	5.0	2	5.0	0.222	9.0	LOS A	1.3	9.1	0.17	0.40	0.17	46.8
Approach		306	5.0	321	5.0	0.222	4.4	LOS A	1.3	9.1	0.17	0.40	0.17	54.3
All Vehicles		812	5.0	827	5.0	0.248	4.9	LOS A	1.6	11.7	0.21	0.44	0.21	53.8

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Victoria Street and Glbson Avenue (Site Folder: General)]

PM Peak Existing
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gibson Ave South														
1	L2	1	5.0	1	5.0	0.004	6.8	LOS A	0.0	0.2	0.63	0.57	0.63	44.3
2	T1	1	5.0	1	5.0	0.004	7.1	LOS A	0.0	0.2	0.63	0.57	0.63	49.4
3	R2	1	5.0	1	5.0	0.004	11.7	LOS A	0.0	0.2	0.63	0.57	0.63	46.4
Approach		3	5.0	3	5.0	0.004	8.5	LOS A	0.0	0.2	0.63	0.57	0.63	46.9
East: Victoria Rd East														
4	L2	6	5.0	6	5.0	0.419	4.1	LOS A	3.3	24.4	0.18	0.44	0.18	47.0
5	T1	530	5.0	530	5.0	0.419	4.3	LOS A	3.3	24.4	0.18	0.44	0.18	53.6
6	R2	115	5.0	115	5.0	0.419	8.9	LOS A	3.3	24.4	0.18	0.44	0.18	54.5
Approach		651	5.0	651	5.0	0.419	5.1	LOS A	3.3	24.4	0.18	0.44	0.18	53.7
North: Gibson Ave North														
7	L2	60	5.0	60	5.0	0.081	5.3	LOS A	0.4	3.1	0.44	0.59	0.44	52.0
8	T1	1	5.0	1	5.0	0.081	5.5	LOS A	0.4	3.1	0.44	0.59	0.44	48.7
9	R2	25	5.0	25	5.0	0.081	10.2	LOS A	0.4	3.1	0.44	0.59	0.44	53.3
Approach		86	5.0	86	5.0	0.081	6.7	LOS A	0.4	3.1	0.44	0.59	0.44	52.3
West: Victoria Rd West														
10	L2	33	5.0	33	5.0	0.244	4.6	LOS A	1.4	10.3	0.31	0.45	0.31	53.0
11	T1	265	5.0	279	5.0	0.244	4.8	LOS A	1.4	10.3	0.31	0.45	0.31	53.5
12	R2	1	5.0	1	5.0	0.244	9.4	LOS A	1.4	10.3	0.31	0.45	0.31	45.7
Approach		299	5.0	313	5.0	0.244	4.8	LOS A	1.4	10.3	0.31	0.45	0.31	53.4
All Vehicles		1039	5.0	1053	5.0	0.419	5.2	LOS A	3.3	24.4	0.24	0.46	0.24	53.5

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

APPENDIX 5

MOVEMENT SUMMARY

Site: 101 [Victoria Street and Glbson Avenue (Site Folder: General)]

AM Peak Projected
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gibson Ave South														
1	L2	1	5.0	1	5.0	0.007	5.2	LOS A	0.0	0.3	0.49	0.59	0.49	44.2
2	T1	1	5.0	1	5.0	0.007	5.5	LOS A	0.0	0.3	0.49	0.59	0.49	49.2
3	R2	5	5.0	5	5.0	0.007	10.0	LOS A	0.0	0.3	0.49	0.59	0.49	46.3
Approach		7	5.0	7	5.0	0.007	8.7	LOS A	0.0	0.3	0.49	0.59	0.49	46.6
East: Victoria Rd East														
4	L2	3	5.0	3	5.0	0.260	4.1	LOS A	1.7	12.4	0.15	0.43	0.15	47.5
5	T1	346	5.0	346	5.0	0.260	4.3	LOS A	1.7	12.4	0.15	0.43	0.15	54.0
6	R2	44	5.0	44	5.0	0.260	8.9	LOS A	1.7	12.4	0.15	0.43	0.15	54.8
Approach		393	5.0	393	5.0	0.260	4.8	LOS A	1.7	12.4	0.15	0.43	0.15	54.1
North: Gibson Ave North														
7	L2	104	5.0	104	5.0	0.126	5.6	LOS A	0.7	4.9	0.48	0.61	0.48	52.2
8	T1	1	5.0	1	5.0	0.126	5.9	LOS A	0.7	4.9	0.48	0.61	0.48	48.9
9	R2	26	5.0	26	5.0	0.126	10.5	LOS A	0.7	4.9	0.48	0.61	0.48	53.5
Approach		131	5.0	131	5.0	0.126	6.6	LOS A	0.7	4.9	0.48	0.61	0.48	52.4
West: Victoria Rd West														
10	L2	11	5.0	11	5.0	0.234	4.2	LOS A	1.3	9.8	0.19	0.41	0.19	53.6
11	T1	306	5.0	322	5.0	0.234	4.4	LOS A	1.3	9.8	0.19	0.41	0.19	54.2
12	R2	2	5.0	2	5.0	0.234	9.0	LOS A	1.3	9.8	0.19	0.41	0.19	46.6
Approach		319	5.0	335	5.0	0.234	4.4	LOS A	1.3	9.8	0.19	0.41	0.19	54.2
All Vehicles		850	5.0	866	5.0	0.260	5.0	LOS A	1.7	12.4	0.22	0.45	0.22	53.8

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Victoria Street and Glbson Avenue (Site Folder: General)]

PM Peak Projected
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Gibson Ave South														
1	L2	1	5.0	1	5.0	0.004	6.9	LOS A	0.0	0.2	0.64	0.57	0.64	44.1
2	T1	1	5.0	1	5.0	0.004	7.2	LOS A	0.0	0.2	0.64	0.57	0.64	49.2
3	R2	1	5.0	1	5.0	0.004	11.8	LOS A	0.0	0.2	0.64	0.57	0.64	46.3
Approach		3	5.0	3	5.0	0.004	8.6	LOS A	0.0	0.2	0.64	0.57	0.64	46.8
East: Victoria Rd East														
4	L2	6	5.0	6	5.0	0.429	4.1	LOS A	3.5	25.4	0.18	0.44	0.18	47.0
5	T1	541	5.0	541	5.0	0.429	4.3	LOS A	3.5	25.4	0.18	0.44	0.18	53.5
6	R2	120	5.0	120	5.0	0.429	8.9	LOS A	3.5	25.4	0.18	0.44	0.18	54.4
Approach		667	5.0	667	5.0	0.429	5.1	LOS A	3.5	25.4	0.18	0.44	0.18	53.7
North: Gibson Ave North														
7	L2	65	5.0	65	5.0	0.086	5.4	LOS A	0.5	3.3	0.45	0.59	0.45	52.0
8	T1	1	5.0	1	5.0	0.086	5.6	LOS A	0.5	3.3	0.45	0.59	0.45	48.7
9	R2	25	5.0	25	5.0	0.086	10.2	LOS A	0.5	3.3	0.45	0.59	0.45	53.3
Approach		91	5.0	91	5.0	0.086	6.7	LOS A	0.5	3.3	0.45	0.59	0.45	52.3
West: Victoria Rd West														
10	L2	33	5.0	33	5.0	0.254	4.6	LOS A	1.5	10.8	0.32	0.45	0.32	52.9
11	T1	276	5.0	291	5.0	0.254	4.8	LOS A	1.5	10.8	0.32	0.45	0.32	53.4
12	R2	1	5.0	1	5.0	0.254	9.5	LOS A	1.5	10.8	0.32	0.45	0.32	45.6
Approach		310	5.0	325	5.0	0.254	4.8	LOS A	1.5	10.8	0.32	0.45	0.32	53.3
All Vehicles		1071	5.0	1086	5.0	0.429	5.2	LOS A	3.5	25.4	0.25	0.46	0.25	53.4

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