



MJM.NL Pty Ltd

# Traffic Impact Assessment Report

Rezoning Proposal – Bakali Road Forresters Beach

27 May 2021

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Appendix A – Rezoning Plan

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## 1 Introduction

Barker Ryan Stewart have been engaged by MJM.NL Pty Ltd to prepare a Traffic Impact Assessment in accordance with the requirements of Central Coast Council and the TfNSW "Guide to Traffic Generating Developments" to accompany a Planning Proposal to be lodge with Central Coast Council to rezone a triangular area of land between Bakali Road and the Central Coast Highway, Forresters Beach, from 7(a) Conservation and Scenic Protection (Conservation) and 7(c2) Conservation and Scenic Protection (Scenic Protection - Rural Small Holdings) under Interim Development Order No 122 (IDO 122) to E2 Environmental Conservation, R2 Low Density Residential and RE1 Public Recreation and to allow for up to 70 additional lots adjacent to 31 existing developed lots within the rezoning area.

The purpose of this report is to assess and address traffic, access, car parking and pedestrian impacts generated by the proposed development. This can be briefly outlined as follows:

- The expected traffic generation to/from the proposed development;
- The impact of the proposed development on the road network;
- Intersection analysis based on traffic counts;
- Vehicle parking provisions;
- Access design requirements;
- Delivery and waste collection;
- Provision for pedestrians; and
- Availability of public transport.

This Traffic Impact Assessment Report concludes that the subject site is suitable for the proposed rezoning and subdivision in relation to traffic impact, vehicle, and safety considerations.

## 2 Existing Conditions

### 2.1 Site Location

The subject site (Figure 1) is located between Bakali Road and the Central Coast Highway, Forresters Beach. It is generally triangular in shape with an area of 12.261 Ha. The site comprises 37 parcels of land in total. Of these 32 are standard residential sized lots fronting the Central Coast Highway and five rural-residential sized lots to the west with access from Bakali Road. Four of the five rural residential lots contain dwelling houses with the remaining rural residential lot (Lot 522 DP 1077907) being vacant. The north-western part of the subject site contains good quality Swamp Sclerophyll Forest on Coastal Floodplains, which is a defined as Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016*. Site location is provided below at Figure 2.1.



**Figure 2.1:** Site Location (Six Maps 2020)

### 2.2 Existing Development

All the subject 37 lots are zoned 7(c2) Conservation and Scenic Protection (Scenic Protection - Rural Small Holdings) under Interim Development Order No 122 (IDO 122), except for Lot 522 DP 1077907, which is zoned part 7(c2) Conservation and Scenic Protection (Scenic Protection - Rural Small Holdings) and part 7(a) Conservation and Scenic Protection (Conservation) as shown in Figure 2.2 below.



Figure 2.2 : Existing Zoning under IDO 122

The subject site also includes 31 developed urban residential lots with access to the Central Coast Highway. 16 lots along the western boundary of Central Coast Highway have access to the Highway via a service road connected to Bakali Road. The five rural-residential sized lots to the west of the site have access to Central Coast Highway from Bakali Road. Remaining 15 lots further north have direct access to Central Coast Highway via individual driveways.

## 2.3 Existing Road Network

### Central Coast Highway

The Central Coast Highway is the major road through Forresters Beach past the subject site, which forms part of the State road network linking the area with the centre of Gosford to the south and the M1 Motorway to the north and through The Entrance to Magenta, Toukley and Budgewoi eventually linking up with the Pacific Highway at Lake Munmorah. In the vicinity of the subject site the Central Coast Highway has short section with two-lane road formation with turn lanes provided at the key intersections to maximise the capacity of the road network. The posted speed limit is 70 km/h in this location.

### Bakali Road

Bakali Road is a single lane road in each direction that provides access to subject site and to the four developed rural residential lots within the subject site. Bakali Road connects with the Central Coast Highway approx. 90 metres north of Crystal Street where there is a two-lane roundabout. All turning movements are currently permitted at the Bakali Road / Central Coast Highway intersection, although during peak periods right turns onto Bakali Road are generally avoided by drivers as it is more efficient and safer to perform a U-turn at the roundabout at Crystal Street and then turn left onto Bakali Road. There are two northbound lanes on the Central Coast Highway extending from the Crystal Street roundabout to approx. 80 metres past Bakali Road where it merges into one lane. These lanes allow left turns into and out of Bakali Road.

### Service Road

Immediately to the north of Bakali Road are 16 residential properties along the western boundary of the Central Coast Highway. Access to these properties is provided via a sealed service road which connects with Bakali Road only 6 metres from the stop line at its intersection with the Central Coast Highway. The service road is separated from the Central Coast Highway at the southern end by a concrete median then further north by a short section of guardrail, a concrete lined drain, and a grass verge. At the northern end of the service road there is an informal connection with the Central Coast Highway. Vehicles were observed merging with northbound traffic on Central Coast Highway at this location.

## 2.4 Future Road Network improvements

### Central Coast Highway upgrade – Wamberal to Bateau Bay

The NSW Government committed \$387 million in March 2019 to duplicate the Central Coast Highway between Wamberal and Bateau Bay. The NSW Government has invested \$4 million to enable TfNSW to progress early planning for this project. Around 26,500 motorists use this section of the highway daily and this upgrade will ensure the Central Coast Highway between Wamberal and Bateau Bay is prepared to handle future growth.

Key benefits of the upgrade include:

- Improved consistent travel time and reducing congestion between Wamberal and Bateau Bay.
- Reduced delays at key intersections.
- Improved road user safety.
- Safer cycling and pedestrian facilities, particularly near intersections.
- Enhancing economic growth and productivity, particularly during busy holiday times.

Key Features of the upgrade include:

New Traffic lights at:

- Tumbi Road intersection.
- Crystal Street intersection.
- Forresters Beach Road intersection.
- Bellevue Road intersection.
- Passage Road / Coleridge Road intersection.
- Existing traffic lights at Bateau Bay Road will be modified.

Roundabout:

- Cresthaven Avenue roundabout upgraded to two through lanes in both directions on the Highway.

Left in - left out only at:

- Bakali Road intersection.
- Alistair Avenue intersection.
- Coleridge Road (north entry) intersection.

Dedicated right turn lane in and out at:

- Apollo Resort Entry, Wamberal.
- Mistview Circuit intersection.
- Whalans Road intersection.

Dedicated right turn lane in and U-turn facility at:

- Maas Parade

Bus bays:

- New indented bus bays north and south of the Tumbi Road intersection.
- New indented bus bays on the northern side of Passage and Coleridge Road intersection.
- Existing bus bay on Tumbi Road approach will be removed.
- Existing bus bay on southern side of Bellevue Road will be removed.

Shared path:

- metres wide on the whole length of the eastern side (3.8 km).

Footpath:

- 1.5 metre wide footpath on whole length of western side (3.3km), except between Bellevue Road and Passage Road.

On road cycleway/shoulder:

- 2 metre wide on-road cycleway in both directions between Tumbi Road and Cresthaven Avenue.

Under the initial designs for the project, the parallel service road on the western side of the highway just north of Bakali Road is retained but modified. The service road length is reduced. It will no longer connect to Bakali Road and will be accessed from the highway northbound carriageway only. In most cases, residents will continue have access via the service road. There are some residences who will not be able to access the shortened access road and will be provided direct access to the highway.

As part of the next phase of project development, TfNSW will carry out additional investigation and design to define the extent of the service road modifications and residential access arrangements in this area.



## 2.5 Existing Traffic Volumes

### 2.5.1 Peak Hour Traffic Data

Transport for NSW (TfNSW) is investigating an upgrade to the Central Coast Highway over a distance of 3.8 kilometre section between Tumbi Road and Bateau Bay Road. The proposed upgrade includes duplication between Tumbi Road and Bateau Bay Road, including provision of associated shared paths and intersection upgrades. As part of this investigation, Traffic counts were undertaken by TfNSW in February 2018 on the seven key intersections between Tumbi Road and Bateau Bay Road.

Barker Ryan Stewart received 2018 traffic volume data form TfNSW for the following intersections to assess the performance of the intersections and impact of the proposed development on the surrounding road network.

- Central Coast Highway / Forrester Beach Road
- Central Coast Highway / Crystal Street

Traffic volumes at the intersection of Central Coast Highway / Bakali Road were derived by using the 2018 data received from TfNSW and by adopting traffic generation rates provided in TfNSW Technical Direction TDT 2013/04a "Guide to Traffic Generating Developments". A growth factor of 1 % was then applied on Central Coast Highway traffic to derive 2021 traffic volumes at Central Coast Highway / Forrester Beach Road and Central Coast Highway / Bakali Road Intersection.

The 2021 AM and PM peak traffic volumes for the two intersections are shown below in Figure 2.3 and 2.4 below:

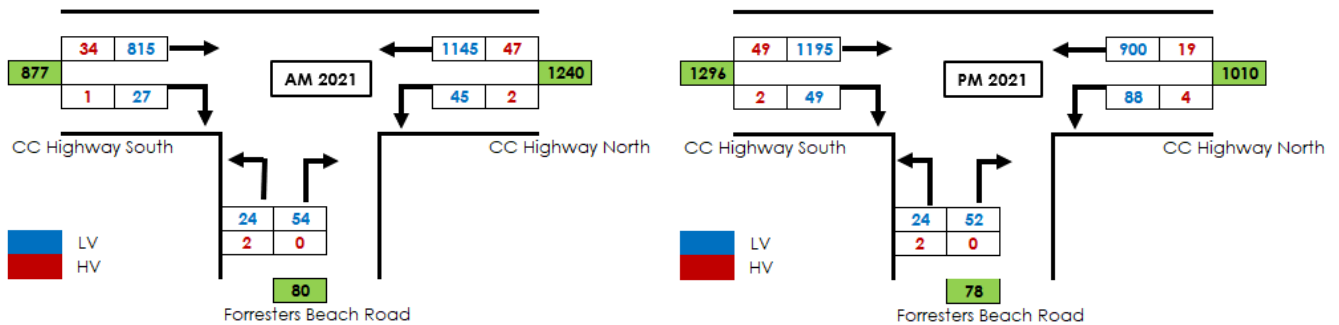


Figure 2.3 – 2021 AM & PM Traffic Volumes at Central Coast Highway / Forrester's Beach Road

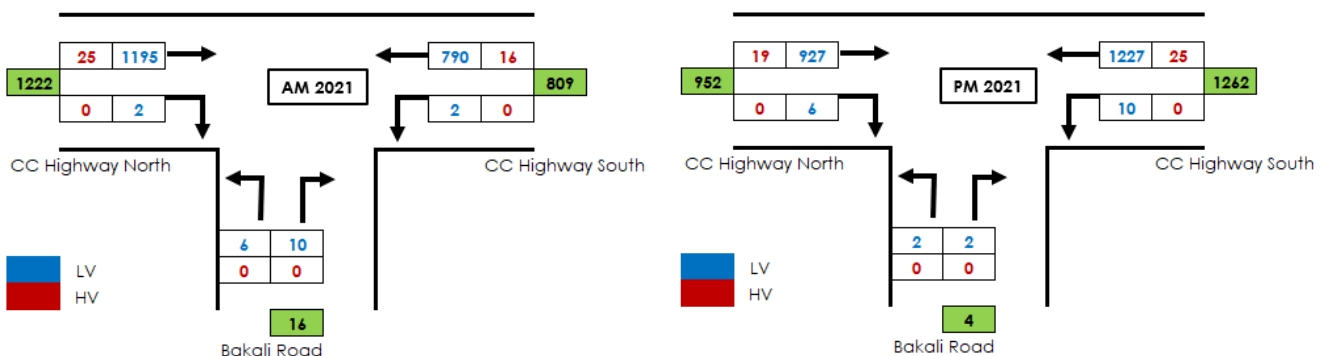


Figure 2.4 – 2021 AM & PM Traffic Volumes at Central Coast Highway / Bakali Road

### 2.5.2 Existing Road Service Level

Below is an overview of the hourly traffic volumes and the current operation performance on the surrounding network, based on table 4.4 of the TfNSW "Guide to Traffic Generating Developments" that states, 'typical one-way mid-block lane capacities on urban arterial roads under interrupted flow

conditions are 900-1000 veh/hr/lane. This calculation assumes Clearway conditions. The capacity falls to 600 veh/hr/lane for a kerbside lane with occasional parked vehicles. These capacities at times may increase under ideal conditions to 1200-1400 veh/hr.'

### Central Coast Highway

The Central Coast Highway (A49) is a major road corridor in the Central Coast region. The route carries significant volumes of both regional and local traffic as it provides an important connection between the M1 Pacific Motorway and Doyalson through Gosford, Erina, and The Entrance. The Central Coast Highway, between the M1 Pacific Motorway at Kariong and Wyong Road at Long Jetty, has been progressively upgraded to a four lane, separated dual carriageway. The 3.8 kilometre section between Tumbi Road and Bateau Bay Road (this project) represents the last remaining two lane, undivided road extent within this part of the Central Coast Highway.

The Central Coast Highway carries high traffic volumes in the southbound direction during the weekday AM peak. In the AM peak about 990 to 1,320 vehicles per hour were recorded in the southbound direction. During the weekday PM peak, heavy traffic volumes are observed in the northbound direction. In the PM peak about 1,140 to 1,390 vehicles per hour were recorded in the northbound direction. The current peak hour volumes between 990 (LoS E) and 1,390 (LoS E) indicate that Central Coast Highway in both AM and PM peak is over saturated and exceeded its capacity.

The proposed upgrade of Central Coast Highway would improve travel speed, improve the reliability of journeys, and provide more consistent driving conditions. The proposed upgrade would improve local amenity and improve road safety by reducing the crash rate.

## **2.6 Public Transport, Pedestrians and Cyclists**

The area is well connected to public transport. Bus connections are in close proximity to the site. There is an existing bus stop adjacent to the site along the Central Coast Highway, providing access to bus routes that connect to Gosford, The Entrance and Wyong. Bus stops are located on each side of the Central Coast Highway between Bakali Road and Crystal Street with pedestrian access facilitated by a break in the central concrete median which acts as a pedestrian refuge.

Cyclists are catered for by sealed shoulders on each side of the Central Coast Highway varying between 1 metre and 3 metres wide.

The availability of public transport, pedestrian and cyclist infrastructure provides opportunities to reduce reliance on private motor vehicles for residents accessing the proposed development.

### 3 Proposed Development

#### 3.1 Development Description

The Planning Proposal seeks to rezone the subject land from 7(c2) Rural Small Holdings and 7(a) Conservation under IDO 122 to R2 Low Density Residential, RE1 Public Recreation and E2 Environmental Conservation under Gosford Local Environmental Plan 2014 (GLEP 2014) or Central Coast Local Environmental Plan (CCLEP) whichever is in effect at the time. Proposed zoning of the land with access to Central coast Highway is shown in Figure 3.1 below.

Specifically, the proposal includes:

- Rezoning to R2 Low Density Residential, the following land:
  - the 32 lots fronting Central Coast Highway;
  - Part of Lot 522 DP 1077907 Central Coast Highway;
  - Lots 1, 2 and 4 DP 1000694, Bakali Road; and
  - Part of Lot 3 DP 1000694, Bakali Road.
- Rezone part of Lot 522 DP 1077907 and part of Lot 3 DP 1000694 to E2 Environmental Conservation
- Rezone part of Lot 522 DP 1077907 to RE1 Public Recreation



**Figure 3.1** – Proposed Zoning of the land with access to Central Coast Highway

Proposed subdivision layout of the rezoned land has been prepared by Bannister and Hunter Pty Ltd which indicates that the existing and undeveloped area could be subdivided into a total of 38 residential lots ranging in size from 550m<sup>2</sup> to 4000m<sup>2</sup>. The total lots and staging of the proposed subdivision are as shown in the table 3.1 below:

**Table 3.1:** Subdivision Stages and total lots

Stage	Number
1,2 & 3	47
4	8
5	9
6	6
Central Coast Highway Existing Properties	31
<b>Total</b>	<b>101</b>

All access to and from the subdivision will be via Bakali Road and via internal subdivision access road. Access road will intersect with Central Coast Highway north of the site opposite Forresters Beach Road. Access Road will be restricted to interim left in / left out arrangement till the intersection is upgraded by TfNSW as part of Central Coast Highway upgrade project.

A copy of the subdivision plan is provided at **Appendix A**.

### 3.2 Access and Circulation

Currently the access to and from the subject site is limited to Bakali Road there are only two options for access to and from the Central Coast Highway:

- Retain the existing arrangement at the Central Coast Highway / Bakali Road intersection which permits all turning movements.
- Restrict Central Coast Highway / Bakali Road intersection to permit only left in and left out traffic movements.

With the first option there are safety concerns with right turn movements out of Bakali Road at this intersection together with its proximity to the roundabout at Crystal Street. As a result, all access to and from the subdivision via Bakali Road will be restricted to left in and left out only.

The second option, however, raises issues regarding access to and from the Central Coast Highway for residents travelling towards the south and those entering from the north. Turning restrictions will not only apply to traffic generated from the proposed subdivision but also to existing residents of the 22 properties along the Central Coast Highway with access via the service road and Bakali Road.

As all traffic exiting Bakali Road will be restricted to left out only, those with destination to the south will need to travel further north for at least 650 metres to Forresters Beach Road or a further 100 metres to Alistair Avenue to turn off the Central Coast Highway for a return trip south. Forresters Beach Road and Alistair Avenue provide the first opportunity for safe turning movements as both intersections have dedicated right turn bays on the Central Coast Highway.

As part of the concept design in the next phase of project development, TfNSW will further investigate the options for access to residences between Bakali Road and Forresters Beach Road when travelling southbound on the Central Coast Highway.

Drivers can also choose to turn right into Maas Parade, 160 metres south of Forresters Beach Road, however, there is no right turn lane at this location, but, 2 metre wide shoulder will allow through vehicles to pass a right turning vehicle. This is likely to appeal to drivers more to wait at this location till find a gap in the oncoming traffic and then turn right safely into Maas Parade rather than travel further north. Once turned into Maas Parade safe U-turn manoeuvres can be performed. Initial map of the Central Coast Highway upgrade seems to indicate a dedicated right turn bay at the intersection and U-turn facility will be constructed on Mass Parade.

The right turn restriction at Bakali Road will not present any significant inconvenience for vehicles travelling from the north as they will only have to travel an extra 90 metres to the roundabout at Crystal Street where they can safely perform a U-turn and turn left into Bakali Road. However, the replacement of the existing Crystal Street roundabout with traffic lights after the duplication of Central Coast Highway will result in the loss of southbound U-turn provision for residences between Bakali Road and Forresters Beach Road and will require local detours.

Is it also proposed to extend the internal subdivision access road to the north to connect with Central Coast Highway opposite Forresters Beach Road as an interim left in / left out arrangement. TfNSW is proposing a future upgrade of the Central Coast Highway / Forresters Beach Road intersection to traffic signals and the subdivision road will become then becomes the 4<sup>th</sup> leg of this intersection.

A copy of the concept plan for Left in Left out (LILLO) arrangement is provided at **Appendix B**.

The photos below show the sight lines available in both directions along Central Coast Highway for the driver of an egressing vehicle from Bakali Road and Forresters Beach Road.



View looking south from Bakali Road



View Looking north from Bakali Road



View looking North from Forrester Beach Road



View looking South from Forrester Beach Road

## 4 Traffic Assessment

The impact of the proposed development on the surrounding road network was assessed using SIDRA Intersection modelling software. The traffic counts outlined in Section 2.4.1 and traffic generation estimated below in Section 4.1 were used to determine an overall traffic level for the area post-development. The following intersections were analysed:

- Central Coast Highway / Bakali Street (Existing and Left in / Left Out)
- Central Coast Highway / Proposed Access Road (Left in Left Out)
- Central Coast Highway / Forresters Beach Road (Existing and Signals)

Intersections was modelled for the following scenarios.

- Existing traffic volumes;
- Existing traffic + development generated traffic;
- Existing traffic + 10-year growth; and
- Existing traffic + development generated traffic + 10-year growth (at 1% per annum on Central Coast Highway).

For robust and conservative assessment, the peak hour distribution of generated traffic in the post-development scenarios has been assumed to be 80% in & 20% out in AM peak & reverse in PM peak. Directional distribution adopted is 40% from North of the site and 60% from South of the site. In predicting future traffic growth, a background traffic growth rate of 1 % per annum on Central Coast Highway has been adopted.

### 4.1 Trip Generation

TfNSW Technical Direction TDT 2013/04a 'Guide to Traffic Generating Developments, Updated Traffic Surveys' provides the following trip generation rates for residential dwellings:

- Daily vehicle trips = 7.4 per dwelling in regional areas; and
- Weekday average AM peak hour vehicle trips = a maximum of 0.90 trips per dwelling in regional areas.
- Weekday average PM peak hour vehicle trips = a maximum of 0.85 trips per dwelling in regional areas.

#### Existing Development

The existing 16 residences along western boundary of the Central Coast Highway and immediately north of Bakali Road and 6 residences along north west and north east of Bakali Road will generate 20 trips in the AM and PM peak hour. Other 15 residences along western boundary of the Central Coast Highway and further north of the site have direct access onto the highway via individual driveways. Traffic generated by these residences is unlikely to use Bakali Road and therefore excluded from this assessment.

The existing trip generation is therefore:

- $22 \times 7.4$  daily vehicle trips = 162.8 (163 trips); and
- $22 \times 0.9$  peak hour trips = 19.8 (20 trips)

The 20 existing peak hour trips will thus need to be included when assessing the traffic impact due to the proposed rezoning / subdivision.

### Proposed Development

The expected trip generation for the proposed 70 lot subdivision on the subject site will be:

- 70 x 7.4 daily vehicle trips = 518 trips; and
- 70 x 0.9 peak hour trips = 63 trips.

Total peak hour trips generated by the proposed development will therefore be 83 (63 trips generated by the proposed subdivision plus 20 trips generated by the existing properties).

## 4.2 Peak Hour Trip Distribution

Following assumptions have been adopted to inform basis for this traffic impact assessment :

### **General:**

- Bakali Road will be restricted to left in left out (LILLO) movement only once the development is approved.

In AM peak, it was assumed, 80% of the trips (66) would be outbound and 20% inbound (17) whilst in the PM peak the opposite would apply (17 outbound and 66 inbound). It is assumed that the current directional split (60% to and from northbound/40% to and from southbound) of traffic on the Central Coast Highway will apply to this development. That being the case the AM Peak would generate 27 vehicles to the north and 40 vehicles to the south with 7 coming from the north and 10 entering from the south. The PM Peak would generate 7 vehicles to the north and 10 vehicles to the south with 27 entering from the north and 40 entering from the south.

### **AM Peak:**

- All vehicles from the development travelling north will exit onto Central Coast Highway via new access road.
- 50% of vehicles travelling south will also exit onto Central Coast Highway via new access road and then turn right onto Alistair Road and will either make a U-turn or travel via Dunlop Road / Lowanna Ave onto Forresters Beach Road and turn left onto CC Hwy heading south.
- Remaining 50% will use Bakali Road and turn left at onto Central Coast Highway to make a U-turn either at Mass parade or Forresters Beach Road.
- Vehicles coming from North will make a U-turn at Crystal Street roundabout. 50% of these vehicles will turn left at Bakali Road and rest 50% will travel north and turn left at new access road off Central Coast Highway.

### **PM Peak:**

- Same directional split as AM peak has been adopted for PM peak.

The AM Peak therefore would generate 46 northbound vehicles at new access road and 20 northbound vehicles to the north at Bakali Road with 9 vehicles from the south turning left on to new access road and 8 onto Bakali Road. The PM Peak would generate 12 northbound vehicles at new access road and 5 northbound vehicles at Bakali Road with 33 from the south vehicles turning left on to new access road and 33 onto Bakali Road.

The 16 existing properties along the western boundary of the Central Coast Highway immediately north of Bakali Road and 6 residences along north west and north east of Bakali Road will generate 20 trips in the peak hour. Based on the trip distribution above, the AM peak would generate 6 vehicles to the north and 10 vehicles to the south with 2 entering from the north and 2 entering from the south. The PM Peak would generate 2 vehicles to the north and 2 to the south with 6 entering from the north and 7 from the south. This is considered to be the worst-case scenario as most trips form these properties to and from the

north will be via the informal northern connection of the service road to the Central Coast Highway as it exists currently.

As stated above other 15 residences along western boundary of the Central Coast Highway and further of the site have direct access to the highway via individual driveways. Traffic generated by these residences is unlikely to use Bakali Road and therefore excluded from this assessment.

The above trip distribution would result in up to 40 additional vehicles turning right at either Forresters Beach Road or Alistair Avenue for the return trip south in the AM Peak and 10 additional vehicles in the PM Peak. It is assumed that 50% (20 vehicles) will turn right at Alistair Avenue and 50% at Forresters Beach Road (20 vehicles) in AM peak and 5 will turn right at Alistair Avenue 5 at Forresters Beach Road in PM peak.

The AM and PM distribution of traffic at the Bakali Road / Central Coast Highway intersection is illustrated in Figure 4.1 and 4.2 below.

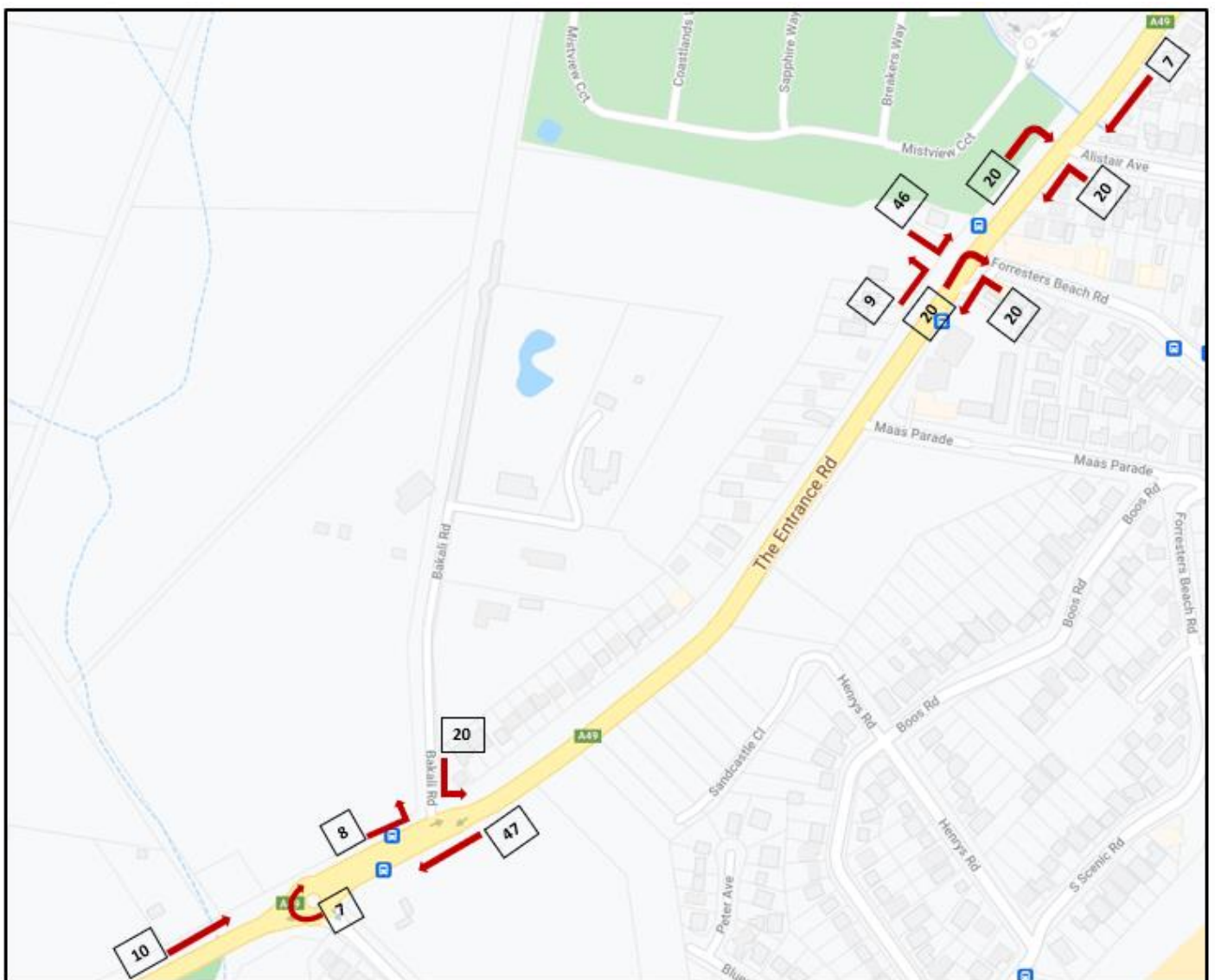


Figure 4.1 – AM peak Traffic Distribution



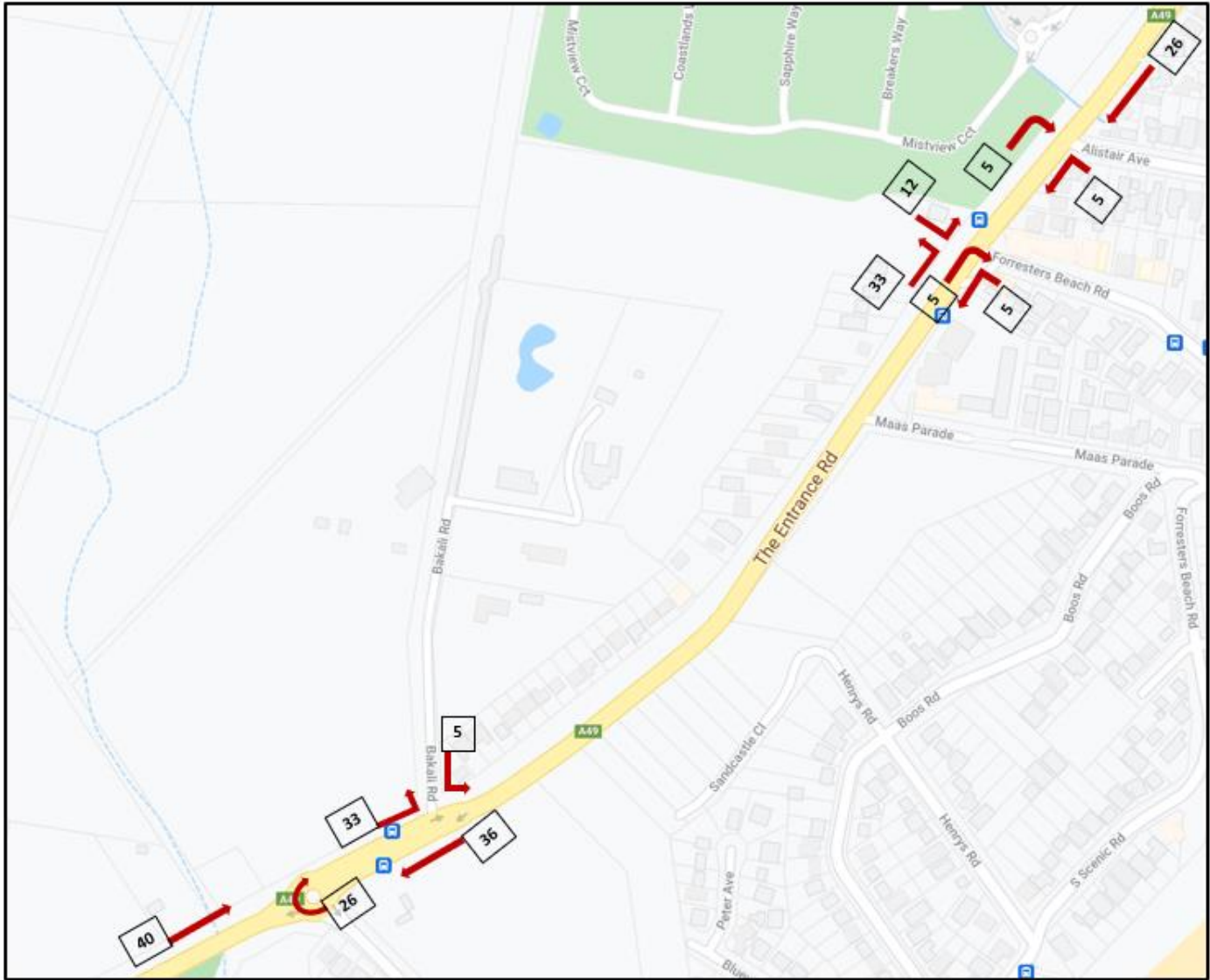


Figure 4.2 – PM peak Traffic Distribution

### 4.3 SIDRA Analysis and Impact of Generated Traffic

The main impacts of the traffic generated to the road network by the proposed subdivision will be due to the left in left out arrangement at the Central Coast Highway / Bakali Road intersection and will occur during the morning peak period when the additional southbound traffic turns left out of Bakali Road and proceeds to turn right at either Forresters Beach Road or Alistair Avenue to facilitate the return trip to the south.

The additional peak hour trips on the Central Coast Highway will have little impact on its capacity as these volumes are minor compared to the existing volumes of more than 2000 vehicles per hour.

The left turn movements from Bakali Road, can safely and efficiently enter the northbound traffic stream via the existing northbound merge lane. Vehicles turning right onto Bakali Road from the north can do so safely by performing a U-turn at the Crystal Street roundabout and then turning left into Bakali Road.

The Central Coast Highway / Forresters Beach Road intersection currently performs at satisfactory level of service and will continue to do so with the additional 20 left turns. The worst movement is currently the right turn out of Forresters Beach Road which operates at LoS B and will change to Los C with the additional turning movements.

The additional 20 peak hour trips generated in Forresters Beach Road and 20 in Alistair Avenue in AM peak will have only a minor impact on the road capacity of 300 vehicles per hour. In both streets there are several locations where U-turns can be safely performed or, alternatively, vehicles can travel between these two streets using Dunlop Road and Lowanna Avenue.

Intersection performance has been assessed using the SIDRA 9 modeling software which uses the level of service (delay) model adopted by Transport for NSW (TfNSW) to assess intersection performance. Average delay is used to determine the level of service (LoS) based on the following table sourced from the NSW 'Guide to Traffic Generating Developments'.

**Table 4.1:** Level of service criteria for intersections

LoS	Average Delay / Vehicle (Sec)	Traffic Signals and Roundabouts	Give Way and Stop Signs
A	< 15	Good	Good
B	15 - 28	Good, with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28 - 42	Satisfactory	Satisfactory, but requires accident study
D	42 - 56	Operating near capacity	Near capacity and requires accident study
E	56 - 70	At capacity, excessive delay: roundabout requires other control method	At capacity, requires other control mode
F	>70	Unsatisfactory, requires other control mode or additional capacity	Unsatisfactory, requires other control mode

For assessment purposes a LoS D is considered satisfactory intersection operation.

The results of this analysis are summarized in Table 4.1 below:

**Table 4.2: Sidra Modelling Summary**

Intersection	Scenario	Peak period	2021				2031			
			Degree of Saturation (v/c)	Average Delay (Sec)	Level of Service (LoS)	95% Back of Queue (m)	Degree of Saturation (v/c)	Average Delay (Sec)	Level of Service (LoS)	95% Back of Queue (m)
Central Coast Hwy / Bakali Rd	Existing	AM	1.13	>800 (West)	F	34	1.76	>1000 (West)	F	62
		PM	0.56	>300 (West)	F	4	0.62	>1000 (West)	F	9
	Existing + DA Left in Left Out (LILO)	AM	0.68	6.9 (West)	A	0	0.75	7.3 (West)	A	0
		PM	0.53	10.3 (West)	A	0	0.58	12.1 (West)	A	0
Central Coast Hwy / Forresters Beach Rd	Existing	AM	0.70	28.5 (East)	C	10	0.77	54.1 (East)	D	16
		PM	0.57	12.8 (East)	A	5	0.62	15.9 (East)	B	6
Central Coast Hwy / Forresters Beach Rd / New Access Rd (LILO)	Existing + DA Left in Left Out (LILO)	AM	0.69	32.7 (East)	C	17	0.97	>100 (East)	F	47
		PM	0.56	12.7 (East)	A	6	0.61	15.9 (East)	B	7
	Traffic Signals	AM	0.73	20	B	148	0.80	22	B	184
		PM	0.77	21	B	166	0.84	24	B	214

The modelling results in Table 5.2 above indicate that the Central Coast Highway/ Bakali Road intersection is currently performing at a level of Service (LoS F) during the AM and PM peak periods with significant delays for right turning movements and is likely to perform at similar Level of Service (LoS F) with increase in average delay in future year (2031) with 1% growth rate on Central Coast Highway and without the proposed development. However, the model does indicate that restricting the intersection movements to left in and left out (LILLO) only, improves the intersection performance to LoS A in existing and in future year (2031) scenario. With LILLO arrangement in place, the intersection will continue to operate at satisfactory level of service (LoS A) post development and in future year (2031) scenario in both AM and PM peak period.

The Central Coast Highway/ Forresters Beach Road intersection is currently performing at a Level of Service (LoS C and A) during AM and PM peak periods with minimum delays. The intersection is likely to perform at Level of Service (LoS D and B) in AM and PM peak with increase in average delay in future year (2031) with 1% growth rate on Central Coast Highway and without the proposed development.

The SIDRA model does indicate that subdivision access road as an interim left in / left out at Central Coast Highway / Forresters Beach Road intersection (till upgraded by TfNSW to traffic signals), will perform at satisfactory level of service (LoS C and A) in both AM and PM peak in post development scenario. However, in future year (2031) scenario the intersection is likely to perform at Level of Service (LoS F and B) in AM and PM peak.

The modelling results demonstrate that upgrading Central Coast Highway/ Forresters Beach Road intersection to traffic signals (as proposed on the TfNSW Project map for Central Coast Highway upgrade – Wamberal to Bateau Bay) will improve intersection performance to Level of Service (LoS B) in both AM & PM peak in post development and future year scenario.

Overall, left in left Out (LLO) arrangement at Central Coast Highway / Bakali Road intersection and interim left in / left out arrangement at internal subdivision access road at Central Coast Highway/ Forresters Beach Road intersection will perform at satisfactory level of service post development. Central Coast Highway / Forresters Beach Road, when upgraded, will result in improvement in overall operational performance of the intersection.

#### **4.4 State Environmental Planning Policy (Infrastructure)**

In accordance with SEPP (Infrastructure) Schedule 3, a referral is required to be forwarded to TfNSW due to site being adjacent to Central Coast Highway and vehicular access from the site is proposed onto Central Coast Highway which is a classified State road.

## 5 Conclusion/Recommendations

Barker Ryan Stewart have been engaged by Progressive Property Solutions to prepare a Traffic Impact Assessment in accordance with the requirements of Central Coast Council and the TfNSW "Guide to Traffic Generating Developments" to accompany a Planning Proposal to be lodge with Central Coast Council to rezone a triangular area of land between Bakali Road and the Central Coast Highway, Forresters Beach, from 7(a) Conservation and Scenic Protection (Conservation) and 7(c2) Conservation and Scenic Protection (Scenic Protection - Rural Small Holdings) under Interim Development Order No 122 (IDO 122) to E2 Environmental Conservation, R2 Low Density Residential and RE1 Public Recreation and to allow for up to 70 additional lots adjacent to 31 existing developed lots within the rezoning area.

Due to safety concerns for right turn movements at the intersection of Central Coast Highway / Bakali Road intersection, it is proposed to restrict the intersection to left in and left out (LILLO) traffic movements. This LILLO restriction will generate additional northbound traffic movements along the Central Coast Highway as those who have a destination to the south will need to travel north to either Forresters Beach Road or Alistair Avenue where they can turn onto these streets and then turn around and turn left out for the return trip to the south.

The AM Peak therefore would generate 46 northbound vehicles at new access road and 20 northbound vehicles at Bakali Road with 9 vehicles from south turning left on to new access road and 8 onto Bakali Road. The PM Peak would generate 12 northbound vehicles at new access road and 5 northbound vehicles at Bakali Road with 33 vehicles from south left from on to new access road and 33 onto Bakali Road.

The 16 existing properties along the western boundary of the Central Coast Highway immediately north of Bakali Road and 6 residences along north west and north east of Bakali Road will generate 20 trips in the peak hour. Based on the trip distribution above, the AM peak would generate 6 vehicles to the north and 10 vehicles to the south with 2 entering from the north and 2 entering from the south. The PM Peak would generate 2 vehicles to the north and 2 to the south with 6 entering from the north and 7 from the south. This is considered to be the worst-case scenario as most trips from these properties to and from the north will be via the informal northern connection of the service road to the Central Coast Highway as it exists currently. Other 15 properties along the western boundary of the Central Coast Highway and further north of the site currently have direct access to the highway via individual driveways. Traffic generated by these residences is unlikely to use Bakali Road and therefore excluded from this assessment.

The proposed subdivision of the rezoning area would result in up to 40 additional vehicles turning right at either Forresters Beach Road or Alistair Avenue for the return trip south in the AM Peak and 10 additional vehicles in the PM Peak. It is assumed that 50% (20 vehicles) will turn right at Alistair Avenue and 50% at Forresters Beach Road (20 vehicles) in AM peak and 5 will turn right at Alistair Avenue 5 at Forresters Beach Road in PM peak.

The results of SIDRA modelling of the Bakali Road and Forresters Beach Road intersections suggests that the proposed left in left Out (LILLO) arrangement at Central Coast Highway / Bakali Road intersection and interim left in / left out arrangement at internal subdivision access road at Central Coast Highway/ Forresters Beach Road intersection till upgraded by TfNSW to traffic signals will have no impact on the operational performance of these intersections due to the additional traffic movements. Central Coast Highway / Forresters Beach Road intersection is proposed to be upgraded to traffic signals as part of the TfNSW Central Coast Highway upgrade project. the subdivision road will become then becomes the 4<sup>th</sup> leg of this intersection. The upgrade will result in improvement in overall operational performance of the intersection.

In view of the above it is recommended that the rezoning proposal be approved as safe and efficient left-in left-out arrangement via Bakali Road, new access road and the additional traffic generated by the proposed subdivision of the rezoning land will have not have significant impact on the safety and efficiency of the existing road network.

## 6 References

Australian Standards, 'AS/NZS 2890.1:2004 Off-Street Car Parking'.

Australian Standards, 'AS 2890.2:2018 Off-Street Commercial Vehicle Facilities'.

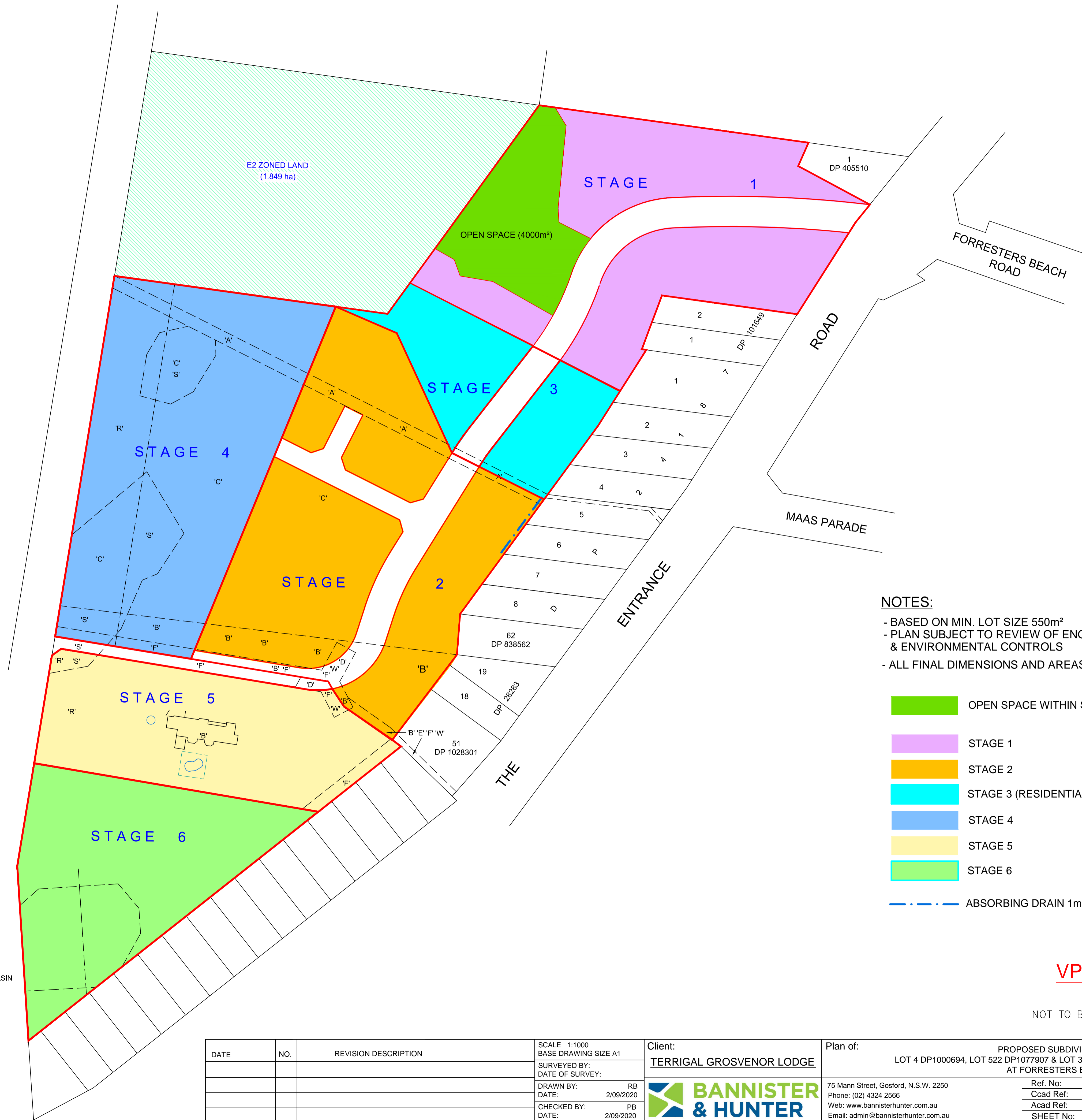
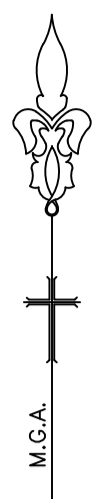
Australian Standards, 'AS/NZS 2890.6:2002 Off-Street Parking for People with Disabilities'.

TfNSW "Guide to Traffic Generating Developments Updated Traffic Surveys" (TDT 2013/04a)

NSW Department of Planning, 'SEPP (Infrastructure) 2007'

Gosford Council's DCP 2013

**Appendix A**  
**Rezoning Plan**



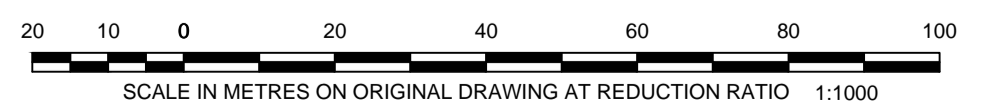
**NOTES:**

- BASED ON MIN. LOT SIZE 550m<sup>2</sup>
- PLAN SUBJECT TO REVIEW OF ENGINEERING, BUSHFIRE & ENVIRONMENTAL CONTROLS
- ALL FINAL DIMENSIONS AND AREAS SUBJECT TO SURVEY

- OPEN SPACE WITHIN STAGE 1 (4000m<sup>2</sup>)
- STAGE 1
- STAGE 2
- STAGE 3 (RESIDENTIAL)
- STAGE 4
- STAGE 5
- STAGE 6
- ABSORBING DRAIN 1m X 0.5m

**VPA PLAN - 12**

PRELIMINARY  
NOT TO BE USED FOR CONSTRUCTION  
PURPOSES



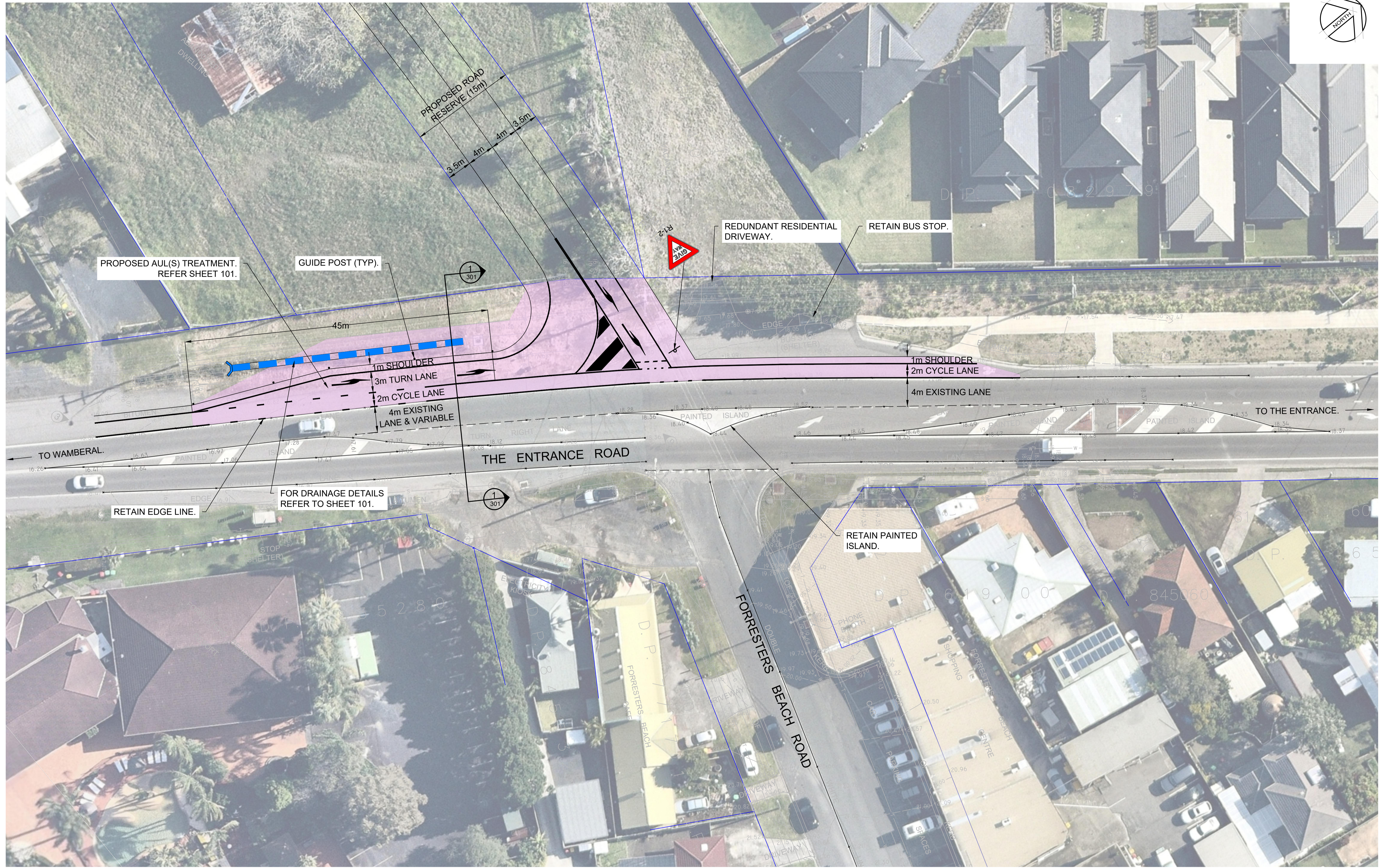
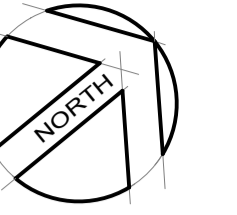
DATE	NO.	REVISION DESCRIPTION	SCALE 1:1000 BASE DRAWING SIZE A1	Client: TERRIGAL GROSVENOR LODGE	Plan of: PROPOSED SUBDIVISION OF LOT 4 DP1000694, LOT 522 DP1077907 & LOT 3 DP101649 AND LOT 2 DP1000694 AT FORRESTERS BEACH
			SURVEYED BY: DATE OF SURVEY:		Ref. No: 58463 Date: 11th March 2021
			DRAWN BY: RB DATE: 2/09/2020		Ccad Ref: 58463-29s Datum: -
			CHECKED BY: PB DATE: 2/09/2020		Acad Ref: VPA - Plan 12 SHEET No: 1 of 1
					REVISION -

75 Mann Street, Gosford, N.S.W. 2250  
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Web: www.bannisterhunter.com.au  
Email: admin@bannisterhunter.com.au

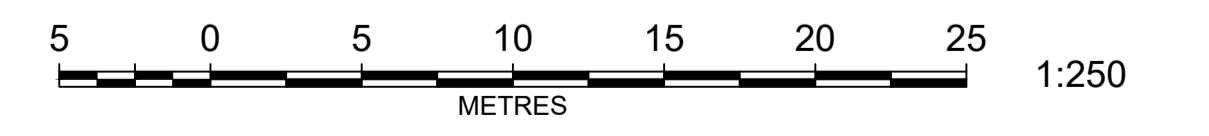


## **Appendix B**

### **New Access Road Layout**



PLAN  
SCALE 1:250



REV	AMENDMENT	ISSUED	DATE
A	CONCEPT DESIGN	SB	22/07/2020

**BARKER RYAN STEWART**  
 SYDNEY P: 02 9659 0005  
 CENTRAL COAST P: 02 4325 5255  
 HUNTER S.E. OLD P: 07 5582 6555  
 www.brs.com.au  
 mail@brs.com.au  
 ABN: 26 134 067 842  
 ©2019

Client:  
**MJM.NL Pty Ltd**

**THE ENTRANCE ROAD & FORRESTERS BEACH ROAD, FORRESTERS BEACH**  
**INTERSECTION DESIGN**  
 GENERAL ARRANGEMENT PLAN

Designed: SB  
 Drawn: DKH  
 Checked: TBA

Scales: Plan 1:250  
 @A1 Horiz. -  
 Vert. -  
 X-Sect. -  
 Datum: A.H.D.

Plan No.  
**CC200104-01-021**  
 File Ref.  
CC200104  
 REV.  
**A**