

**ASSESSMENT OF TRAFFIC AND
PARKING IMPACTS**

**ST GEORGE MOTOR BOAT CLUB
MARINA PROJECT**

AT

**2 WELLINGTON STREET
SANS SOUCI**

Ref. 29073r

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Prepared By

TRANSPORT & URBAN PLANNING
Traffic, Road Safety, Transport Planning and
Project Management Consultants
5/90 Toronto Parade
P.O. Box 533
SUTHERLAND NSW 2232
Tel: (02) 9545-1411
Fax: (02) 9545-1556
Email: tupa@tpg.com.au

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EXECUTIVE SUMMARY

This report documents the assessment of the traffic and parking impacts of a proposal by St George Motor Boat Club to extend the existing marina at the Motor Boat Club.

The proposal is to expand the marina facility to provide a total of 229 berths which include:

- Continued use of the existing 23 unapproved berths, (as well as 128 approved berths);*
- Additional 78 new berths together with the associated infrastructure;*
- Additional car parking on a new decked car park over a portion of the lower level car park as well as other changes to the existing car park that will increase the total parking from 202 spaces to 238 spaces. These changes will provide an additional 36 new parking spaces for the marina and club and 39 additional parking spaces for use by members / visitors to St George Motor Boat Club.*

There will be no changes to other facilities which operate at the club and marina including the boat ramp, the marina workshop and slipway and the licensed club.

The St George Motor Boat Club and Marina is located at 2 Wellington Street Sans Souci.

The existing vehicle access to the marina and club is via Plimsoll Street, Wellington Street and Vista Street.

An entry / exit driveway to the lower car park and marina is provided in Plimsoll Street with a vehicle entry from Vista Street. Entry to the upper level car park is from Plimsoll Street with the exit via Wellington Street.

Sundays are the busiest for use of the marina and the assessment of traffic conditions on the road network adjacent St George Motor Boat Club indicates that existing traffic conditions are satisfactory on Sundays, with a good Level of Service on the roads and at the adjacent intersections.

Bus routes operate along Rocky Point Road and also in Fountainbleau Street which is a short walk from St George Motor Boat Club and Marina. Pedestrian and cyclist facilities are also provided on the adjacent road network.

Both AS3962 (2001) and the Roads and Traffic Authority's Guide to Traffic Generating Developments (2002) recommend traffic and parking studies be undertaken on similar marina developments to determine marina usage and the parking requirements of marina proposals.

Marina and parking surveys undertaken as part of the assessment indicates that the existing 151 berths at the marina generate a maximum parking demand of 0.35 cars / berth. Adopting this maximum figure for the proposed expansion indicates that the additional parking requirement and for proposed additional berths will be a total of 36 parking spaces consisting of 27.3 spaces for the 78 new berths and 8.1 spaces for the existing 23 unapproved berths.

Parking surveys of the car parks at St George Motor Boat Club indicate that on particular busy Sundays when large functions are held at the club, which also coincides with good boating days, the car parks reach capacity during the Sunday lunchtime and mid afternoon period.

The proposal by providing an additional 39 spaces for use by Club members and visitors will ensure that adequate parking will be provided to cater for the maximum parking demand of the additional proposed berths at the marina. The proposed parking changes will meet or exceed the requirements of AS2890.1 with regard to space size, aisle widths, ramp grades etc. There will be no change to the existing entry and exit driveways to the car parks of the marina and club.

The traffic generation of the additional new berths is estimated to be 28 vehicles arriving and 28 vehicles departing the marina on a busy Sunday, with up to 60% of these arriving and or departing in the busiest one hour period in the morning and afternoon. The impacts of these additional vehicles on the adjacent road network will be relatively minor and traffic conditions are expected to remain unchanged with a good level of service on the road network and at the intersections, adjacent St George Motor Boat Club and Marina.

Additional service vehicles generated by the marina expansion will include up to three (3) tradesman vehicles per day (Monday to Saturday) and one (1) additional fuel delivery per month. There will be no change to the number of service vehicles coming to the club.

The proposed marina expansion and changes to the car parking will not impact on service vehicle manoeuvring on the St George Motor Boat Club site. Service vehicle manoeuvring on the site is fully compliant with AS2890.2 requirements.

A Construction Traffic Management Plan will be prepared following approval of the Development Application for the marina expansion to manage the traffic impact during the construction period.

1.0 INTRODUCTION

The St George Motor Boat Club which is located at 2 Wellington Street Sans Souci operates a club and marina facility at the site.

St George Motor Boat Club is proposing to upgrade its marina which includes:

- Continued use of 23 unapproved berths and pontoon.
- Increasing the capacity of the marina by 78 berths together with the associated infrastructure.

Transport and Urban Planning has been appointed by St George Motor Boat Club to undertake the traffic and parking assessment for the proposed upgrade, which will form part of the Environmental Assessment for the project.

This report examines the traffic and parking impacts associated with the expansion of the marina. The report should be read in conjunction with the Environmental Assessment report prepared by Planning Ingenuity and the plans of the proposal.

This assessment has been undertaken in accordance with the requirements of the Roads and Traffic Authority Guide to Traffic Generating Developments (October 2002).

As part of the preparation of the traffic and parking impact assessment for the proposed expansion consideration was given to the requirements of the Director General (of the Department of Planning) which were set out in a letter dated 8 May 2009 and for traffic and access included:

- (i) A traffic impact study of the project on the safety and performance of the surrounding road network;
- (ii) An assessment of parking demand and the potential impacts of this demand on the availability of parking (including services vehicles);
- (iii) The potential loss of public access to the foreshore and waterways of Kogarah Bay;
- (iv) The navigation and safety impacts on water users of Kogarah Bay and Georges River; and
- (v) Consultation with the Roads and Traffic Authority.

Items (iii) and (iv) above are not traffic and parking matters and are addressed by Planning Ingenuity in the EA report.

With regard to Item (v) Transport and Urban Planning contacted the RTA's Parramatta Office by letter seeking any comments from the Authority concerning the proposal. The Authority, by letter, requested the following to be included in the assessment:

- Details of the proposed access and the parking provision associated with the development including compliance with relevant Australian standards and parking codes;
- Details of service vehicle movements including vehicle type and arrival and departure times;
- Photographs of the site including the proposed access;
- The identification of pedestrian, cyclist and public transport infrastructure; and
- Identification of any infrastructure required to ameliorate any traffic and safety impacts associated with the proposed development.

The remaining sections of this report address the following:

- Section 2 outlines the study methodology;
- Section 3 provides details of the existing club and marina facility and details the proposed expansion;
- Section 4 examines the existing road network and traffic conditions in the area;
- Section 5 assesses parking issues associated with the proposed marina expansion; and
- Section 6 assesses the traffic impacts of the proposed marina expansion.

2.0 STUDY METHODOLOGY

Boating activities including the use of marinas typically have their peak usage times during daylight hours on weekends with Sundays being the busiest day. The weather is a significant factor with regard to usage of boats, regardless of whether or not it is the summer boating season, which starts on the October long weekend. St George Motor Boat Club includes a licensed club premises, as well as the marina and the associated boating facilities. These uses share the existing car parking at the Club. The existing approvals for St George Motor Boat Club and the marina do not nominate any specific allocation for the parking on the site between the various uses.

A review of the Club's activities including functions on weekends indicated that the number of patrons / members visiting the club are higher on Sundays at lunchtime and in the early afternoon. While functions also occur on Saturdays the larger functions on Saturdays are normally held late afternoon or in the evening. These periods do not overlap with the peak usage of the marina.

The study methodology included the following tasks to identify and assess the traffic and parking impacts of the proposed expansion of the marina;

- A review of the Club's activities and functions on weekends to identify busy days in terms of visitation numbers to the club. In this regard functions and activities for the period between 1 July and the end of November 2009 were examined;
- Surveys of the marinas at various times between 6 July and 29 November 2009 on good boating days to identify the usage of the existing 151 berths (which includes the 23 unapproved berths). Some of these survey days also coincided with busy days at the Club;
- Corresponding parking surveys on these days to identify traffic generation and parking rate for the existing berths at the marina, as well as the existing parking demand of the marina and the Club;
- Traffic volume counts on the road network adjacent St George Motor Boat Club and the marina;
- The identification of the additional traffic and parking demand associated with the additional berths at the marina, once these berths are operational and the assessment of the impacts;
- The identification of the changes in the number of services vehicles that will visit the St George Motor Boat Club and Marina with the proposal in place; and
- The assessment of the traffic impacts associated with the construction of the proposal.

3.0 EXISTING SITUATION AND PROPOSAL

3.1 Existing Club and Marina

The Club and Marina is located in the block bound by Wellington Street, Plimsoll Street and Vista Street, with a street address of 2 Wellington Street Sans Souci. **Figure 1** refers.

Existing development and activities on the site include:

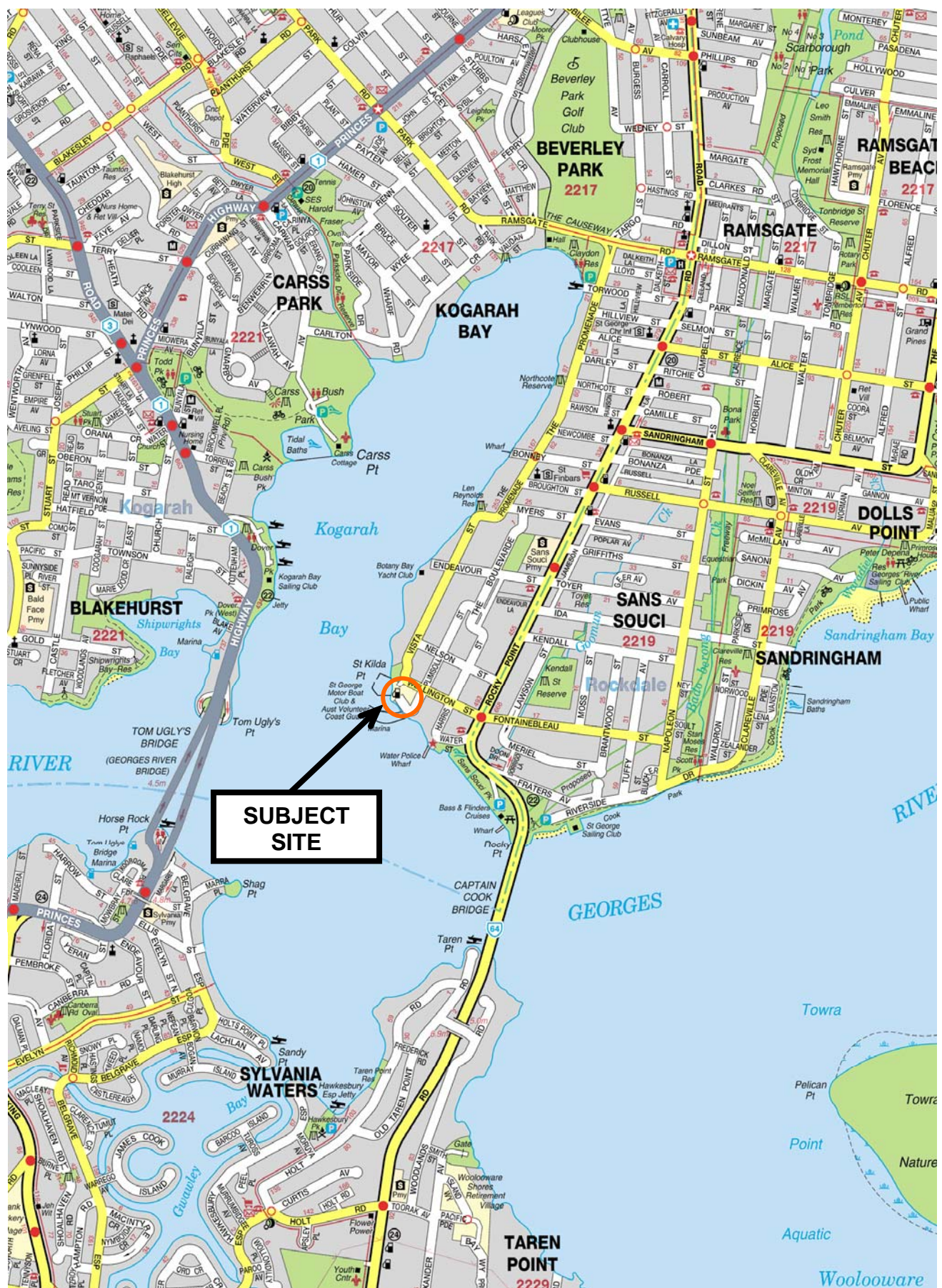
- The two storey club facility;
- A marina with associated facilities for 151 berths; of which 128 are approved and 23 are not approved;
- A marina workshop and slip way;
- A boat ramp which can accommodate three (3) boats for use by members;
- Two (2) off street car parking areas.

Figure 2 shows an overview of the site and **Figure 3** shows the layout of the site including the car parks and service vehicle areas.

The marina and vehicles accessing the boat ramp use the lower level car park which is accessed from the southern end of Plimsoll Street (entry / exit). An entry to the lower level car park is also provided from Vista Street. The lower level car park has 118 spaces including 18 spaces that can be jointly used by either boat trailers and or cars.

The upper level car park has a total of 84 spaces which includes 75 spaces for use by members, 6 spaces for club officials and 3 other spaces for senior staff. The upper level car park has a separate entry in Plimsoll Street and a separate exit driveway in Wellington Street, west of Plimsoll Street. The use of the car parks by the members either using the club facility and or the marina and boat ramp is complimentary and the parking particularly in the lower level car park is shared by the various users, based on the demand at any one time. Of the 202 total car spaces on the site, 193 spaces are for the use of members using the Club, Marina and or boat ramp.

The upper level car park is predominantly used by patrons of the Club facility. The lower level car park provides the principal parking for the marina and boat ramp users. Members parking their boat trailers in the lower level car park are required to remove the trailer and park the trailer and car separately, as the trailer spaces are the same size as the car spaces.



TRANSPORT AND URBAN PLANNING
TRAFFIC, TRANSPORT & PROJECT
MANAGEMENT CONSULTANTS

5/90 Toronto Parade, Sutherland NSW 2232
 Phone 02 9545 1411 Fax 02 9545 1556

tupa@tpgi.com.au www.transurbanplan.com.au

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NOT TO SCALE

FIGURE 1

**ST GEORGE MOTOR BOAT CLUB,
 SANS SOUCI**

SITE LOCATION

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MANAGEMENT CONSULTANTS

5/90 Toronto Parade, Sutherland NSW 2232
 Phone 02 9545 1411 Fax 02 9545 1556

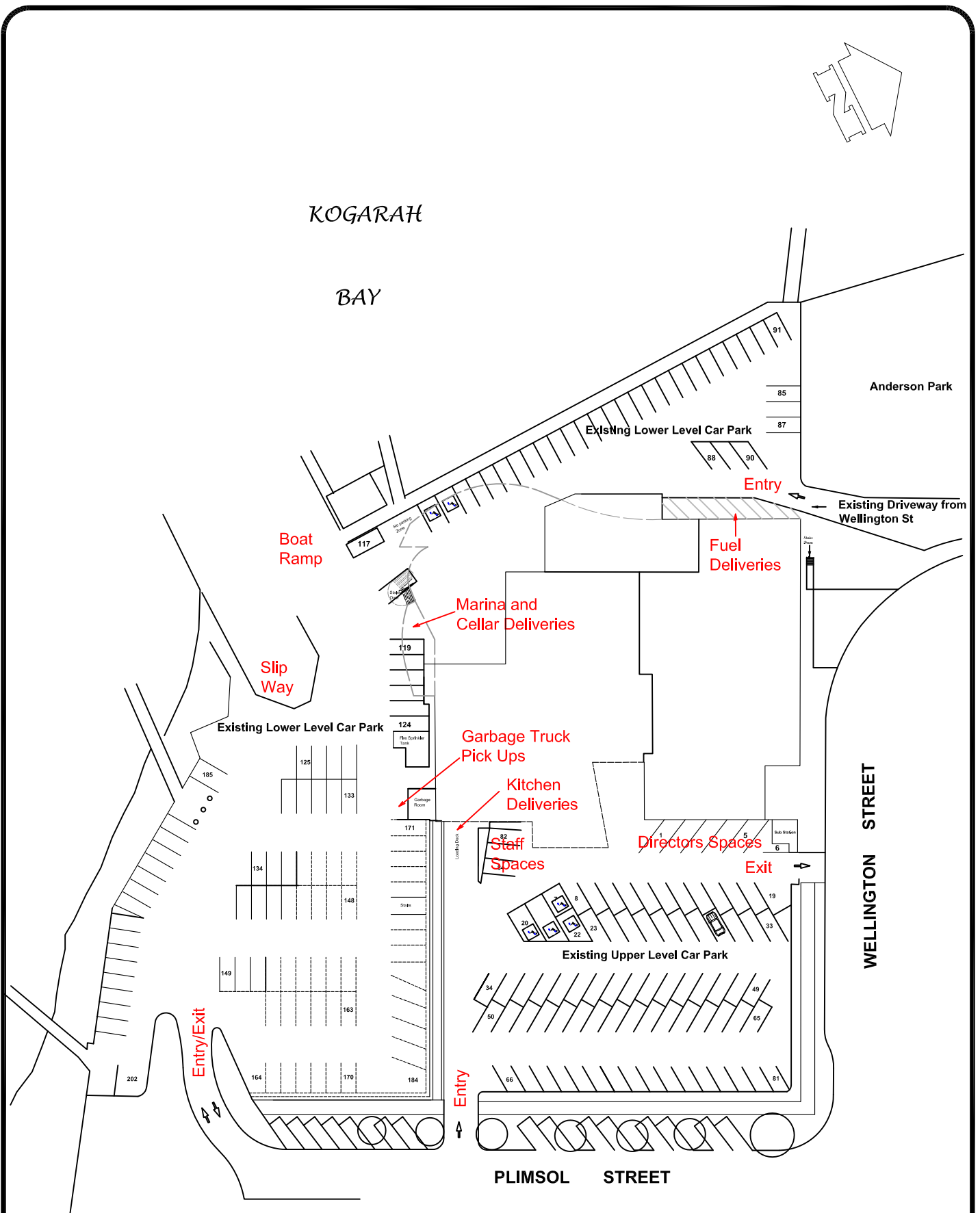
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NOT TO SCALE

FIGURE 2
ST GEORGE MOTOR BOAT CLUB,
SANS SOUCI
EXISTING SITE LAYOUT

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The adjacent development to St George Motor Boat Club in the immediate area includes low density residential (houses), as well as the NSW Water Police facility and NSW Maritime on the corner of Harris Street and Water Street and commercial use (restaurants) in Water Street near Rocky Point Road. Two small parks / reserves are located adjacent the Motor Boat Club on the corner of Wellington Street / Vista Street (Anderson Park) and at the southern end of Plimsoll Street.

Appendix 1 shows photographs of the existing marina, vehicle access driveways and the upper and lower level car parks.

3.2 Proposal

The proposal is to expand the marina facility to provide a total of 229 berths which will include:

- Continued use of the existing 23 unapproved berths, (as well as 128 approved berths);
- Additional 78 new berths together with the associated infrastructure;
- Additional car parking on a new decked car park over a portion of the lower level car park as well as reconfiguring the lower level car park to accommodate an additional 36 cars. This will increase the total car parking on the site from 202 spaces to 238 spaces. As part of these changes, it is proposed that in the upper car park the 6 director spaces will be also shared by senior staff and the 3 senior staff spaces made available to members/visitors. This will provide a total of 232 spaces available for use by members, which is an increase of 39 spaces from the existing 193 spaces that are currently available to members.

There will be no change to other facilities which operate at the club and marina including:

- The boat ramp;
- The marina workshop and slipway; and
- The licensed club.

The plans of the expanded marina are shown in Appendix 2.

4.0 ROAD NETWORK AND TRAFFIC CONDITIONS

4.1 Existing Road Network

The road network immediately adjacent St George Motor Boat Club includes;

- Wellington Street;
- Vista Street;
- Plimsoll Street;
- Harris Street; and
- Rocky Point Road.

Vista Street, Wellington Street, Plimsoll Street and Harris Street are local roads under the control of Kogarah Council. Vista Street and Wellington Street generally provide a collector road function for the local area, but are also used by other traffic as part of an alternative route that connects Rocky Point Road and Ramsgate Road. Kogarah Council has installed a considerable amount of traffic calming in Vista Street and The Promenade (continuation of Vista Street) to reduce traffic volumes on this route and to calm traffic speeds. Road narrowing has been provided in other local streets including Plimsoll Street and Harris Street, as part of the traffic calming works.

The section of Plimsoll Street, south of Wellington Street is a dead end street, and provides access to the club's two car parks (entry to the upper level car park and entry and exit to the lower level car park) as well as access to residential properties on the eastern side of the street. Angle parking for 15 cars is provided on the western side of Plimsoll Street along the frontage of the club.

Wellington Street, east of Plimsoll Street is 12.8 metres wide between kerbs providing travelling lanes in both directions plus parking lanes.

All other local streets provide travelling lanes in each direction (for two way traffic) plus parking on both sides of the street either as dedicated parking spaces behind the rolled kerb or on road.

Rocky Point Road (a State Road) provides the major north south arterial road route in Sans Souci linking to the Princes Highway and Sandringham Street to the north and Caringbah and the Sutherland Shire to the south via Captain Cook Bridge and Taren Point Road.

Traffic controls on the immediate road network include:

- Give way control on Plimsoll Street at Wellington Street;
- Stop sign control on Harris Street at Wellington Street; and
- Traffic signal control at the intersection of Rocky Point Road / Wellington Street / Fountainbleau Street, which includes No Right Turn restrictions from Rocky Point Road (into) Wellington Street.

The above right turn restriction results in southbound vehicles in Rocky Point Road who wish to turn right into Wellington Street using Nelson Street, which is north of Wellington Street.

A 50km/hr speed limit applies in the local streets including Wellington Street, Vista Street, Plimsoll Street and Harris Street. The speed limit in Rocky Point Road is 60km/hr.

Figure 4 shows the traffic controls on the road network adjacent the St George Motor Boat Club and Marina.

The site distance for vehicles exiting the southern side of Plimsoll Street at Wellington Street is slightly restricted to the east by a combination of a crest and parked vehicles (when present). However the sight distance is adequate and meets the minimum stopping sight distance for the posted 50km/hr speed limit which is 47 metres. The narrowing of Wellington Street on the southern side of the intersection allows vehicles exiting Plimsoll Street to move forward to obtain better sight lines to the east, (85 metres) past any parked vehicles.

The available sight distance at the entry and exit driveways to the Club's and Marina's car parks in Vista Street, Wellington Street and Plimsoll Street are considered to be satisfactory and meet the minimum stopping sight distance requirements for the estimated vehicle speeds in these streets, which is less than the 50km/hr speed limit.

4.2 Existing Traffic Conditions

4.2.1 Adjacent Road Network

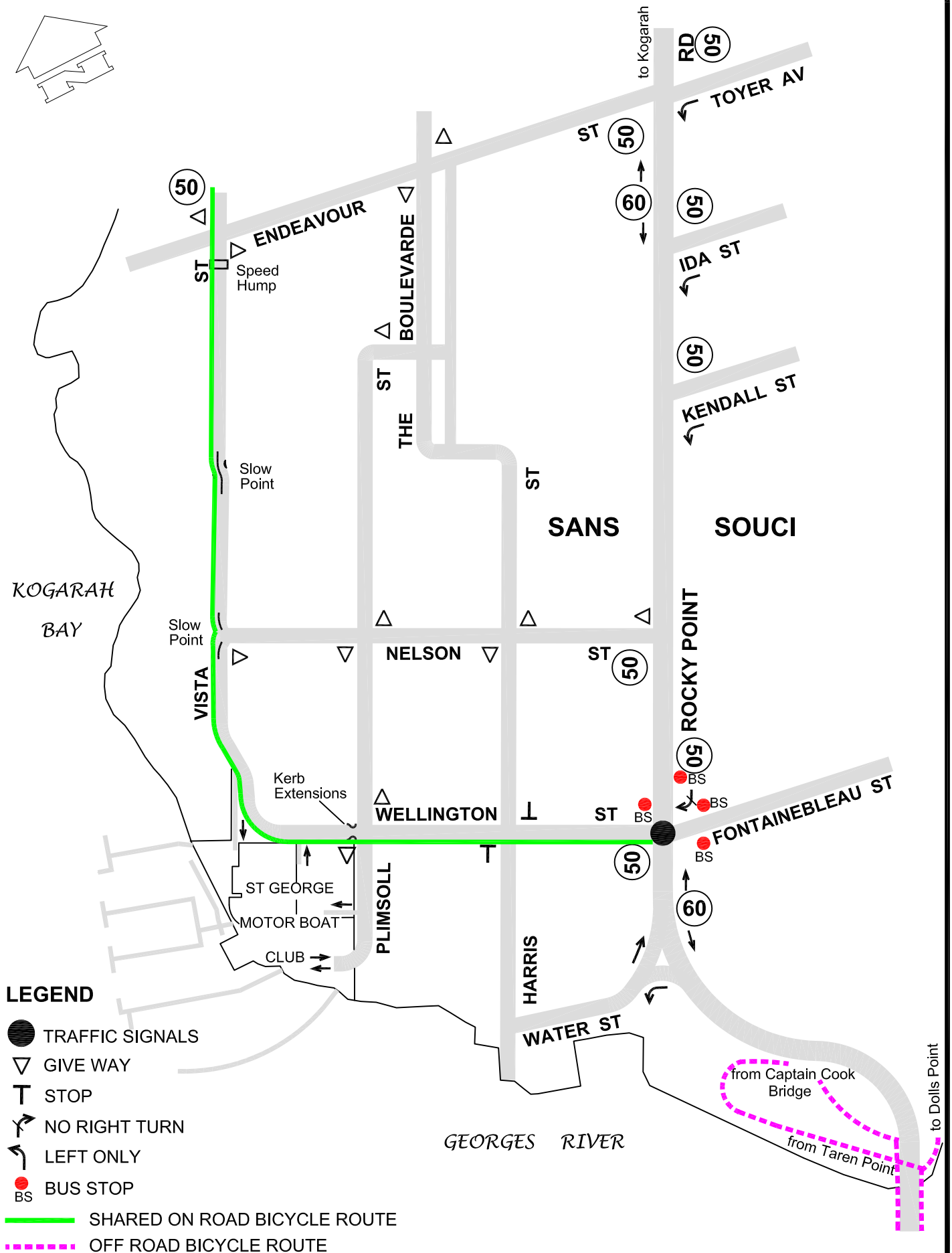
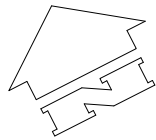
Surveys of the Marina's usage revealed that the highest usage occurs on weekends with Sundays being the busiest day for usage of the marina, the boat ramp, and the club during daytime hours.

Traffic counts were undertaken in Vista Street, Wellington Street and Plimsoll Street adjacent St George Motor Boat Club on Sunday 13 September 2009 at various intervals between 8.00am and 4.30pm.

This Sunday was a good boating day with fine and hot weather conditions all day resulting in a very high usage of the marina. It was also a very busy day at the club, with several functions scheduled for the midday and early afternoon period.

Table 4.1 summarises the traffic volumes in these streets adjacent the club. Reference to Table 4.1 shows that;

- The traffic volumes using these roads are the lowest during the morning 8.00am – 10.00am period and highest during the midday 11.00am – 1.00pm midday period. The midday period coincides with Sunday lunch time at the club, as well as higher level of traffic activity using the road network generally.



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**TRAFFIC, TRANSPORT & PROJECT
MANAGEMENT CONSULTANTS**
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Phone 02 9545 1411 Fax 02 9545 1556
tupa@tpgi.com.au www.transurbanplan.com.au

FIGURE 4
ST GEORGE MOTOR BOAT CLUB, SANS SOUCI
TRAFFIC CONTROLS

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- Vista Street, north of the club typically carries two way traffic volumes on Sundays in the order of 90-284 vehicles per hour (vph).
- Wellington Street, east of Plimsoll Street carries two way traffic volumes on Sundays in the order of 97-328 vph; and
- Plimsoll Street, south of Wellington Street carries two way traffic volumes on Sundays in the order of 30-228 vph.

These traffic volumes could be described as a relatively low to moderate level of traffic and consistent with the collector road status of Wellington Street and Vista Street. Traffic volumes in Plimsoll Street, south of Wellington Street reflects that Plimsoll Street provides access to the car parks for the Marina and Club.

Traffic conditions on the road network are generally good with free flowing conditions on Wellington Street, Vista Street and Plimsoll Street and minimal delays occurring at the adjacent intersection. Observations confirm that those traffic movements that are subject to priority or sign control at intersections experienced very small levels of delay, consistent with Level of Service A operation, which represents a good level of service and good traffic conditions.

Figure 5 shows the turning movements at intersections and at the Club's entry/exit driveways to the upper and lower level car parks for the peak one hour in the morning (9am-10am), midday period (12noon-1pm) afternoon period (3.15pm-4.15pm)

Observations confirm that traffic volumes using other local streets on Sundays are relatively light and consistent with traffic levels on local roads.

The intersection of Rocky Point Road / Wellington Street / Fountainbleau Street is controlled by traffic signals and provides safe intersection facilities for traffic to join, or cross Rocky Point Road from Wellington Street, as well as facilitating traffic to enter Wellington Street. This intersection operates with plenty of spare capacity on Sundays with minimal delays. The traffic signals also provide pedestrian facilities which enable safe pedestrian crossing movements to occur at the intersection.

TABLE 4.1

**SUNDAY TRAFFIC VOLUMES ON LOCAL ROADS
ADJACENT ST GEORGE MOTOR BOAT CLUB**

Street	8.00AM – 9.00AM			9.00AM – 10.00AM		
	South/ East *	North/ West *	Total	South/ East *	North/ West *	Total
Vista Street (north of the club)	75	15	90	94	38	132
Wellington Street (east of Plimsoll Street)	68	29	97	59	90	149
Plimsoll Street (south of Wellington Street)	25	5	30	43	12	55
Street	11.00AM – 12.00 NOON			12.00 NOON – 1.00PM		
	South/ East *	North/ West *	Total	South/ East *	North/ West *	Total
Vista Street (north of the club)	108	67	175	193	91	284
Wellington Street (east of Plimsoll Street)	121	117	238	171	157	328
Plimsoll Street (south of Wellington Street)	73	23	96	155	73	228
Street	2.30PM – 3.30PM			3.30PM – 4.30PM		
	South/ East *	North/ West *	Total	South/ East *	North/ West *	Total
Vista Street (north of the club)	85	84	169	90	77	167
Wellington Street (east of Plimsoll Street)	108	103	211	137	95	232
Plimsoll Street (south of Wellington Street)	49	27	76	60	42	102

Source: Traffic Counts – Sunday 13 September 2009

* Direction of Travel

4.2.2 Club's Car Parks

Table 4.2 shows the entry / exit movements to and from the upper level car park and the lower level car park at St George Motor Boat Club on Sunday 13 September 2009 at various times between 8.00am and 4.30pm.

The number of entry / exit movements to and from the car parks in the midday period indicates that this particular Sunday was a very busy day at the Club, resulting in vehicles circulating both the car parks looking for a parking space.

TABLE 4.2

ENTRY / EXIT MOVEMENTS TO CAR PARKS OF ST GEORGE MOTOR BOAT CLUB ON SUNDAY

Time	UPPER LEVEL CAR PARK			LOWER LEVEL CAR PARK			
	Entry Plimsoll Street	Exit Wellington Street	Total	Entry Vista Street	Entry Plimsoll Street	Exit Plimsoll Street	Total
8.00 – 9.00am	14	6	20	4	13	5	22
9.00 – 10.00am	26	13	39	5	17	10	32
11.00am – 12.00pm	44	23	67	5	36	23	64
12.00 – 1.00pm	122	71	193	25	59	62	146
2.30 – 3.30pm	41	32	73	8	17	25	50
3.30 – 4.30pm	48	47	95	6	16	39	61

Source: Traffic Counts – Sunday September 13, 2009

4.3 Public Transport

Sydney Buses operates the 476 and 477 bus routes between Sans Souci and Rockdale (476) and Sans Souci / Miranda and Rockdale (477). The 466 bus route operates along Rocky Point / Taren Point Road. The 476 bus route operates along Fountainbleau Street / Napoleon Street / Claireville Avenue / Russell Avenue / The Grande Parade and has its bus terminus in Wellington Street, west of Rock Point Road.

On Saturdays and Sundays the 476 service operates a 30 minute schedule during the day. The 477 service operates a 30 minute schedule on Saturdays and a one (1) hour schedule on Sundays during the day.

4.4 Pedestrian and Cyclist Infrastructure

Footpaths are provided on all the streets adjacent St George Motor Boat Club and Marina, except on a small section of Vista Street near vehicle entry driveway to the lower level car park. A suitable footpath is provided on the eastern side of Vista Street which provides for a safe walk route.

The existing pedestrian access to the Club is from Wellington Street and to the Marina is either via Plimsoll Street or from within the site via stairs between the upper and lower level car parks, or via the Club.

While there are no pedestrian crossing facilities adjacent the St George Motor Boat Club site, road narrowing at the Wellington Street/Plimsoll Street intersection facilitates safe pedestrian crossing movements at this intersection which is adjacent the site. Pedestrian crossing volumes at the intersection on Sundays are shown on **Figure 5**. The majority of these pedestrians are generated by the Club and local area and not the marina.

On the wider road network the traffic signals at the intersection of Rocky Point Road/Wellington Street/Fontainebleau Street provide safe crossing facilities for walk trips from the eastern side of Rocky Point Road or from the bus stops.

Provision for bicycles on the road network adjacent to St George Motor Boat Club is a mixture of on road and off road bicycle routes. Wellington Street/Vista Street/The Promenade between Rocky Point Road and Ramsgate Road is a nominated on road bicycle route, with cyclists sharing the road with vehicles. There is also an off road route (shared paths) on Captain Cook Bridge to the south and an off road route adjacent Riverside Drive to the east, connecting to Dolls Point and Brighton le Sands. **Figure 4** shows the bicycle routes, in the area.

5.0 PARKING ASSESSMENT

5.1 Methodology

As part of the parking assessment Transport and Urban Planning examined the Club's planned functions on weekends between early July and the end of November 2009 to identify particular busy days at St George Motor Boat Club. Sundays were identified as having the largest functions, that would also overlap with the usage of the marina in terms of traffic and parking demand. The surveys were undertaken on Saturdays and Sundays including several Sundays where the club was very busy, as well as more typical Sundays.

5.2 Establishing the Parking Requirements of the Marina

AS3962 (2001) and the Roads and Traffic Authority's Guide to Traffic Generating Developments (2002) recommend traffic and parking studies be undertaken on similar developments to determine the marina usage and the parking requirements, for marina proposals.

The existing marina at St George Motor Boat Club already operates 151 wet berths, as well as associated boating facilities and therefore is the most appropriate model to use to calculate the parking requirement of the additional 78 new wet berths.

St George Motor Boat Club advises that it has a waiting list for marina berths and considers that the majority of berths will be taken up by existing members.

Transport and Urban Planning undertook marina usage and concurrent parking surveys at St George Motor Boat Club on nine (9) separate occasions between early July and the end of November 2009 to establish the Marina usage and the parking demand associated with its usage.

Marina usage for the purpose of calculating the parking demand included;

- Berths where owners / visitors or tradesmen were on the boat still moored on the berth and were relaxing or working on the boat.
- Berths where the boat had been taken out of the marina (i.e. off the berth) and was being used by the owner / boat operator.

Usage of the boats at the marina varied between 5% on a weekday in July up to a maximum of 35% on a particularly warm / hot Sunday in September. The usage of the marina was higher on those days when the weather conditions suited boating (i.e. fine conditions). The average usage of boats at the marina on good boating days generally ranged between 20% - 30% of which approximately one third of the boats remained on their mooring with the owners / users either relaxing, or working on the boat.

Observations undertaken during the surveys also confirmed that for the majority (90%) of these boats that were being used on weekends that the parking demand was one (1) vehicle per boat being occupied or used off the marina. Table 5.1 summarises the surveys of the marina's usage between July and the end of November 2009.

Adopting the highest use of the boats at the marina recorded during the surveys indicates that a parking rate of 0.35 space / berth represents the maximum parking demand of the existing 151 wet berths at St George Motor Boat Club.

TABLE 5.1

**USAGE OF BERTHS AT ST GEORGE MOTOR BOAT CLUB
BETWEEN JULY AND NOVEMBER 2009**

DATE	Number and % of Berths in Use (Capacity 151 Wet Berths)
July 13 (Monday) 3.00 – 3.30pm Fine	8 (5%)
August 1 (Saturday) 2.00 – 5.00pm Fine	23 - 30 (15% - 21%)
August 2 (Sunday) 2.00 – 5.00pm Fine	27 - 36 (18% - 24%)
August 23 (Sunday) 9.00 – 11.30am Fine	42 - 45 (28% - 30%)
September 13 (Sunday) 8.00 – 4.00pm Fine and Hot	30 - 53 (20% - 35%)
September 27 (Sunday) 12.00 – 12.30pm Cool - Windy	Low usage
November 15 (Sunday) 10.30am – 2.30pm Fine and Warm (Hot)	38 - 46 (25% - 31%)
November 28 (Saturday) 9.00am - 12.00pm Fine and Hot	30 - 37 (20% - 25%)
November 29 (Sunday) 8.00am – 2.30pm Fine and Hot	36 - 42 (24% - 28%)

5.3 Existing Parking Demand on Saturdays and Sundays

Marina and Boat Ramp

The marina and the boat ramp at St George Motor Boat Club have their highest usage on weekends with Sundays being the busiest day for boating activities, subject to the weather conditions. Good boating days are typically fine days and conditions without strong winds and rain.

The surveys confirmed that the highest usage of the boat ramp usually occurs in the early to mid morning period for boats arriving at the boat ramp. Boats returning to the boat ramp arrive back from late mid morning and increase from midday into the afternoon period.

On those good boating Sundays the maximum demand for cars and trailers in the Club's car park ranged between 12-20 trailers and cars which required between 24-40 trailer and or car spaces in the lower car park.

The usage of the boats from the marina was also typically higher in the mornings through to mid to late afternoon depending on the weather conditions.

The parking demand on good boating Sundays for the 151 existing berths (which includes the 23 unapproved berths) ranged between 27-53 car spaces in the lower level car park and is based on a usage rate of the total boats in the marina (i.e. 151 berths) ranging between 18% to 35%).

The peak parking rate of 35% for the marina only occurred on one day and involved a large proportion of boat owners working or relaxing on their boats on this particular day.

Clubs Activities

The Clubs activities also add to the parking demand in St George Motor Boat Club's car parks on Sundays.

While the parking demands of the marina and the boat ramp and the Club are generally complimentary to each other (i.e. have their maximum parking demands at different times) there is an overlap on Sunday's at lunch time and in the early afternoon period.

The parking demand at the Club on Sundays varies depending on the activities being held at the Club. On those Sundays when large functions are held at the Club, the parking demand is higher during the lunch time and early afternoon periods.

Existing Car Parks

Table 5.2 summarises the parking demand for the spaces available to members/visitors in the Club's car parks on various Saturday and Sundays between August and November 2009.

Reference to Table 5.2 shows that:

- Saturdays have a lower overall parking demand during the day with a considerable number of vacant spaces. On Saturday 1 August there were between 50 - 62 vacant parking spaces and on Saturday 28 November there were between 100 and 133 vacant spaces, in the two (2) car parks.
- Sunday mornings (before the midday period) also have a relatively low overall parking demand regardless of the usage of the marina. Both car parks have considerable spare parking capacity at this time, with the total number of vacant spaces on the Sunday mornings surveyed no less than 40 vacant spaces and typically ranging between 75 – 138 parking spaces.
- Sunday afternoons from the lunchtime period onwards have the highest overall parking demand due to the activities of the Club and in particular when large functions were being held at the Club. On several of the Sundays surveyed both car parks became full from lunchtime onwards (after 12.30pm) and the overflow parking was accommodated on street. Whilst some vacant spaces became available during these periods in the car parks, the on street parking did not reduce until the overall demand started to reduce from 3.00pm onwards.

As previously noted there are 6 parking spaces dedicated to Club Directors and 3 spaces for senior staff in the upper level car park. These 9 spaces are largely unused on Saturdays and Sundays.

On Street Parking Demand

Wellington Street and Plimsoll Street along the frontage of St George Motor Boat Club provides convenient on street parking and are used regularly by patrons coming to the Club, regardless of the parking demand in the Club's car parks.

On those busy Sunday afternoons parking demand on street extends to the east along Wellington Street, Plimsoll Street north of Wellington Street, Vista Street and also Harris Street, depending on the level of demand. All of the fronting properties to these streets have off street parking, so any inconvenience from this parking is considered to be relatively minor.

TABLE 5.2

**EXISTING PARKING DEMAND ON SATURDAYS AND SUNDAYS
IN CAR PARKS OF ST GEORGE MOTOR BOAT CLUB**

Date, Times and Weather	Number and % of Marina Berths in Use Capacity – 151 Berths	Demand (Vacant Spaces) Club’s Car Parks		Total Demand (Vacant Spaces) Capacity 193 Spaces
		Upper Level Car Park Capacity 75 Spaces ¹	Lower Level Car Park Capacity 118 Spaces	
Saturday 1 August, 2009 - Fine				
2.00 pm	27 (18%)	68 (7)	70 + 5T (43)	143 (50)
3.00 pm	31 (21%)	55 (20)	71 + 5T (42)	131 (62)
4.00 pm	29 (19%)	58 (17)	74 + 5T (39)	137 (56)
5.00 pm	23 (15%)	63 (12)	65 + 5T (48)	133 (60)
Sunday 2 August, 2009 – Fine				
9.00 am	27 (18%)	7 (68)	49 + 6T (63)	62 (131)
9.30 am	33 (22%)	13 (62)	45 + 6T (67)	64 (129)
10.15 am	36 (24%)	14 (61)	42 + 6T (70)	62 (131)
11.00 am	33 (22%)	12 (63)	37 +6T (75)	55 (138)
Sunday 23 August, 2009 – Fine and Warm				
12.30 pm	45 (30%)	70 (5)	77 + 12T (29)	149 (34)
2.00 pm	43 (28%)	73 (2)	106 + 12T (0)	189 ² (2) ²
3.00 pm	40 (26%)	72 (3)	99 + 14T (5)	185 (8) ²
4.00 pm	34 (23%)	73 (2)	102 + 14T (2)	189 (4) ²
4.30 pm	30 (20%)	68 (7)	97 + 9T (12)	174 (19)
Sunday 13 September, 2009 – Fine and Hot				
8.30 am	32 (21%)	8 (67)	54 + 19T (45)	81 (112)
11.30 am	53 (35%)	46 (29)	87 + 20T (11)	153 (40)
12.30 pm	53 (35%)	69 (6)	95 + 20T (3)	184 (9) ²
2.00 pm	53 (35%)	75 (0)	103 + 15T (0)	193 (0) ²
3.30 pm	52 (34%)	69 (6)	102 + 12T (4)	183 (10) ²
4.00 pm	-	75 (0)	91 + 12T (15)	178 (15)
Sunday 27 September, 2009 – Cool and Windy				
12.30 pm	Low Usage	50 (25)	45 + 2T (71)	97 (96)
Sunday 15 November, 2009 – Fine and Warm				
10.30 am	46 (30%)	11 (64)	68 + 18T (32)	97 (96)
11.30 am	46 (30%)	17 (58)	88 + 13T (17)	118 (75)
1.30 pm	38 (25%)	75 (0)	89 + 13T (16)	177 (16)
2.30 pm	42 (28%)	62 13)	90 + 10T (18)	162 (31)
*10 cars associated with children’s party in park used lower level car park				
Saturday 28 November, 2009 – Fine and Hot				
9.00 am	30 (20%)	6 (69)	46 + 8T (64)	60 (133)
11.30am – 12.00 noon(pm)	37 (25%)	12 (63)	71 + 10T (37)	93 (100)

TABLE 5.2 CONTINUED

**EXISTING PARKING DEMAND ON SATURDAYS AND SUNDAYS
IN CAR PARKS OF ST GEORGE MOTOR BOAT CLUB**

Date, Times and Weather	Number and % of Marina Berths in Use Capacity – 151 Berths	Demand (vacant spaces) Club’s Car Parks		Total Demand (Vacant Spaces) Capacity 193 Spaces
		Upper Level Car Park Capacity 75 Spaces ¹	Lower Level Car Park Capacity 118 Spaces	
Sunday 29 November, 2009 – Fine and Hot				
8.00 am	36 (24%)	7 (68)	58 + 7T (53)	72 (121)
9.00 am	40 (26%)	9 (66)	66 + 8T (44)	83 (110)
11.30 am	41 (27%)	15 (60)	76 + 13T (29)	104 (89)
1.30 pm	42 (28%)	75 (0)	104 + 12T (2)	191 (2) ²
2.30 pm	42 (28%)	72 (3)	105 + 8T (5)	185 (8) ²

Source: Surveys by Transport and Urban Planning

Where:

- T* - Trailer
- (12)* - Vacant Spaces
- ¹ - Capacity of upper level car park is public or member spaces only and does not include six (6) Director and three (3) Staff spaces.
- ² - On Street parking occurred away from immediate frontage streets.
- * - Other parking in Club's car parks

5.4 Assessment of Additional Parking for the Proposed Marina Extension

The parking surveys indicate that some additional off street parking should be provided to cater for the additional parking demand generated by the additional berths at the marina. The proposal is to provide for an additional 78 new berths as well as the continued use of the 23 berths.

Based on adopting the maximum usage parking rate of 0.35 parking spaces per berth, the additional parking requirement is:

- 27.3 spaces for the 78 new berths; and
- 8.1 spaces for the 23 unapproved berths, if these are also taken into account providing a total requirement of 36 parking spaces if the unapproved berths are included in the parking calculation or 28 spaces, if they are not.

The proposed additional parking will be provided by the construction of a new level of parking over a portion of the lower level car park which will connect to the upper level of the car park via a two way vehicle ramp. This will provide 34 new spaces. A section of the lower level car park will also be remarked to increase the number of spaces by 2 (spaces) and 3 spaces currently used by senior staff will become member/visitor spaces, two (2) of which will be additional disabled spaces. This will provide an additional 39 car spaces for use by members and visitors to St George Motorboat Club and is more than sufficient to meet the maximum additional parking demand generated by the marina extension proposal.

The new upper level car park section has been designed to observe the foreshore line setback of 23 metres and will be 1.44 metres lower than the existing upper level car park to minimise visual impacts.

The parking layout can be designed to fully comply with AS2890.1 in terms of space size, aisle widths, ramp grades etc. The space size and aisle widths meet or exceed AS2890.1 requirements and sufficient room is provided in the dead end aisles of the new upper level extension to allow vehicle to turn around if all parking spaces are occupied. There will be no change to existing entry and exit driveways to upper level and lower level car parks, as part of the proposal. The plans of the existing and proposed parking changes are shown in Appendix 2.

The provision of the additional 39 spaces for use by members and visitors to St George Motor Boat Club will have other positive impacts on parking at the Club and in the immediate area including:

- Reduce the likelihood and incidence of spill over parking occurring in the nearby streets at all busy times including Sunday afternoons; and
- Reduce the amount of circulation between the upper level car park and the lower level car park by Club patrons at busy times.

The additional parking will increase the total off street parking at St George Motor Boat Club to 238 spaces with 120 spaces on the lower level and 118 spaces on the upper level including the six (6) director and staff spaces. The lower level car park will retain two (2) existing disabled parking spaces and the upper level car park will have six (6) disabled spaces.

6.0 ASSESSMENT OF TRAFFIC IMPACTS

6.1 Traffic Generation of the Additional Berths with the Marina Extension and Assessment of Impacts.

6.1.1 Boat Users on Sundays

The surveys confirmed that maximum usage of boats at the existing marina was 35% of the 151 berths on a Sunday, which is the busiest day.

Adopting this maximum usage rate indicates that the additional 78 berths would result in another 28 vehicles arriving and departing the marina on a Sunday with a total of 56 additional vehicle trips over the day.

A worst case assessment is that 60% of these vehicles (ie. 17 vehicles) would arrive in the morning and depart in the afternoon in the same one (1) hour period between 9.00am – 10.00am (arrivals) and 3.15pm – 4.15pm departures. These vehicles would be typically cars or light vehicles (i.e. Austroad Class 1 vehicles).

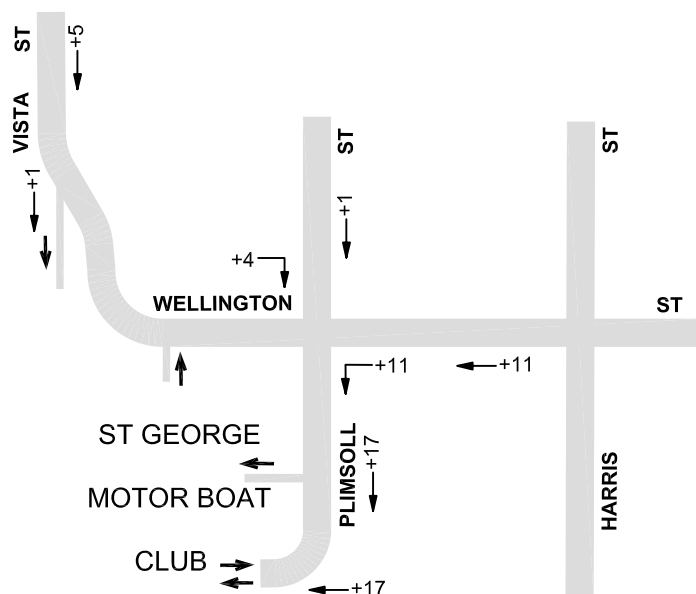
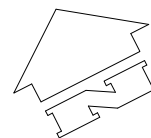
Figure 6 shows the additional traffic assigned to the road network based on the current arrival and departure patterns on Sunday.

Reference to **Figure 6** shows that the increase in traffic volumes on Sunday morning and afternoon in Plimsoll Street and on the adjacent road network of Vista Street and Wellington Street due to the marina extension will be small in real terms. The traffic impacts in these streets including at the adjacent intersections will be relatively minor, with no noticeable change to delay or levels of service in these streets.

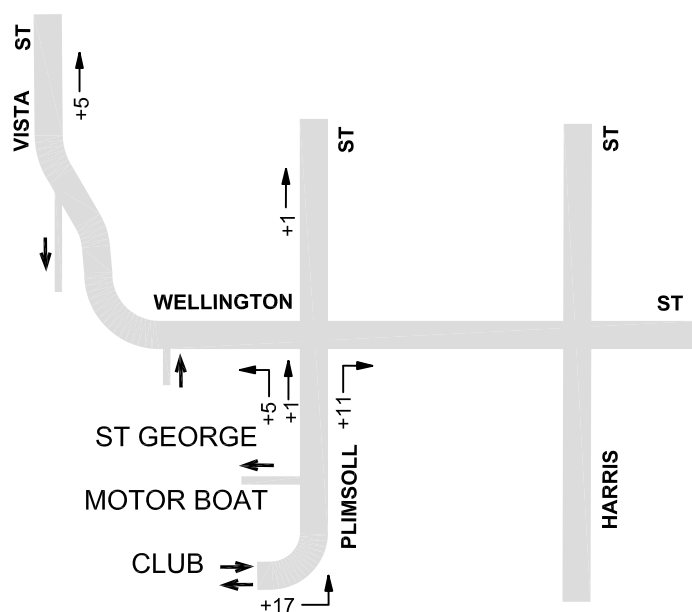
To assess the impact of the additional traffic on the Wellington Street / Plimsoll Street intersection traffic modelling using the software package SIDRA has been undertaken.

SIDRA assesses the operational performance of intersections under traffic signal, roundabout or sign / priority control. The best criteria for assessing intersections controlled by sign / priority control are Level of Service (LS), Degree of Saturation (DS), and Average Vehicle Delay (AVD). Table 6.1 shows the Level of Service Criteria for intersections as reproduced from the RTA's Guide to Traffic Generating Developments. The desirable design criteria for intersections is a Level of Service C or better.

For intersections controlled by priority or Give Way / Stop sign control the Level of Service of the intersection is determined by the movement with the highest average vehicle delay and not the average vehicle delay for all vehicles using the intersection.



SUNDAY AM



SUNDAY PM

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FIGURE 6
 ST GEORGE MOTOR BOAT CLUB, SANS SOUCI
ADDITIONAL TRAFFIC ON SUNDAY
MORNING & AFTERNOON FROM
MARINA EXTENSION
 JOB NO. 29073

TABLE 6.1**LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS**

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode

Source: Table 4.1 RTA Guide to Traffic Generating Developments October 2002

The modelling has been undertaken for the existing conditions using the traffic volumes shown on **Figure 3** for the 9.00am – 10.00am period and the 3.15pm – 4.15pm period, as well as with the additional traffic from the marina extension (**Figure 6**) and adopting the existing geometry and traffic management at the Wellington Street / Plimsoll Street intersection.

The results of the traffic modelling are shown in Tables 6.2 and 6.3. Reference to these tables shows that the intersection will continue to operate at Level of Service A operation with low average vehicle delays in all approaches at the intersection. This indicates that the intersection will continue to operate at a good level of service with the marina extension in place, with little or no change from existing conditions.

TABLE 6.2

**SIDRA MODELLING
WELLINGTON STREET AND PLIMSOLL STREET
EXISTING SUNDAY MORNING AND AFTERNOON**

Approach	AM Peak Hour				PM Peak Hour			
	DS	AVD	LS	95% Queue Length	DS	AVD	LS	95% Queue Length
Plimsoll Street - North Leg	0.009	8.1	A	0.3	0.010	8.4	A	0.3
Plimsoll Street - South Leg	0.012	8.8	A	0.4	0.049	8.9	A	1.6
Wellington Street - East Leg	0.033	4.1	A	1.5	0.056	3.5	A	2.7
Wellington Street – West Leg	0.050	1.5	A	2.3	0.076	2.3	A	3.6
All Vehicles	0.050	3.3	A	2.3	0.076	4.0	A	3.6

TABLE 6.3

**SIDRA MODELLING
WELLINGTON STREET AND PLIMSOLL STREET
SUNDAY MORNING AND AFTERNOON
WITH MARINA EXTENSION PROPOSAL**

Approach	AM Peak Hour				PM Peak Hour			
	DS	AVD	LS	95% Queue Length	DS	AVD	LS	95% Queue Length
Plimsoll Street - North Leg	0.010	8.1	A	0.3	0.010	8.4	A	0.3
Plimsoll Street - South Leg	0.012	8.8	A	0.4	0.065	9.0	A	2.1
Wellington Street - East Leg	0.039	4.8	A	1.8	0.056	3.5	A	2.7
Wellington Street – West Leg	0.053	1.8	A	2.4	0.076	2.4	A	3.6
All Vehicles	0.053	3.7	A	2.4	0.076	4.3	A	3.6

Where:

DS

AVD

LS

95thtile Queue Length

Degree of Saturation

Average Vehicle Delay in Seconds

Level of Service

95thtile Back of Queue Length in metres

6.1.2 Other Vehicles

Tradesman and Service Vehicles

The marina currently receives 4 fuel truck deliveries per month and up to 6 tradesman's visits per day (Monday – Saturday). The fuel truck is a smaller capacity tanker and the equivalent of a medium rigid truck, which is 8.8 metres long.

The tradesman's vehicles are typically utes, vans and small trucks (i.e. small rigid trucks 6.4 metres long).

With the additional 78 berths one (1) additional fuel delivery per month will be required using the same size fuel tanker. An additional 3 tradesman could also be expected to visit the marina per day between Monday and Saturday.

Club's Service Vehicles

The additional berths at the marina will not change the number of service/delivery vehicles coming to the Club.

The Club currently receives 6 cellar deliveries per week and 30 deliveries to its kitchen loading dock per week between Monday and Saturday as well as several waste management trucks. This is an average of 1 cellar, 5 kitchen delivery vehicles per day, as well as a waste management vehicle every 2 days. These delivery vehicles are small to medium rigid trucks up to 8.8 metres long. The Club's administration also receives approximately one (1) vehicle trip per day from a visitor and or courier / delivery vehicle.

The impact of the additional tradesman and service vehicles coming to St George Motor Boat Club associated with the marina extension will be minimal. Additional tradesman and other service vehicle numbers are estimated at up to three (3) tradesman vehicles per day, as well as one (1) additional fuel delivery per month.

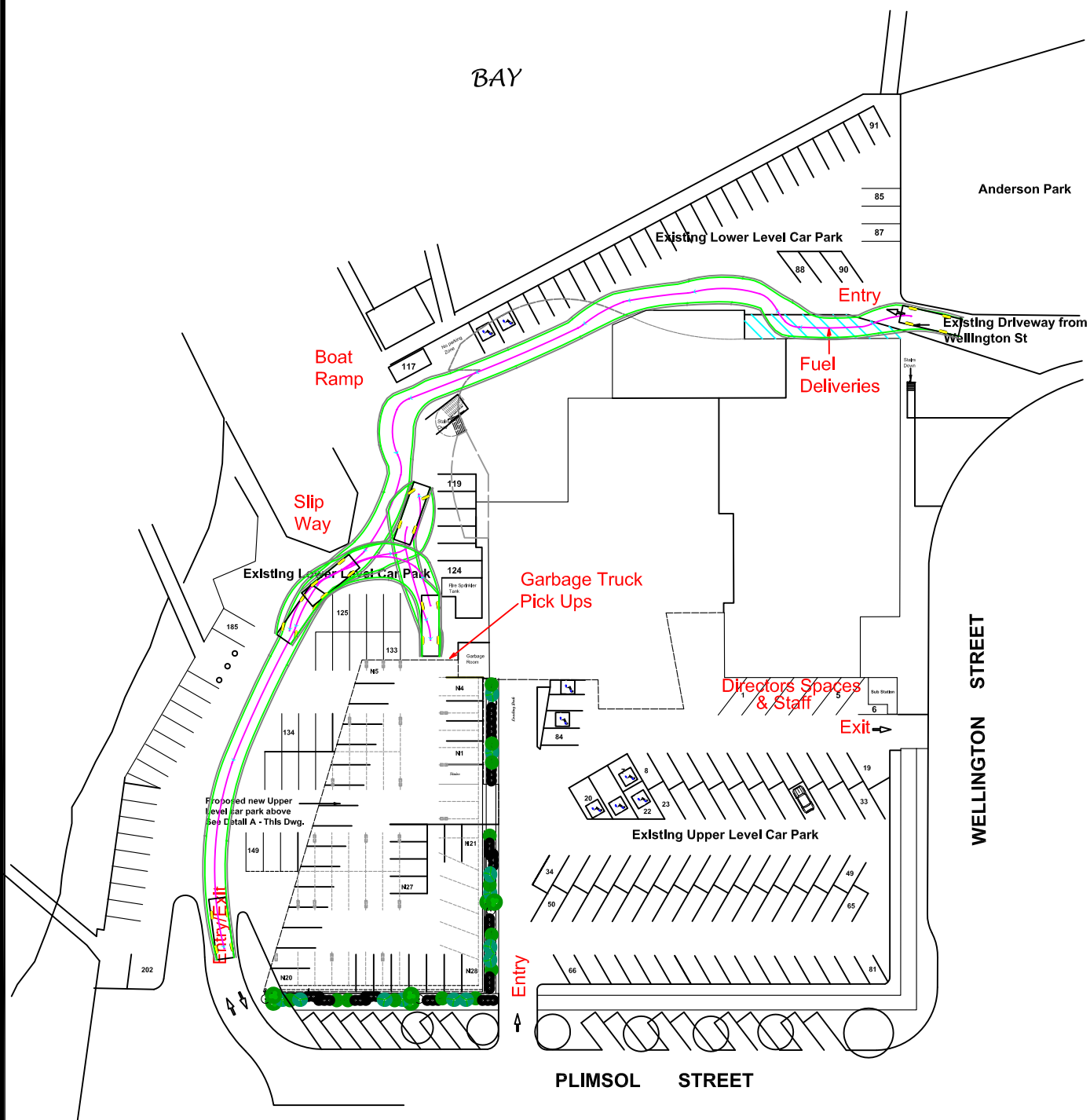
As noted above, there will be no change to the number of service vehicles coming to the Club, due to the expanded marina.

6.2 Impact of the Marina Proposal and Associated Car Parking Facilities on Service Vehicle Manoeuvring

The proposed marina extension including the car park changes will not impact on service vehicle manoeuvring on the St George Motor Boat Club site. **Figures 7A** and **7B** shows locations for service vehicle entry / exit and the manoeuvring areas for service vehicles coming to the club facility, as well as fuel deliveries for the marina. Reference to **Figures 7A** and **7B** shows that service vehicle paths and manoeuvring areas will remain unchanged with the marina extension and on site manoeuvring will continue to be satisfactory for service vehicles coming to the club and marina. Service vehicle manoeuvring is fully compliant with AS2890.2 requirements.

KOGARAH

BAY



* FUEL DELIVERIES AND WASTE MANAGEMENT VEHICLES

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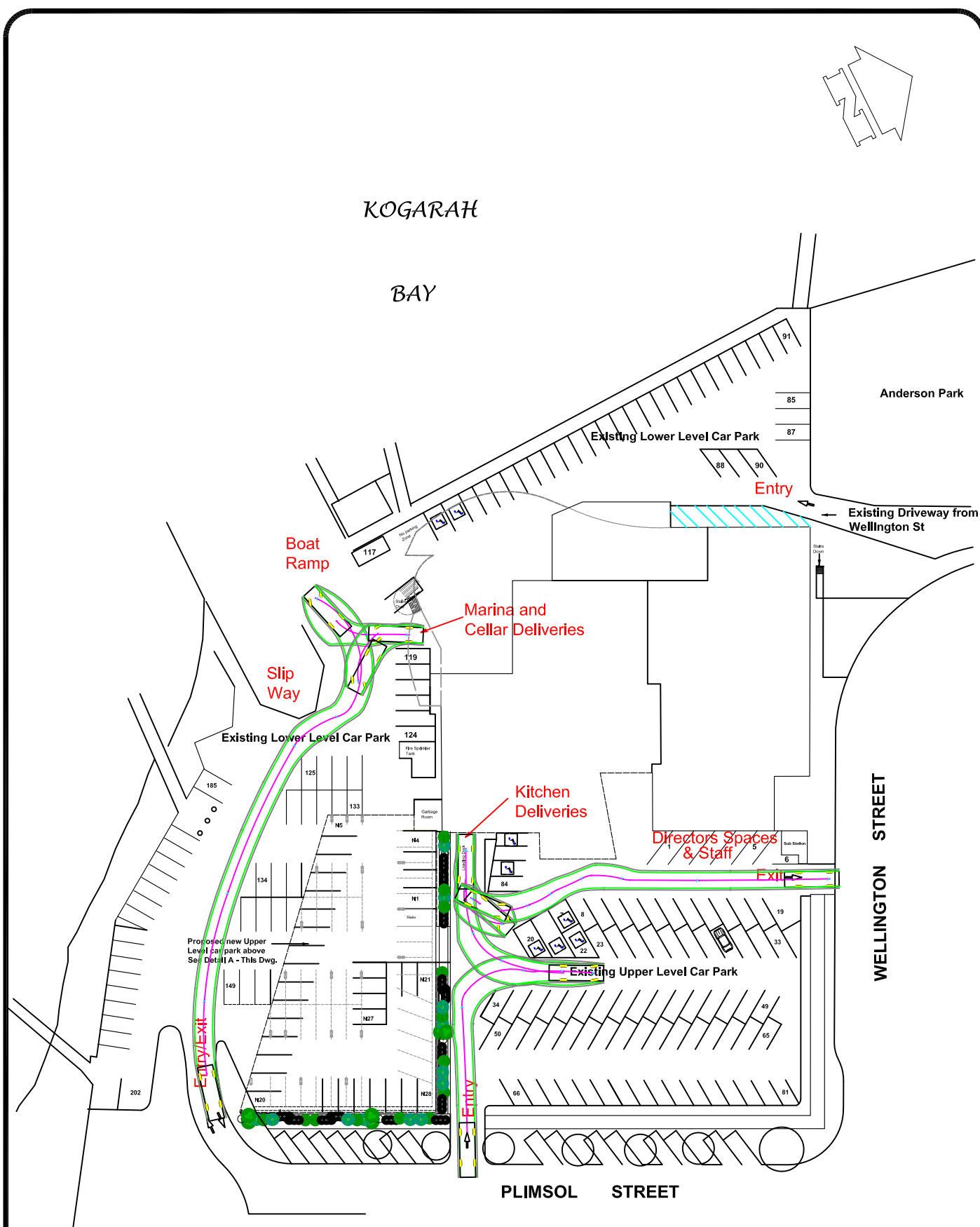
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FIGURE 7A

ST GEORGE MOTOR BOAT CLUB, SANS SOUCI

**SERVICE VEHICLE PATHS
MRV (8.8 METRES LONG)**

JOB NO. 29073



* KITCHEN AND CELLAR DELIVERIES

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FIGURE 7B

ST GEORGE MOTOR BOAT CLUB, SANS SOUCI

**SERVICE VEHICLE PATHS
MRV (8.8 METRES LONG)**

JOB NO. 29073

6.3 Traffic Impacts during Construction

Construction of the marina is expected to take approximately 20 weeks and involve between 6-20 construction workers on site at the same time. To minimise impacts on the adjacent land uses, the Club and marina, work hours will be 7.30am – 4.00pm Monday to Friday.

Based on information provided by St George Motor Boat Club, the traffic generation associated with the construction is estimated to be:

- 6 construction worker trips per day (i.e. 6 arrivals and 6 departures) for 4 weeks increasing to 20 construction worker trips (i.e. 20 arrival and 20 departure trips) per day for 16 weeks;
- 3-4 general delivery vehicles per week in small to medium rigid trucks;
- 2 semi trailer deliver vehicles per week; and
- A 40 tonne mobile crane coming to the site up to 6 times during the 20 week construction period.

A Traffic Management Plan (TMP) will be prepared for the construction activities of the marina extension and associated works, following approval of the Development Application to manage the traffic impacts of the construction.

APPENDIX 1

PHOTOGRAPHS OF ST GEORGE MOTORBOAT CLUB SITE, MARINA AND ADJACENT ROADS.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



1. Plimsoll Street which provides entry/exit to the Marina and entry to the upper level car park.



2. Wellington Street looking east towards Rocky Point Road from Plimsoll Street.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



3. Wellington Street looking west towards Vista Street from Plimsoll Street.



4. Entry to upper level car park in Plimsoll Street.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



5. Exit from upper level car park in Wellington Street.



6. Upper level car park.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



7. Entry and exit to lower level car park and Marina in Plimsoll Street.



8. Entry to lower level car park from Vista Street.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



9. Lower level car park.



10. Lower level car park.

ST GEORGE MOTOR BOAT CLUB SITE, MARINA AND ADJACENT ROADS



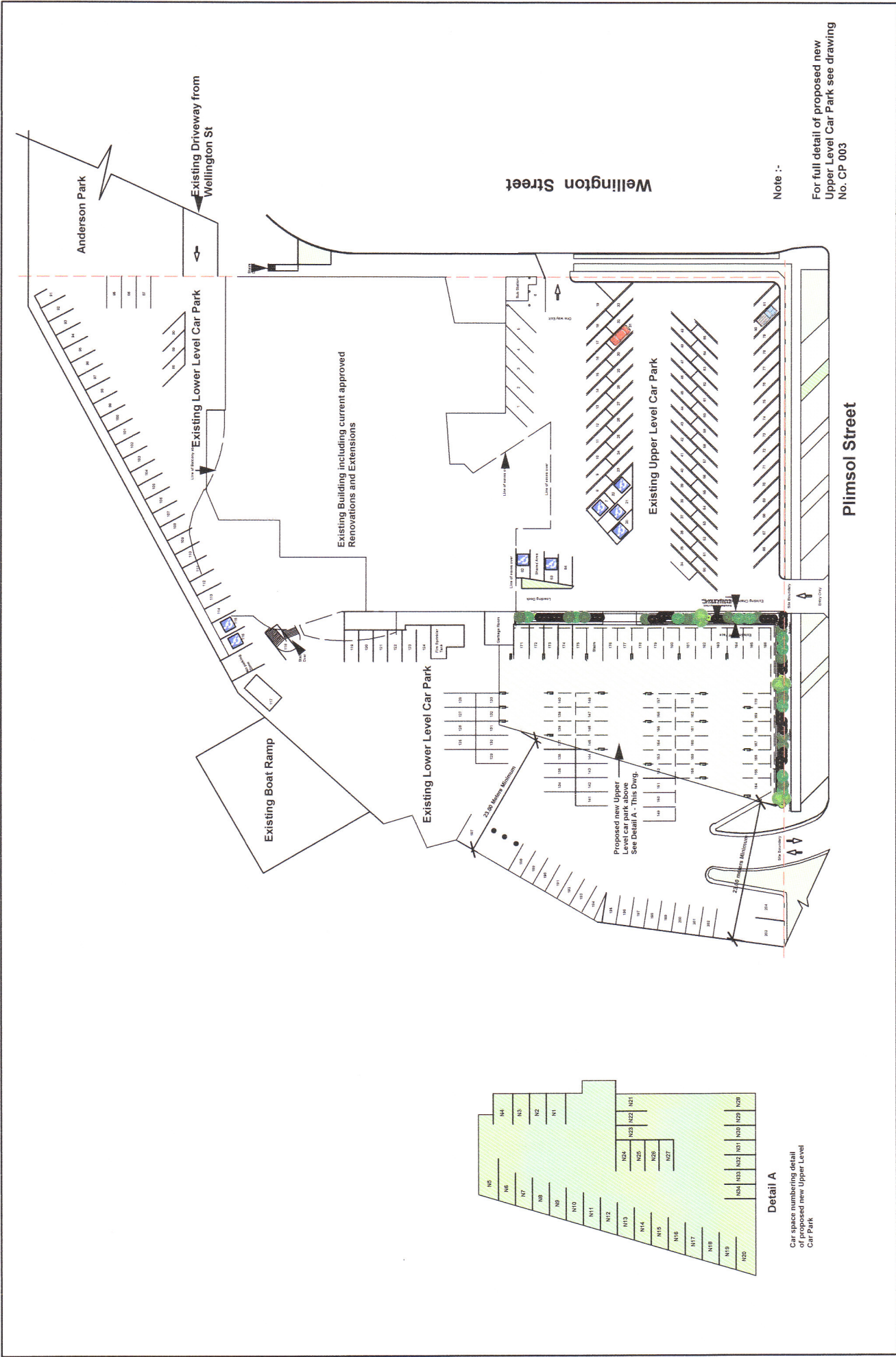
11. Lower level car park.




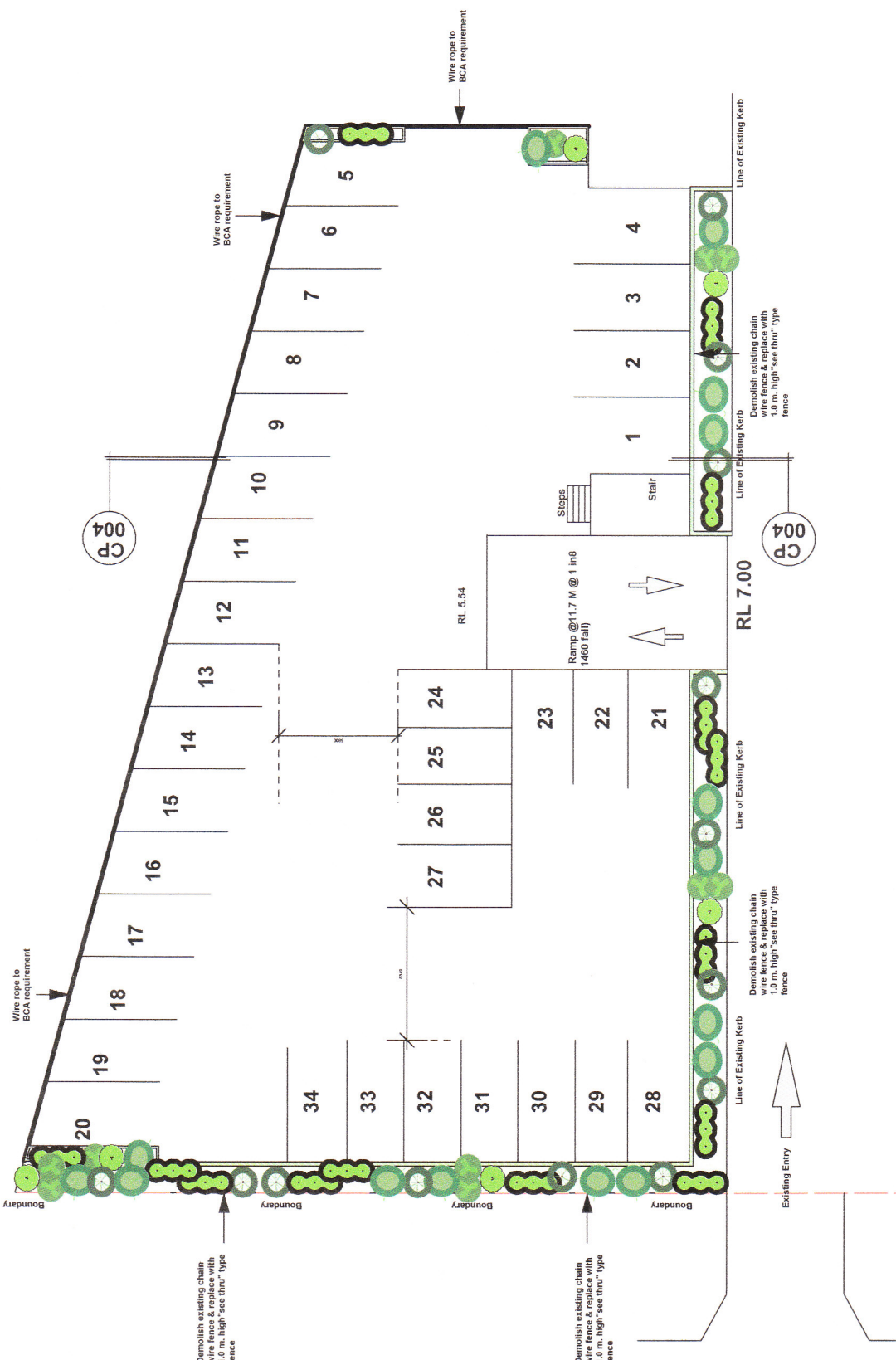
12. Boat Ramp

APPENDIX 2

PLANS OF PROPOSAL



	Project St. George Motor Boat Club 2 Wellington Street Sans Souci	Drawing No. CP00 2			Revision No. E
		Drawn DB	Scale 1 : 300	Date 7/11/09	
		Title Proposed New Car Parking			



Parking Space Schedule		
Space No.	Width	Length
N1 & M4	3460	5400
N 2 & N3	3000	5400
N6	2800	5400
N8 - N19	2820	5400
N20 - N23	2800	5400
N24 - N27	2800	5400
N28	2900	5400
N29 - N34	2870	5400

PROJECT

St. George Motor Boat Club
2 Wellington St. Sans Souci

DRAWN

DB

SCALE

As Shown

DATE

02/12/09

DWG NO

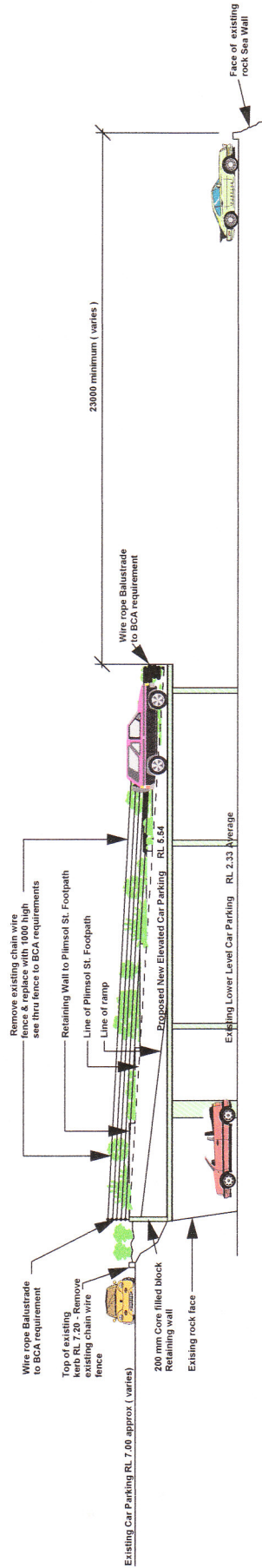
CP00 3

REV

C

TITLE

Proposed New Park Detail



Notes

1. Design of structural Slabs, Beams and Columns to future Structural Engineers details



PROJECT
St. George Motor Boat Club
2 Wellington St. Sans Souci

DRAWN	SCALE	DATE	DWG NO	REV
DB	As Shown	02/12/09	CP00 4	B
TITLE Section through new Car Park				



Additional Berths as per this proposal										
Berth Details		Arm								
Symbol	Type	F	E	D	C	B	A	Visitors	Totals	
	New 18 Metre	Nil	1	1	1	1	Nil	Nil	4	
	New 15 Metre	1	1	3	Nil	Nil	Nil	Nil	5	
	New 12 Metre	Nil	2	Nil	Nil	Nil	Nil	Nil	2	
	New 10 Metre	36	Nil	3	Nil	Nil	Nil	Nil	39	
	New 8 Metre	Nil	35	12	Nil	Nil	3	6	56	
	Deleted Berths	Nil	Nil	4	Nil	1	Nil	Nil	5	
	In use in Berths	37	39	15	1	Nil	3	6	101	
	As approved	Nil	23	33	27	28	17	Nil	128	
	Total Proposed Berthing	37	62	48	28	20	20	6	229	