STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

PARKING & TRAFFIC IMPACT ASSESSMENT

PROPOSED PRIMARY SCHOOL
THE INTERNATIONAL CHINESE SCHOOL
211 PACIFIC HIGHWAY
ST LEONARDS

PREPARED FOR INTERNATIONAL CHINESE SCHOOL
OUR REF: 19-050

AUGUST 2019

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1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by International Chinese School to undertake a Parking & Traffic Impact Assessment in support of a proposal to establish a primary school at 211 Pacific Highway, St Leonards.

The proposal involves the alterations and additions to an existing commercial building situated within Cemetery Trust land between Pacific Highway and Gore Hill Oval to accommodate The International Chinese School, a bilingual primary school with a capacity of 210 students.

The school is proposed to be serviced by a small undercroft car parking area containing 10 parking spaces. Further, it is proposed that a formal set-down / pick-up area be provided to the east of the building, being located on Cemetery Trust land.

Vehicular access to the undercroft parking area and formal student set-down / pick-up area is proposed to be obtained via a Council owned public off-street car parking area situated further to the east, which links with Pacific Highway eastbound carriageway via a driveway to the south-east of the subject building.

This aim of this assessment is to investigate and report upon the potential parking and traffic consequences of the proposal 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 and operational characteristics;
- Section 3 assesses the site access, internal circulation and servicing considerations of the proposal with respect to the relevant Australian Standard and Council specifications in conjunction with the expected operational requirements;
- Section 4 assesses the adequacy of the on-site and immediately adjoining long and short term parking supply associated with established Council requirements and the expected operational demands;
- Section 5 assesses the existing transport conditions within the vicinity of the site including road network operation and sustainable transport access and connectivity;
- Section 6 assesses the projected transport conditions incorporating the development with respect to the projected traffic generating ability of the proposed development and the ability or otherwise of the surrounding road

network to be capable of accommodating the altered demand in a safe and efficient manner; and

- Section 7 provides an indicative assessment of the traffic and pedestrian management measures likely to be implemented during the construction phases of the development.

The report has been prepared pursuant to State Environmental Planning Policy (Infrastructure) 2007.

The application forms a State Significant Development and the Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement are extensive with respect to Transport and Accessibility. To assist, **Table 1** below and overleaf specifies which section or sections of this report address each of the SEARs with respect to Transport and Accessibility.

TABLE 1
SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS
TRANSPORT & ACCESSIBILITY

Requirement	Section/s of Report Addressing Item
An assessment of all relevant vehicular traffic routes and intersections for access to / from the subject properties.	Sections 3.1, 5.1, 6.2 and 6.4.3
An assessment of construction and operational traffic impacts on existing intersections, capacity of the local and classified road network.	Sections 5.3, 6.3, 6.4.1 and 7
Identify road network infrastructure upgrades that are required to maintain existing levels of service on both the local and classified road network for the development (if required).	Sections 6.4.1 and 6.5
The adequacy of public transport, pedestrian and bicycle networks in the vicinity of the site.	Sections 5.4, 5.5, 5.6, 6.5 and 6.6
Access arrangements, including car and bus pick-up / drop-off facilities if proposed, and measures to mitigate any associated traffic impacts and impacts on public transport, including pedestrian crossings and refuges and speed control devices and zones.	Sections 3, 4, 6.4.2, 6.4.3, 6.5 and 6.6
Proposed bicycle parking provision, including end of trip facilities, in secure, convenient, accessible areas close to main entries incorporating lighting and passive surveillance.	Sections 3.3.3 and 4.1.4
Details of available on-site car parking spaces for teaching staff and visitors in accordance with the existing parking codes and justification for the level of car parking provided on-site.	Section 4
An assessment of the cumulative on-street parking impacts of cars and bus pick-up / drop-off, staff parking and any other parking demands associated with the development.	Section 4
An assessment of road and pedestrian safety adjacent to the proposed development and the details of required road safety measures and personal safety in line with CPTED.	Sections 5.5 and 6.5
Emergency vehicle access, service vehicle access, delivery and loading arrangements and estimated service vehicle movements (including vehicle type and the likely arrival and departure times).	Section 3.4

TABLE 1 CONTINUED SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS TRANSPORT & ACCESSIBILITY	
Requirement	**Section/s of Report Addressing Item**
Details of travel demand management measures to minimise the impact on general traffic and bus operations, including details of a location-specific sustainable travel plan (Green Travel Plan and specific Workplace travel plan) and the provision of facilities to increase the non-car mode share for travel to and from the site.	Sections 3.3.3, 4.1.4, 4.2.2, 5.5, 5.6, 6.5 and 6.6
The proposed access arrangements, including car and bus pick-up / drop-off facilities, and measures to mitigate any associated traffic impacts and impacts on public transport, pedestrian and bicycle networks, including pedestrian crossings and refuges and speed control devices and zones.	Sections 3, 6.4.2, 6.5 and 6.6

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- The Roads & Maritime Services' *Guide to Traffic Generating Developments*;
- Transport for NSW's *Guide to Transport Impact Assessments*;
- Willoughby City Council's *Willoughby Development Control Plan* (DCP 2016);
- The following Australian Standards for *Parking Facilities:*
  - *Part 1: Off-Street Car Parking* (AS2890.1:2004);
  - *Part 2: Off-Street Commercial Vehicle Facilities* (AS2890.2:2002);
  - *Part 3: Bicycle Parking* (AS2890.3:2015);
  - *Part 5: On-Street Parking* (2890.5:1993); and
  - *Part 6: Off-Street Parking for People with Disabilities* (AS2890.6:2009).

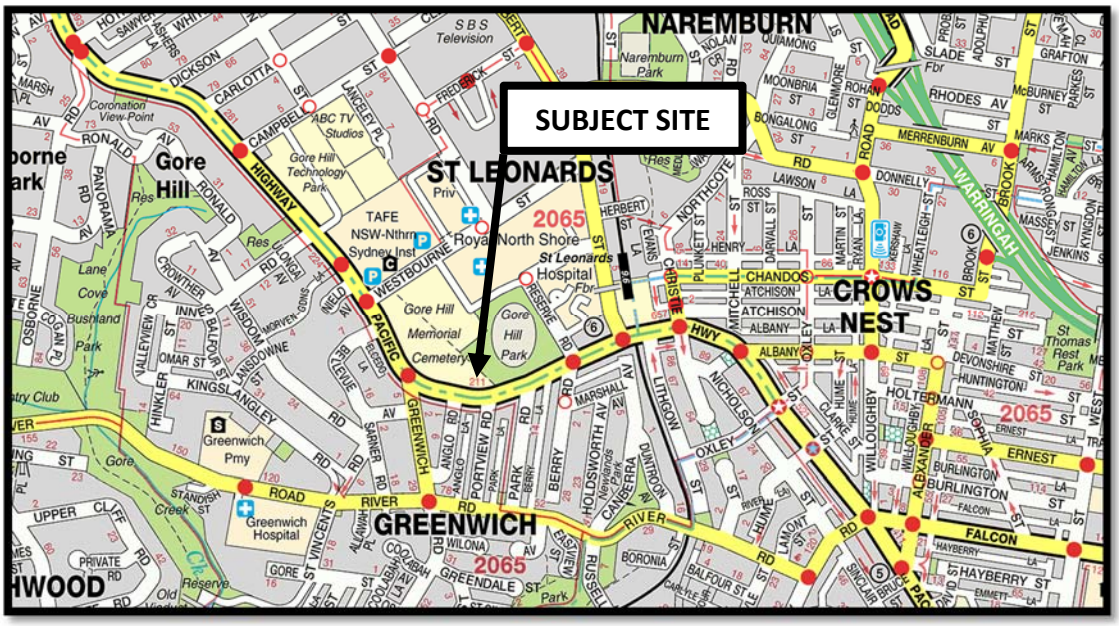
Architectural plans have been prepared by Stanton Dahl Architects, reduced copies of a selection of which are attached as **Appendix 1**.

1.3 Site Details

1.3.1 Site Location

The subject site is located on the northern side of Pacific Highway, approximately midway between Greenwich Road and Reserve Road, St Leonards. The site location is illustrated overleaf within a local an 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 (accessed 2/05/19)

1.3.2 Site Description

The site provides a street address of 211 Pacific Highway, St Leonards. The site predominantly forms a triangular shaped parcel of land, providing an approximate frontage of 75m to Pacific Highway. The site extends to the north away from Pacific Highway approximately 58m and 51m along the north-eastern and north-western boundaries, respectively, resulting in a total site area in the order of 1,600m^2.

1.3.3 Existing Use

The subject site currently accommodates a vacant commercial building providing an approximate leasable floor space of 700m^2, which is currently undergoing extensive alterations and addition works including a first floor addition to replace an existing mezzanine in accordance with DA-2014/301.

The existing site building is currently serviced by an undercroft parking area.

Vehicular connectivity between the on-site basement parking area and a Council owned public off-street car parking area is provided via a single lane access road over a primarily pedestrian access pathway extending between Pacific Highway and Westbourne Street servicing Gore Hill Memorial Cemetery (known as The Avenue). This Council owned car parking area thence provides connectivity to the Pacific Highway eastbound carriageway via a driveway to the south-east of the site.

Pedestrian access to the site is provided via formal pedestrian gates connecting with the northern Pacific Highway footpath, approximately central to the public roadway frontage. Further pedestrian access is provided via The Avenue, connecting to the north-eastern boundary of the site.

1.3.4 Surrounding Land Uses

The site is surrounded by a mix of land-uses as follows:

- Land immediately adjoining to the north-west is occupied by Gore Hill Memorial Cemetery;

- The Avenue, a primarily pedestrian access path bisecting the abovementioned cemetery abuts the eastern site boundary and links Westbourne Street in the north to Pacific Highway in the south;

- Gore Hill Park is situated to the north-east of the site, comprising the following:

    - A Council owned car park containing 37 spaces (including two disabled spaces is situated to the east of the site on the opposite side of The Avenue, connecting with Pacific Highway eastbound carriageway via a driveway to the south-east of the site;
    - A half basketball and handball court is situated to the north of the car parking area;

- A change room building is situated to the east of the car parking area;
- A children's playground is situated to the north of the half basketball court; and
- Gore Hill Oval is situated to the north-east of the change room building.

- Royal North Shore Public & Private Hospitals are situated to the north of Gore Hill Park.

2. DESCRIPTION OF PROPOSAL

2.1 Built Form & Operation

The subject proposal involves the alterations and additions to an existing commercial building situated within Cemetery Trust land at 211 Pacific Highway, St Leonards, to accommodate a bilingual International Chinese School, providing the following site population capacities:

- 210 students; and
- 12 staff (including teachers and administration employees).

The school is proposed to provide staggered start and finish times as follows:

- Years K – 2, comprising up to 90 students, are to operate between 8:45am and 3:00pm; and
- Years 3 – 6, comprising up to 120 students, are to operate between 8:45am and 3:15pm.

Notwithstanding the above, a small before and after school program is also proposed, capable of accommodating up to 25 students between 7:00am – 8:45am and 3:00pm – 6:00pm.

The school is proposed to be contained within the existing commercial building, which is to be modified to provide the following:

- Ground Floor:
  - Four general learning areas;
  - An entry foyer and reception area;
  - A sick bay / clinic;
  - Four small offices / meeting rooms / general purpose rooms;
  - A shared resource area / library; and
  - Amenities.
- First Floor:
  - Three general learning areas;
  - A shared resource area;
  - Amenities.

The school building is to be supplemented by a large open play area situated within the south-eastern corner of the site, providing an area of approximately 300m^2.

Pedestrian access is proposed to be retained via the existing gates connecting with the northern Pacific Highway footpath and The Avenue to the west and north of the abovementioned open play area, respectively.

The school is proposed to be serviced by the existing basement car parking area containing 10 passenger vehicle parking spaces and one motorcycle parking space connecting with The Avenue via a single lane driveway situated in the north-eastern corner of the site. A further 10 bicycle parking spaces are proposed to be provided within the development, situated at ground floor level to the south of the building.

2.1.1 External Works

The following external works are proposed adjacent to the site in order to ensure the school integrates into the precinct in a safe and efficient manner:

- The establishment of a new formal one-way northbound roadway within The Avenue adjacent to the north-eastern boundary accommodating:
  - A student set-down / pick-up area, capable of accommodating up to five passenger vehicles in a queued arrangement at any one time;
  - An adjacent northbound travel lane facilitating connectivity to the basement car parking area; and
  - A formal pedestrian footpath between the roadway and the north-eastern site boundary.
- Construction of a new 25m long one-way roadway facilitating ingress movements between the Council car park access road situated to the east of the site and the abovementioned school access roadway.
- Minor modifications / widening of the existing roadway connecting The Avenue to the northern extent of the existing Council car park (which is proposed to provide an egress only function from the abovementioned school access roadway).

3. ACCESS & INTERNAL CIRCULATION CONSIDERATIONS

3.1 Vehicular Access

3.1.1 Precinct Access / Egress

Vehicular connectivity between the existing on-site basement parking area and the adjacent formal student set-down / pick-up area within The Avenue is proposed to be obtained via an existing Council owned public off-street car parking area situated further to the east. This car parking area is serviced by an existing driveway connecting with the eastbound Pacific Highway carriageway, providing 4m wide ingress and egress laneways, separated by a triangular island containing a pedestrian refuge. The ingress and egress lanes merge to the north of the Highway to form a single two-way access roadway, thence forming the central aisle servicing adjacent 90 degree angled parking spaces within the off-street car parking area.

Connectivity between the Council car park access roadway and the school access and set-down / pick-up roadway within The Avenue is proposed via a new roadway extending to the west of the Council car park some 40m to the north of Pacific Highway. This roadway is proposed to provide a minimum width of 4m, prior to connecting with The Avenue, and result in the removal of three existing parking spaces situated within the western Council car parking row. Within The Avenue, the school access roadway is proposed to provide a width of 6.5m, providing a 3m wide formal student set-down / pick-up lane in conjunction with an adjacent 3.5m wide through travel lane.

The abovementioned school access roadway is proposed to provide connectivity to the school basement car parking area via a 3.5m wide combined ingress / egress lane situated in the north-eastern corner of the site. Egress from the school access roadway is proposed via a widened (to a minimum of 4m) existing roadway connecting The Avenue and the northern portion of the Council owned car parking area, which thence connects back to the Pacific Highway eastbound carriageway via the existing driveway to the south-east of the subject site.

The proposed creation of the school access and set-down / pick-up roadway within The Avenue results in school traffic occurring via a one-way clockwise circular movement between the Council car parking area and The Avenue.

3.1.2 Assessment of Existing Access Design

It has previously been presented that the school is proposed to be accessed via an existing driveway connecting with Pacific Highway eastbound carriageway. This driveway provides 4m wide ingress and egress laneways, separated by a raised triangular island forming a pedestrian refuge.

In order to undertake an assessment of the existing driveway arrangement to accommodate the proposed additional demand associated with the proposed school, reference is made to AS2890.1:2004. This Standard 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 2 type driveway is required, providing a combined ingress / egress driveway width of between 6m and 9m based on the arterial functional order of Pacific Highway, the primary school / recreational land-uses and the off-street passenger vehicle parking provision of less than 100 vehicles. The existing separated 4m wide ingress and egress driveway design therefore complies with the minimum AS2890.1:2004 specifications and accordingly is considered to be satisfactory.

The safety and efficiency of access / egress movements have also been observed to be assisted by the following:

- The provision of relatively level grades within the internal access roadway on approach to the Pacific Highway boundary;

- No unreasonable obstructions to visibility between motorists and pedestrians along the northern Pacific Highway footpath adjacent to the egress driveway in accordance with AS2890.1:2004; and

- The provision of approximately 90m of sight distance between the egress driveway and approaching eastbound public road traffic flow within Pacific Highway thereby exceeding the minimum requirements of Clause 3.2.4(a) of AS2890.1:2004 with respect to the applicable speed limit of 60km/h.

Whilst the school is primarily proposed to generate passenger vehicles associated with staff parking and parent set-down / pick-up arrangements, it is acknowledged that a minor extent of heavy vehicles may also be accommodated associated with regular waste collection, deliveries, mini buses and emergency vehicles. In order to assess the ability of the existing site access driveway to accommodate such vehicles, swept path plans have been prepared by this Practice, copies of which are contained within **Appendix 2**. These swept paths illustrate that vehicles up to and including Medium Rigid Vehicles (MRVs) are capable of manoeuvring between the Pacific Highway eastbound carriageway and the precinct via the existing access driveway. In consideration of this and the above discussion, the existing precinct access driveway is considered to be suitability capable of accommodating school ingress and egress activity in a safe and efficient manner.

3.2 Pedestrian Access

Pedestrian connectivity between the school and the adjoining public infrastructure is proposed as follows:

- A pedestrian gate will be provided approximately central to the southern boundary connecting with the northern Pacific Highway footpath;

- A pedestrian gate will be provided between the school and The Avenue, approximately 20m north of Pacific Highway access;

- A footpath is proposed to be formalised along the western alignment of The Avenue adjacent to the site, providing connectivity between the abovementioned school access gate and the formalised school access road,

and linking with The Avenue pedestrian connection to the northern Pacific Highway footpath to the south-east of the site.

3.3 Internal Circulation and Manoeuvrability

3.3.1 Set-Down / Pick-Up Area

It has previously been presented that connectivity between the Council car park access roadway and the school access and set-down / pick-up roadway within The Avenue is proposed via a new roadway, extending to the west of the Council car parking area some 40m north of Pacific Highway. This roadway is proposed to provide a straight alignment with a minimum width of 4m, prior to connecting with The Avenue. Within The Avenue, the school access roadway is proposed to provide a width of 6.5m, providing a formal student set-down / pick-up lane in conjunction with an adjacent through travel lane, providing the following minimum dimensions in accordance with AS2890.5:1993:

- Parallel parking space width = 3m;
- End parallel parking space length = 5.4m;
- Central parallel parking space length = 6m; and
- Adjoining one-way roadway width = 3.5m.

The abovementioned school access roadway is proposed to provide connectivity to the school basement car parking area via an existing 3.5m wide combined ingress / egress lane situated in the north-eastern corner of the site. Egress from the school access roadway is proposed via a widened (to a minimum of 4m) existing roadway connecting The Avenue and the northern portion of the Council owned car parking area, which thence connects back to the Pacific Highway eastbound carriageway via the existing driveway to the south-east of the subject site.

The proposed creation of the school access and set-down / pick-up roadway within The Avenue results in school traffic occurring via a one-way clockwise circular movement between the Council car parking area and The Avenue.

In order to assess manoeuvrability throughout the abovementioned clockwise precinct access roadways, a series of swept paths have been prepared by this Practice, copies of which are contained within **Appendix 2**. These swept paths illustrate that passenger vehicles are capable of manoeuvring throughout the precinct access roadways in a safe and efficient manner.

3.3.2 Basement Car Parking Area

Passenger vehicles wishing to access the existing on-site basement parking area will do so in a forward direction via left turn movement from the formal student set-down / pick-up area within The Avenue.

The basement car parking area is to primarily comprise two rows of 90 degree angled parking spaces, being serviced by a single circulating aisle. A further two parking spaces are proposed to be provided in the same alignment of the parking aisle, being directly access from the end of the aisle.

The constrained dimensions of the basement area are such that a majority of the parking spaces are to be allocated as 'small car' bays, providing reduced parking space lengths. Notwithstanding this, the passenger vehicle parking area have been designed to accord with the relevant requirements of AS2890.1:2004 and AS2890.6:2009, providing the following minimum dimensions:

- Staff car parking space width = 2.4m;
- Disabled car vehicular parking space width = 2.4m (with adjoining 2.4m wide shared area);
- Visitor car parking space width = 2.6m;
- Motorcycle parking space width = 1.2m;
- Standard and disabled vehicular parking space length = 5.4m;
- Small vehicular parking space length = 5.0m;
- Motorcycle space length = 3m;
- Vehicular parking aisle width adjoining parking spaces = 5.8m;
- Minimum clearance = 2.2m; and
- Minimum clearance above disabled parking space = 2.5m.

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 and AS2890.6:2009 specifications.

In order to demonstrate the internal passenger vehicle manoeuvrability within the vicinity of these areas and generally throughout the overall parking area, this Practice has prepared a number of swept path plans which are included as **Appendix 2**. The turning paths provided on the plans have been generated using Autoturn software and derived from B99 and B85 vehicle specifications provided within AS2890.1:2004.

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

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

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

Whilst the basement parking area forms a dead end aisle, a formalised turnaround bay is provided allowing passenger vehicles to undertake a three point turn in order to exit the site in a forward direction in the event of all parking spaces being occupied. The proposed basement parking area layout as it relates to passenger vehicle manoeuvrability is therefore considered to be satisfactory.

3.3.3 Bicycle Parking

The proposal involves the provision of five parking racks situated at ground floor level to the south of the school building, capable of accommodating 10 bicycles, being situated in a secure, convenient, accessible area close to the main entry of the school, incorporating appropriate levels of lighting and passive surveillance. These racks have been designed in accordance with AS2890.3:2015, providing the following minimum dimensions:

- Bicycle parking length = 1.8m;
- Rack spacing = 1.0m; and
- Adjacent manoeuvring aisle and access path width = 1.5m.

In consideration of the above compliance of the bicycle parking infrastructure with AS2890.3:2015, the bicycle parking arrangements are concluded to be satisfactory.

3.4 Heavy Vehicle Activity

Whilst the proposed school is primarily to generate and accommodate passenger vehicle traffic, it is expected that the school will generate demand for a minor level of heavy vehicular traffic, as follows:

- The school is likely to generate regular demand for waste collection activities, expected to be undertaken by private contractors, utilising vehicles up to and including MRVs;
- The school is envisaged to generate semi-regular demand for deliveries such as food and stationary, most likely within vans, utilities and Small Rigid Vehicles (SRVs), but also occasionally up to MRVs;

- It may be necessary that the school accommodate emergency vehicles such as ambulances and fire appliances up to and including MRVs.

Further, whilst it is understood that the school does not propose to provide a regular special school bus service, there may be occasions when one or more mini-buses may specifically be chartered for class excursions. It is expected that this irregular bus activity is comprise mini-buses, which provide dimensions and manoeuvring capabilities similar to SRVs.

The largest vehicles expected to service the school are therefore envisaged to be MRVs.

The abovementioned heavy vehicle servicing of the site is proposed to be undertaken within the formal set-down / pick-up roadway adjacent to the site within The Avenue.

The abovementioned regular and scheduled servicing is proposed to occur outside of peak student set-down / pick-up activity (between 10:00am – 2:00pm) to ensure there is no undesirable interaction between heavy vehicles and school activity.

In order to assess the ability of the proposed circulation areas to accommodate heavy vehicles, a series of swept path plans have been prepared by this Practice, copies of which are contained within **Appendix 2**. These plans indicate that vehicles up to and including MRVs are capable of servicing the site in a safe and efficient manner.

4. PARKING CONSIDERATIONS

4.1 On-Site Parking Provision

4.1.1 Vehicular Parking Provision

Formalised on-site passenger vehicle parking is proposed to be contained within a single basement level, containing 10 spaces.

4.1.2 Council's Vehicular Parking Requirements

Willoughby City Council relies on DCP 2016 for locally sensitive parking requirements for the subject site. DCP 2016 provides the following parking requirements for educational establishments relating to the subject proposal:

1 space per 2 staff
1 space per 10 tertiary students
1 space per 10 students in assembly hall

As the school is only proposed to accommodate children between Kindergarten and Year 6 and is not proposed to accommodate an assembly hall, DCP 2016 specifies that the requirement parking is solely a function of the number of staff proposed. In this regard, DCP 2016 requires a minimum of six parking spaces on the basis of a maximum of 12 staff being employed by the school.

The proposed basement car parking area, providing 10 parking spaces, therefore complies with the relevant DCP 2016 requirements and also provides additional capacity for irregular visitor parking demand, should it be required.

4.1.3 Motorcycle Parking

The basement parking area is proposed to provide one motorcycle parking space.

DCP 2016 specifies that motorcycle parking should be provided at a rate of one space per 25 car spaces within all developments.

On the basis of the development providing 10 passenger vehicle parking spaces, a minimum of 0.4 (adopt one) motorcycle parking space is required.

The proposed motorcycle parking provision is accordingly compliant with DCP 2016 and therefore considered to be satisfactory.

4.1.4 Bicycle Parking

The subject development is to provide five bicycle storage racks, capable of accommodating up to 10 bicycles.

DCP 2016 does not provide bicycle parking requirements specifically for educational establishments. Notwithstanding this, the proposed bicycle parking provision, equating to approximately 1 space per 20 students is considered satisfactory.

Given the limited scale of the development and thus the limited number of bicycle parking spaces proposed, it is not considered that end of trip facilities such as lockers, change rooms and showers are required and accordingly, none are proposed.

4.2 Off-Street Student Set-Down / Pick-Up

4.2.1 Student Set-Down / Pick-Up Area Capacity

Notwithstanding the previously presented compliance of the on-site passenger vehicle parking provision with DCP 2016 requirements, it is acknowledged that the school is expected to generate additional short-term demand associated with the setting-down / picking-up of students by parents / guardians prior to the commencement and following the completion of the school day.

It has previously been presented that this activity is proposed to be accommodated within the formalised set-down / pick-up roadway contained within The Avenue, adjacent to the north-eastern boundary of the site. The roadway is proposed to provide a formalised set-down / pick-up area with a length of 30m, thereby being capable of accommodating at least five vehicles at any one time. Further, the set-down / pick-up area is proposed to be serviced by a roadway connecting the area with the existing adjacent Council car park. This additional roadway is proposed to provide a length of approximately 30m between The Avenue and the Council car park, thereby being capable of accommodating a further five vehicles queued on approach to the set-down / pick-up area, without impeding the Council car park access roadway.

The abovementioned set-down / pick-up and approach queuing capacity of 10 vehicles represents approximately one parent vehicle per 20 students. This Practice's experience with the assessment of other educational establishments as well as other Local Government requirements suggests an average instantaneous set-down / pick-up demand rate of 1 vehicle per 30 students enrolled at the school. The proposed set-down / pick-up demand is accordingly considered to be satisfactory.

Notwithstanding the above, the following operational characteristics should be acknowledged, which are expected to result in a staggering of the parent vehicle arrival, which will limit the instantaneous parent vehicle demand associated with set-down / pick-up activity:

- Student set-down activity prior to the school start time of 9:00am typically occurs over an approximate period of one hour, depending of parent journey to work or personal schedule, thereby resulting in the set-down activity not occurring during a single concentrated period;

- The proposed provision of a before school supervision program (accommodating up to 25 students) will result in a notable portion of students being set-down outside of the normal school start peak period;

- The school finish period is proposed to be staggered as follows:

  - Years K – 2, comprising up to 90 students, are to finish at 3:00pm; and
  - Years 3 – 6, comprising up to 120 students, are to finish at 3:15pm.

- The proposed provision of an after school supervision program (accommodating up to 25 students) will result in a notable portion of students being picked-up following the abovementioned normal school finish peak period.

4.2.2 Student Set-Down / Pick-Up Area Management

Notwithstanding the previously presented staggering of school student arrival and departure periods, in order to ensure that the proposed formalised student set-down / pick-up arrangements do not unreasonably impede public vehicle access / egress movements within the Council car parking area, it is recommended that the student set-down / pick-up activity to be governed by an Operational Management Plan (OMP).

The OMP should be formulated to address potential safety issues associated with the proposed normal daily school start and finish traffic operations. The primary objective of the OMP should be to maximise the efficiency of the set-down / pick-up area, thereby ensuring that parking demand associated with student set-down / pick-up does not occur within the adjoining Council car parking area.

The requirement for the OMP could reasonably be imposed by as a condition of consent. Notwithstanding this, the following sub-sections of this report provide a draft OMP for consideration including general administration and operational items to assist in the accommodation of the increased traffic and parking demands associated with the expansion of the school.

4.2.1.1 OMP General Items

- A Management & Safety Committee is to be established to implement the OMP and to develop further guidelines in order to ensure that on and off-site vehicular and pedestrian safety is maximised. The committee shall comprise the school principal or his / her senior representative, a parent's representative as well an independent traffic consultant to provide initial assistance in the implementation of the OMP as well as subsequent periodic guidance in the ongoing review of the OMP.

- The OMP should also be subject to periodic review by Councils Traffic and Transport Planner to ensure that road safety issues as they relate to the public roads are both appropriately documented as well as being implemented in accordance with sound traffic engineering and road safety practices.

- The Management and Safety Committee shall undertake ongoing reviews of school student safety as necessary but initially ensure that the procedures contained within this OMP are put in place with respect to on and off-site traffic management and safety issues.

- The Committee shall put in place measures which should ensure parent / guardian compliance with the OMP. These should take the form of specific instructions via the student newsletter and indications that such instructions are to be observed as may be applicable to any private property and could therefore form part of the initial enrolment procedures.

4.2.1.2 Student Set-Down / Pick-Up

- During the initial stages of the implementation of this OMP, teachers will supervise the off-street school set-down area during the morning prior to school start to ensure that students are disembark parent vehicles in an efficient manner.

- Students disembarking parent vehicles will do so via the passenger side so that direct access to the adjoining footpath is obtained to ensure pedestrian safety.

- The off-street student pick-up area will employ the following operational management arrangements during the afternoon school finish period:

  - Students assemble under the supervision of a teacher at the northern end of the set-down / pick-up area following the staggered completion of the school day;
  - Parents display the names of children to be picked-up on the windscreen of the vehicle when entering the internal pick-up area;
  - The teacher supervising the student assembly area arranges for the relevant student/s to be brought to the front of the assembly area upon the arrival of the parent vehicle to the pick-up location.

- Parents picking-up / setting-down students lane must not exit their vehicle to assist in the loading / unloading of students. This is to be done under the supervision of teachers.

- No student pick-up / set-down is to occur within the queue lane on approach to the assembly area.

- Staff parking within the school car parking area should access the site prior to 8.00am and exit the site after 4.00pm so as not to interact unfavourably with the student set-down / pick-up activities.

4.2.1.3 Discussion on Impacts

The school proposes to implement a series of operational initiatives which will result in the staggering of parent vehicles associated with student set-down / pick-up activity. Notwithstanding this, it is anticipated that the school will generate concentrated periods of arrival and departure of vehicles, particularly during the staggered school finish periods of 3:00pm and 3:15pm.

The proposed provision of a formalised off-street set-down / pick-up and approach queuing area is however expected to be capable of accommodating the instantaneous demand. Further, the implementation of the OMP is anticipated to ensure a particularly efficient set-down / pick-up arrangement resulting in a high turnover of parent vehicles during peak periods and ensure there are no undesirable impacts on the existing adjacent operation of the Council car parking area and indeed, the Pacific Highway eastbound travel lane.

4.3 Council Car Park Activity

4.3.1 Existing Car Park Capacity

It has previously been presented that site is adjoined to the east by a Council owned public off-street car parking area. The car parking area services the surrounding land uses and has capacity to accommodate up to 37 passenger vehicle parking spaces, as follows:

- 34 car parking spaces governed by signposted two hour restrictions between 6:00am – 6:00pm Monday to Friday;
- Two disabled car parking spaces; and
- One car parking space governed by signposted full time five minute restrictions.

4.3.2 Existing Parking Demand

The Council car parking area accommodates demand associated with Gore Hill Park, comprising the half basketball court, the children's play area and the playing field.

In order to obtain an indication of existing demands within the Council car parking area, the following parking demand surveys were undertaken:

- Surveys were undertaken of the parking demand for a full week of operation between the 1st and 11th of April, 2018 by Ethos Urban; and
- Surveys were undertaken of the parking demand for a single day of operation on the 8th of May, 2018 on behalf of this Practice.

The weeklong surveys were undertaken between 8:00am and 4:00pm, whilst the single day surveys were undertaken between 7:00am – 9:30am and 2:30pm – 6:00pm.

Table 2 below provides a summary of the peak surveyed parking demand between 7:00am – 6:00pm, whilst full details are contained within **Appendix 3**.

TABLE 2 SUMMARY OF PEAK PARKING DEMAND COUNCIL CAR PARKING AREA – GORE HILL PARK APRIL / MAY 2018		
Time Period	**Maximum Number of Spaces Occupied**	**Minimum Number of Unoccupied Spaces**
7:00am – 8:00am	3	34
8:00am – 9:00am	6	31
9:00am – 10:00am	11	26
10:00am – 11:00am	12	25
11:00am – 12:00pm	19	18
12:00pm – 1:00pm	22	15
1:00pm – 2:00pm	19	18
2:00pm – 3:00pm	14	23
3:00pm – 4:00pm	16	21
4:00pm – 5:00pm	31	6
5:00pm – 6:00pm	32	5

Table 2 indicates the following:

- Parking demand was typically low (a minimum of 25 unoccupied spaces were available) prior to 11:00am;
- Parking demand was moderate (a minimum of 15 unoccupied spaces were available) between 11:00am – 4:00pm; and
- Parking demand was high (a minimum of 5 unoccupied spaces were available) between 4:00pm – 6:00pm.

4.3.3 Discussion

The proposed creation of the vehicular connection between the Council car park and the school set-down / pick-up area is expected to result in the removal of three existing parking spaces within the western parking row of the Council car park.

The previously presented parking demand surveys indicate that the minimum number of unoccupied parking spaces within the Council car park during weekday business periods is five spaces. It is therefore envisaged that the reduction in the parking supply within the Council car park of three spaces associated with the proposal is capable of being reasonably accommodated.

During other periods, the removal of the three spaces is proposed to be readily off-set by the creation of five formalised parking spaces within the school set-down / pick-up area (with The Avenue) in the event that these spaces are sign posted appropriately (say 'No Parking 8:00am – 9:30am and 2:30pm – 4:00pm School Days').

The minimum number of unoccupied parking spaces within the Council car park during the likely peak operational periods of the school (between 7:00am and 4:00pm) has been surveyed to be 15 spaces. There is accordingly considered to be notable capacity to accommodate additional parking demand which may be generated associated with the proposed school. Notwithstanding this, the overall intention of the OMP is to ensure that school parents / guardians are expected to utilise the formal student set-down / pick-up area within The Avenue to drop-off and collect children immediately prior to and following the school periods. The desired outcome is therefore that parents do not park within the Council car park prior to and following the school day.

5. EXISTING TRANSPORT CONDITIONS

5.1 Surrounding Road Network

The following provides a description of the surrounding road network:

- **Pacific Highway** performs a State Road function under the care and control of Roads & Maritime Services, providing a major inter-regional link between the city of Sydney in New South Wales and the city of Brisbane in Queensland. Within the context of Sydney, Pacific Highway provides a connection between Hornsby in the north and North Sydney in the south.

  Pacific Highway, in the vicinity of the subject site, primarily provides three lanes in each direction, separated by a raised concrete central median. Pavement widening is provided on approach to major junctions to facilitate exclusive turning lanes.

  Clearway parking restrictions apply along the eastbound kerb-side travel lane during the morning peak period (6:00am – 10:00am) on weekdays to facilitate three unobstructed traffic lanes. Notwithstanding this, the eastbound kerb-side lane forms a T3 transit lane during the morning weekday commuter peak period. Further, the provision of regular bus stops ensure that eastbound kerb-side travel lane vehicle volumes are significantly reduced compared with the adjacent centre and median travel lanes. Kerb-side parking is accommodated within the eastbound kerb-side travel lane outside of weekday morning commuter periods, being governed by a combination of two and four hour ticket restrictions between 10:00am – 6:00pm weekdays and between 8:30am – 12:30pm on Saturdays.

  Pacific Highway forms a T-junction with Greenwich Road approximately 150m to the west of the subject, operating under traffic signal control. Unrestricted turning movements are facilitated at this junction, with Greenwich Road access movements being assisted by exclusive left and right turning lanes within the westbound and eastbound Highway carriageways, respectively.

  Pacific Highway forms a cross intersection with Reserve Road and Berry Road approximately 200m to the east of the subject site, operating under traffic signal control. Unrestricted turning movements are facilitated at this intersection, with Reserve Road and Berry Road access movements being assisting by the provision of opposing exclusive right turn lanes within both Highway carriageways.

  The westbound Pacific Highway carriageway also forms T-junctions with a series of low order local access roads within the subject precinct in Anglo Road, Portview Road, Park Road and Berry Lane operating under major / minor priority control with Pacific Highway forming the priority route in these instances.

  Traffic flow on Pacific Highway within the vicinity of the site is governed by a sign posted speed limit of 60km/h.

- **Greenwich Road** performs a collector road function under the care and control of Lane Cove Council, facilitating connectivity between the Greenwich residential precinct to the south and Pacific Highway.

  Greenwich Road in the vicinity of the site provides a varying pavement width of approximately 13m, generally facilitating one through lane of traffic in each direction in conjunction with parallel parking along both kerb alignments. Kerb-side parking restrictions however apply in Greenwich Road on approach to Pacific Highway to facilitate two approach and departure travel lanes.

  Greenwich Road forms T-junctions with Bellevue Avenue and Anglo Road to the south-west of the site, operating under major / minor priority control with Greenwich Road forming the priority route in both instances.

  Further south, Greenwich Road intersects with River Road operating under traffic signal control and allowing for all turning movements, with the exception of right turn movements from the eastern River Road approach.

  Traffic flow within Greenwich Road is governed by a speed limit of 50km/h, consistent with State Government Policy for local residential roads.

- **Reserve Road** performs an access function to the hospital precinct situated to the north of Gore Hill Park, comprising Royal North Shore Private and Public Hospitals. Reserve Road forms a 13m wide pavement, generally providing one through lane of traffic in each direction in conjunction with kerb-side parking along the eastern kerb alignment. Kerb-side parking restrictions apply on approach to Pacific Highway to facilitate two southbound approach lanes to the signalised intersection.

  Reserve Road intersects with a series of hospital precinct access roads approximately 200m north of Pacific Highway, under single lane circulating roundabout control, providing a convenient turnaround facility.

- **Berry Road** performs an access function between Pacific Highway and the commercial precinct immediately to the south of the Highway and the residential precinct further to the south. Berry Road forms a 13m wide pavement, generally providing one through lane of traffic in each direction in conjunction with kerb-side parking along both alignments. Kerb-side parking restrictions apply on approach to Pacific Highway to facilitate two northbound approach lanes to the signalised intersection.

5.2 Existing Traffic Volumes

This Practice has commissioned the undertaking of morning and afternoon peak period traffic surveys of the following junctions in order to accurately ascertain existing traffic demands within the immediate precinct:

- The junction of Pacific Highway and Greenwich Road;

- The junction of Pacific Highway and the Council owned car park driveway; and

- The intersection of Pacific Highway, Reserve Road and Berry Road.

Surveys were undertaken between 7:00am – 9:30am and 2:30pm – 6:00pm on the 7th of May 2019 in order to capture the peak operational periods of the school.

Table 3 below provides a summary of the surveyed peak hour (8:00am -9:00am and 2:30pm – 3:30pm) traffic demands throughout the surrounding public road network, whilst more detailed summaries are provided as **Appendix 4**. Whilst it is acknowledged that the abovementioned afternoon peak hour period does not align with the commuter peak, it has been assessed as it aligns with the school finish period.

TABLE 3
EXISTING MORINING AND AFTERNOON PEAK HOUR TRAFFIC VOLUMES

Road	AM Peak Hour			PM Peak Hour		
	North / East	South / West	Total	North / East	South / West	Total
Pacific Highway						
West of Greenwich Road	1507	1266	2773	1015	1307	2322
East of Greenwich Road	1799	1305	3104	1083	1414	2497
West of Council Car Park Access	1830	1489	3319	1034	1371	2405
East of Council Car Park Access	1829	1489	3318	1027	1371	2398
West of Reserve Road	1778	1440	3218	1094	1273	2367
East of Reserve Road	1809	1579	3388	1204	1312	2516
Greenwich Road						
South of Pacific Highway	669	416	1085	357	396	753
Car Park Access						
North of Pacific Highway	4	3	7	12	5	17
Reserve Road						
North of Pacific Highway	266	157	423	156	223	379
Berry Road						
South of Pacific Highway	147	146	293	141	137	278

Table 3 indicates the following approximate peak hour traffic demands:

- Pacific Highway accommodates:
  - Two directional demands of between 2,700 – 3,400 vehicles during the morning peak hour; and
  - Two directional demands of between 2,300 – 2,500 vehicles during the afternoon peak hour.

- Greenwich Road accommodates:
  - Two directional demands of approximately 1,100 vehicles during the morning and peak hour; and
  - Two directional demands of approximately 750 vehicles during the afternoon and peak hour.

- Reserve Road accommodates:
  - Two directional demands of up between 380 – 420 vehicles during both the morning and afternoon peak hours.

- Berry Road accommodates:
  - Two directional demands of between 275 - 300 vehicles during both the morning and afternoon peak hours.

- The Council car park access road accommodates less than 20 vehicles per hour during the morning and afternoon peak hours.

5.3 Existing Road Network Operation

The surveyed public road junctions 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 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 4** below (being the RMS NSW method of calculation of Level of Service).

TABLE 4
LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS

Level of Service	Average Delay per Vehicle (secs/veh)	Expected Delay
SIGNALISED INTERSECTIONS AND ROUNDABOUTS		
A	Less than 14	Little or no delay
B	15 to 28	Minimal delay and spare capacity
C	29 to 42	Satisfactory delays with spare capacity
D	43 to 56	Satisfactory but near capacity
E	57 to 70	At capacity, incidents will cause excessive delays
F	> 70	Extreme delay, unsatisfactory
PRIORITY CONTROLLED INTERSECTIONS		
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 **Appendix 4**.

Table 5 below provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 5**.

TABLE 5 SIDRA OUTPUT EXISTING WEEKDAY PEAK HOUR PERFORMANCE		
	AM	**PM**
Pacific Highway & Greenwich Road		
Delay	25.3	18.9
Degree of Saturation	0.65	0.56
Level of Service	B	B
Pacific Highway & Council Car Park Access Road		
Delay	8.2	5.8
Degree of Saturation	0.32	0.25
Level of Service	A	A
Pacific Highway, Reserve Road & Berry Road		
Delay	25.1	26.5
Degree of Saturation	0.77	0.47
Level of Service	B	B

Table 5 indicates that the immediately surrounding public road intersections provide a level of service of A or B during peak commuter periods, representing good operation with spare capacity.

5.4 Public Transport

5.4.1 Heavy Rail

The site is located approximately 400m to the south-west of St Leonards Station. St Leonards Station provides access to train services which operate along the T1 (North Shore, Northern & Western) Line.

Services along the T1 Line provide efficient connectivity to the remainder of the Sydney metropolitan rail network via interchanges at the Hornsby, City, Redfern, Strathfield, Lidcombe, Clyde, Granville and Blacktown.

5.4.2 Buses

Sydney buses operate the following bus services in the immediate vicinity of the site:

- Route 143 – Manly to Chatswood via Balgowlah & St Leonards;
- Route 144 – Chatswood to Manly via Royal North Shore Hospital;
- Route 252 – Gladesville to City King Street Wharf via North Sydney;
- Route 254 – McMahons Point to Riverview;

- Route 265 – North Sydney to Lane Cove via Greenwich;
- Route 286 – Milsons Point to Denistone East via North Sydney & St Leonards;
- Route 287 – Ryde to Milsons Point via St Leonards & North Sydney;
- Route 290 – Epping to City Erskine St via Macquarie University & North Sydney;
- Route M20 – Botany to Gore Hill;
- Route 622 – Dural to Milsons Point via Cherrybrook;
- Route 653 – West Pennant Hills to Milsons Point;
- Route 602X – Rouse Hill to North Sydney; and
- Route 612X – Kellyville to Milsons Point.

Routes 143, 144, 252, 254, 265, 286, 287, 290 and M20 operate along Pacific Highway with the closest stop being situated within approximately 200m walking distance of the site.

Routes 140, 622, 653, 602X and 612X also operate on Pacific Highway, to the west of the subject site, with the closest stop being situated within 320 walking distance of the site.

5.4.3 Sydney Metro

Stage 2 of Sydney Metro is planned to extend between Chatswood and Bankstown via The City by 2024, with a new station being located at Crows Nest, situated approximately 800m to the south-east of the subject site. Sydney Metro is planned to provide a 'turn up and go' facility with capacity for services to operate every two minutes during peak periods.

5.5 Pedestrian Infrastructure

The following pedestrian access and mobility infrastructure surrounds the subject site:

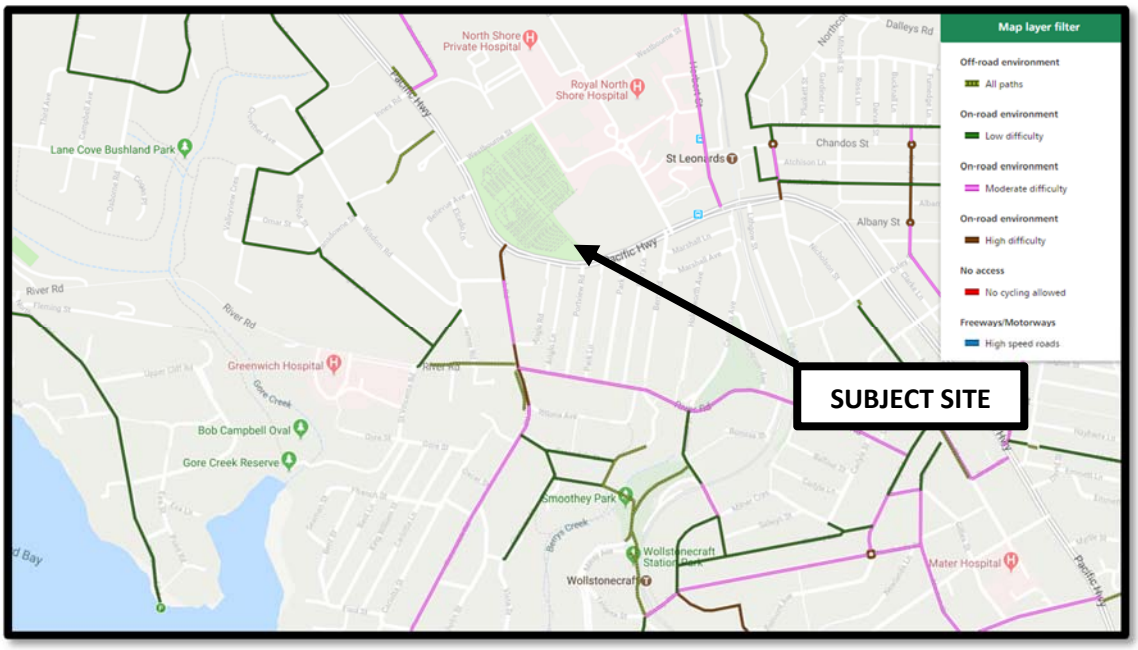
- Footpaths are provided on both sides of Pacific Highway adjacent to the site;
- Signalised pedestrian crossings are provided over the northern, southern and western approaches of the intersection of Pacific Highway, Berry Road and Reserve Road to the north-east of the site;
- Signalised pedestrian crossings are provided over the southern and western approaches of the intersection of Pacific Highway and Greenwich Road to the west of the site; and

- A path is provided along The Avenue between Pacific Highway and Westbourne Street.

5.6 Cycle Routes

Figure 3 below provides a graphical representation of on and off-road cycleways within the immediate vicinity of the subject site.

FIGURE 3
SURROUNDING CYCLEWAYS WITHIN THE SUBJECT VINCITY OF THE SITE



Source: RMS Website

Figure 3 indicates the following:

- Herbert Street, Broadcast Way, Greenwich Road, River Road (east of Greenwich Road), Herbert Street, Christie Street and Atchison Street provide on-road cycle routes; and

- Off-road cycle paths are provided on River Road (to the west of Greenwich Road), Morven Gardens and a short section of Pacific Highway to the north of Broadcast Way.

6. PROJECTED TRANSPORT CONDITIONS

6.1 Traffic Generation

The traffic generating capacity of schools is most directly proportional to the number of students. The proposal involves the alterations and additions to an existing commercial building to accommodate an International Chinese school containing up to 210 students.

Whilst the capacity of the school is proposed to be 210 students, 25 students are envisaged to attend the before and after school program, thereby travelling to and from the school prior to and following the standard school start and finish periods. The peak hourly traffic generating capacity of the school is therefore most appropriately estimated based on a population of 185 students.

To quantify the above, reference is made to Transport for NSW's *Guide to Transport Impact Assessments*. This publication presents that primary schools typically generate an average of 0.7 and 0.5 hourly vehicle trips per student during the morning and afternoon peak hours, respectively. Application of this rate results in approximately 130 and 92 vehicle trips to and from the precinct during weekday morning and afternoon peak hours respectively.

Given the high proportion of the above trips are likely to comprise student set-down and pick-up activity, it is projected that these trips will be evenly split between inbound and outbound movements. The proposal is therefore expected to generate in the order of 65 inbound and 65 outbound vehicle movements during the morning peak hour and 46 inbound and 46 outbound vehicle movements during the afternoon peak hour.

6.2 Trip Assignment

The development has been projected to generate in the order of 130 and 92 vehicle movements to and from the subject site during school start and finish peak hours, respectively. The specialist nature of the school is such that it could be expected that students will travel from various areas within the Sydney metropolitan area. On this basis, the following trip assignment is envisaged:

- 40% of vehicles are expected to approach and depart the site from and to the north-west via Pacific Highway;
- 40% of vehicles are expected to approach and depart the site from and to the south-east via Pacific Highway; and
- The remaining 20% of vehicles are expected to approach and depart the site from the south via Greenwich Road.

The restricted left in / left out access arrangements facilitated between the site (via the Council car park) and Pacific Highway eastbound carriageway are such that approach routes from the south-east and departure routes to the north-west via Pacific Highway westbound carriageway are somewhat circuitous. In this

regard, vehicle approach routes from the south-east via Pacific Highway westbound carriageway can occur via one of the following routes:

- Left turn from Pacific Highway to Portview Road, right turn to River Road, right turn to Sarner Road, right turn to Bellevue Road, left turn to Greenwich Road, right turn to Pacific Highway eastbound carriageway and thence a left turn to the site (via the Council car park);

- Right turn from Pacific Highway to Reserve Road, left turn to unnamed southern hospital precinct access road, left turn to Westbourne Street, left turn to Pacific Highway eastbound carriageway and thence a left turn to the site (via the Council car park); or

- Right turn from Pacific Highway to Westbourne Street, circulate around hospital precinct access roundabout to access Westbourne Street westbound travel lane, left turn to Pacific Highway eastbound carriageway and thence a left turn to the site (via the Council car park).

For the purposes of this assessment and in order to generate an absolute worst case scenario, all vehicles approaching the site from the south-east via Pacific Highway are projected to travel via the first of the abovementioned routes.

Vehicle departure routes to the north-west via Pacific Highway westbound carriageway can occur via one of the following routes:

- Left turn from the site (via the Council car park) to Pacific Highway eastbound carriageway, right turn to Berry Road, circulate around roundabout at Marshall Avenue to access the Berry Road northbound travel lane and thence turn right to Pacific Highway westbound carriageway;

- Left turn from the site (via the Council car park) to Pacific Highway eastbound carriageway, left turn to Reserve Road, circulate around hospital precinct access roundabout to access the Reserve Road southbound travel lane and thence turn right to Pacific Highway westbound carriageway;

- Left turn from the site (via the Council car park) to Pacific Highway eastbound carriageway, left turn to Reserve Road, left turn to unnamed southern hospital precinct access road, left turn to Westbourne Street followed by right turn to Pacific Highway westbound carriageway;

- Left turn from the site (via the Council car park) to Pacific Highway eastbound carriageway, left turn to Herbert Street, left turn to Frederick Street, right turn to Reserve Road, left turn to Campbell Street and thence a right turn to Pacific Highway westbound carriageway.

For the purposes of this assessment and in order to generate an absolute worst case scenario, all vehicles departing the site to the north-west via Pacific Highway are projected to travel via the first of the abovementioned routes.

6.3 Projected Road network Performance

The surrounding public road intersections have been modelled in order to estimate that likely impact on traffic safety and efficiency utilising the projected traffic volumes incorporating the proposed development. A summary of the most pertinent results are indicated within **Table 6** whilst more detailed summaries are provided within **Appendix 6**.

TABLE 6
SIDRA OUTPUT
WEEKDAY PEAK HOUR PERFORMANCE

	Existing Conditions		Projected Conditions	
	AM	**PM**	**AM**	**PM**
Pacific Hwy & Greenwich Rd				
Delay	25.3	18.9	26.0	19.4
Degree of Saturation	0.65	0.56	0.67	0.57
Level of Service	B	B	B	B
Pacific Hwy & Council Car Park Access Rd				
Delay	8.2	5.8	8.2	5.7
Degree of Saturation	0.32	0.25	0.34	0.26
Level of Service	A	A	A	A
Pacific Hwy, Reserve Rd & Berry Rd				
Delay	25.1	26.5	27.2	27.1
Degree of Saturation	0.77	0.47	0.82	0.48
Level of Service	B	B	B	B

Table 6 indicates that the additional traffic generated by the development is not projected to have noticeable impacts on operation of the surrounding public road intersections with only minor alterations projected with respect to delay and degree of saturation. In this regard, the intersection levels of service are projected to remain unaltered, representing good conditions with spare capacity.

6.4 Traffic Impacts

6.4.1 Road Network Efficiency

The proposal has been estimated to generate up to 65 inbound and 65 outbound vehicle movements during peak operational periods of the school. Such a level of additional traffic represents, on average, just over one additional inbound vehicle trip and one addition outbound trip per minute during peak periods.

It is acknowledged that the left in / left out nature of the site access arrangements (via the Council car park) and Pacific Highway are such that some motorists will be required to undertake somewhat circuitous approach and departure routes. In this regard, motorists approaching the site from the south-east via Pacific Highway are required to travel an additional 1km to access the Highway eastbound carriageway and thus the site. Similarly, motorists departing the site to the north-west via the Pacific Highway are required to travel an additional 600m to access the Highway westbound carriageway. The extent of these approach and departure routes are considered to be unreasonably onerous and are common for developments fronting divided carriageways. Indeed, motorists

may well elect to alert their approach and departure routes further away from the subject site thereby resulting in these local circuitous routes not being travelled.

The previous analysis contained within this report presents that the surrounding public road network currently operates with a good level of service with spare capacity. The abovementioned level of additional traffic is accordingly not projected to result in any unreasonable impacts on the current operational performance of the road network. Upgrades / alterations to the surrounding road network are therefore not warranted in association with this development.

6.4.2 Speed Limit Impacts

It is expected that the proposal will result in the implementation of a 40km/h school zone speed limit applying within Pacific Highway within the immediate vicinity of the site, applying between 8:00am – 9:30am and 2:30pm – 4:00pm on school days. The length of this reduced speed limit zone is envisaged to be a maximum of 500m, applying from a position to the west of Greenwich Road to a position to the east of Reverse Road (although a reduced length of approximately 300m is more likely). The reduced speed limit is expected to result in an increased travel time of approximately 10 seconds in each direction along the Highway, thereby not resulting in noticeable impacts on through arterial road traffic efficiency.

6.4.3 Site Access

In consideration of the previous sub-sections of this report, the impact of the development is therefore most likely to be a factor of the ability or otherwise for vehicles to safely and efficiently access the site via the Council car park access roadway. In this regard, it has previously been presented that the Council car park access roadway provides for safe movement of vehicles from and to Pacific Highway eastbound carriageway, being assisted by the provision of appropriate sight distance along the State Road.

Notwithstanding the above, this Practice notes that it is Roads & Maritime Services policy that development proposals fronting State Roads investigate the requirement or otherwise for the provision of a dedicated deceleration lane to ensure that vehicles entering the site do not unreasonably impact / impede trailing through traffic flow. Such an assessment is required to take into consideration the prevailing lane by lane traffic demands within the public road and the traffic generating capacity of the development.

It has previously been presented that Pacific Highway eastbound carriageway immediately adjacent to the site provides three lanes, being separated from the westbound carriageway by a raised concrete central median. Clearway parking restrictions apply along the eastbound kerb-side travel lane during the morning peak period (6:00am – 10:00am) on weekdays to facilitate three unobstructed traffic lanes. Notwithstanding this, the eastbound kerb-side lane forms a T3 transit lane during the morning weekday commuter peak period. Further, the provision of regular bus stops to the east and west of the site ensure that eastbound kerb-side travel lane vehicle volumes are significantly reduced

compared with the adjacent centre and median travel lanes. Kerb-side parking is accommodated within the eastbound kerb-side travel lane outside of weekday morning commuter periods, being governed by a combination of two and four hour ticket restrictions between 10:00am – 6:00pm weekdays and between 8:30am – 12:30pm on Saturdays. A break in the abovementioned kerb-side parking and indeed, the provision of bus stops to the east and west of the site therefore facilitate a pseudo deceleration lane on approach to the existing Council car park access road.

In order to quantify the above analysis, this Practice has obtained SCATS traffic signal detector data for eastbound Pacific Highway travel lanes on approach to Greenwich Road and Reserve Road from Roads & Maritime Services. A summary of the obtained data is provided within **Table 7**, whilst full details are contained within **Appendix 7** for reference.

TABLE 7
SUMMARY OF TRAFFIC SIGNAL DETECTOR DATA
PACIFIC HIGHWAY, ST LEONARDS – EASTBOUND CARRIAGEWAY

	Maximum AM Hourly Volume	Maximum PM Hourly Volume	Total Daily Volume
ON APPROACH TO GREENWICH ROAD			
Kerb-side Lane	132	58	912
Centre Lane	760	670	9091
Median Lane	533	421	4916
Right Turn Lane	186	207	2445
ON APPROACH TO RESERVE ROAD			
Kerb-side Lane	367	277	3735
Centre Lane	806	651	8766
Median Lane	658	485	5360
Right Turn Lane	57	57	778

It should be acknowledged that the detector data provided within **Table 7** somewhat overstates the kerb-side lane usage immediately adjacent to the site as vehicles tend to fill all approach lanes at traffic signals when on approach to the red traffic signal. Further, the detector data on approach to Reserve Road captures all left turning traffic into the hospital precinct.

Notwithstanding this, the detector data establishes that the eastbound kerb-side travel lane accommodates significantly lower demands compared to the adjoining centre and median travel lanes. **Table 7** indicates that eastbound kerb-side travel lane traffic demands account for less than 10% and 20% of the total eastbound traffic demands within Pacific Highway on approach to Greenwich Road and Reserve Road, respectively. The significantly reduced demands within the kerb-side travel lane, in conjunction with the low projected peak hourly inbound traffic demands associated with the development (65 movements during the morning peak hour and 46 vehicle movements during the afternoon peak hour) are such that a deceleration lane servicing the Council car park access roadway is not considered to be warranted.

Site egress movements are expected to be significantly assisted by the punctuation of eastbound Highway traffic demands associated with the operation of traffic signals to the west at Greenwich Road. These signals provide

for regular and extended gaps in eastbound Highway traffic flow allowing motorists to exit the Council car park access driveway with a reasonable level of efficiency. In consideration of this and the above discussion, it not considered that the subject development will result in any unreasonable impacts on the safety and efficiency of the adjoining Pacific Highway eastbound carriageway traffic flow efficiency and accordingly not alterations to the existing infrastructure are required.

6.5 Pedestrian Impacts

The proposed development has the potential to result in a minor level of additional pedestrian demands within the immediate vicinity of the site. The notable pedestrian access and mobility infrastructure within the immediate vicinity (see Section 5.5 of this report) is such that pedestrians are provided with a particularly good level of service and connectivity throughout the surrounding precinct, which is readily capable of accommodating additional demand.

Notwithstanding the above, it is acknowledged that Pacific Highway somewhat forms an impediment to north-south pedestrian desire lines within the immediately precinct. Safe and efficient pedestrian crossing movements over Pacific Highway is facilitated within 200m of the site both to the east and west via signalised crossings at Reserve Road and Greenwich Road, respectively.

The primary school nature of the school is such that students are not expected to walk to and from the school unattended. In this regard and having consideration to the abovementioned nearby signalised pedestrian crossing facilities over Pacific Highway, it is not expected that students will undesirably attempt to cross the Highway immediately adjacent to the school in an ad-hoc manner. Similarly, it is not expected that parents will set-down / pick-up students on the southern side of Pacific Highway, thereby resulting in their child be required to cross Pacific Highway. Notwithstanding this, if considered necessary central median pedestrian fencing could be provided within Pacific Highway, within the vicinity of the school, the requirement for which could be imposed as a condition of consent.

6.6 Public Transport Impacts

Section 5.4 of this report presents that the precinct surrounding the subject site is particularly well serviced by public transport infrastructure with the site being in easy walking distance to rail and bus services as well a planned metro service at Crows Nest. It is accordingly expected that a proportion of the future school staff and some older students may 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.

It is acknowledged that school and / or employment generated developments are, at times, required to prepare a site specific Green Travel Plan. Green Travel Plans provide advice to development users with respect to sustainable travel modes and infrastructure and on the basis of infrastructure available provide

sustainable travel targets, which are reviewed regularly following occupation of the development.

The small scale of the proposed school, only generating a projected employee yield of 12 staff, is such that it is not considered that a Green Travel Plan is warranted. Notwithstanding this, the requirement for a Plan could reasonably be imposed, if considered necessary, as a condition of consent.

7. PRELIMINARY CONSTRUCTION MANAGEMENT PLAN

7.1 Introductory Statement

This Section of the report constitutes a preliminary Construction Traffic Management Plan (CTMP) addressing the traffic access and safety issues associated with demolition and construction works associated with the proposal. CTMPs are generally prepared at Construction Certificate stage following the commissioning of a builder thereby allowing a greater appreciation of the likely construction methodology and therefore the required traffic management measures to be implemented.

The terms of the initiatives contained within the following subsections of this report are therefore somewhat generic and some modifications may be needed by or on behalf of the successful builder / civil contractor at Construction Certificate stage depending on their feasibility taking into consideration all project requirements.

7.2 Traffic Management During On-Site Works

The scale of the development works are such that they are contained within off-street areas and therefore are not envisaged to require the temporary or medium term occupation of the public road network.

Construction vehicles and equipment are most likely to be wholly accommodated either within the site or within The Avenue, being accessed via the adjacent Council car parking area.

Class A Hoarding or construction fencing will be provided around the site and The Avenue boundaries thereby effectively separating construction activities from the adjoining public spaces.

7.3 Safe Ingress and Egress of Construction Traffic

It is expected that construction vehicles servicing the site will be limited to MRVs, accessing the construction area in a forward direction via the adjoining Council car parking area. Similarly, construction vehicles are envisaged to exit the construction area in a similar simple forward direction to the adjoining Council car parking area.

All construction vehicle Works Zone access and egress movements are to be strictly controlled by appropriately qualified traffic controllers.

No queuing / marshalling of construction vehicles is to occur in any public road.

7.4 Construction Vehicle Transport Routes

Construction vehicles are to access and vacate the subject site utilising Pacific Highway, as follows:

Inbound Route

Pacific Highway, left turn into the Council car parking area and thence a left turn into the construction area.

Outbound Route

Forward movement from the construction area to the Council car parking area and thence a left turn into Pacific Highway.

7.5 Parking Control

All construction employee / tradesperson passenger vehicle parking is to be accommodated within the surrounding public road network until such time as the basement car park is capable of being utilised. Construction workers / tradespersons will be encouraged to do either of the following when travelling to the site in order to minimise the extent of parking demand:

- Utilise public transport to the site (the site is well serviced by previously presented rail and bus services operating within the subject vicinity); and / or
- Car pool with other construction workers.

The above transport options will form part of the conditions of commissioning when engaging the relevant site workers and as such form part of any site induction process.

No construction worker parking is occur within the adjoining Council car park or Pacific Highway.

7.6 Construction Traffic Generation

The small scale of the construction works are such the traffic generating capacity of the construction works are limited. In this regard, it is expected that a maximum of two heavy vehicles will service the site during peak construction periods, such as concrete pours. During these periods of heavy construction vehicle generation, drivers are to be instructed by radio when to arrive at the site to ensure that there is no vehicle queuing or parking within the adjoining road network. This is to be strictly adhered to.

7.7 Traffic Impact

The recent traffic investigations of the adjoining road network and the analysis contained within previous sections of this report have indicated that motorists are provided with a reasonable level of service within the immediately adjoining public road network. It is therefore considered that the limited traffic generation associated with the construction activities can be accommodated without any unreasonable impacts on adjoining vehicle movements considering the previously mentioned maximum hourly traffic generation.

Notwithstanding the above, it is recommended that construction vehicle movements to and from the site be eliminated where possible during road peak operational periods (7:00am – 9:00am and 4:00pm – 6:00pm).

7.8 Impacts on Pedestrians

Pedestrian demands along Pacific Highway and indeed, within the Council car parking area are notable however pedestrian movements adjacent to the site are to occur in an unimpeded fashion during all periods of construction. Qualified traffic controllers will supervise the movement of construction vehicles between the construction area and Pacific Highway.

Unimpeded pedestrian access to adjoining developments and indeed, nearby bus stops, will be maintained at all times.

Boundary hoarding / fencing will protect pedestrians from dust and debris.

No unreasonable impacts on the safety or mobility of pedestrians are therefore anticipated during the construction works associated with the subject development.

8. CONCLUSION

This report assesses the potential parking and traffic implications associated with a proposal involving the undertaking of alterations and additions to an existing commercial building situated within Cemetery Trust land at 211 Pacific Highway, St Leonards, to accommodate an International Chinese school containing up to 210 students. Based on this assessment, the following conclusions are now made:

- The proposal involves the construction of a new formal student set-down / pick-up area to be situated along the north-eastern boundary directly adjacent to the site;

- The proposal also involves the construction of a new one-way roadway facilitating access between the Local Council car park situated to the east of the site and the abovementioned proposed student set-down / pick-up area;

- The new off-street set-down / pick-up area is proposed to be capable of accommodating up to 10 passenger vehicles in a queued arrangement at any one time;

- It is recommended that the school implement an Operational Management Plan to govern the abovementioned student set-down / pick-up arrangement to ensure safe and efficient operation during school start and finish periods;

- Whilst it is expected that the off-street set-down / pick-up facility will accommodate peak operational demands, recent surveys have indicated that there is additional capacity within the adjoining Council car parking area to accommodate a moderate level of additional demand, in the unlikely event that it is generated by the school operation;

- Further to the above, an on-site parking area capable of accommodating 10 car spaces is specifically allocated for staff and visitor use during school operational periods;

- The on-site passenger vehicle parking provision is compliant with the numerical requirements of DCP 2016;

- The proposed access and internal circulation arrangements are projected to be capable of accommodating internal passenger vehicle manoeuvring in a safe and efficient manner;

- The surrounding road network has been observed to operate with a reasonable level of service during peak school start and finish periods with some spare capacity;

- It is expected that the proposal will result in the generation of a moderate level of additional vehicle trips to and from the precinct during school start and finish periods;

- The surrounding road network is capable of accommodating the moderate level of additional traffic projected to be generated by the precinct during school start and finish periods and in this regard, it is not envisaged that any specific road upgrades are required to accompany the development;

- The site is well serviced by a variety of sustainable transport infrastructure including public bus services, train services, pedestrian infrastructure and primarily on-road cycle routes; and

- The limited scale and primary school nature of the site is such that it is not expected that the development will result in any notable impact on the capacity of the existing public transport infrastructure.

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

APPENDIX 1

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www.stantondahl.com.au

International Chinese School, Anglo Australian Christian and Charitable Trust
211 Pacific Highway, St Leonards, NSW

Architectural Drawings

01 **Location Plan - Map**

02 **Location Plan - Aerial Image**

Architecture
Project management
Interior design

stanton dahl
architects

International Chinese School

Anglo Australian Christian and Charitable Trust
211 Pacific Highway,
St Leonards, NSW

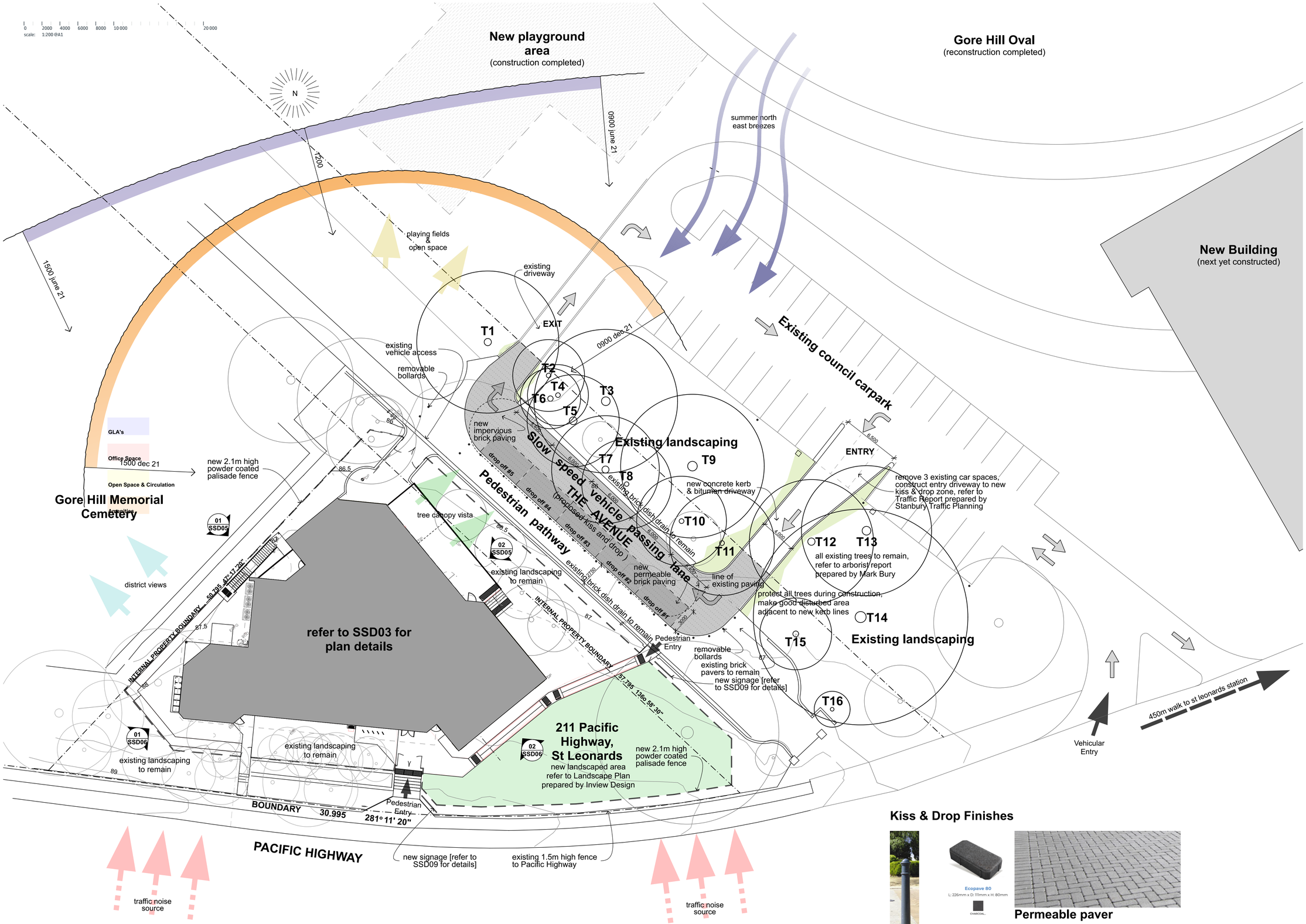
Drawn; cjh
Checked; cjh
Plot date; 26/8/19

Scale; 1:1 as noted @ A1

Project No;
2417.19

Drawing No; SSD00
Revision#; 03

Cover Sheet



01 **Site Plan & Site Analysis**
1:200

Kiss & Drop Finishes

Typical bollard
(removable)

Permeable paver

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Rev	Issue	Date
01	Client Issue	25/02/19
02	Client Issue	03/04/19
03	Quattro Issue	11.09.19
04	Consultant Issue	23.05.19
05	SSD DRAFT Issue	12.06.19
06	SSD Final DRAFT Issue	19.06.19
07	SSD Issue	26.06.19

Architecture
Project management
Interior design

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architects

International Chinese School

211 Pacific Highway,
St Leonards, NSW

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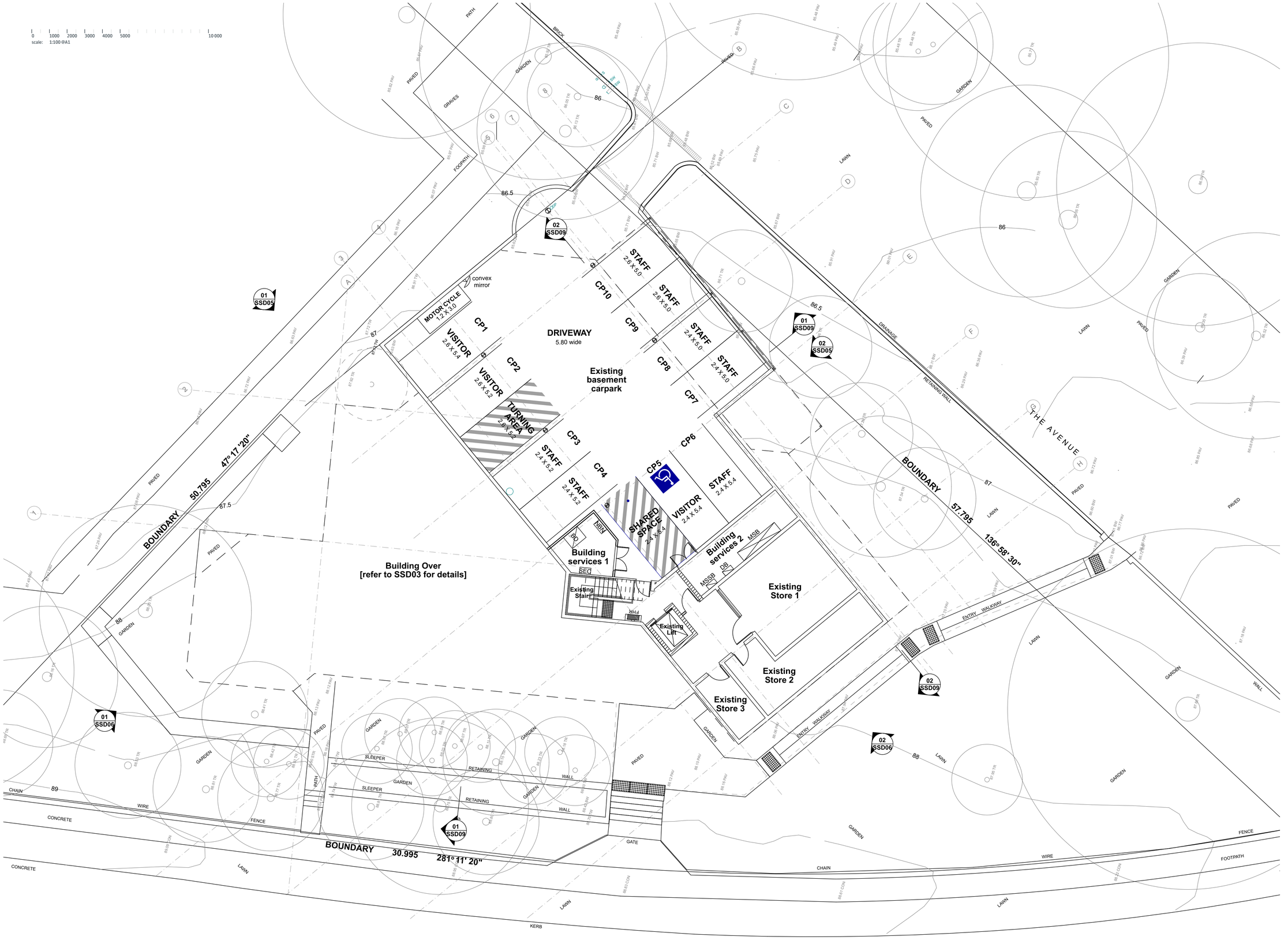
Scale; 1:200 as noted @ A1

Project No;
2417.19

Drawing No; SSD01
Revision#; 07

Site Plan & Site Analysis Plan



01 **Basement Floor Plan**
1:100

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05	SSD Issue	26.06.19

Architecture
Project management
Interior design

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International Chinese School

211 Pacific Highway,
St Leonards, NSW

Drawn; cjh
Checked; cjh
Plot date; 26/8/19

Scale; 1:100 as noted @ AI

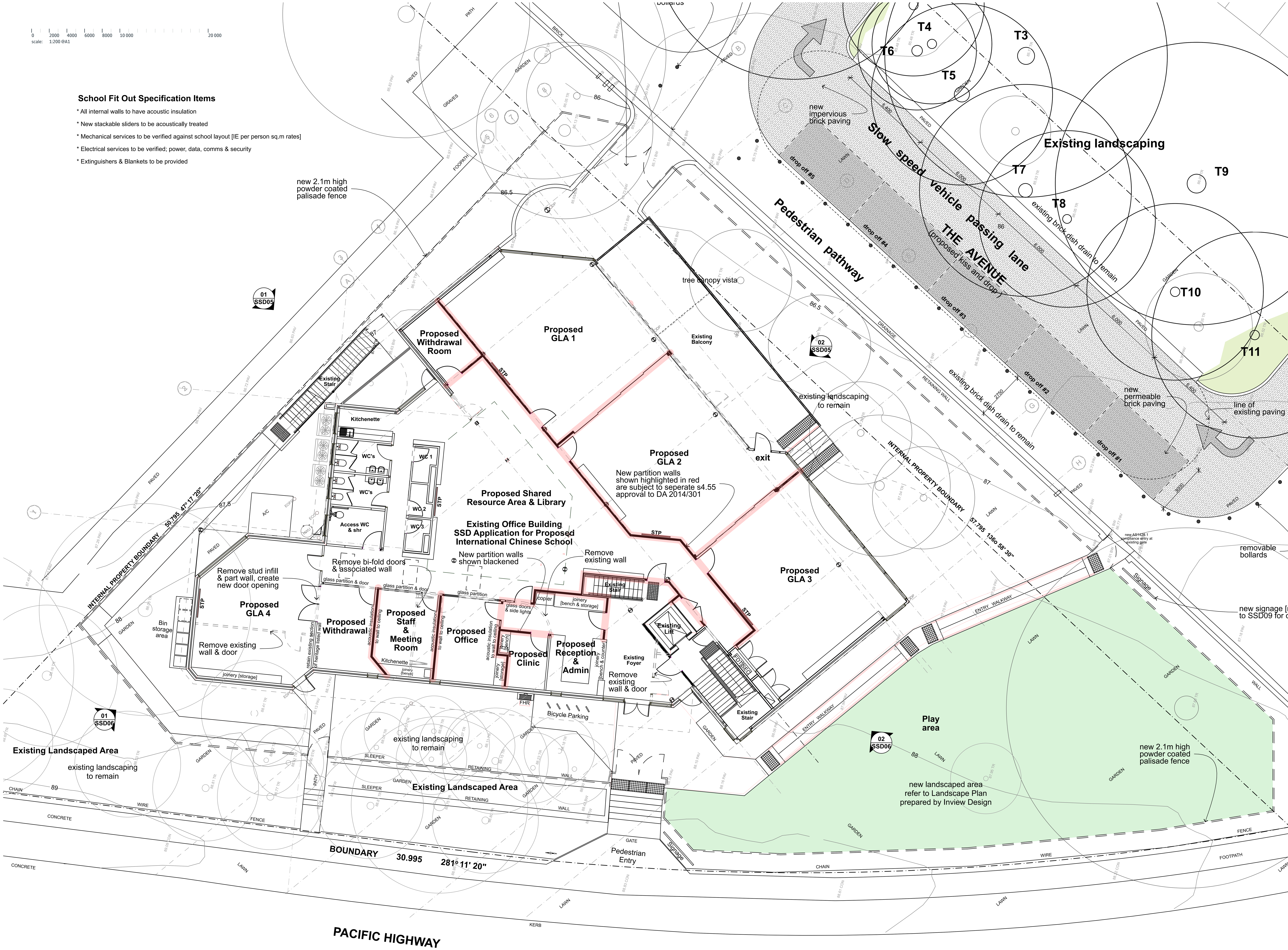
Project No;
2417.19

Drawing No; SSD02
Revision#; 05

Basement Floor Plan

School Fit Out Specification Items

* All internal walls to have acoustic insulation
* New stackable sliders to be acoustically treated
* Mechanical services to be verified against school layout [IE per person sq.m rates]
* Electrical services to be verified; power, data, comms & security
* Extinguishers & Blankets to be provided



new 2.1m high powder coated palisade fence
Slow speed vehicle passing lane
Pedestrian pathway
THE AVENUE
(proposed kiss and drop)
Existing landscaping
T3
T4
T5
T6
T7
T8
T9
T10
T11
new impervious brick paving
drop off #5
drop off #4
drop off #3
drop off #2
drop off #1
existing brick dish drain to remain
new permeable brick paving
line of existing paving
tree canopy vista
Existing Balcony
existing landscaping to remain
INTERNAL PROPERTY BOUNDARY
57.795 136o 58' 30"
Proposed Withdrawal Room
Proposed GLA 1
Proposed GLA 2
Proposed GLA 3
Proposed GLA 4
exit
New partition walls shown highlighted in red are subject to seperate s4.55 approval to DA 2014/301
Existing Stair
Kitchenette
WC's
WC 1
WC 2
WC 3
Access WC & shr
Proposed Shared Resource Area & Library
Existing Office Building SSD Application for Proposed International Chinese School
New partition walls shown blackened
Remove bi-fold doors & associated wall
Remove existing wall
Remove stud infill & part wall, create new door opening
Remove existing wall & door
INTERNAL PROPERTY BOUNDARY 50.795 47° 17 '20"
Bin storage area
Proposed Withdrawal
Proposed Staff & Meeting Room
Proposed Office
Proposed Clinic
Proposed Reception & Admin
Existing Foyer
Existing Lift
Existing Stair
Remove existing wall & door
removable bollards
new signage [refer to SSD09 for details]
Signage
ENTRY WALKWAY
Play area
new 2.1m high powder coated palisade fence
new landscaped area refer to Landscape Plan prepared by Inview Design
Existing Landscaped Area
existing landscaping to remain
Existing Landscaped Area
existing landscaping to remain
Bicycle Parking
FHR
BOUNDARY 30.995 281° 11' 20"
Pedestrian Entry
GATE
PACIFIC HIGHWAY

01 **Ground Floor Plan**
1:100

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All dimensions to be verified on site and any discrepancies referred to architect for determination. figured dimensions to take precedence over scaled dimensions.

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03	SSD DRAFT Issue	12.06.19
04	SSD Final DRAFT Issue	19.06.19
05	SSD Issue	26.06.19

Architecture
Project management
Interior design

stanton dahl architects

International Chinese School

211 Pacific Highway,
St Leonards, NSW

Drawn; cjh
Checked; cjh
Plot date; 26/8/19

Scale; 1:100 as noted @ AI

Project No;
2417.19

Drawing No; SSD03
Revision#; 05

Ground Floor Plan

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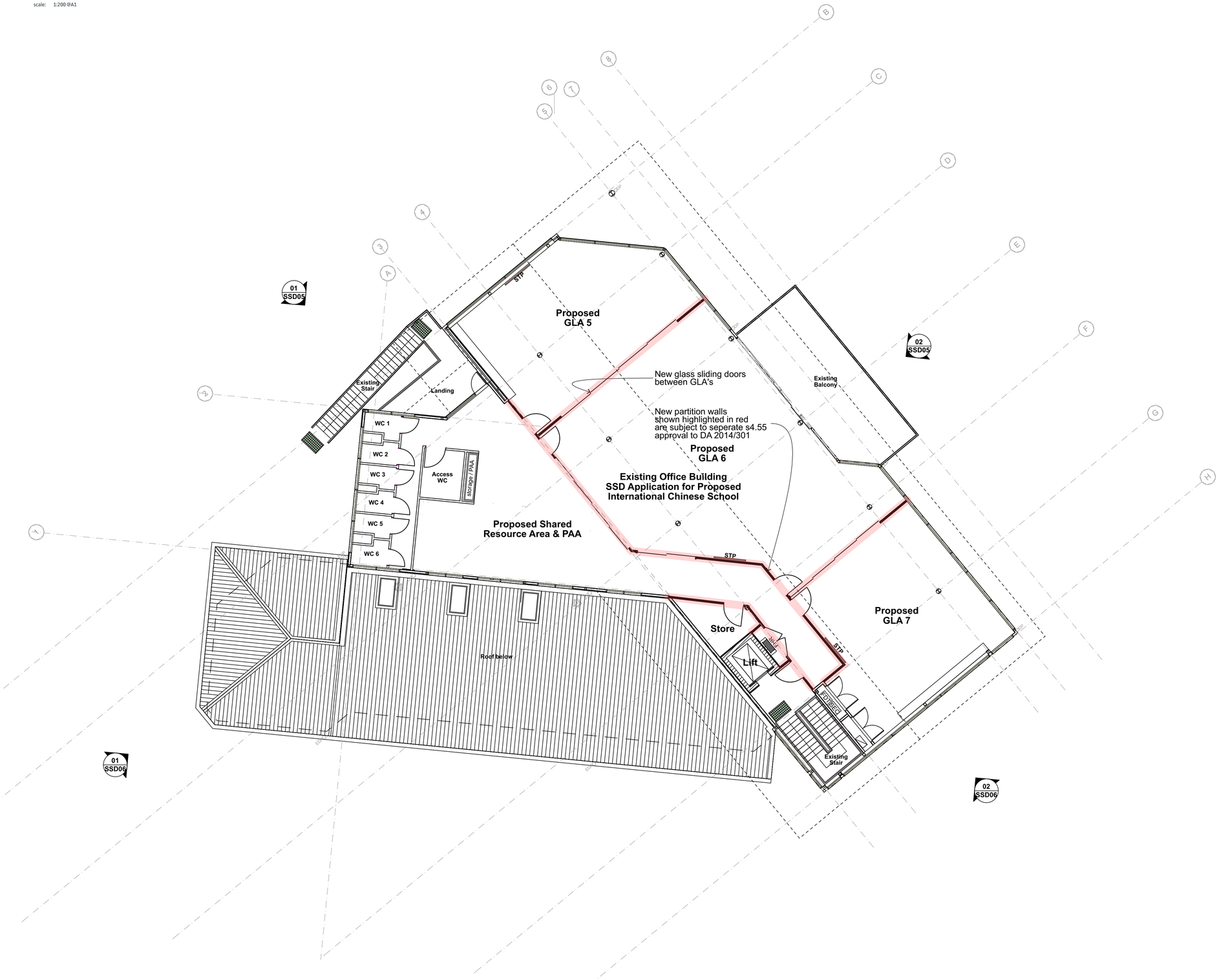

01 First Floor Plan
1:100

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04	SSD Final DRAFT Issue	19.06.19
05	SSD Issue	26.06.19

Architecture
Project management
Interior design

stanton dahl
architects

International Chinese School

211 Pacific Highway,
St Leonards, NSW

Drawn; cjh
Checked; cjh
Plot date; 26/8/19

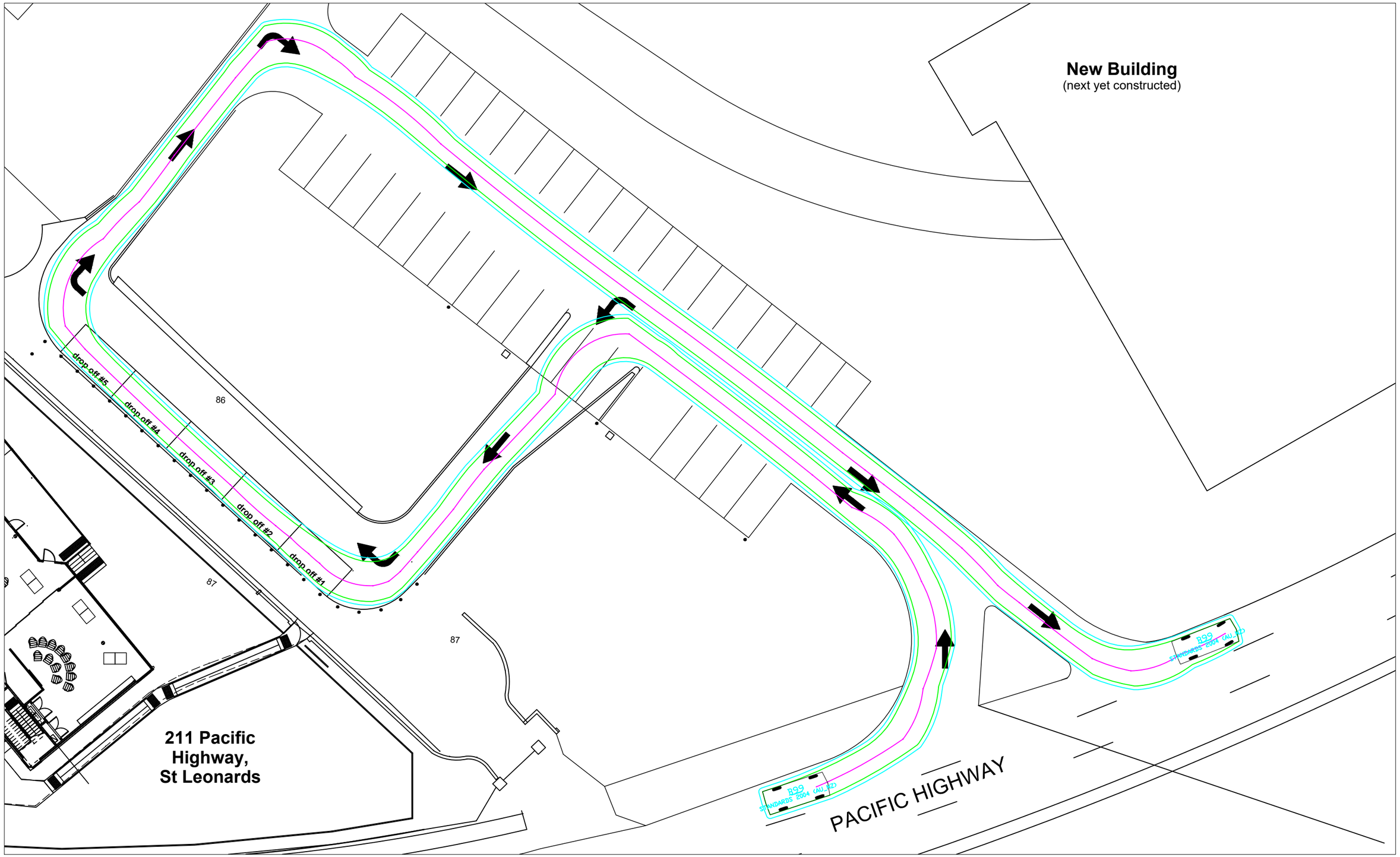
Scale; 1:100 as noted @ AI

Project No;
2417.19

Drawing No; SSD04
Revision#; 05

First Floor Plan

APPENDIX 2



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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 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 PRIMARY SCHOOL
211 PACIFIC HIGHWAY, ST LEONARDS

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FILE: 19-050
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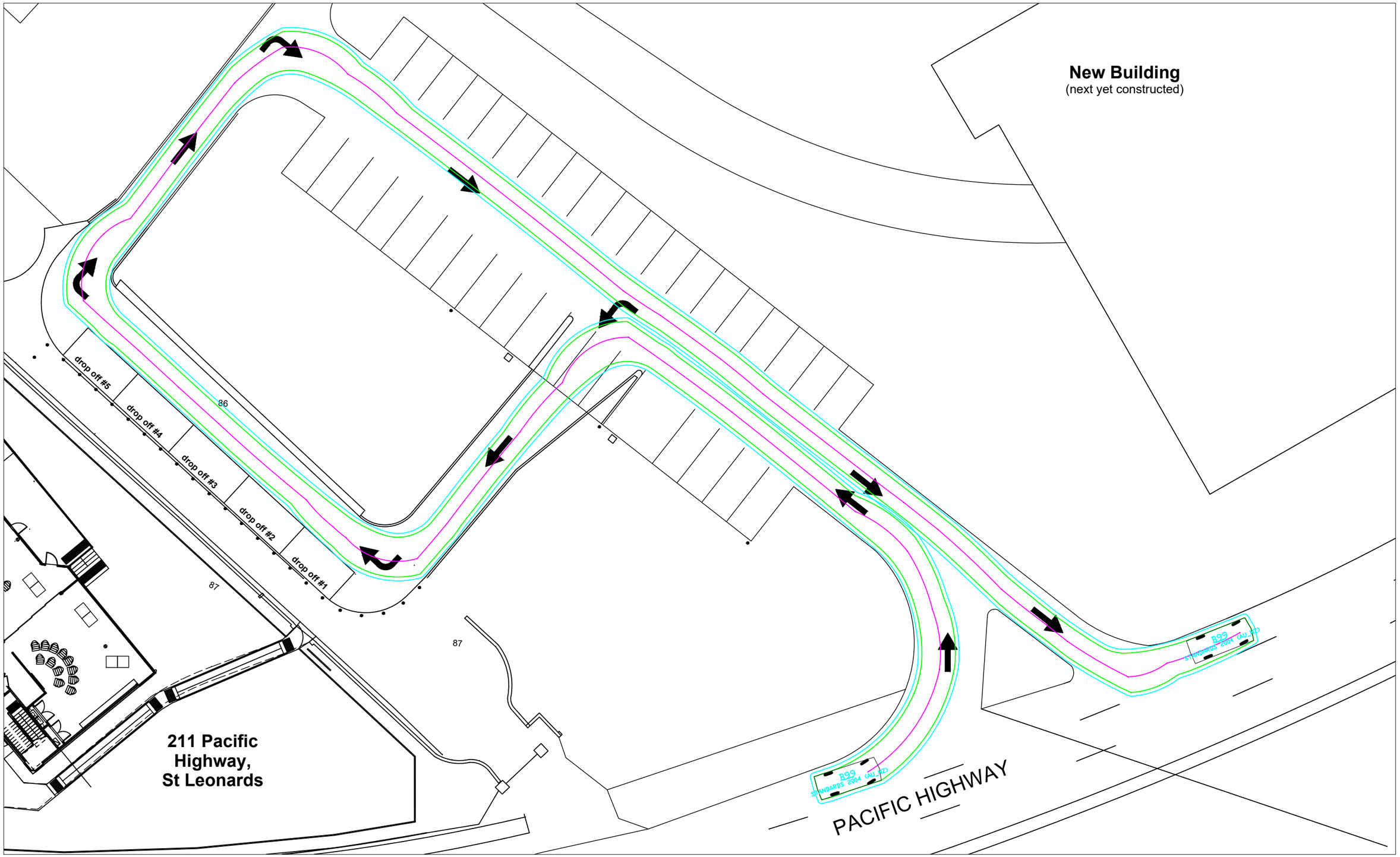
ISSUE A
SHEET 1



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

SITE INGRESS / EGRESS MOVEMENTS

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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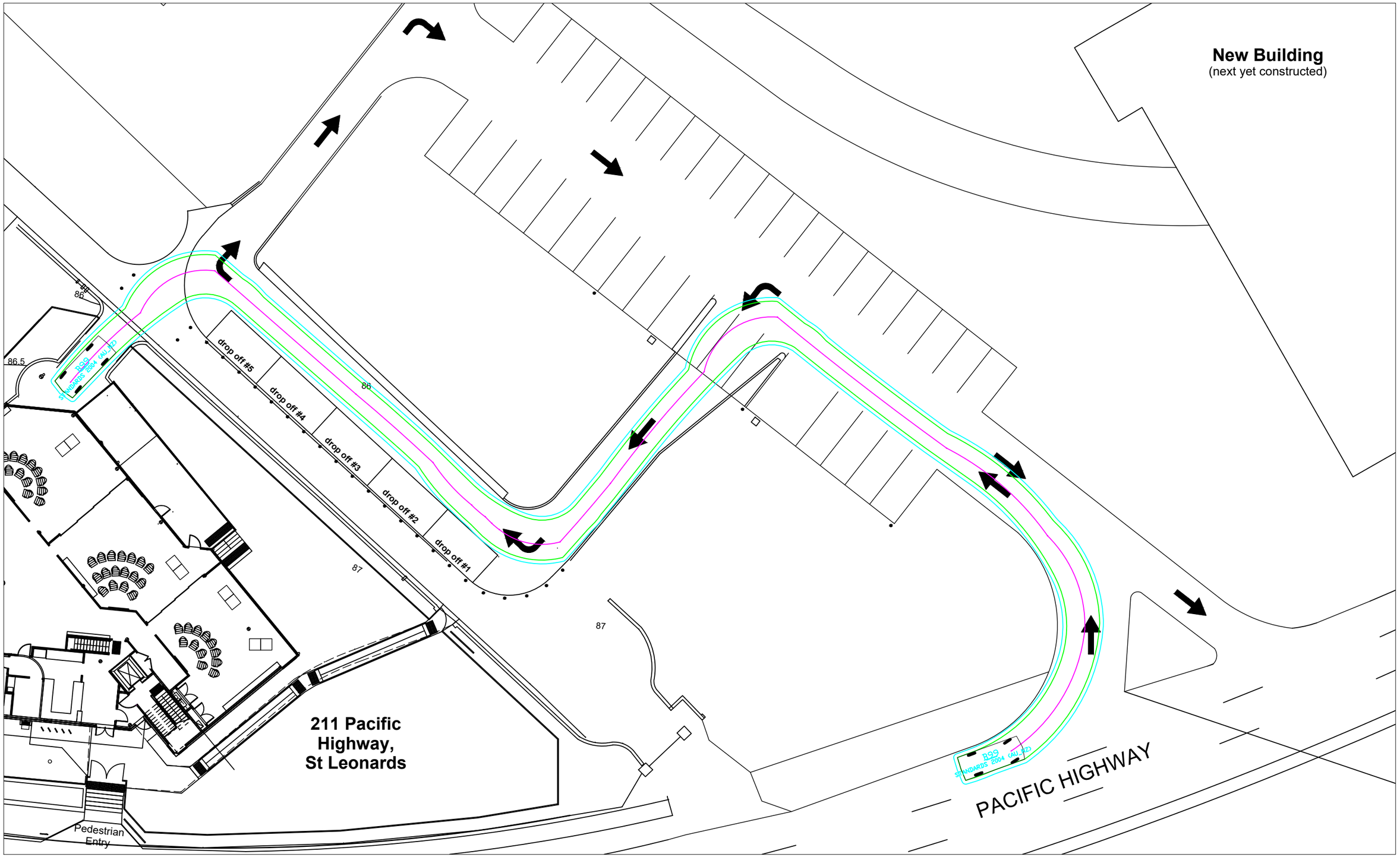

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

BASEMENT PARKING LEVEL INGRESS MOVEMENT

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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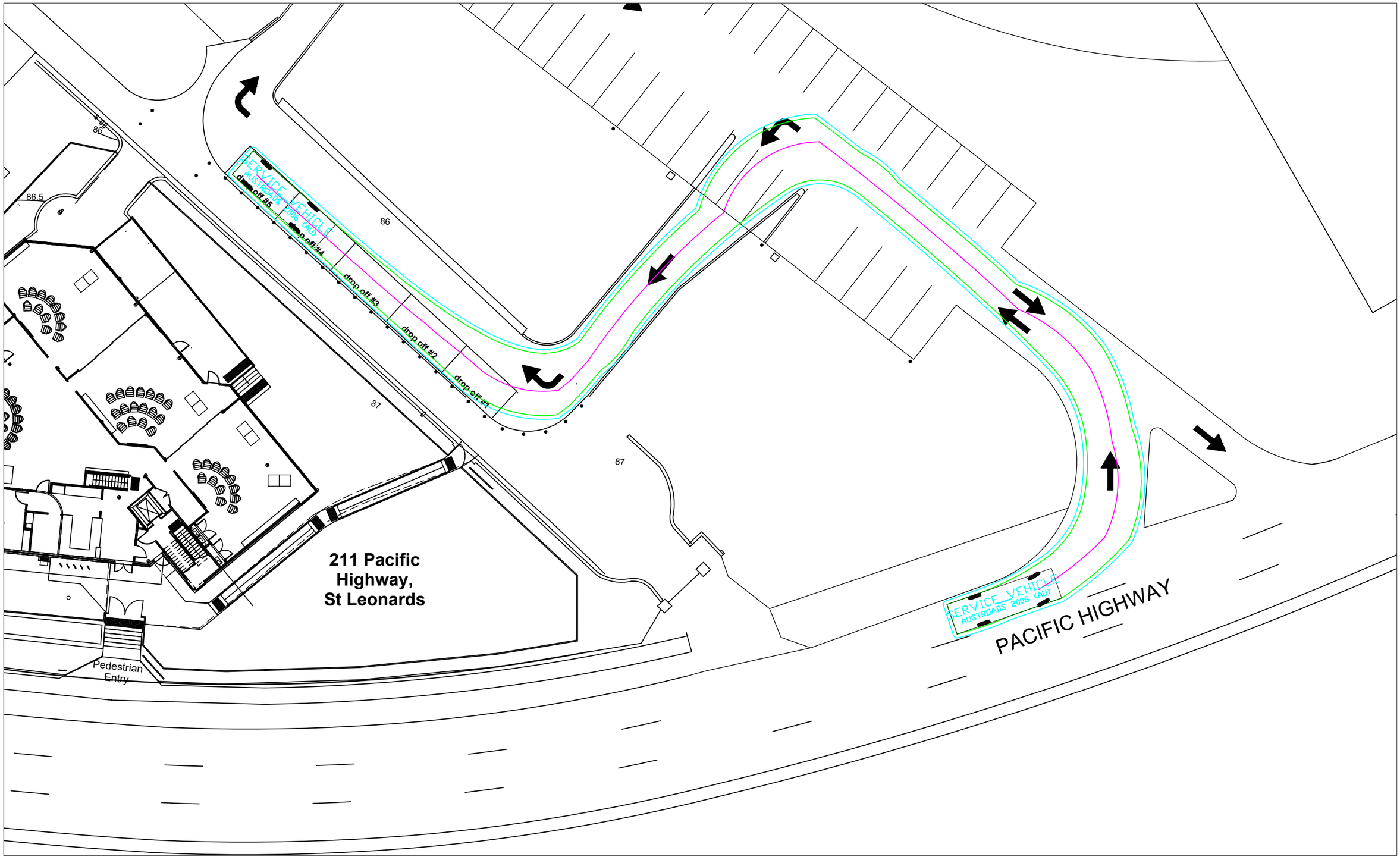

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STANBURY TRAFFIC PLANNING

MEDIUM RIGID VEHICLE SWEPT PATHS

SITE INGRESS MOVEMENT

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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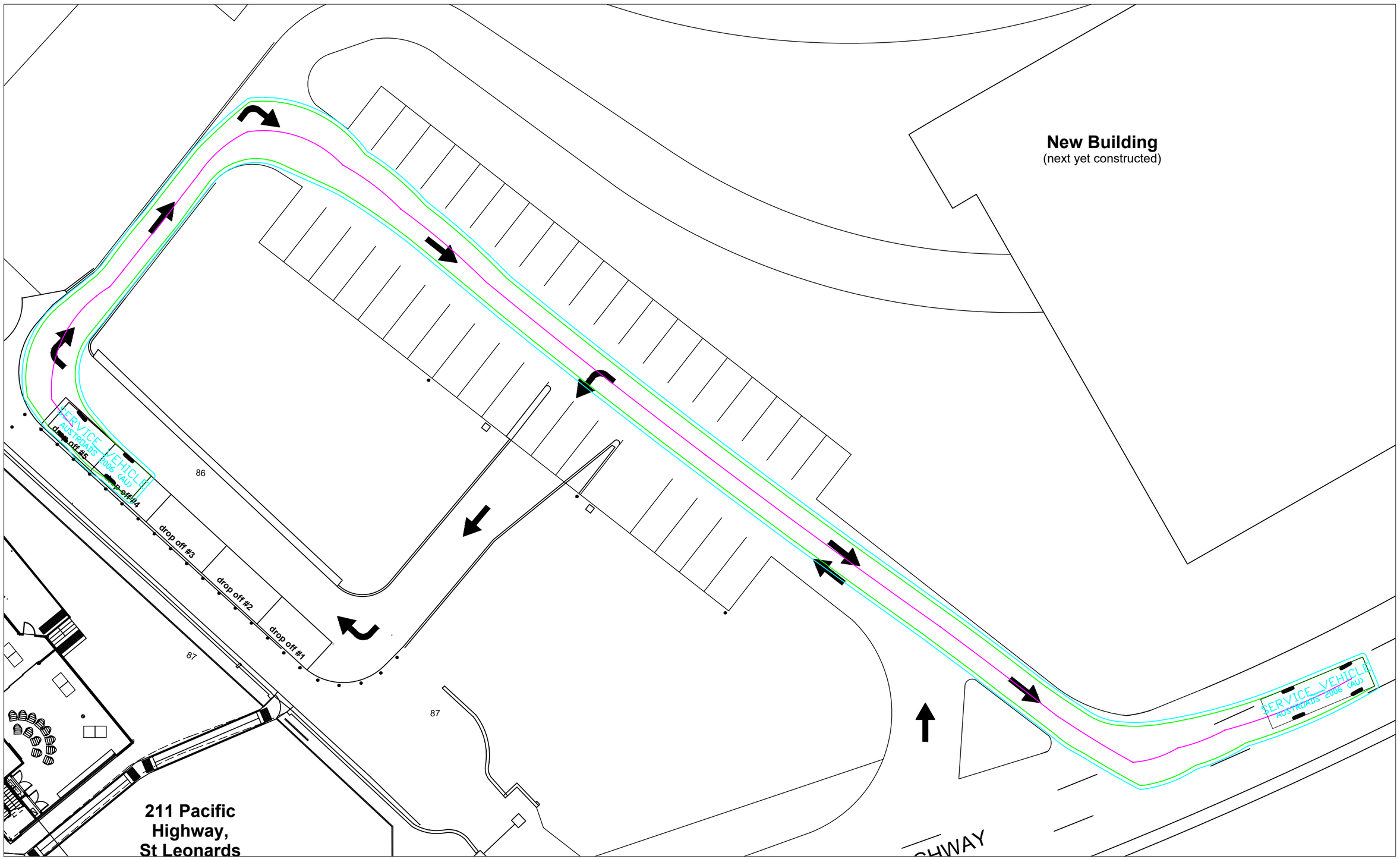

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STANBURY TRAFFIC PLANNING

MEDIUM RIGID VEHICLE SWEPT PATHS

SITE EGRESS MOVEMENT

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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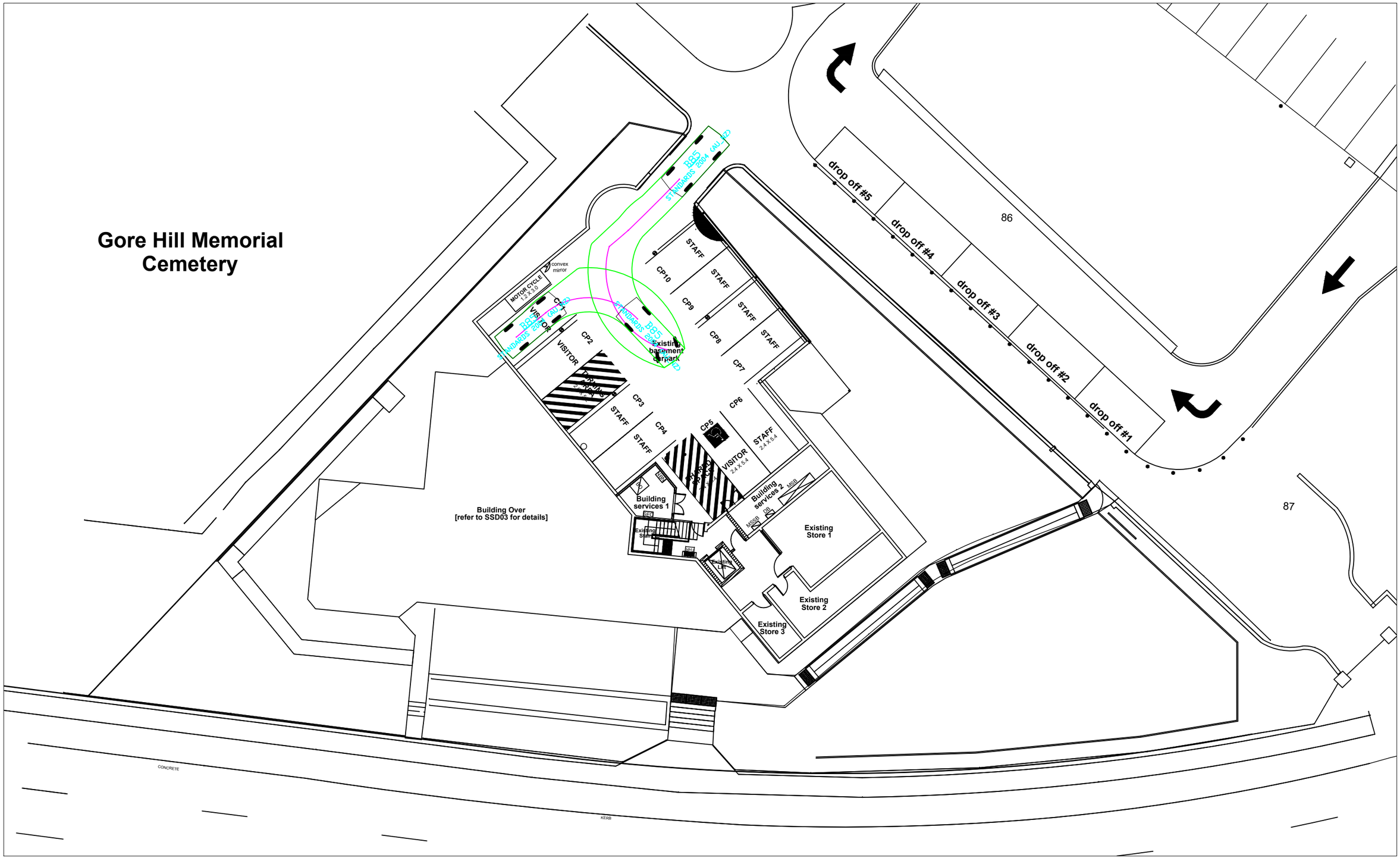
SHEET 5

Gore Hill Memorial Cemetery



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE MANOEUVRING

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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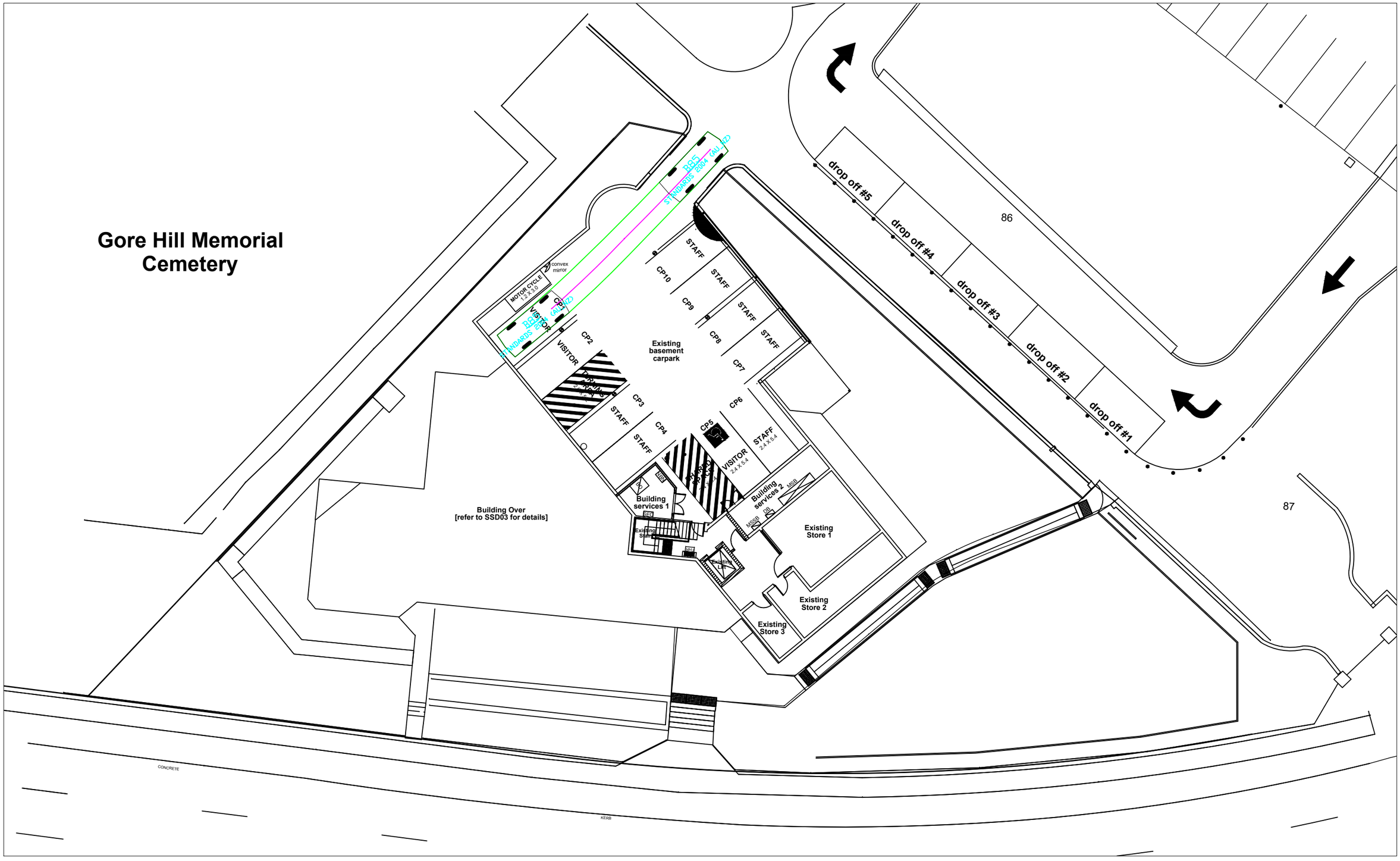
Gore Hill Memorial Cemetery



STANBURY TRAFFIC PLANNING

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STANBURY TRAFFIC PLANNING

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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE MANOEUVRING

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

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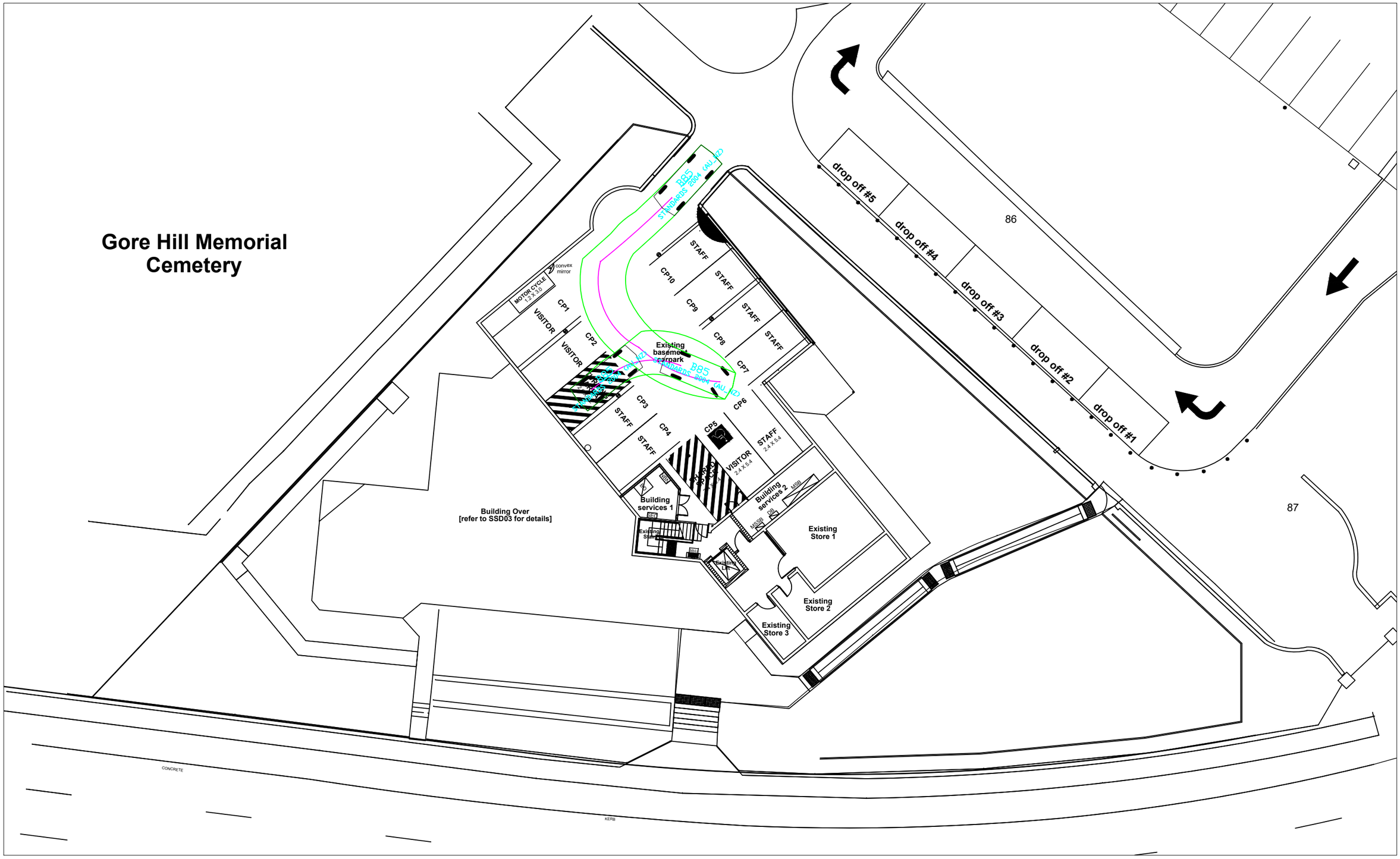
Gore Hill Memorial Cemetery



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STANBURY TRAFFIC PLANNING

PASSENGER VEHICLE SWEPT PATHS

INTERNAL PARKING SPACE MANOEUVRING

PROPOSED PRIMARY SCHOOL

211 PACIFIC HIGHWAY, ST LEONARDS

SCALE: 1:200 AT A3

ISSUE: A

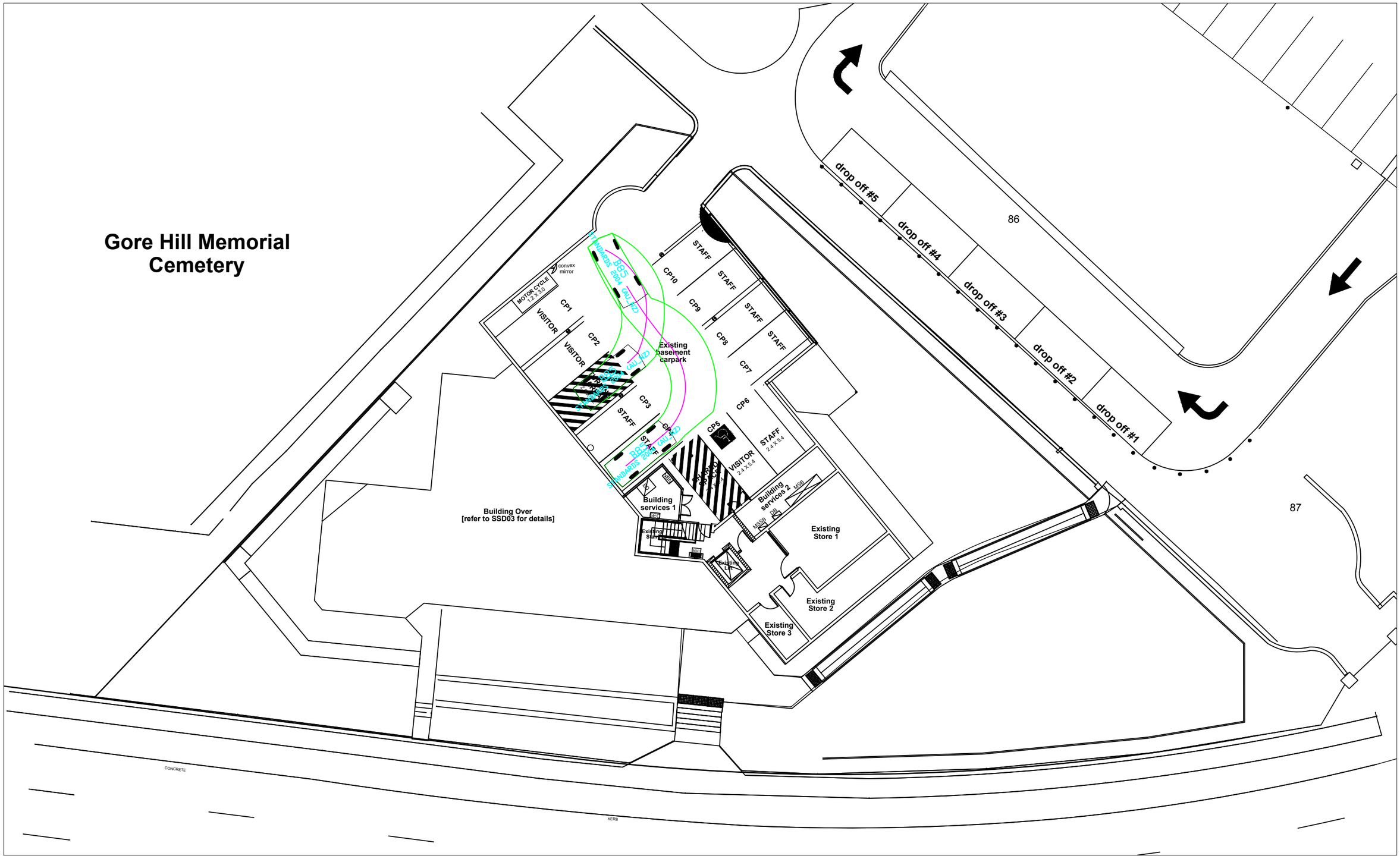
FILE: 19-050

SUPERSEDES SHEET/ISSUE: -

DATE: 27/08/2019

SHEET: 8

Gore Hill Memorial Cemetery



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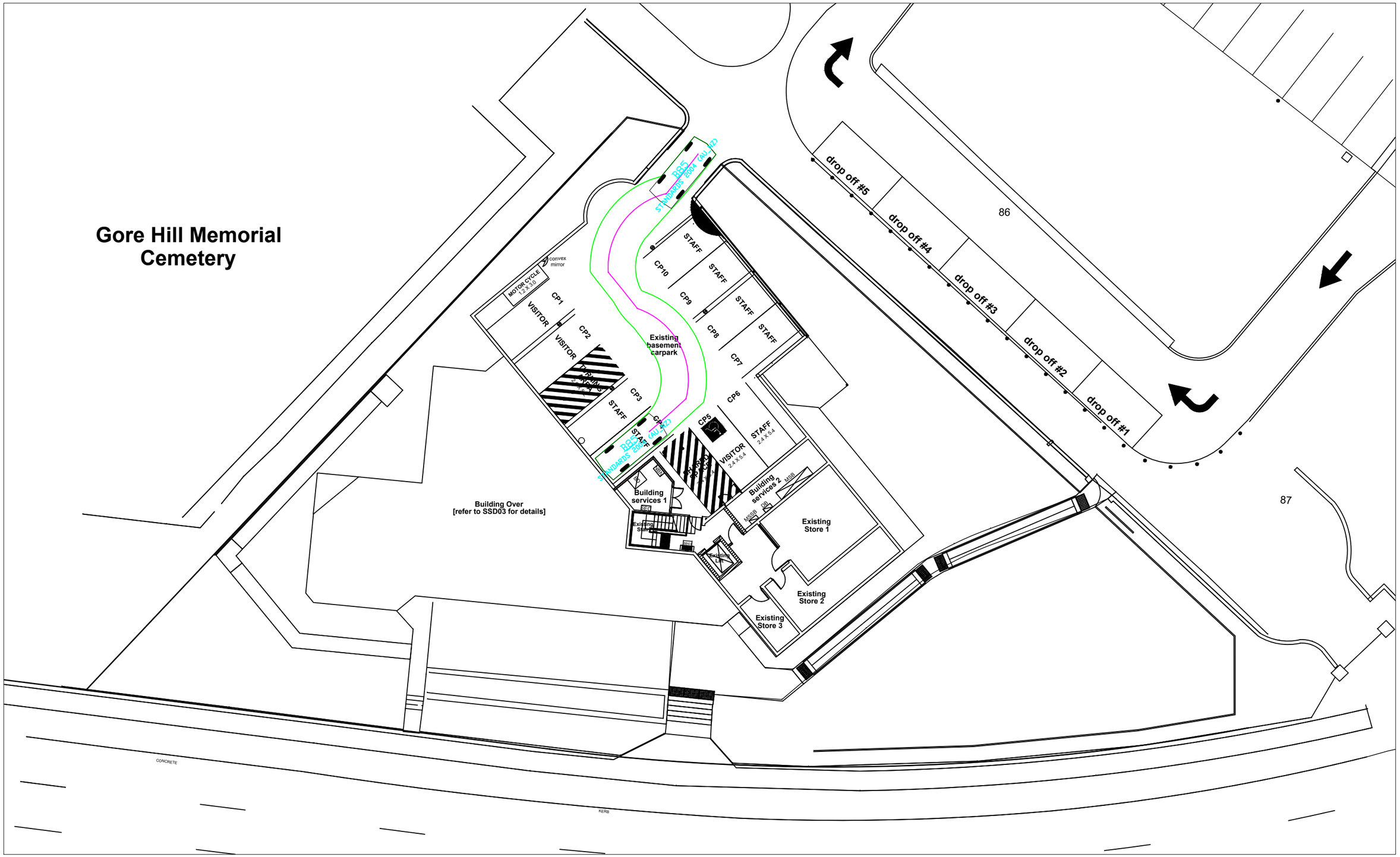

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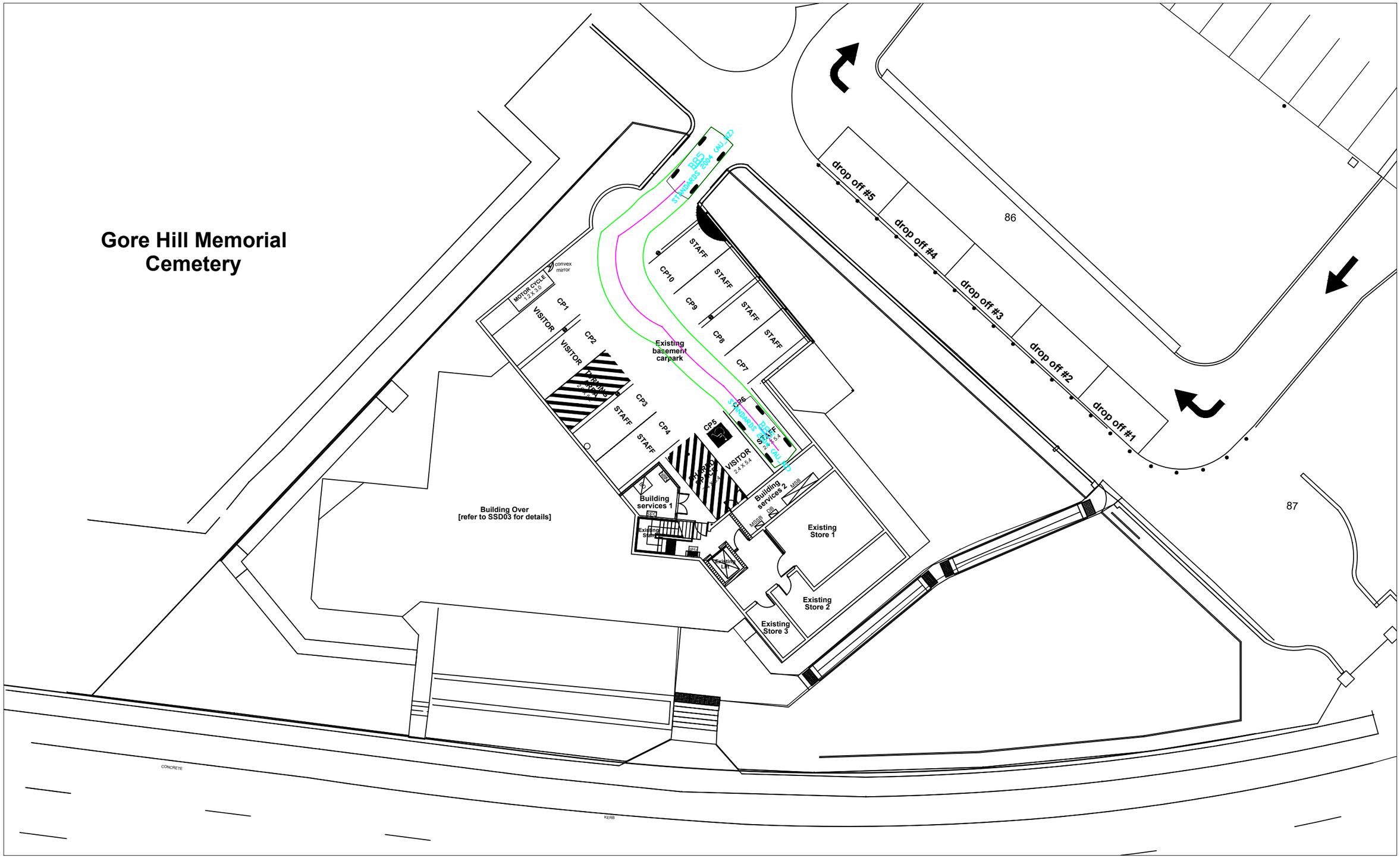
Gore Hill Memorial Cemetery



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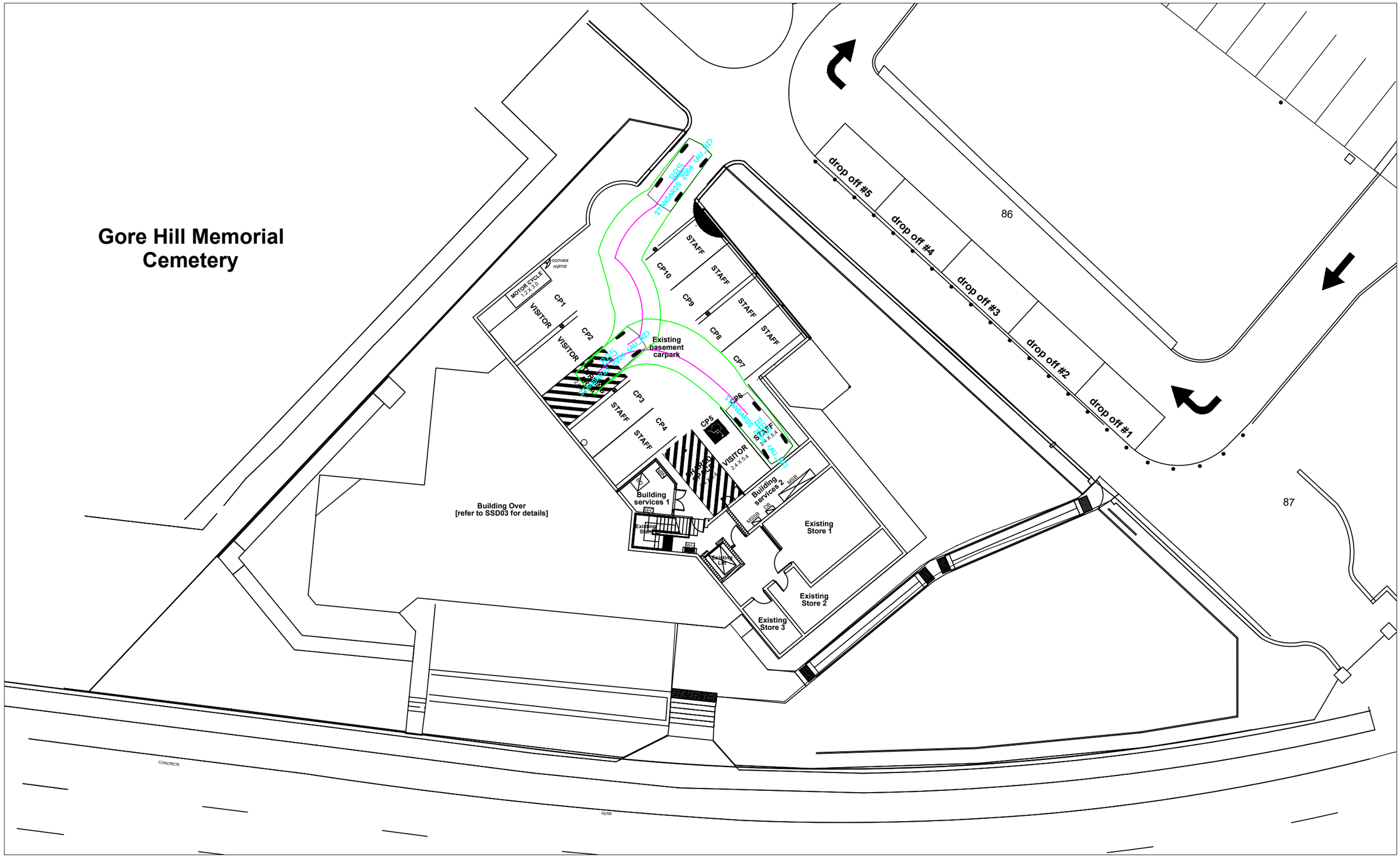
Gore Hill Memorial Cemetery



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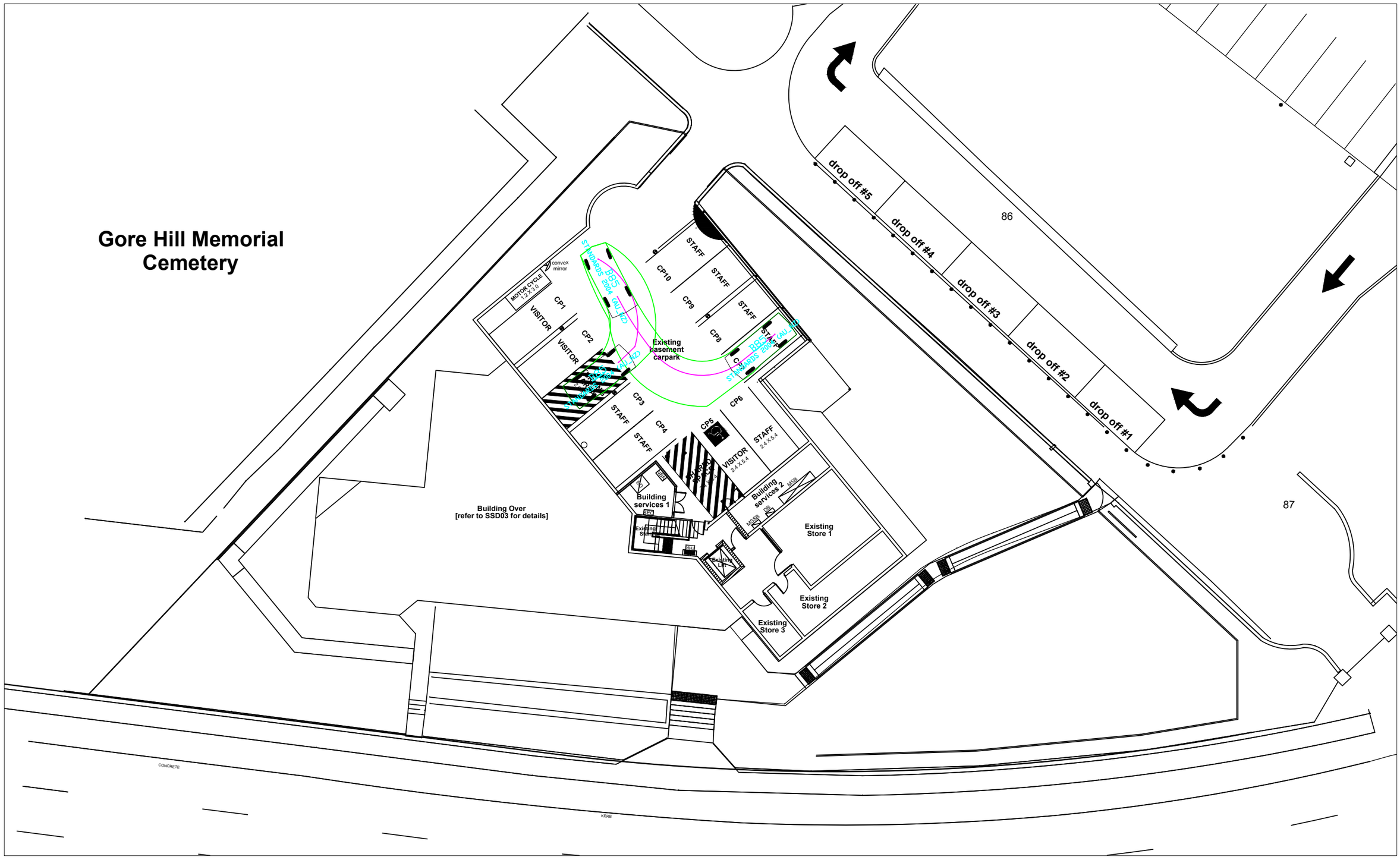
Gore Hill Memorial Cemetery



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STANBURY TRAFFIC PLANNING

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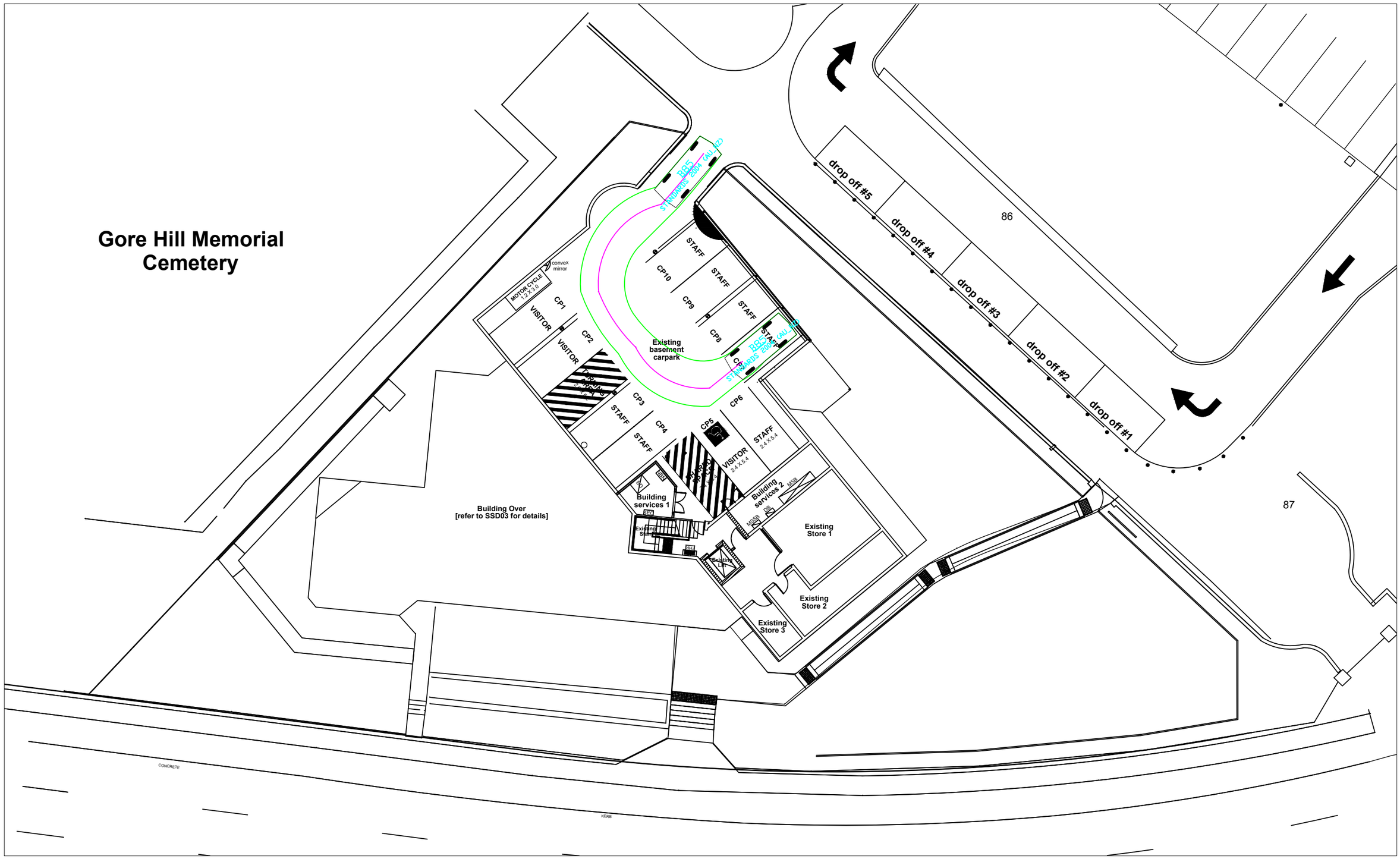
Gore Hill Memorial Cemetery



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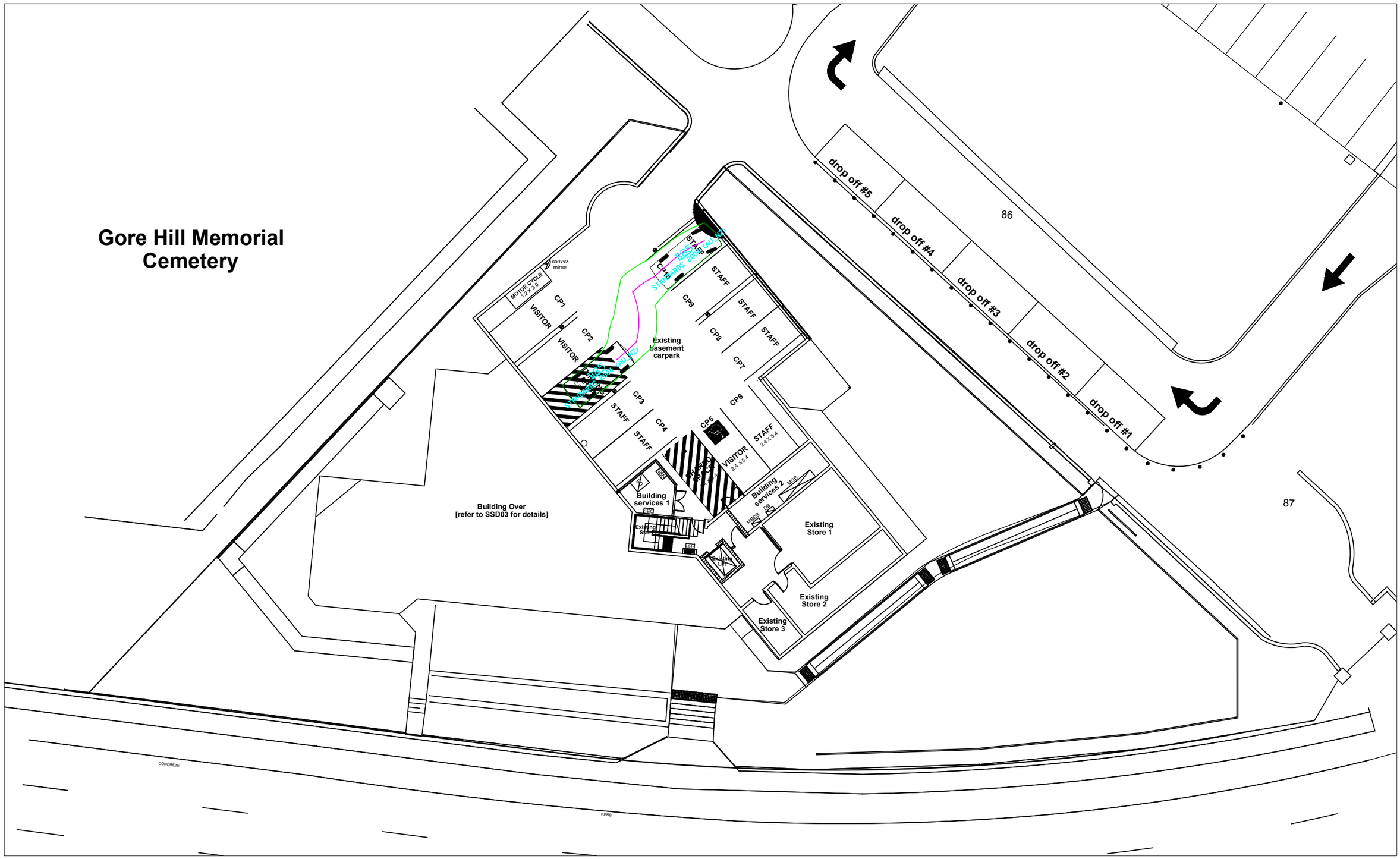

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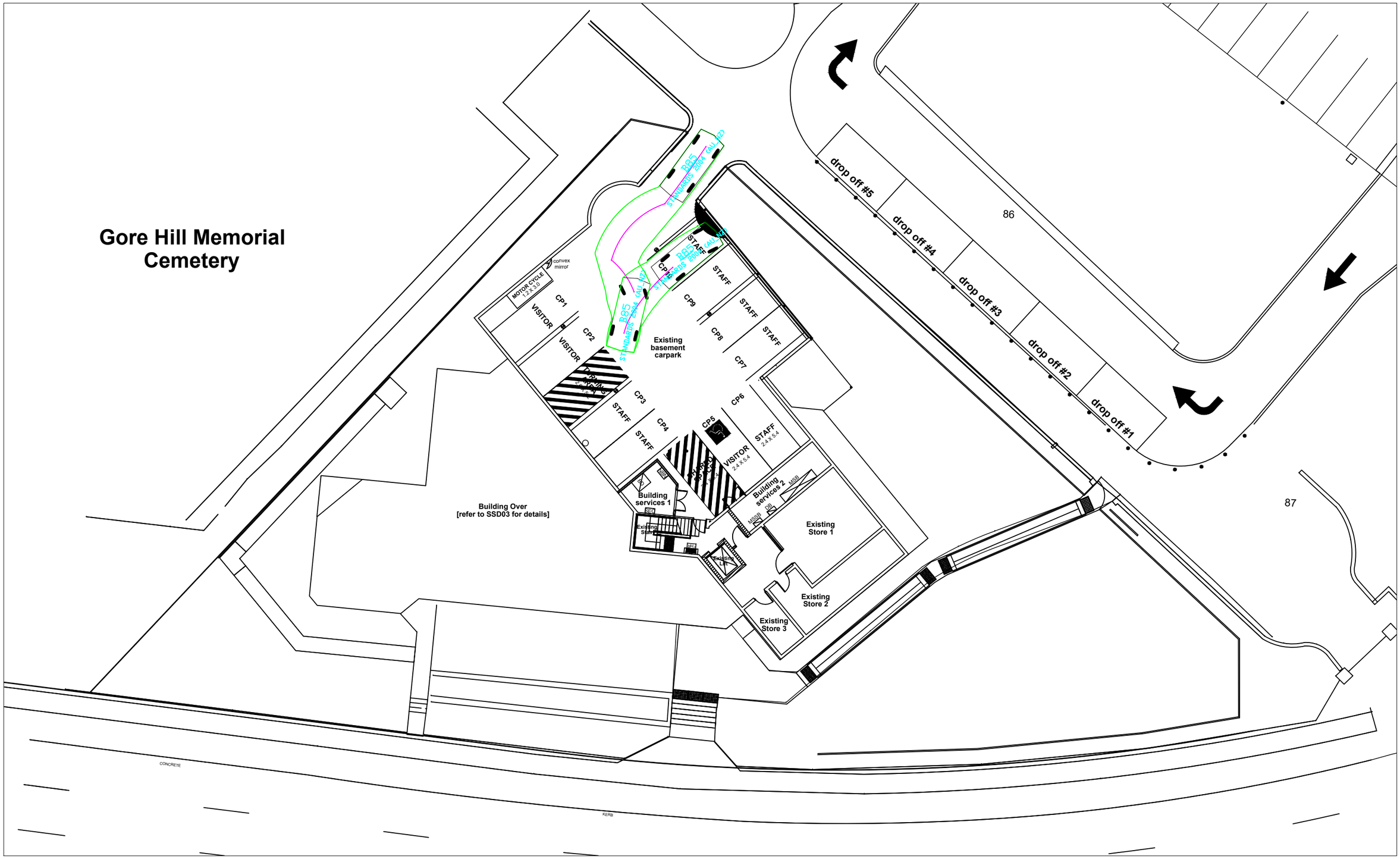
Gore Hill Memorial Cemetery



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APPENDIX 3

ETHOS URBAN

2 May 2019

211 Pacific Highway, ST LEONARDS – INTERNATIONAL CHINESE SCHOOL
GORE HILL OVAL AND CAR PARK DATA COLLECTION

1.0 Car Park Summary

For the purposes of the International Chinese School the anticipated hours in which the carpark will need to be used the most would be between usual school drop off and pick up times (8:00-10:00 and 14:30-16:00).

The school is proposing to utilise the existing car park off the Pacific Highway as the main entry to the school. A loop road is proposed to connect through to the front of the school to allow for drop off and pick up of students. Two car spaces will be lost in the car park to construct the loop road.

Council is concerned about the existing capacity of the car park and is already fielding complaints from local AFL teams about lack of parking.

1.1 Key Findings

- The number of cars utilising the car park between school drop off and pick up times is typically low, and the car park has significant capacity.
- The peak hour times identified in the car park are between 10:00 and 12:00.
- There were 37 car parking spaces (including 2 accessible spaces) identified in the car park. The average capacity of the car park was generally greater than 70% during school pick up and drop off times (except for Wednesday which fell to 56.8%). The only time in which the car park fell below 50% capacity was during the peak hour times between 11:00 and 14:00.
- The car park provides for a maximum stay of 2 hours.
- Often cars were parked in the car park for up to 2-3 hours.
- Majority of cars arriving at the car park had more than one person (usually a parent and child) and mostly used the adjacent playground.
- The total average length of stay in the car park is 1hour and 3 minutes per car. The longest time a single car remained in the car park was approximately 4 hours.

Tables 1 and **2** outline the car park capacity each hour.

Table 1 Average car park capacity per hour

Time period (hour)	Car park capacity (%)
8:00-9:00	89.2
9:00-10:00	79.5
10:00-11:00	80.5
11:00-12:00	74.6
12:00-13:00	68.1
13:00-14:00	71.9
14:00-15:00	81.6
15:00-16:00	78.9

Table 2 Car park arrival and capacity summary per day

Hour of Arrival	Number of Cars (No.)	Capacity (No.)	Capacity (%)
Monday			
8:00-9:00	4	33	89.2
9:00-10:00	7	30	81.1
10:00-11:00	10	27	73.0
11:00-12:00	10	27	73.0
12:00-13:00	11	26	70.3
13:00-14:00	10	27	73.0
14:00-15:00	5	32	86.5
15:00-16:00	9	28	75.7
Tuesday			
8:00-9:00	6	31	83.8
9:00-10:00	9	28	75.7
10:00-11:00	6	31	83.8
11:00-12:00	7	30	81.1
12:00-13:00	4	33	89.2
13:00-14:00	3	34	91.9
14:00-15:00	3	34	91.9
15:00-16:00	2	35	94.6
Wednesday			
8:00-9:00	2	35	94.6
9:00-10:00	7	30	81.1
10:00-11:00	5	32	86.5
11:00-12:00	10	27	73.0
12:00-13:00	21	16	43.2
13:00-14:00	19	18	48.6
14:00-15:00	14	23	62.2
15:00-16:00	16	21	56.8
Thursday			
8:00-9:00	3	34	91.9
9:00-10:00	11	26	70.3
10:00-11:00	12	25	67.6
11:00-12:00	19	18	48.6
12:00-13:00	22	15	40.5
13:00-14:00	16	21	56.8
14:00-15:00	8	29	78.4
15:00-16:00	6	31	83.8
Friday			
8:00-9:00	5	32	86.5
9:00-10:00	4	33	89.2

Hour of Arrival	Number of Cars (No.)	Capacity (No.)	Capacity (%)
10:00-11:00	3	34	91.9
11:00-12:00	1	36	97.3
12:00-13:00	1	36	97.3
13:00-14:00	4	33	89.2
14:00-15:00	4	33	89.2
15:00-16:00	6	31	83.8

Figure 1 Gore Hill car park between 12:00 and 13:00

2.0 Open Space Study

The proposed site for the International Chinese School has limited open space for the students and negotiation with Council has commenced to allow the school to access Gore Hill Oval and possibly the adjacent spaces including the playground.

Council has allowed access to Gore Hill Oval under the condition that the booking concludes before Midday as they have existing corporate bookings for the oval use after this time.

The purpose of the open space study is to confirm the extent or conflict that the school use of the facilities will have on the public by understanding the peak times of use. By identifying peak times, we can best inform the most suitable time for the school to use the open space facilities that will have a negligible impact on the community.

Our studies over a five-day data collection period concluded that the use of the oval prior to midday would have no detrimental impact on the public use.

2.1 Key Findings

- The most used open space facility is the playground, which proved to be consistently busy between the hours of 10:00 and 14:00.
- The peak times identified for the oval are between 12:00 and 14:00. Corporate bookings occurred during this time period as well as a large amount of people using the track for running etc.
- Outside of the peak hours identified for the oval, people were seen running around the outside of the oval. The use of the oval by the school would not impact this activity.
- After 15:00, school sports teams had made bookings for training sessions. Both public and private schools were identified to be using the oval for this purpose.
- The basketball court is usually vacant outside of business lunch hours (12:00-14:00).
- Occasionally, people were identified bringing their dogs to the oval to play with them.
- The highest recorded method of arrival is walking
- Most people arriving by use of the car park used the adjacent playground.
- The adjacent open space parklands are usually vacant outside of business lunch hours however it is noted that it is close to a major road with no boundaries.

In Summary, the use of the oval outside of the hours of 12:00-14:00 should not be problematic nor impact on public use. The use of the playground however may be more difficult considering the consistently high number of people using it each hour. Another option to alleviate this is the use of the basketball court which has minimal public use outside of business lunch hours.

As council mentioned, there are often booking associated with the use of the oval. From the data collected, there was always sports games happening on the oval between 12:00 and 13:30 and school sports teams often had bookings for the oval for from 15:30 onwards.

Tables 3 and 4 provide a summary of the use of each facility at Gore Hill Oval.

Table 3 Average number of people using each facility per hour

Hour of Arrival	Oval (No.)	Playground (No.)	Adjacent Open Space (No.)	Other (No.)
8:00-9:00	4	4	2	1
9:000-10:00	4	9	3	0
10:00-11:00	3	19	5	0
11:00-12:00	14	12	3	1
12:00-13:00	26	14	8	1
13:00-14:00	6	7	5	0
14:00-15:00	4	7	1	0
15:00-16:00	16	10	1	0

Table 4 Number of arrivals at each facility per hour

Hour of arrival	Oval (No.)	Playground (No.)	Adjacent Open Space (No.)	Other (No.)
Monday				
8:00-9:00	4	4	0	0
9:00-10:00	1	6	0	0
10:00-11:00	0	27	6	0
11:00-12:00	40	25	6	3
12:00-13:00	24	13	14	0
13:00-14:00	9	4	7	0
14:00-15:00	6	1	1	0
15:00-16:00	45	8	0	0
Tuesday				
8:00-9:00	4	11	2	0
9:00-10:00	1	19	2	0
10:00-11:00	2	17	4	0
11:00-12:00	0	2	0	0
12:00-13:00	20	2	4	0
13:00-14:00	3	7	3	0
14:00-15:00	4	6	5	2
15:00-16:00	5	7	6	0
Wednesday				
8:00-9:00	0	0	6	0
9:00-10:00	0	14	5	0
10:00-11:00	0	24	7	0
11:00-12:00	3	23	2	2
12:00-13:00	43	14	22	3
13:00-14::00	5	14	9	0
14:00-15:00	1	13	1	0
15:00-16:00	24	12	0	0

Hour of arrival	Oval (No.)	Playground (No.)	Adjacent Open Space (No.)	Other (No.)
Thursday				
8:00-9:00	10	3	0	5
9:00-10:00	15	6	2	1
10:00-11:00	11	17	6	0
11:00-12:00	24	2	4	0
12:00-13:00	45	37	0	1
13:00-14:00	10	4	5	2
14:00-15:00	7	8	0	0
15:00-16:00	6	3	0	1
Friday				
8:00-9:00	1	0	1	0
9:00-10:00	1	0	4	0
10:00-11:00	1	12	3	2
11:00-12:00	3	8	2	0
12:00-13:00	0	3	1	0
13:00-14:00	4	4	3	0
14:00-15:00	0	7	0	0
15:00-16:00	1	22	1	0

Figure 2 Gore Hill Oval and playground at 12:30pm

Figure 3 Gore Hill playground at 9:30am

Figure 4 Gore Hill adjacent facilities at 12:30pm

Client	Stanbury Traffic Planning
Location	St Leonards - Gore Hill Car Park Count
Date	Tuesday, 8th May 2019
Survey Time	7:00-9:30 & 14:30-18:00 (6hrs)
Description	Gor Hill Car Park IN & OUT

Car Park Total Space	37	
Parking before Survey time	AM	3
	PM	1

[15mins interval]

Time Period	Gor Hill Car Park Access												Grand Total	Parking Total	Parking Occupancy
	IN (Right-turn)			IN (Left-turn)			OUT (Left-turn)			OUT (Right-turn)					
	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total			
7:00 to 7:15	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**	**3**	**8%**
7:15 to 7:30	0	0	**0**	1	0	**1**	2	0	**2**	0	0	**0**	**3**	**2**	**5%**
7:30 to 7:45	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**	**2**	**5%**
7:45 to 8:00	0	0	**0**	2	0	**2**	3	0	**3**	0	0	**0**	**5**	**2**	**5%**
8:00 to 8:15	0	0	**0**	0	0	**0**	0	0	**0**	0	0	**0**	**0**	**3**	**8%**
8:15 to 8:30	0	0	**0**	1	0	**1**	2	0	**2**	0	0	**0**	**3**	**2**	**5%**
8:30 to 8:45	0	0	**0**	0	0	**0**	1	0	**1**	0	0	**0**	**1**	**2**	**5%**
8:45 to 9:00	0	0	**0**	3	0	**3**	0	0	**0**	0	0	**0**	**3**	**6**	**16%**
9:00 to 9:15	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	**2**	**5**	**14%**
9:15 to 9:30	0	0	**0**	2	0	**2**	2	0	**2**	0	0	**0**	**4**	**3**	**8%**
AM Total	**0**	**0**	**0**	**11**	**0**	**11**	**10**	**0**	**10**	**0**	**0**	**0**	**21**	**-**	**-**
14:30 to 14:45	0	0	**0**	2	0	**2**	0	0	**0**	0	0	**0**	**2**	**3**	**8%**
14:45 to 15:00	0	0	**0**	1	0	**1**	2	0	**2**	0	0	**0**	**3**	**2**	**5%**
15:00 to 15:15	0	0	**0**	3	0	**3**	3	0	**3**	0	0	**0**	**6**	**2**	**5%**
15:15 to 15:30	0	0	**0**	6	0	**6**	0	0	**0**	0	0	**0**	**6**	**8**	**22%**
15:30 to 15:45	0	0	**0**	5	0	**5**	1	0	**1**	0	0	**0**	**6**	**12**	**32%**
15:45 to 16:00	0	0	**0**	2	0	**2**	1	0	**1**	0	0	**0**	**3**	**13**	**35%**
16:00 to 16:15	0	0	**0**	3	0	**3**	4	0	**4**	0	0	**0**	**7**	**12**	**32%**
16:15 to 16:30	0	0	**0**	15	0	**15**	5	0	**5**	0	0	**0**	**20**	**22**	**59%**
16:30 to 16:45	0	0	**0**	11	0	**11**	2	0	**2**	0	0	**0**	**13**	**31**	**84%**
16:45 to 17:00	0	0	**0**	11	0	**11**	11	0	**11**	0	0	**0**	**22**	**31**	**84%**
17:00 to 17:15	0	0	**0**	12	0	**12**	11	0	**11**	0	0	**0**	**23**	**32**	**86%**
17:15 to 17:30	0	0	**0**	4	0	**4**	5	0	**5**	0	0	**0**	**9**	**31**	**84%**
17:30 to 17:45	0	0	**0**	7	0	**7**	22	0	**22**	0	0	**0**	**29**	**16**	**43%**
17:45 to 18:00	0	0	**0**	5	0	**5**	6	0	**6**	0	0	**0**	**11**	**15**	**41%**
PM Total	**0**	**0**	**0**	**87**	**0**	**87**	**73**	**0**	**73**	**0**	**0**	**0**	**160**	**-**	**-**

Hourly Summary

Time Period	Gor Hill Car Park Access												Grand Total
	IN (Right-turn)			IN (Left-turn)			OUT (Left-turn)			OUT (Right-turn)			
	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
7:00 to 8:00	0	0	**0**	3	0	**3**	5	0	**5**	0	0	**0**	**8**
7:15 to 8:15	0	0	**0**	3	0	**3**	5	0	**5**	0	0	**0**	**8**
7:30 to 8:30	0	0	**0**	3	0	**3**	5	0	**5**	0	0	**0**	**8**
7:45 to 8:45	0	0	**0**	3	0	**3**	6	0	**6**	0	0	**0**	**9**
8:00 to 9:00	0	0	**0**	4	0	**4**	3	0	**3**	0	0	**0**	**7**
8:15 to 9:15	0	0	**0**	6	0	**6**	3	0	**3**	0	0	**0**	**9**
8:30 to 9:30	0	0	**0**	7	0	**7**	3	0	**3**	0	0	**0**	**10**
AM Total	**0**	**0**	**0**	**11**	**0**	**11**	**10**	**0**	**10**	**0**	**0**	**0**	**21**
14:30 to 15:30	0	0	**0**	12	0	**12**	5	0	**5**	0	0	**0**	**17**
14:45 to 15:45	0	0	**0**	15	0	**15**	6	0	**6**	0	0	**0**	**21**
15:00 to 16:00	0	0	**0**	16	0	**16**	5	0	**5**	0	0	**0**	**21**
15:15 to 16:15	0	0	**0**	16	0	**16**	6	0	**6**	0	0	**0**	**22**
15:30 to 16:30	0	0	**0**	25	0	**25**	11	0	**11**	0	0	**0**	**36**
15:45 to 16:45	0	0	**0**	31	0	**31**	12	0	**12**	0	0	**0**	**43**
16:00 to 17:00	0	0	**0**	40	0	**40**	22	0	**22**	0	0	**0**	**62**
16:15 to 17:15	0	0	**0**	49	0	**49**	29	0	**29**	0	0	**0**	**78**
16:30 to 17:30	0	0	**0**	38	0	**38**	29	0	**29**	0	0	**0**	**67**
16:45 to 17:45	0	0	**0**	34	0	**34**	49	0	**49**	0	0	**0**	**83**
17:00 to 18:00	0	0	**0**	28	0	**28**	44	0	**44**	0	0	**0**	**72**
PM Total	**0**	**0**	**0**	**87**	**0**	**87**	**73**	**0**	**73**	**0**	**0**	**0**	**160**

[Peak Hour Summary]

Time Period	Gor Hill Car Park Access												Grand Total
	IN (Right-turn)			IN (Left-turn)			OUT (Left-turn)			OUT (Right-turn)			
	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	Lights	Heavies	Total	
8:30 to 9:30	0	0	**0**	7	0	**7**	3	0	**3**	0	0	**0**	**10**
16:45 to 17:45	0	0	**0**	34	0	**34**	49	0	**49**	0	0	**0**	**83**

APPENDIX 4

St Leonards IC - Traffic Flows

MATRIX Traffic and Transport Data

Search By Time and Classfication

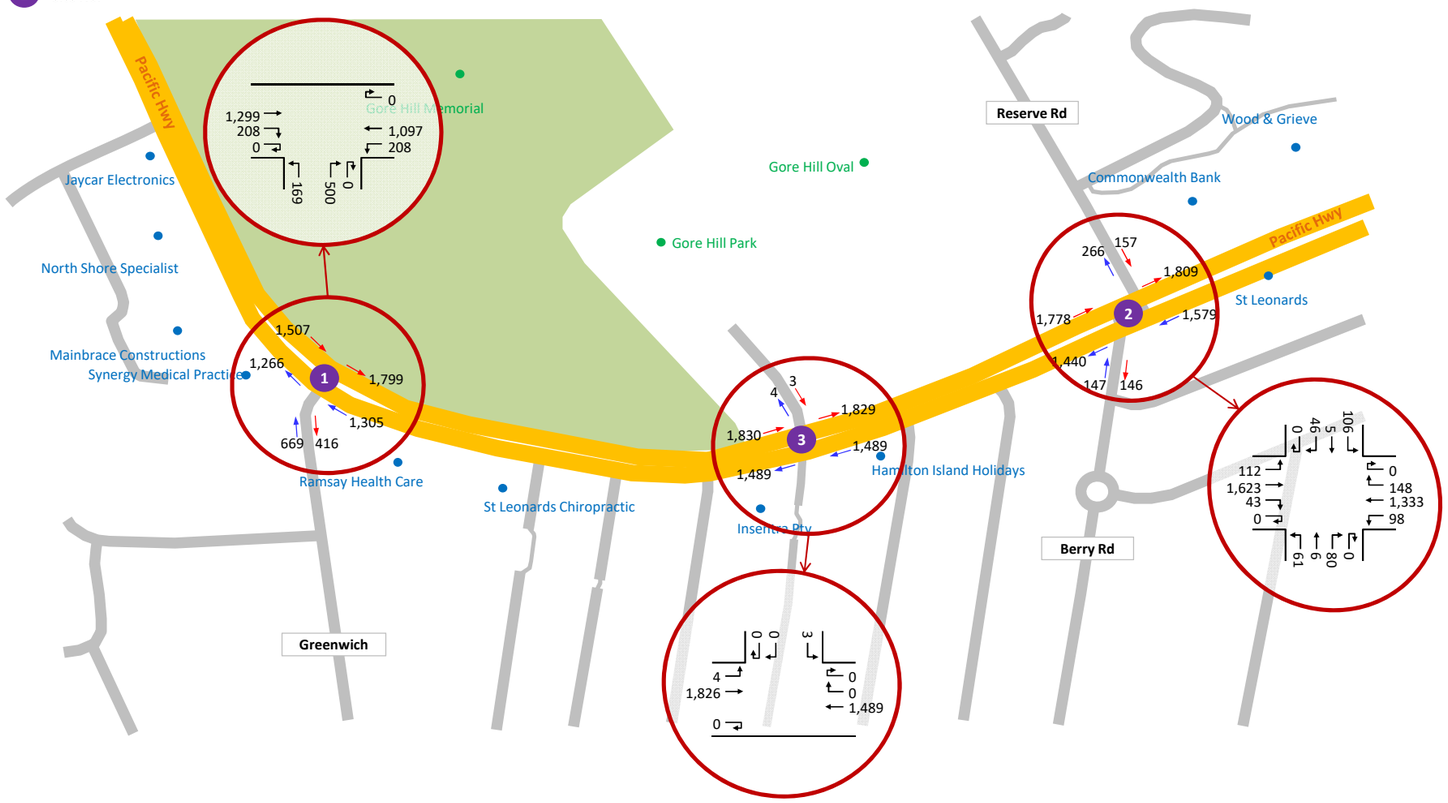
Day	Start Time	End Time	Classification
AM	8:00	9:00	All vehicles

Volume Forecasting

0 % * 0 = original survey data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

1 Site No.



St Leonards IC - Traffic Flows

MATRIX Traffic and Transport Data

Search By Time and Classfication

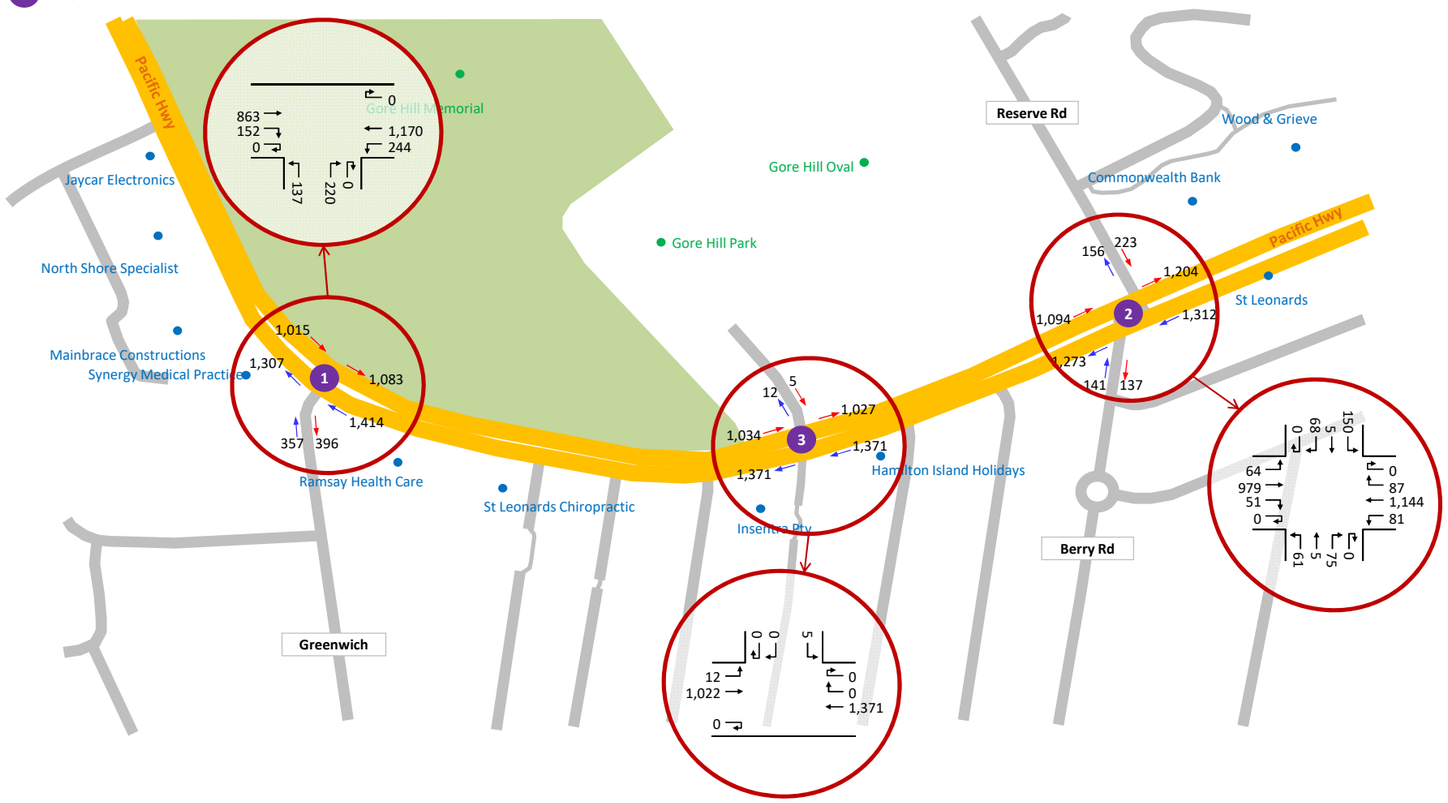
Day	Start Time	End Time	Classification
PM	14:30	15:30	All vehicles

Volume Forecasting

0 % * 0 = original survey data

(e.g. input 20 for volume increase 20% or -20 for volume decrease 20%)

1 Site No.



APPENDIX 5

MOVEMENT SUMMARY

Site: [Pacific Highway & Greenwich Road]

Existing AM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Greenwich Road												
1	L2	169	5.0	0.640	44.9	LOS D	17.5	127.8	0.92	0.84	0.92	33.9
3	R2	500	5.0	0.640	45.9	LOS D	17.5	127.8	0.93	0.84	0.93	33.8
Approach		669	5.0	0.640	45.6	LOS D	17.5	127.8	0.93	0.84	0.93	33.8
East: Pacific Highway East												
4	L2	208	5.0	0.148	8.9	LOS A	2.9	21.2	0.26	0.65	0.26	50.9
5	T1	1097	5.0	0.645	27.3	LOS B	24.7	180.0	0.83	0.75	0.83	41.5
Approach		1305	5.0	0.645	24.4	LOS B	24.7	180.0	0.74	0.73	0.74	42.7
West: Pacific Highway West												
11	T1	1299	5.0	0.372	12.1	LOS A	12.4	90.3	0.53	0.47	0.53	50.1
12	R2	208	5.0	0.636	48.7	LOS D	11.2	81.5	0.98	0.96	1.25	32.8
Approach		1507	5.0	0.636	17.1	LOS B	12.4	90.3	0.60	0.54	0.63	46.7
All Vehicles		3481	5.0	0.645	25.3	LOS B	24.7	180.0	0.72	0.67	0.73	42.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	54.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway & Greenwich Road]

Existing PM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 122 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Greenwich Road												
1	L2	137	5.0	0.546	53.0	LOS D	10.6	77.6	0.95	0.82	0.95	31.6
3	R2	220	5.0	0.546	56.0	LOS D	10.6	77.6	0.96	0.81	0.96	30.9
Approach		357	5.0	0.546	54.9	LOS D	10.6	77.6	0.96	0.81	0.96	31.1
East: Pacific Highway East												
4	L2	244	5.0	0.177	9.5	LOS A	3.8	27.4	0.28	0.66	0.28	50.5
5	T1	1170	5.0	0.556	18.3	LOS B	22.0	160.5	0.69	0.62	0.69	46.1
Approach		1414	5.0	0.556	16.8	LOS B	22.0	160.5	0.62	0.63	0.62	46.8
West: Pacific Highway West												
11	T1	863	5.0	0.289	5.5	LOS A	7.8	57.0	0.35	0.31	0.35	55.1
12	R2	152	5.0	0.407	30.7	LOS C	7.5	54.6	0.87	0.83	0.87	39.1
Approach		1015	5.0	0.407	9.2	LOS A	7.8	57.0	0.43	0.38	0.43	51.9
All Vehicles		2786	5.0	0.556	18.9	LOS B	22.0	160.5	0.59	0.56	0.59	45.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	55.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	55.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	55.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway & Car Park Access Road]

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
North: Access Road												
7	L2	3	5.0	0.004	8.2	LOS A	0.0	0.1	0.52	0.61	0.52	51.5
Approach		3	5.0	0.004	8.2	LOS A	0.0	0.1	0.52	0.61	0.52	51.5
West: Pacific Highway West												
10	L2	4	5.0	0.323	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	58.0
11	T1	1826	5.0	0.323	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1830	5.0	0.323	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1833	5.0	0.323	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.9

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: [Pacific Highway & Car Park Access Road]

Existing PM
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
North: Access Road												
7	L2	5	5.0	0.003	5.8	LOS A	0.0	0.1	0.17	0.53	0.17	52.9
Approach		5	5.0	0.003	5.8	LOS A	0.0	0.1	0.17	0.53	0.17	52.9
West: Pacific Highway West												
10	L2	12	5.0	0.050	5.6	LOS A	0.0	0.0	0.00	0.08	0.00	57.4
11	T1	1022	5.0	0.249	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		1034	5.0	0.249	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles		1039	5.0	0.249	0.1	NA	0.0	0.1	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: [Pacific Highway, Reserve Road & Berry Road]

Exisitng AM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 121 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Berry Road												
1	L2	61	5.0	0.179	50.1	LOS D	3.0	22.2	0.88	0.75	0.88	32.4
2	T1	6	5.0	0.703	63.6	LOS E	5.4	39.3	1.00	0.85	1.15	28.2
3	R2	80	5.0	0.703	69.3	LOS E	5.4	39.3	1.00	0.85	1.15	27.9
Approach		147	5.0	0.703	61.1	LOS E	5.4	39.3	0.95	0.80	1.04	29.6
East: Pacific Highway East												
4	L2	98	5.0	0.105	21.1	LOS B	2.9	21.0	0.54	0.70	0.54	43.6
5	T1	1333	5.0	0.760	22.8	LOS B	28.9	211.0	0.80	0.72	0.80	43.6
6	R2	148	5.0	0.770	34.9	LOS C	5.6	40.9	0.94	0.90	1.15	37.5
Approach		1579	5.0	0.770	23.9	LOS B	28.9	211.0	0.80	0.74	0.82	43.0
North: Reserve Road												
7	L2	106	5.0	0.155	31.9	LOS C	4.1	29.7	0.69	0.74	0.69	38.6
8	T1	5	5.0	0.450	61.5	LOS E	3.1	22.4	1.00	0.75	1.00	28.8
9	R2	46	5.0	0.450	67.1	LOS E	3.1	22.4	1.00	0.75	1.00	28.4
Approach		157	5.0	0.450	43.1	LOS D	4.1	29.7	0.79	0.74	0.79	34.6
West: Pacific Highway West												
10	L2	112	5.0	0.603	27.1	LOS B	23.9	174.7	0.75	0.71	0.75	42.7
11	T1	1623	5.0	0.603	21.3	LOS B	24.2	176.4	0.75	0.68	0.75	44.3
12	R2	43	5.0	0.214	23.3	LOS B	1.1	7.8	0.76	0.72	0.76	42.4
Approach		1778	5.0	0.603	21.7	LOS B	24.2	176.4	0.75	0.68	0.75	44.1
All Vehicles		3661	5.0	0.770	25.1	LOS B	28.9	211.0	0.78	0.71	0.79	42.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	54.8	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	54.8	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	54.8	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	54.8	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway, Reserve Road & Berry Road]

Exisitng PM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Berry Road												
1	L2	61	5.0	0.146	44.9	LOS D	2.8	20.7	0.83	0.74	0.83	33.9
2	T1	5	5.0	0.469	55.0	LOS D	4.6	33.3	0.97	0.78	0.97	30.2
3	R2	75	5.0	0.469	60.6	LOS E	4.6	33.3	0.97	0.78	0.97	29.9
Approach		141	5.0	0.469	53.6	LOS D	4.6	33.3	0.91	0.76	0.91	31.5
East: Pacific Highway East												
4	L2	81	5.0	0.473	29.5	LOS C	16.2	118.5	0.74	0.68	0.74	41.6
5	T1	1144	5.0	0.473	23.9	LOS B	16.4	119.8	0.74	0.66	0.74	42.9
6	R2	87	5.0	0.312	22.5	LOS B	2.6	18.8	0.70	0.72	0.70	43.0
Approach		1312	5.0	0.473	24.2	LOS B	16.4	119.8	0.74	0.67	0.74	42.8
North: Reserve Road												
7	L2	150	5.0	0.189	27.3	LOS B	5.3	38.5	0.65	0.74	0.65	40.6
8	T1	5	5.0	0.429	55.4	LOS D	4.2	30.3	0.97	0.77	0.97	30.1
9	R2	68	5.0	0.429	61.1	LOS E	4.2	30.3	0.97	0.77	0.97	29.8
Approach		223	5.0	0.429	38.2	LOS C	5.3	38.5	0.75	0.75	0.75	36.3
West: Pacific Highway West												
10	L2	64	5.0	0.420	28.8	LOS C	14.0	102.1	0.72	0.66	0.72	42.0
11	T1	979	5.0	0.420	23.0	LOS B	14.1	103.0	0.71	0.63	0.71	43.4
12	R2	51	5.0	0.208	22.7	LOS B	1.5	10.7	0.71	0.71	0.71	42.9
Approach		1094	5.0	0.420	23.3	LOS B	14.1	103.0	0.71	0.63	0.71	43.3
All Vehicles		2770	5.0	0.473	26.5	LOS B	16.4	119.8	0.74	0.66	0.74	41.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	54.3	LOS E			0.95	0.95

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

APPENDIX 6

MOVEMENT SUMMARY

Site: [Pacific Highway & Greenwich Road]

Projected AM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Greenwich Road												
1	L2	169	5.0	0.660	44.5	LOS D	18.5	135.0	0.93	0.85	0.93	34.1
3	R2	539	5.0	0.660	45.4	LOS D	18.5	135.0	0.93	0.84	0.93	33.9
Approach		708	5.0	0.660	45.2	LOS D	18.5	135.0	0.93	0.84	0.93	33.9
East: Pacific Highway East												
4	L2	221	5.0	0.157	9.0	LOS A	3.1	22.7	0.26	0.65	0.26	50.9
5	T1	1123	5.0	0.673	28.4	LOS B	25.9	189.1	0.86	0.77	0.86	40.9
Approach		1344	5.0	0.673	25.2	LOS B	25.9	189.1	0.76	0.75	0.76	42.3
West: Pacific Highway West												
11	T1	1325	5.0	0.384	12.7	LOS A	13.0	94.7	0.55	0.49	0.55	49.7
12	R2	208	5.0	0.652	50.9	LOS D	11.3	82.3	0.99	0.97	1.30	32.1
Approach		1533	5.0	0.652	17.9	LOS B	13.0	94.7	0.61	0.55	0.65	46.2
All Vehicles		3585	5.0	0.673	26.0	LOS B	25.9	189.1	0.73	0.68	0.75	41.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	54.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway & Greenwich Road]

Projected PM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Greenwich Road												
1	L2	137	5.0	0.563	52.1	LOS D	11.1	81.1	0.95	0.82	0.95	31.8
3	R2	248	5.0	0.563	54.4	LOS D	11.1	81.1	0.96	0.81	0.96	31.3
Approach		385	5.0	0.563	53.6	LOS D	11.1	81.1	0.96	0.82	0.96	31.5
East: Pacific Highway East												
4	L2	254	5.0	0.183	9.3	LOS A	3.8	27.7	0.28	0.66	0.28	50.7
5	T1	1188	5.0	0.572	18.8	LOS B	22.5	164.2	0.71	0.64	0.71	45.9
Approach		1442	5.0	0.572	17.1	LOS B	22.5	164.2	0.63	0.64	0.63	46.6
West: Pacific Highway West												
11	T1	881	5.0	0.302	5.9	LOS A	8.3	60.7	0.37	0.32	0.37	54.7
12	R2	152	5.0	0.426	32.3	LOS C	7.7	56.2	0.90	0.84	0.90	38.4
Approach		1033	5.0	0.426	9.8	LOS A	8.3	60.7	0.45	0.40	0.45	51.5
All Vehicles		2860	5.0	0.572	19.4	LOS B	22.5	164.2	0.61	0.58	0.61	45.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		105	54.3	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway & Car Park Access Road]

Projected 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
North: Access Road												
7	L2	68	5.0	0.077	8.2	LOS A	0.3	2.1	0.52	0.72	0.52	51.5
Approach		68	5.0	0.077	8.2	LOS A	0.3	2.1	0.52	0.72	0.52	51.5
West: Pacific Highway West												
10	L2	69	5.0	0.335	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.5
11	T1	1826	5.0	0.335	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		1895	5.0	0.335	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles		1963	5.0	0.335	0.5	NA	0.3	2.1	0.02	0.05	0.02	59.3

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: [Pacific Highway & Car Park Access Road]

Projected PM
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
North: Access Road												
7	L2	51	5.0	0.033	5.7	LOS A	0.1	1.0	0.11	0.54	0.11	53.1
Approach		51	5.0	0.033	5.7	LOS A	0.1	1.0	0.11	0.54	0.11	53.1
West: Pacific Highway West												
10	L2	58	5.0	0.052	5.6	LOS A	0.0	0.0	0.00	0.36	0.00	55.1
11	T1	1022	5.0	0.261	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		1080	5.0	0.261	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.5
All Vehicles		1131	5.0	0.261	0.6	NA	0.1	1.0	0.00	0.05	0.00	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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: [Pacific Highway, Reserve Road & Berry Road]

Projected AM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 127 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Berry Road												
1	L2	100	5.0	0.283	52.7	LOS D	5.3	38.8	0.89	0.77	0.89	31.7
2	T1	6	5.0	0.803	71.2	LOS F	5.9	42.9	1.00	0.90	1.30	26.7
3	R2	80	5.0	0.803	76.8	LOS F	5.9	42.9	1.00	0.90	1.30	26.4
Approach		186	5.0	0.803	63.6	LOS E	5.9	42.9	0.94	0.83	1.08	29.0
East: Pacific Highway East												
4	L2	98	5.0	0.105	21.9	LOS B	3.0	22.0	0.54	0.70	0.54	43.1
5	T1	1359	5.0	0.778	24.3	LOS B	31.3	228.7	0.81	0.74	0.81	42.9
6	R2	148	5.0	0.817	42.7	LOS D	6.6	48.4	0.97	0.95	1.27	34.8
Approach		1605	5.0	0.817	25.8	LOS B	31.3	228.7	0.81	0.75	0.84	42.0
North: Reserve Road												
7	L2	106	5.0	0.153	32.6	LOS C	4.2	30.9	0.69	0.74	0.69	38.3
8	T1	5	5.0	0.510	66.3	LOS E	3.3	23.9	1.00	0.75	1.00	27.7
9	R2	46	5.0	0.510	71.9	LOS F	3.3	23.9	1.00	0.75	1.00	27.4
Approach		157	5.0	0.510	45.2	LOS D	4.2	30.9	0.79	0.74	0.79	33.9
West: Pacific Highway West												
10	L2	112	5.0	0.625	28.6	LOS C	26.4	192.9	0.77	0.72	0.77	42.0
11	T1	1649	5.0	0.625	22.6	LOS B	26.7	194.8	0.75	0.69	0.75	43.6
12	R2	82	5.0	0.432	26.4	LOS B	2.2	16.3	0.84	0.76	0.84	40.9
Approach		1843	5.0	0.625	23.1	LOS B	26.7	194.8	0.76	0.69	0.76	43.4
All Vehicles		3791	5.0	0.817	27.2	LOS B	31.3	228.7	0.79	0.73	0.81	41.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	57.8	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	57.8	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	57.8	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	57.8	LOS E			0.95	0.95

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

MOVEMENT SUMMARY

Site: [Pacific Highway, Reserve Road & Berry Road]

Projected PM
Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 122 seconds (Site Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Berry Road												
1	L2	90	5.0	0.211	45.8	LOS D	4.3	31.4	0.84	0.76	0.84	33.6
2	T1	5	5.0	0.477	56.1	LOS D	4.6	33.9	0.98	0.78	0.98	30.0
3	R2	75	5.0	0.477	61.8	LOS E	4.6	33.9	0.98	0.78	0.98	29.6
Approach		170	5.0	0.477	53.2	LOS D	4.6	33.9	0.91	0.77	0.91	31.6
East: Pacific Highway East												
4	L2	81	5.0	0.480	30.0	LOS C	16.8	122.6	0.74	0.68	0.74	41.4
5	T1	1162	5.0	0.480	24.3	LOS B	17.0	123.8	0.74	0.66	0.74	42.7
6	R2	87	5.0	0.321	23.0	LOS B	2.6	19.1	0.71	0.72	0.71	42.8
Approach		1330	5.0	0.480	24.6	LOS B	17.0	123.8	0.74	0.67	0.74	42.6
North: Reserve Road												
7	L2	150	5.0	0.189	27.5	LOS B	5.3	39.1	0.64	0.74	0.64	40.5
8	T1	5	5.0	0.462	57.0	LOS E	4.3	31.1	0.98	0.77	0.98	29.8
9	R2	68	5.0	0.462	62.6	LOS E	4.3	31.1	0.98	0.77	0.98	29.4
Approach		223	5.0	0.462	38.9	LOS C	5.3	39.1	0.75	0.75	0.75	36.0
West: Pacific Highway West												
10	L2	64	5.0	0.436	29.3	LOS C	14.9	108.7	0.72	0.66	0.72	41.7
11	T1	997	5.0	0.436	23.4	LOS B	15.0	109.6	0.71	0.63	0.71	43.2
12	R2	79	5.0	0.329	23.5	LOS B	2.4	17.3	0.73	0.73	0.73	42.5
Approach		1140	5.0	0.436	23.7	LOS B	15.0	109.6	0.72	0.64	0.72	43.0
All Vehicles		2863	5.0	0.480	27.1	LOS B	17.0	123.8	0.74	0.67	0.74	41.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	South Full Crossing	53	55.3	LOS E	0.2	0.2	0.95	0.95
P3	North Full Crossing	53	55.3	LOS E	0.2	0.2	0.95	0.95
P4	West Full Crossing	53	55.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	55.3	LOS E			0.95	0.95

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

APPENDIX 7

Site: 883 Tuesday, 6 August 2019 Traffic Flow
filename:WILL_20190806.VS

Tuesday, 06 August 2019

EB L1, Detector: 5

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	1	0	0	1	0	3	11	11	7	14	8	0
:10	2	0	0	1	0	1	6	10	12	7	7	2
:15	0	0	0	0	0	2	5	14	15	10	11	2
:20	0	0	0	0	1	0	3	7	14	14	1	0
:25	0	0	1	3	2	6	4	8	11	16	5	0
:30	0	0	1	0	0	3	5	12	15	8	7	0
:35	1	0	0	0	0	5	10	11	7	10	2	2
:40	0	0	0	0	0	1	10	10	10	8	2	0
:45	1	0	0	0	1	3	11	9	11	4	1	0
:50	0	0	0	0	1	5	7	13	9	11	4	2
:55	1	1	0	0	1	2	11	7	9	11	3	0
:60	0	0	0	0	2	7	17	11	12	4	2	-
Hourly												
Total	6	1	2	5	8	38	100	123	132	117	53	8

AM Total: 593 AM peak 139 08:05 - 09:05

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	1	0	5	0	5	2	2	2	5	3	2
:10	0	0	3	3	1	4	4	3	2	2	0	1
:15	0	0	1	3	0	4	4	3	1	1	0	2

:20	0	0	4	5	0	10	6	2	0	5	3	0
:25	0	0	1	7	2	4	5	2	2	3	2	0
:30	0	0	3	4	1	7	2	4	1	1	1	3
:35	1	0	1	3	2	5	5	4	1	0	2	1
:40	1	0	5	1	5	5	7	4	2	2	1	1
:45	1	0	3	2	3	4	2	1	4	2	1	1
:50	0	0	2	2	7	2	8	2	1	2	1	0
:55	0	1	4	4	7	7	4	0	2	2	1	0
:60	1	1	2	1	3	1	0	0	2	3	4	0
Hourly												
Total	4	3	29	40	31	58	49	27	20	28	19	11

PM Total: 319 PM peak 65 16:45 - 17:45

Daily Total 912

EB L2, Detector: 6

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	2	3	1	4	0	9	29	40	53	72	45	40
:10	6	1	4	1	2	6	28	42	62	52	39	53
:15	3	4	3	0	3	8	28	50	68	49	48	48
:20	8	4	2	4	4	19	35	50	64	58	49	50
:25	4	1	3	3	6	18	29	45	61	61	49	39
:30	10	2	2	4	6	16	38	49	68	56	39	51
:35	5	1	0	2	11	13	42	49	71	58	49	43
:40	4	3	2	3	1	20	37	57	60	51	41	46

:45	6	1	1	2	7	26	55	56	60	49	41	43
:50	3	0	1	4	9	27	41	58	67	48	36	62
:55	4	1	1	2	12	31	42	63	60	73	52	49
:60	2	0	2	2	8	30	34	61	66	46	41	-
Hourly												
Total	57	21	22	31	69	223	438	620	760	673	529	524

AM Total: 3967 AM peak 779 08:05 - 09:05

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	59	41	58	45	59	49	37	30	32	9	16
:10	45	37	46	42	47	56	53	47	23	17	21	8
:15	40	39	33	43	46	54	45	38	20	31	14	12
:20	52	46	40	41	51	61	49	30	29	20	21	9
:25	37	42	42	51	48	58	51	27	27	20	12	8
:30	43	50	47	53	50	50	37	33	37	20	17	5
:35	50	38	42	48	35	57	74	28	31	17	15	10
:40	26	53	50	47	54	63	51	29	29	16	11	7
:45	38	47	50	33	41	57	33	28	31	19	10	10
:50	51	34	39	46	61	50	49	29	27	24	14	8
:55	46	41	34	52	51	53	42	30	26	12	5	7
:60	39	43	35	41	63	52	51	28	18	17	16	6
Hourly												
Total	467	529	499	555	592	670	584	384	328	245	165	106

PM Total: 5124 PM peak 690 16:45 - 17:45

Daily Total 9091

EB L3, Detector: 7

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	1	0	0	0	0	5	13	28	45	41	25	18
:10	1	0	0	0	0	3	9	30	57	43	27	32
:15	2	0	0	0	3	7	11	31	47	28	26	20
:20	0	1	0	0	0	9	28	29	44	41	25	26
:25	0	0	0	1	1	15	22	31	41	42	16	19
:30	2	1	0	0	0	9	27	55	52	44	26	24
:35	1	0	0	1	1	12	27	45	48	34	26	26
:40	0	0	0	0	1	9	29	44	39	39	23	28
:45	0	0	0	0	3	6	27	43	38	21	24	14
:50	0	0	0	1	3	14	30	45	51	28	18	39
:55	0	2	0	0	2	18	20	51	41	32	19	20
:60	0	0	0	0	5	17	30	58	30	24	19	-
Hourly Total	7	4	0	3	19	124	273	490	533	417	274	266

AM Total: 2410 AM peak 575 07:25 - 08:25

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	24	20	16	22	28	22	18	10	12	3	2
:10	18	25	14	29	20	41	31	19	9	9	4	1
:15	23	20	19	24	23	26	31	21	12	11	2	3
:20	22	23	20	19	30	36	28	17	11	7	6	2

:25	26	26	19	20	28	45	20	22	9	7	4	4
:30	15	19	28	16	32	27	18	21	13	14	6	2
:35	22	26	16	26	19	45	36	13	16	5	4	4
:40	19	26	27	25	31	37	18	12	10	8	1	2
:45	21	23	18	18	24	45	17	12	13	3	2	0
:50	20	17	23	21	38	34	17	12	10	5	4	1
:55	21	26	19	29	25	27	16	18	7	4	5	0
:60	23	17	19	21	29	30	20	8	9	9	4	0
Hourly												
Total	230	272	242	264	321	421	274	193	129	94	45	21

PM Total: 2506 PM peak 422 16:45 - 17:45

Daily Total 4916

EB L4 RT, Detector: 4

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	3	0	0	0	0	1	4	11	16	23	18	11
:10	1	0	1	0	0	2	8	13	14	18	10	12
:15	1	0	0	0	0	2	6	15	8	15	8	14
:20	1	0	0	0	0	1	3	14	14	14	8	10
:25	0	0	0	0	0	1	8	13	10	12	11	11
:30	1	0	0	0	1	4	7	9	9	11	11	14
:35	0	0	0	0	0	4	11	21	13	18	10	10
:40	0	0	1	0	1	3	13	17	11	12	11	18
:45	0	0	0	0	0	3	12	22	14	21	11	8

:50	1	0	1	0	0	5	14	20	23	15	9	9
:55	0	0	0	0	0	5	13	16	18	16	12	12
:60	0	0	0	0	0	7	14	15	25	11	11	-
Hourly												
Total	8	0	3	0	2	38	113	186	175	186	130	129

AM Total: 970 AM peak 210 08:45 - 09:45

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	18	7	20	15	22	9	14	5	7	3	1
:10	16	7	7	12	14	16	20	7	7	3	4	2
:15	7	14	16	21	13	21	26	11	9	9	9	3
:20	14	11	12	9	21	16	17	9	3	2	4	1
:25	16	12	12	14	14	17	11	10	9	5	4	3
:30	14	22	13	16	18	27	17	8	11	3	3	3
:35	10	8	12	16	13	17	11	5	6	4	3	0
:40	7	9	14	16	17	24	18	10	8	9	2	1
:45	17	10	17	18	14	3	10	8	12	6	2	0
:50	12	12	10	12	22	9	10	2	9	7	4	1
:55	6	8	11	12	20	25	9	8	5	3	4	1
:60	10	12	13	10	15	10	7	7	8	4	3	1
Hourly												
Total	129	143	144	176	196	207	165	99	92	62	45	17

PM Total: 1475 PM peak 231 16:40 - 17:40

Daily Total 2445

Site: 771 Tuesday, 6 August 2019 Traffic Flow
filename:WILL_20190806.VS

Tuesday, 06 August 2019

PH EB L1, Detector: 1

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	1	2	1	2	0	4	23	18	21	35	18	22
:10	3	0	1	0	0	2	13	19	32	29	17	17
:15	0	0	1	0	2	4	17	34	37	27	23	22
:20	0	0	1	1	2	5	17	2	30	27	20	16
:25	1	1	0	2	3	7	15	15	30	30	14	13
:30	0	0	0	1	0	5	20	25	36	29	23	17
:35	0	0	0	0	1	4	21	23	28	34	19	18
:40	0	0	0	0	1	8	19	27	30	22	16	21
:45	2	0	0	0	1	6	25	19	27	27	18	15
:50	0	0	0	1	3	12	23	32	28	24	20	18
:55	0	1	0	0	0	11	24	29	38	32	22	23
:60	0	0	1	1	1	15	17	25	30	29	17	-
Hourly Total	7	4	5	8	14	83	234	268	367	345	227	202

AM Total: 1764 AM peak 381 08:05 - 09:05

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	16	18	19	15	33	24	17	13	13	4	2
:10	17	9	18	13	13	19	18	15	11	11	8	6
:15	13	10	15	18	19	20	21	13	8	11	4	5

:20	15	18	14	14	26	20	21	13	9	10	11	2
:25	15	22	16	20	13	20	16	12	12	12	4	2
:30	16	12	22	12	16	27	14	7	4	4	6	2
:35	15	20	26	24	16	23	20	9	9	7	5	3
:40	20	11	18	19	23	26	24	17	12	10	4	2
:45	10	20	16	18	16	31	19	7	10	5	3	2
:50	13	14	22	21	19	16	19	16	10	9	2	2
:55	12	12	13	33	22	22	16	13	14	4	3	0
:60	10	17	15	18	20	20	19	7	9	9	10	2
Hourly												
Total	156	181	213	229	218	277	231	146	121	105	64	30

PM Total: 1971 PM peak 280 16:45 - 17:45

Daily Total 3735

PH EB L2, Detector: 2

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	3	3	0	2	1	7	27	47	69	67	49	40
:10	4	1	3	1	1	8	26	34	72	63	39	39
:15	4	5	2	0	4	6	27	52	71	52	45	47
:20	7	3	2	4	2	14	35	55	65	61	44	40
:25	5	1	3	2	4	16	29	51	60	64	43	46
:30	10	2	1	3	8	17	31	57	63	48	54	40
:35	8	2	1	2	7	15	36	53	67	79	40	44
:40	3	3	2	3	4	13	46	63	79	49	46	48

:45	5	1	1	2	8	19	47	56	64	45	40	36
:50	3	0	1	4	6	24	40	63	71	47	40	46
:55	4	1	1	3	11	30	40	64	66	53	40	45
:60	2	0	1	1	13	30	34	61	59	48	35	-
Hourly												
Total	58	22	18	27	69	199	418	656	806	676	515	471

AM Total: 3935 AM peak 808 07:55 - 08:55

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	57	49	50	47	57	45	38	29	24	11	12
:10	38	42	44	34	51	52	43	45	22	13	15	9
:15	38	42	34	33	40	57	53	49	25	24	11	8
:20	52	49	26	40	41	62	53	31	25	16	16	9
:25	47	36	41	47	43	50	40	28	23	16	12	7
:30	37	39	36	43	38	54	51	27	35	18	13	5
:35	45	33	37	46	39	58	61	34	31	13	14	7
:40	29	39	37	51	47	44	57	29	26	15	10	8
:45	37	46	61	41	40	68	31	31	24	14	12	7
:50	39	36	36	38	54	55	52	29	33	17	14	5
:55	51	34	37	51	49	49	41	32	28	10	9	7
:60	38	45	29	37	49	45	42	22	18	19	7	5
Hourly												
Total	451	498	467	511	538	651	569	395	319	199	144	89

PM Total: 4831 PM peak 655 16:50 - 17:50

Daily Total 8766

PH EB L3, Detector: 3

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	0	0	0	0	0	6	13	34	57	42	27	20
:10	2	0	0	0	0	3	8	30	64	47	23	31
:15	3	0	0	0	0	6	11	43	65	35	33	24
:20	0	0	0	0	0	8	31	38	45	46	28	27
:25	0	0	0	1	0	10	21	32	52	42	20	26
:30	1	0	0	0	0	2	24	57	62	41	32	27
:35	0	0	0	0	1	10	24	46	56	42	29	31
:40	1	0	0	0	0	9	35	53	60	31	19	31
:45	0	1	0	0	4	5	39	51	50	33	17	22
:50	0	0	0	0	2	14	25	51	49	36	18	36
:55	0	2	1	0	3	12	21	45	51	36	22	31
:60	0	0	0	0	2	12	36	54	47	27	24	-
Hourly Total	7	3	1	1	12	97	288	534	658	458	292	306

AM Total: 2657 AM peak 665 07:55 - 08:55

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	29	23	24	20	42	36	21	10	14	5	1
:10	25	17	20	22	21	43	25	19	8	8	7	2
:15	26	26	17	24	25	44	36	19	11	11	3	0
:20	25	27	19	27	28	43	26	12	8	5	4	4

:25	22	34	24	23	33	42	21	20	8	8	5	3
:30	19	20	18	19	32	45	21	17	13	13	6	1
:35	29	21	27	26	22	37	29	17	14	6	6	1
:40	24	28	29	24	30	30	29	20	12	7	1	3
:45	18	36	28	21	28	48	17	10	16	5	1	0
:50	28	17	23	23	38	41	22	8	7	6	1	2
:55	18	16	20	33	25	41	22	18	11	5	4	0
:60	27	20	13	22	30	29	24	8	11	7	4	0
Hourly												
Total	261	291	261	288	332	485	308	189	129	95	47	17

PM Total: 2703 PM peak 486 16:55 - 17:55

Daily Total 5360

PH EB RT, Detector: 4

	00:	01:	02:	03:	04:	05:	06:	07:	08:	09:	10:	11:
:05	1	0	0	0	0	2	4	6	8	5	3	1
:10	2	0	1	2	0	2	0	3	5	5	4	2
:15	0	0	0	0	2	5	2	1	8	7	3	3
:20	0	1	0	0	0	1	3	4	6	6	3	3
:25	0	0	0	0	1	5	1	2	4	3	3	2
:30	1	1	0	0	0	4	4	5	4	5	1	2
:35	0	1	0	0	1	4	3	7	4	4	4	3
:40	0	0	0	0	0	2	0	1	5	5	6	1
:45	1	0	0	0	0	2	3	4	2	3	5	4

:50	0	0	0	1	2	4	4	1	5	5	3	5
:55	0	0	0	0	0	5	3	3	3	5	4	2
:60	0	0	1	0	1	2	1	3	2	4	1	-
Hourly Total	5	3	2	3	7	38	28	40	56	57	40	28

AM Total: 307 AM peak 57 07:50 - 08:50

	12:	13:	14:	15:	16:	17:	18:	19:	20:	21:	22:	23:
:05	0	4	3	2	6	8	2	4	2	3	2	2
:10	5	0	3	4	5	3	5	4	2	4	2	1
:15	3	5	5	2	7	3	6	6	3	4	1	0
:20	4	5	6	4	3	4	6	3	3	2	1	1
:25	4	1	6	4	4	3	3	6	1	2	3	1
:30	5	3	5	3	3	3	2	6	0	1	1	1
:35	3	5	4	2	6	3	7	1	3	2	1	0
:40	2	2	2	7	5	3	3	6	1	3	1	2
:45	4	5	4	5	4	2	3	6	1	4	1	1
:50	2	4	1	1	3	4	4	2	10	2	4	0
:55	3	7	7	7	8	3	3	6	2	2	1	1
:60	3	2	9	4	3	2	3	2	3	4	1	0
Hourly Total	38	43	55	45	57	41	47	52	31	33	19	10

PM Total: 471 PM peak 59 16:05 - 17:05

Daily Total 778