D4

Appendix D4

MALBEC PROPERTIES PTY LIMITED

TRANSPORT REPORT FOR PROPOSED RESIDENTIAL SUBDIVISION, SOUTH WEST ROCKS

NOVEMBER 2008

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1. INTRODUCTION

1.1. Colston Budd Hunt & Kafes Pty Ltd has been commissioned by Malbec Properties Pty Limited to prepare a report examining the transport implications of a proposed 318 lot residential subdivision at South West Rocks. The site location is shown in Figure 1.

1.2. The Director –General's Requirements for the Project Application include:

> ***5. Traffic and Access***
>
> *5.1 Prepare a traffic impact study in accordance with Table 2.1 of the RTA's* Guide to Traffic Generating Developments.
>
> *5.2 Protect existing public access to and along the beach and coastal foreshore and provide, where appropriate, new opportunities for controlled public access. Consider access for the disabled, where appropriate*.

1.3. The findings of our assessment of the proposed residential subdivision are set down through the following chapters:

- Chapter 2 - describing the existing conditions; and
- Chapter 3 - assessing the transport implications of the proposed development.

1.4. Our report has been prepared with reference to the RTA's "Guide to Traffic Generating Developments" and Kempsey Shire Council's Development Control Plan No. 36 – Guidelines for Engineering and Subdivision.

1.5. The proposed development is a Schedule 3 development under State Environmental Planning Policy (Infrastructure) 2007 and will be referred to the RTA for its comment by the consent authority as part of the assessment process.

2. EXISTING CONDITIONS

Site Location and Road Network

2.1 The site is east of Gregory Street and north of Belle O'Connor Street in South West Rocks as shown in Figures 1 and 2. It forms the southern part of a larger release area for which Council has prepared a local environmental study and Section 94 plan.

2.2 The road network in the vicinity of the site includes Gregory Street, Philip Drive, Belle O'Connor Street and Waianbar Avenue. Gregory Street provides the main north-south connection in and to South West Rocks. It provides one traffic lane in each direction, with sealed shoulders. It provides a 50 kilometre per hour speed limit and provides access to residential, retail and commercial development. Where newer residential development fronts Gregory Street, parking lanes are provided. Gregory Street includes a median adjacent to The Rocks Shopping Centre, south of the site. There is a bus stop adjacent to the shopping centre.

2.3 Phillip Drive provides an east-west connection, via Landsborough Street and McIntyre Street, between Gregory Street in the west and Arakoon in the east. Phillip Drive provides for one traffic lane in each direction, and provides access to residential development and the golf club. Some sections of the road are kerbed and guttered. Phillip Drive has a 60 kilometre per hour speed limit.

2.4 Belle O'Connor Street intersects Gregory Street at a roundabout. Steve Eagleton Drive forms a fourth approach to the intersection. East of Gregory Street, Belle O'Connor Street provides one traffic lane and one parking in each direction with a central landscaped median. It provides access to residential properties and is a dead end at the eastern end of the new residential subdivision. The south-western part of

the site has frontage to the eastern end of Belle O'Connor Street.

2.5 Waianbar Avenue runs south from Phillip Drive at an unsignalised, priority controlled t-intersection, at which Phillip Drive has priority. Waianbar Avenue provides for two-way traffic with parking permitted. It provides access to residential development south of Phillip Drive. At present, there is no road connection between Waianbar Avenue and Belle O'Connor Street.

Existing Traffic Flows

2.6 In order to gauge traffic conditions, counts were undertaken during weekday morning and afternoon periods at the following intersections:

- Gregory Street/Belle O'Connor Street/Steve Eagleton Drive;
- Gregory Street/Landsborough Street; and
- Phillip Drive/Waianbar Avenue.

2.7 These intersections are shown in Figure 1. The results of the counts are shown on Figures 3 and 4 and summarised in Table 2.1. Gregory Street carried some 300 to 650 vehicles per hour two-way during the morning and afternoon peak periods. Flows on Landsborough Street, Belle O'Connor Street and Phillip Drive were lower at generally some 100 to 200 vehicles per hour two-way during peak hours. Steve Eagleton Drive and Waianbar Avenue carried less than 100 vehicles per hour two-way during the surveyed morning and afternoon peak hours.

Table 2.1: Existing two-way (sum of both directions) peak hour traffic flows			
Road	**Location**	**AM peak hour**	**PM peak hour**
Gregory Street	North of Landsborough Street	315	325
	South of Landsborough Street	405	430
	North of Belle O'Connor Street	595	620
	South of Belle O'Connor Street	580	615
Landsborough Street	East of Gregory Street	140	205
Belle O'Connor Street	East of Gregory Street	105	105
Steve Eagleton Drive	West of Gregory Street	60	50
Phillip Drive	East of Waianbar Avenue	120	130
	West of Waianbar Avenue	125	140
Waianbar Avenue	South of Phillip Drive	15	20

Intersection Operations

2.8 The capacity of the road network is largely determined by the capacity of its intersections to cater for peak period traffic flows. The surveyed intersections shown in Figures 3 and 4 have been analysed using the SIDRA program as identified in RTA guidelines.

2.9 SIDRA analyses isolated intersections controlled by signals, roundabouts or signs. The program produces a number of measures of intersection operations. The most useful measure provided is average delay per vehicle expressed in seconds per vehicle. Based on average delay per vehicle, SIDRA estimates the following levels of service (LOS):

- For traffic signals, the average delay per vehicle in seconds is calculated as delay/(all vehicles), for roundabouts the average delay per vehicle in seconds is selected for the movement with the highest average delay per vehicle, equivalent to the following level of service (LOS):

0 to 14	=	"A"	Good
15 to 28	=	"B"	Good with minimal delays and spare capacity
29 to 42	=	"C"	Satisfactory with spare capacity
43 to 56	=	"D"	Operating near capacity
57 to 70	=	"E"	At capacity and incidents will cause excessive delays. Roundabouts require other control mode.
>70	=	"F"	Unsatisfactory and requires additional capacity

- For give way and stop signs, the average delay per vehicle in seconds is based on the movement with the highest average delay per vehicle, equivalent to following LOS:

0 to 14	=	"A"	Good
15 to 28	=	"B"	Acceptable delays and spare capacity
29 to 42	=	"C"	Satisfactory but accident study required
43 to 56	=	"D"	Near capacity and accident study required
57 to 70	=	"E"	At capacity and requires other control mode
>70	=	"F"	Unsatisfactory and requires other control mode

2.10 It should be noted that for roundabouts, give way and stop signs, in some circumstances, simply examining the highest individual average delay can be misleading. The size of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service A, except one which is at level of service E, may not necessarily define the intersection level of service as E if that movement is very small. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue was also involved.

2.11 The analysis found that the roundabout controlled intersection of Gregory Street with Belle O'Connor Street and Steve Eagleton Drive is operating with average delays for the highest delayed movement of less than 15 seconds per vehicle during morning and afternoon peak periods. This represents level of service A/B, a good level of service.

2.12 The unsignalised intersections of Gregory Street with Landsborough Street and Phillip Drive with Waianbar Avenue are operating with average delays for the highest delayed movement of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

2.13 Council's Section 94 plan identifies a series of road and intersection works to cater for new development in the area. The works include road and intersection upgrades along Gregory Street, Landsborough Street, Phillip Drive and Arakoon Road.

Public Transport

2.14 Local bus services are provided by Cavanagh's. As previously discussed, there is a bus stop on Gregory Street south of the site, adjacent to the shopping centre. Services use Gregory Street as well as other local streets in South West Rocks. Services connect local areas in South West Rocks and Kempsey.

3. IMPLICATIONS OF PROPOSED DEVELOPMENT

3.1 It is proposed to develop a residential subdivision comprising 318 lots. Vehicular access is proposed to be provided from Belle O'Connor Street and a new road connecting north from the site to Phillip Drive. A concept layout of the proposed subdivision is shown in Figure 5.

3.2 Parking provision will be provided in accordance with Council's requirements and be finalised at the time of applications for individual dwellings. This chapter examines the implications of the proposed development through the following sections:

- public transport;
- proposed access and internal layout;
- traffic generation and effects; and
- summary.

Public Transport

3.3 The proposed residential subdivision will be close to bus services which connect to local areas in South West Rocks and Kempsey. The proposed subdivision, with its increase in residential population, will strengthen demand for public transport services in the area.

3.4 The proposed development, in association with other development to the north, will provide increased opportunities for public transport services in the area. The main north-south through road connection between Belle O'Connor Street and Phillip Drive will be provided with an appropriate width to accommodate buses. This will provide a good opportunity to service the release area.

3.5 Pedestrian connections will be provided through the subdivision to areas of public open space within and external to the subdivision.

Proposed Access and Internal Layout

3.6 Vehicular access is proposed to be provided via an eastern extension to Belle O'Connor Street on the southern side of the site, and a new road connecting north from the site towards Phillip Drive. New internal roads would connect from the extended Belle O'Connor Street for access to the development in three locations.

3.7 The western connection on Belle O'Connor Street will provide the main north-south connection through the development to other sites in the release area to the north. A roundabout is proposed to be provided at the intersection of this road with the extended Belle O'Connor Street.

3.8 In addition to connecting to other parts of the release area to the north, the road connection to the north will provide for a connection through to Phillip Drive, via Waianbar Avenue. This connection would distribute traffic more evenly on the surrounding road network, provide more convenient access to and through the release area and reduce overall vehicle kilometres travelled. It will also improve public access to the beach and coastal foreshore.

3.9 Internal roads within the subdivision are proposed to be provided as follows:

- Road 1
  - 17 metre reserve width;
  - 3.5 metre verge on western side;
  - seven metre carriageway; and
  - 6.5 metre verge on eastern side, including a swale.

- Roads 2, 3, 4, 5, 13, northern east-west part of Road 15 and Belle O'Connor Street extension (east of Road 6)
  - 16 metre reserve width;
  - nine metre carriageway; and
  - 3.5 metre verges on both sides.

- Road 6
  - 34.5 metre reserve width;
  - 20 metre verge on western side, including a swale;
  - 11 metre carriageway; and
  - 3.5 metre verge on eastern side.

- Road 7
  - 17 metre reserve width;
  - 4.5 metre verge on western side;
  - nine metre carriageway; and
  - 3.5 metre verge on eastern side.

- Road 8 north
  - 15 metre reserve width;
  - eight metre carriageway; and
  - 3.5 metre verges on both sides.

- Road 8 south
  - 25 metre reserve width;
  - 3.5 metre verge on western side;
  - eight metre carriageway; and
  - 13.5 metre verge on eastern side, including a swale.

- Road 9
  - 15.5 metre reserve width;
  - 3.5 metre verge on western side;
  - seven metre carriageway; and
  - five metre verge on eastern side.

- Road 10, northern part of Road 11
  - 9.5 metre reserve width;
  - 3.5 metre verges on western and eastern sides of roads 10 and 11 respectively;
  - six metre carriageway; and
  - roads 10 and 11 are separated by a drainage swale.

- Southern part of Road 11
  - 29 metre reserve width;
  - 16.5 metre reserve on western side, including a swale;
  - nine metre carriageway; and
  - 3.5 metre verge on eastern side.

- Road 12, southern east-west part of Road 15
  - 15 metre reserve width;
  - seven metre carriageway; and
  - four metre verges on both sides.

- Road 14
  - 18.5 metre reserve width;
  - six metre verge on western side, including a swale;
  - nine metre carriageway; and
  - 3.5 metre verge on eastern side.

- Road 15 (north-south part)
  - 15 metre reserve width;
  - 4.5 metre verge on western side;
  - seven metre carriageway; and
  - 3.5 metre verge on eastern side.

- Belle O'Connor Street extension (between western edge of site and Road 6)
  - 19 metre reserve width;
  - 11 metre carriageway; and
  - four metre verges on both sides.

3.10 The above carriageway widths are generally in accordance with Council's Guidelines for Engineering and Subdivision (DCP 36), which suggest carriageway widths of seven metres (access place), nine metres (local street) and 11 metres (collector road).

3.11 The exceptions to this are roads 10 and 11, which provide six metre carriageways. These roads include a drainage swale in the centre and the six metre carriageways are provided on each side of the swale. The six metre carriageways serve a low number of lots (some three and four lots each) with development on one side only. They are therefore considered to be appropriate for these short, low order roads.

3.12 Reserve widths are also generally in accordance with DCP 36, except where they are wider to include drainage swales and bicycle paths.

3.13 A pedestrian/cycle connection will be provided from Belle O'Connor Street into the subdivision. Bicycle paths and pedestrian footpaths will also be provided internally.

3.14 Internal roads will be designed to accommodate the swept paths of garbage trucks and furniture delivery vans. A roundabout will be provided at the main four-way intersection inside the site. Turning heads will be provided in the two short culs-de-sac in the south-western corner of the site.

3.15 As previously discussed, internal roads within the subdivision have been provided in accordance with the principles in Council's Guidelines for Engineering and Subdivision. The principles in Council's guidelines have been developed from AMCORD. Within residential precincts, AMCORD distinguishes two levels of streets, local streets and collector streets.

3.16 On local streets the residential environment dominates. Traffic speeds and volumes are low and pedestrian/cycle movements encouraged. Vehicle speeds should, as far as possible, be controlled by street length, parked cars, landscaping design, built form and activity along the frontage. Bicycles are generally provided for on-street.

3.17 Collector streets collect traffic from access streets and generally carry higher traffic flows. A good level of residential amenity and safety is maintained by restricting traffic volumes and vehicle speeds. Vehicle speeds on collector streets are controlled by street alignment, parked cars, street length, intersection design and built form.

3.18 The adoption of Council's guidelines/AMCORD provides an appropriate framework for the promotion of alternative travel modes to the private car, in particular, improved pedestrian and cyclist facilities.

Traffic Generation and Effects

3.19 Traffic generated by the development will have its greatest effects during morning and afternoon peak periods. Surveys undertaken by the RTA indicate that residential subdivisions generate 0.85 vehicles per hour per lot two-way during peak hours.

3.20 The proposed subdivision will therefore generate some 270 vehicles per hour two-way during the morning and afternoon peak periods.

3.21 During the morning peak hour, some 70 per cent of traffic would be outbound from the development. The reverse would apply in the afternoon. The additional traffic has been assigned to the road network. Existing traffic flows plus the additional traffic from the proposed development are shown in Figures 3 and 4. A summary is provided in Table 3.1.

Table 3.1: Existing two-way peak hour traffic flows plus development traffic

Road	Location	AM peak hour		PM peak hour	
		Existing	Plus development	Existing	Plus development
Gregory Street	North of Landsborough Street	315	+30	325	+30
	South of Landsborough Street	405	+30	430	+30
	North of Belle O'Connor Street	595	+70	620	+70
	South of Belle O'Connor Street	580	+180	615	+180
Landsborough Street	East of Gregory Street	140	-	205	-
Belle O'Connor Street	East of Gregory Street	105	+250	105	+250
Steve Eagleton Drive	West of Gregory Street	60	-	50	-
Phillip Drive	East of Waianbar Avenue	120	+5	130	+5
	West of Waianbar Avenue	125	+15	140	+15
Waianbar Avenue	South of Phillip Drive	15	+20	20	+20

3.22 Table 3.1 shows that traffic increases on Gregory Street (south of Belle O'Connor Street) and Belle O'Connor Street would be some 180 to 250 vehicles per hour two-way during peak hours. Increases on Gregory Street (north of Belle O'Connor Street), Phillip Drive and Waianbar Avenue would be lower at some five to 70 vehicles per hour two-way.

3.23 Roads within the subdivision would generally carry traffic flows less than 100 vehicles per hour two-way. This level of traffic would not be unexpected for these roads. The proposed roundabout and other priority controlled internal intersections will be able to cater for these traffic flows.

3.24 The intersections previously analysed in Chapter 2 have been re-analysed with SIDRA for the additional traffic flows shown in Figures 3 and 4.

3.25 The analysis found that with the additional development traffic, the intersection of Gregory Street with Belle O'Connor Street and Steve Eagleton Drive would continue to operate with average delays for the highest delayed movement of less than 15 seconds per vehicle during morning and afternoon peak periods. This represents level of service A/B, a good level of service.

3.26 The intersections of Gregory Street with Landsborough Street and Phillip Drive with Waianbar Avenue would continue to operate with average delays for the highest delayed movement of less than 15 seconds per vehicle during peak periods. This represents level of service A/B, a good level of service.

3.27 Therefore, the road network will be able to accommodate the additional traffic from the proposed development. Appropriate contributions will be made by the proposed development, as well as other developments in the area, towards works in Council's Section 94 plan.

3.28 At this stage the overall construction methodology, process and staging has not been defined. However, indicative peak construction traffic flows have been estimated based on information provided by the study team. Peak daily traffic flows during construction would be up to some 200 vehicles two-way. These flows would include peak deliveries of construction materials of some 40 to 50 deliveries per day.

3.29 Based on an eight hour working day, the peak traffic generation of 200 vehicles per day is equivalent to an average of some 25 vehicles per hour two-way. The surrounding road network will be able to cater for these relatively small movements.

Summary

3.30 In summary, the main points relating to the proposed residential subdivision in South West Rocks are:

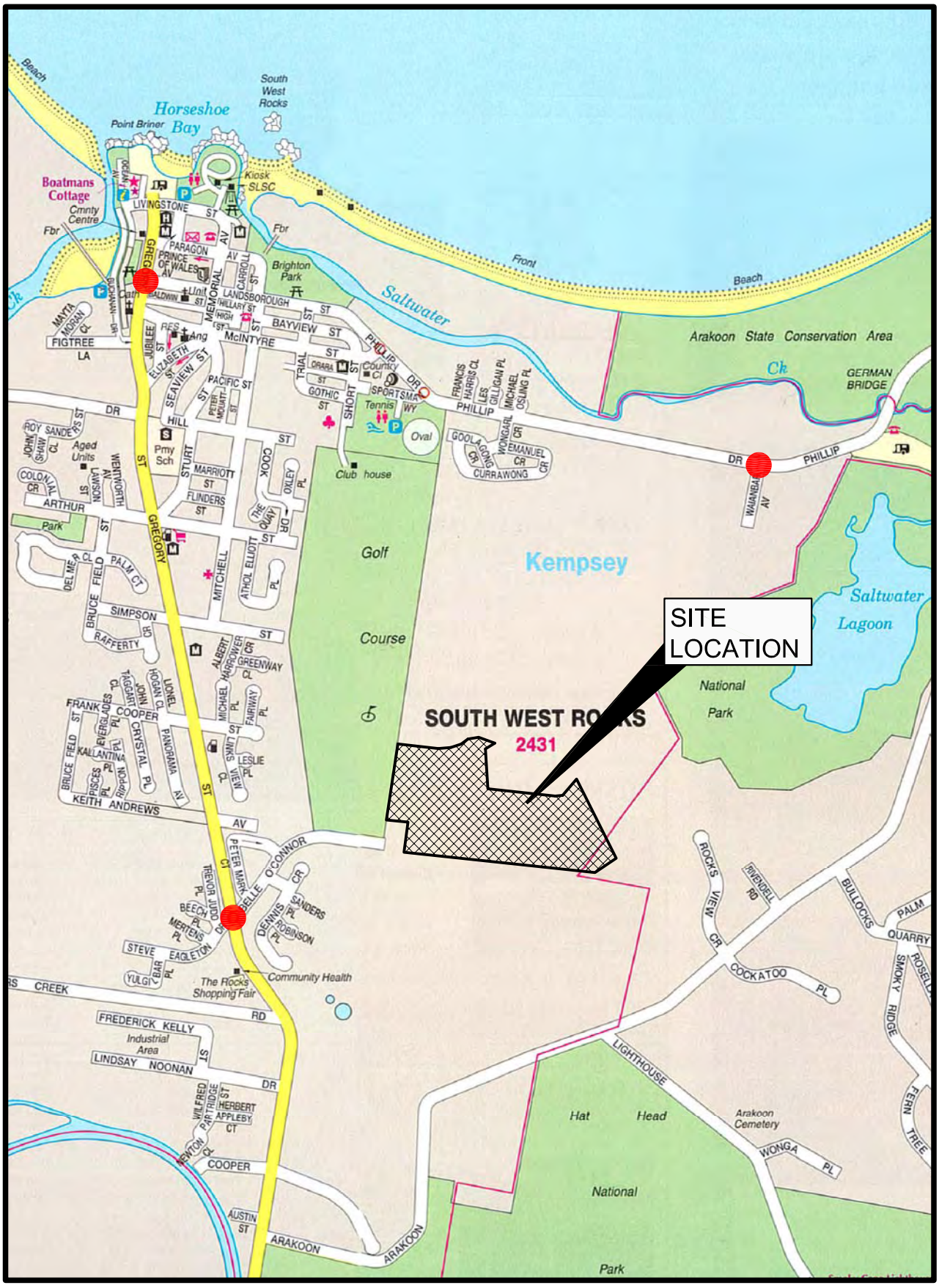
(i) the proposed residential subdivision comprises 318 lots;

(ii) vehicular access to the proposed subdivision will be via new roads from Belle O'Connor Street, and a connection to Phillip Drive;

(iii) the proposed access arrangements are considered appropriate;

(iv) internal roads will be provided in accordance with the principles in Council's guidelines and AMCORD; and

(v) the road network will be able to cater for traffic from the proposed development.



LEGEND

- surveyed intersections

LOCATION PLAN

1

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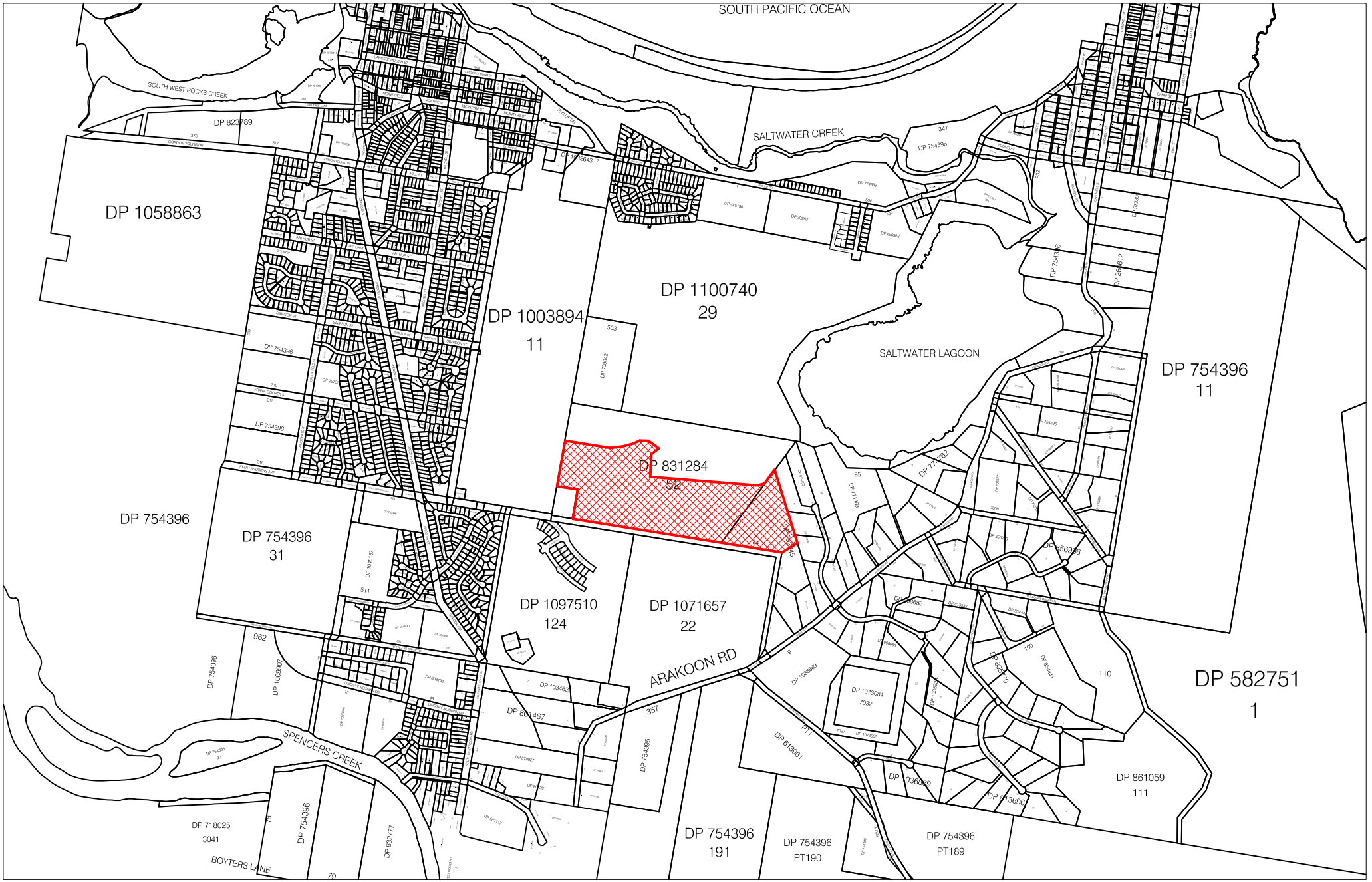

NOTE:
SKETCH PLAN ONLY. PROPERTY BOUNDARIES, UTILITIES, KERBLINES & DIMENSIONS ARE SUBJECT TO SURVEY AND FINAL DESIGN. TRAFFIC MEASURES PROPOSED IN THIS PLAN ARE CONCEPT ONLY AND ARE SUBJECT TO FINAL DESIGN BY CIVIL ENGINEERS.

SITE LOCATION

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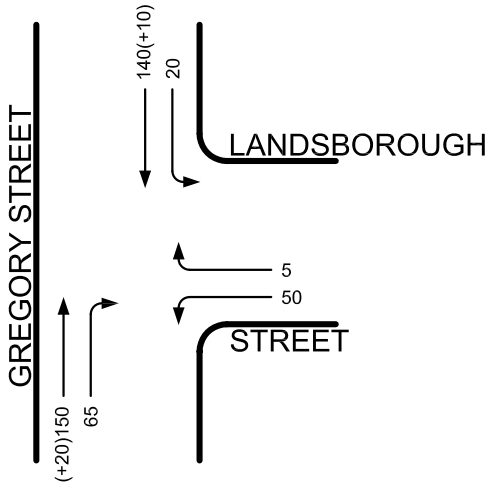

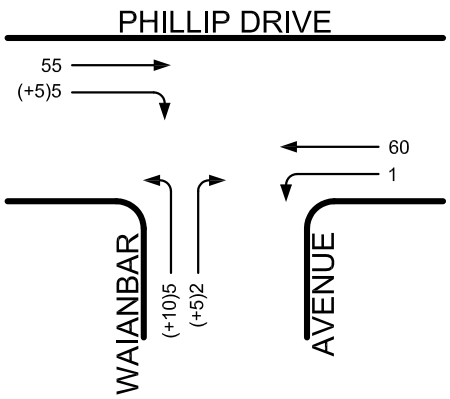

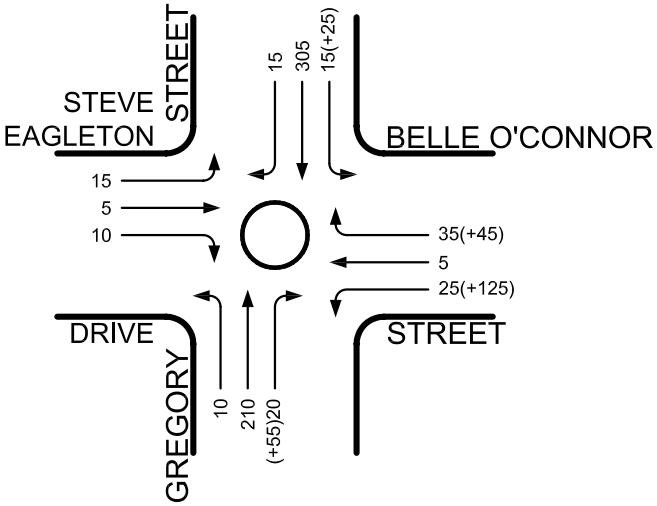

LEGEND

100 - Existing Peak Hour Flows

(+10) - Additional Development Traffic

○ - Roundabout

EXISTING MORNING PEAK HOUR TRAFFIC FLOWS PLUS DEVELOPMENT TRAFFIC

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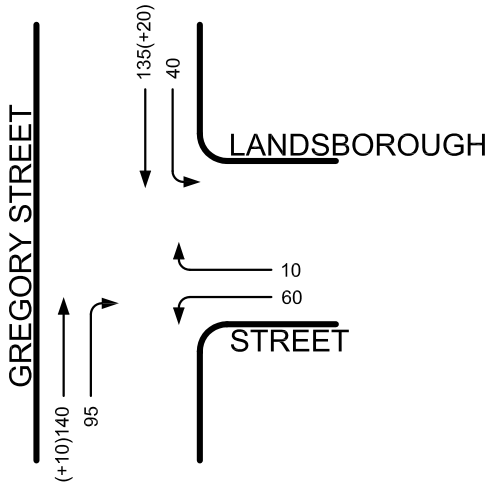
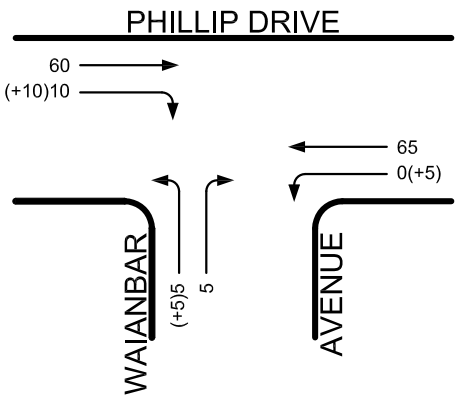
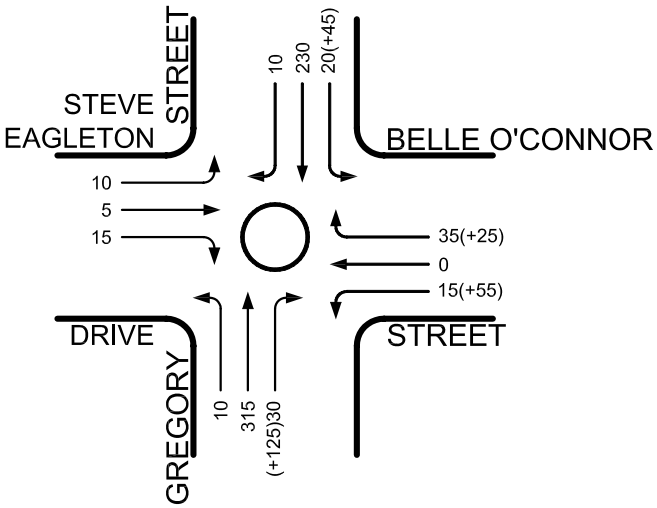
3







LEGEND

100 - Existing Peak Hour Flows

(+10) - Additional Development Traffic

○ - Roundabout

EXISTING AFTERNOON PEAK HOUR TRAFFIC FLOWS PLUS DEVELOPMENT TRAFFIC

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LEGEND

- LES Development Line
- 20 Metre APZ
- Swale / Vegetated Corridor
- Bike / Pedestrian Paths
- Playground
- Public Open Space with Facilities
- Staging Boundary
- SEPP 14 Wetland Area
- Fire Access Trail
- Wetland / Stormwater Treatment Pond

EDAW | AECOM

Malbec Lands - South West Rocks » **Subdivision Plan**

Scale 1:1500 @ A1, 1:3000 @ A3

14 November 2008