"COASTAL GROVE"
PROPOSED
RESIDENTIAL SUBDIVISION
1 SURVEY STREET, LENNOX HEAD

Assessment of Traffic and Parking Implications

September 2006

Reference 05167

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1. INTRODUCTION

This report has been prepared to accompany an Application to the Department of Planning for a proposed residential subdivision on a site extending to the south of Blue Seas Parade at Lennox Head (Figure 1).

Townships in NSW coastal regions are experiencing population growth as the existing centres consolidate consequential to natural growth and relocations from the major southern cities. Former grazing lands with convenient access to town services are being subdivided to provide residential housing which has regard for contemporary 'ESD' planning principles such as good solar access and permeable safe access road systems.

The proposed subdivision at Lennox Head represents a relatively small 'infill' area immediately inland from the prominent headland. The proposal involves 45 residential lots and the new subdivision road system will connect to Blue Seas Parade and Survey Street which link to the 'higher order' roads of North Creek Road and The Coast Road.

The purpose of this report is to provide an assessment of potential road and traffic related implications of the proposed subdivision and, in particular, respond to the 'Director General's Requirements' which include:

8. Traffic

8.1 Provide an appropriate traffic report addressing site access, internal traffic/movement hazards, the road system capacity, local traffic speed environment and facilities for pedestrians, cyclists and public transport.

8.2 Address the provisions of the Northern Rivers Local Government Development and Design Manual – Version 2.

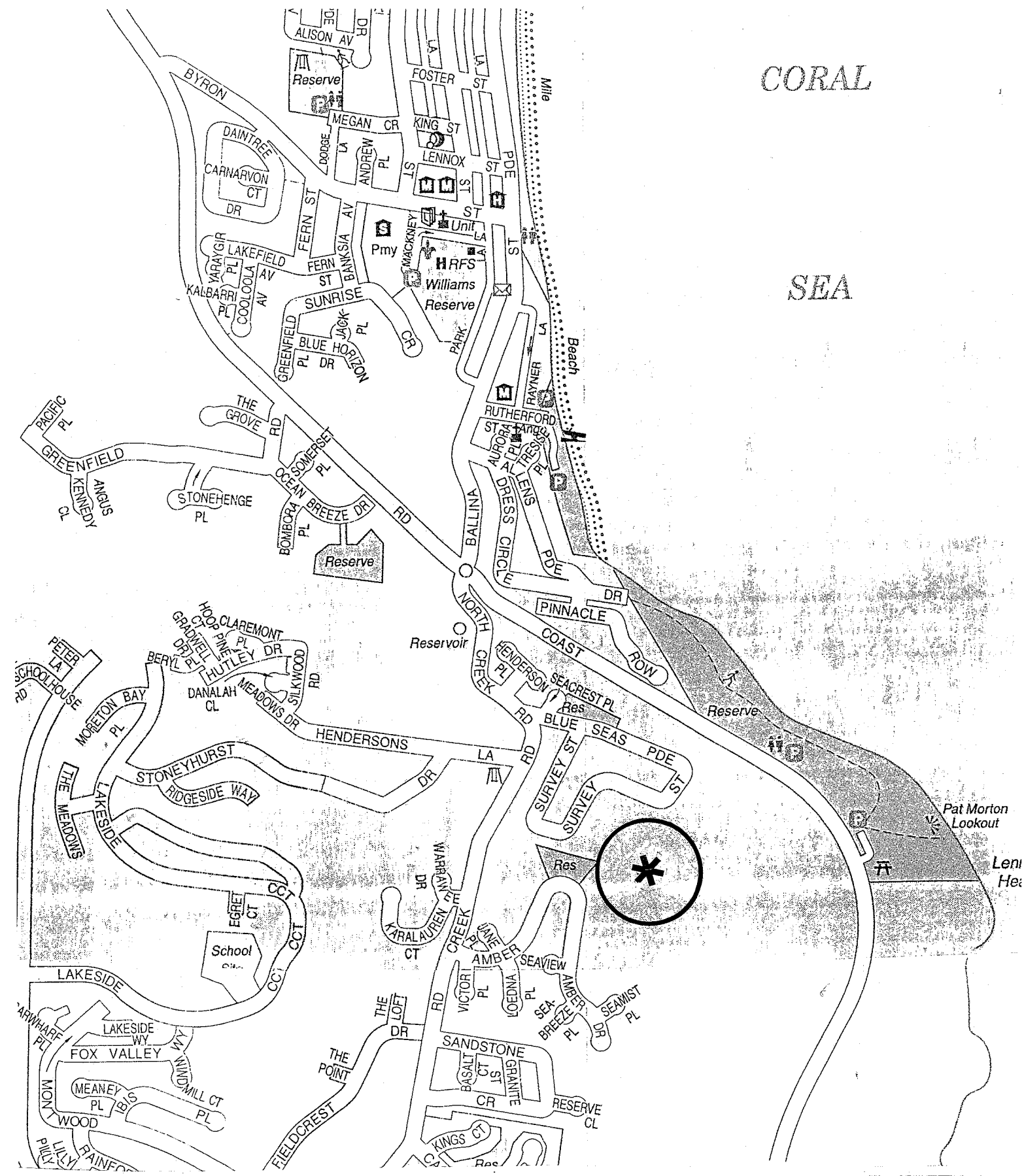
13. Noise

13.1 Demonstrate that the proposal will be designed, constructed, operated and maintained so that there are no adverse impacts from noise (including traffic noise).

Consultation

During the preparation of the Environmental Assessment, you must consult with the relevant Local, State and Commonwealth Government authorities, service providers, community groups or affected landowners. In particular, you must consult with:

* *Ballina Shire Council;*
* *NSW Roads and Traffic Authority.*



LEGEND

LOCATION

FIG 1

2. PROPOSED DEVELOPMENT

2.1 SITE AND CONTEXT

The development site (Figure 2) is Lot 2 DP 622475 occupying an irregular shaped area of 14.71 ha of which some 10 ha is zoned 'Residential' and some 4.7 ha is zoned 'Urban Investigation and Environmental Protection'. The undulating site (which is shown in the context of its surrounds on the aerial photo overleaf) is cleared grassland, apart from the remnant rainforest in the southern portion, being former farming land located some 1.5 kms to the south of the small Lennox Head township.

The site is adjoined to the west by relatively new single dwelling housing and to the east, over the bounding Crown Land Road Reserve, by grassland. Further to the east over The Coast Road there is a public reserve extending to the oceanfront which contains the Pat Morton Lookout.

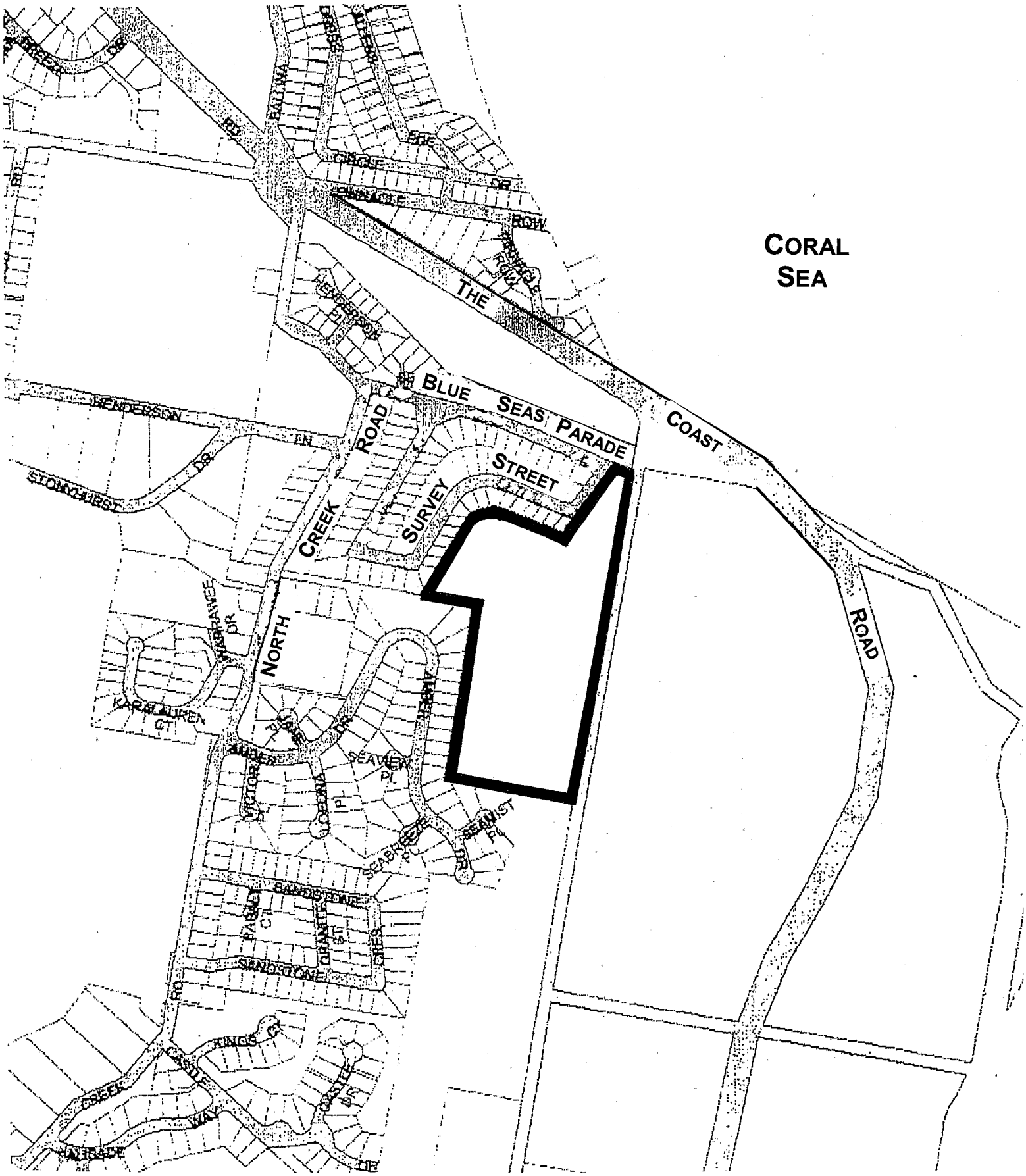
2.2 PROPOSED SUBDIVISION

The proposed subdivision will reflect the nature of the existing adjoining residential lands to the west and south with a road system which:

* runs along the bounding Crown Road Reserve
* has a central circuit with a connecting cul-de-sac.

There will be a total of 45 residential lots ranging from 670m^2 to 2,000m^2 set out along the new road frontages with the ability of 4 lots to be developed as dual occupancies (ie potentially 49 dwellings). The southern and south-western parts will be retained and upgraded as open space while there will be a small 'pocket park' on the northern side of the cul-de-sac.

Details of the proposed subdivision are provided on the plans prepared by Hassell which accompany the Application and are reproduced in part overleaf.



LEGEND

SITE

FIG 2

LEGEND

N

AERIAL PHOTO

HASSELL

LEGEND

- SITE BOUNDARY
- REMNANT VEGETATION TO REMAIN
- EXISTING REVEGETATION PLANTING TO REMAIN
- EXISTING VEGETATION TO BE REMOVED
- TOP OF CREEK BANK
- 20M TOP OF BANK OFFSET
- PROPOSED TOP OF KERB AND PATHWAY (1.2M)
- PROPOSED CYCLEWAY THROUGH OPEN SPACE (2.5M)
- PROPOSED RAINGARDEN
- PLAYGROUND AREA (PAVING/MULCH/PLAY EQUIPMENT)
- 30 LOT NUMBER
- (D) INDICATES POTENTIAL DUPLEX DEVELOPMENT LOT
- LOCATION OF Arthraxon hispidus AS SURVEYED BY OTHERS
- ECOLOGICAL BUFFER TO PROTECT THREATENED GRASS SPECIES (Arthraxon hispidus)

PLANTING:
Refer to Plant Schedule for species

- PROPOSED STREET TREE AND VERGE TREE PLANTING
- PROPOSED SHRUB PLANTING ALONG ROAD NO. 1 VERGE
- PROPOSED DENSE TREES AND SHRUBS
- PROPOSED OPEN TREES AND GRASSES
- PROPOSED RIPARIAN EDGE PLANTING INCORPORATED INTO OPEN SPACE DESIGN
- PROPOSED BUFFER TO GRASS (5M MAINTAINED BUFFER)
- PROPOSED PLANTED BIO-RETENTION SWALES
- PROPOSED GRASS AREA

INDICATIVE PLANT LIST FOR OPEN SPACE PLANTING

PLANT SCHEDULE	PSL3394_Coastal Grove	Height
Proposed street tree and verge tree species		
Cupaniopsis anacardioides	Tuckeroo	21m
Lophostemon confertus	Brush Box	20m
Melaleuca quinquenervia	Broad Leaved Paperbark	18m
Waterhousia floribunda	Weeping Lilly Pilly	18m
Crown road reserve shrub planting in verge		
Banksia integrifolia	Coastal Banksia	15m
Banksia robur	Swamp Banksia	20m
TO ADD SPECIES SIMILAR TO RIDGE PLANTING THAT IS GOING		
TO BE REMOVED Awaiting flora report		
Proposed dense trees and shrubs		
Trees		
Acacia irorata	Wattle	12m
Acmena hemilampra	Broad leaved Lilly Pilly	5-10m
Acmena smithii	Lilly Pilly	15m
Acronychia imperforata	Logan Apple	9m
Allocasuarina littoralis	Black She-Oak	10m
Archontophoenix cunninghamiana	Bungalow Palm	14m
Banksia integrifolia	Coastal Banksia	15m
Callistemon salignus	Pink tipped bottlebrush	9m
Cupaniopsis anacardioides	Tuckeroo	5-10m
Drypetes deplanchei	Yellow Tulip	20m
Elaeocarpus reticulatus	Blueberry Ash	12m
Eupomatia laurina	Native Bolwarra	5m
Euroschinus falcata var. falcata	Ribbonwood	20m
Glochidion ferdinandi	Cheese Tree	15m
Guioa semiglauca	Guioa	5-8m
Harpullia pendula	Tulipwood	15m
Hymenosporum flavum	Native Frangipani	10m
Livistona australis	Cabbage Tree Palm	30m
Melaleuca quinquenervia	Broad Leaved Paperbark	18m
Polyscias elegans	Celerywood	10m
Podocarpus elatus	Plum Pine	40m
Syzigium australe	Brush Cherry	18m
Syzigium oleosum	Blue Lilly Pilly	10m
Tristaniopsis laurina	Water Gum	12m
Waterhousia floribunda	Weeping Lilly Pilly	18m
Shrubs		
Alocasia brisbanensis	Cunjevoi	1.5m
Alpinia caerulea	Native Ginger	1.5m
Asplenium australasicum	Bird's Nest Fern	1m
Pittosporum revolutum	Hairy Pittosporum	3m
Groundcovers		
Adiantum aethiopicum	Common Maindenhair	0.8m
Dianella caerulea	Coastal Flax Lily	0.7m
Dianella revoluta	Black Anther Flax Lily	1m
Dichondra repens	Guinea Weed	0.2m
Doodia aspera	Rasp Fern	0.4m
Hibbertia scandens	Climbing Guinea Flower	0.5m
Pandorea pandorea	Wonga Vine	0.3m
Viola hederacea	Native Violet	0.2m
Proposed open trees and grasses		
Trees		
Same as above		
Shrubs		
Banksia robur	Swamp Banksia	2m
Callistemon sp.	Callistemon	1.5m
Crinum pedunculatum	Swamp Lily	1m
Melaleuca pachelia	Claw Honey Myrtle Flower	0.7m
Groundcovers/grasses		
Dianella caerulea	Coastal Flax Lily	0.7m
Dianella revoluta	Black Anther Flax Lily	1m
Dichelachne crinita	Long-Hair Plume Grass	0.7m
Hibbertia scandens	Climbing Guinea Flower	0.5m
Lomandra hystrix	Small Mat Rush	0.7m
Lomandra longifolia	Lomandra	1m
Microlaena stipoides	Microlaena	0.4m
Proposed riparian edge planting and bio-retention swales		
Carex apressa	Tall sedge	1m
Dianella caerulea	Coastal Flax Lily	0.7m
Imperata cylindrica	Blady Grass	1m
Isolepis nodosa	Isolepis	0.6m
Juncus usitatus	Juncus	0.8m
Lobelia trigonocaulis	Forest Lobelia	0.5m
Lomandra longifolia	Lomandra	1m
Lomandra hystrix	Small Mat Rush	0.7m
Schoenoplectus validus	River Club Rush	1.2m
Proposed turf		
Pennisetum clandestinum	Kikuyu	n/a

0 20M 40M 80M

1:1000 @ A1

PSL 3394 / PA03 Landscape Plan

Scale 1:1000 @ A1 / 1:2000 @ A3

August 2006

DRAFT

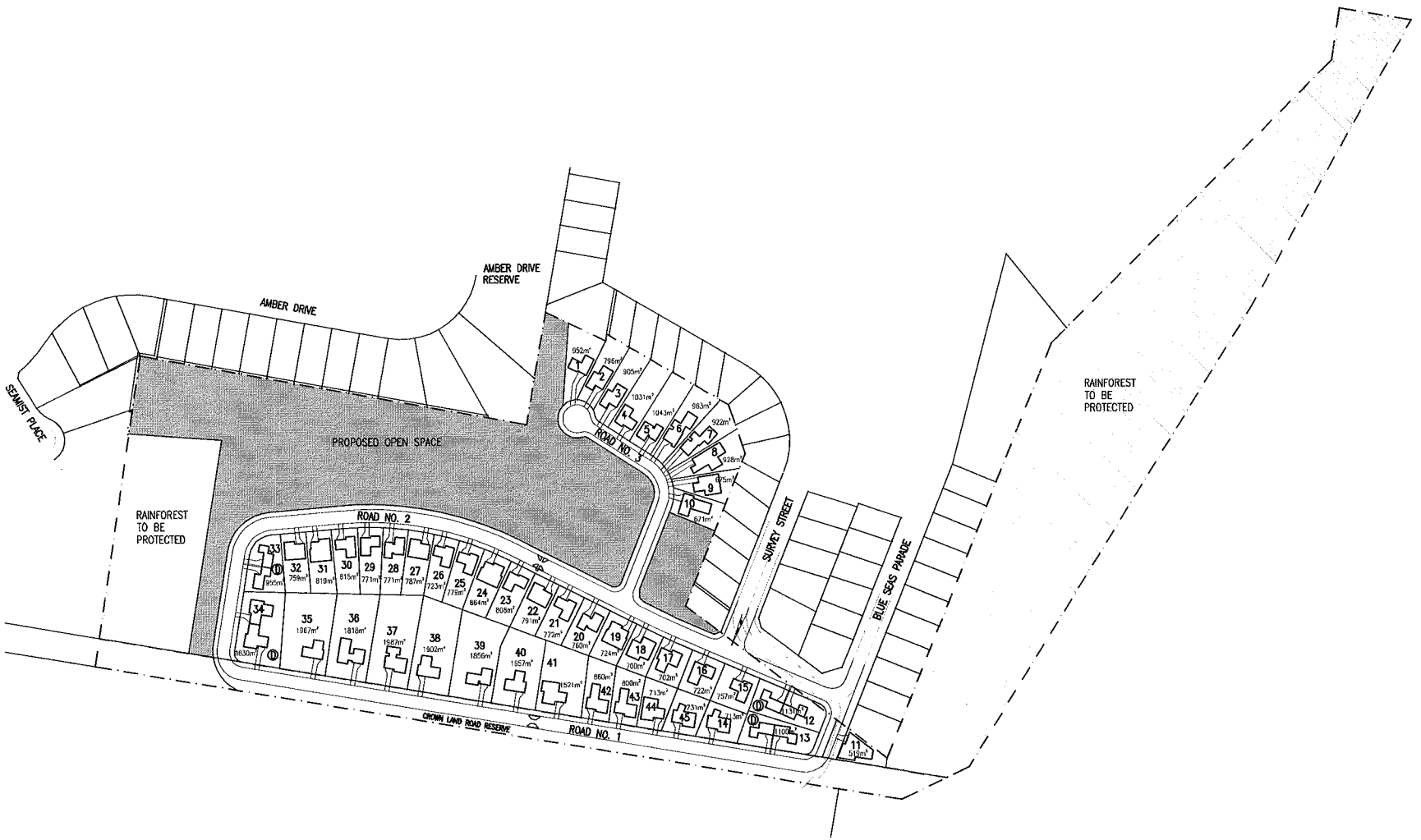
COASTAL GROVE DEVELOPMENTS

SAKE

Lennox Head

coastal grove

HASSELL



LEGEND

- SITE BOUNDARY
- 22 / 791m² — PROPOSED LOT NUMBER AND AREA
- INDICATIVE BUILDING AND DRIVEWAY OUTLINE
  * REFER TO 'DESIGN GUIDELINES' DOCUMENT AND BALLINA COUNCIL DCP FOR PERMISSIBLE HOUSE GUIDELINES FOR DEVELOPMENT
- (D) — DUAL OCCUPANCY LOT
- PROPOSED OPEN SPACE
- EXISTING RAINFOREST FOR PROTECTION

0 30M 60M 120M

1:1500 @ A1

PSL 3394 / PA02 Subdivision Plan

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

August 2006

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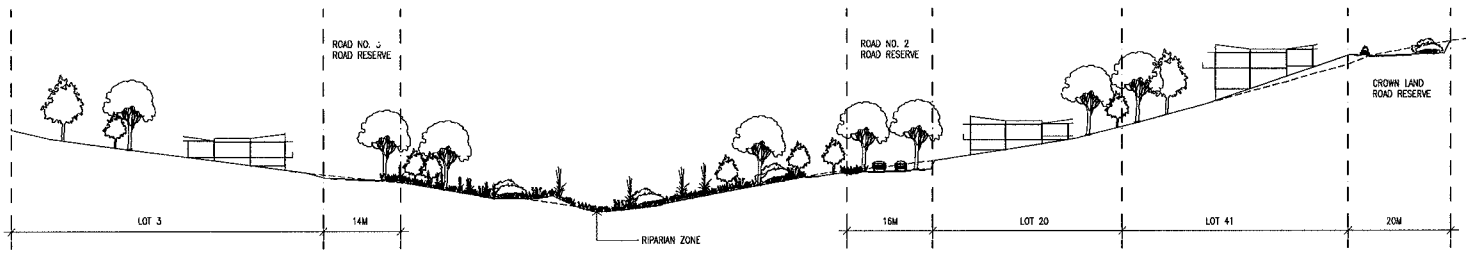
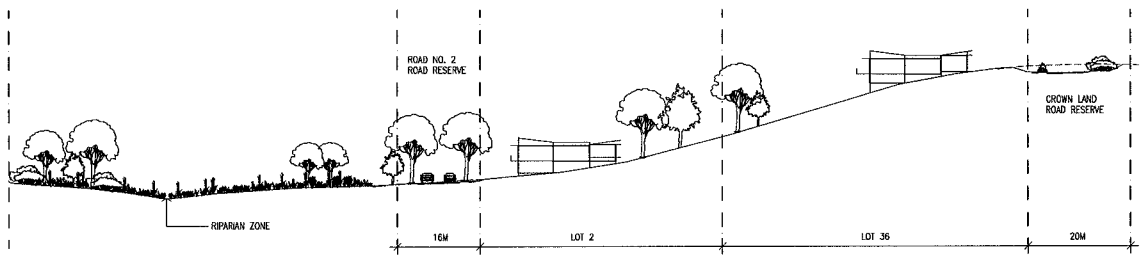
COASTAL GROVE DEVELOPMENTS

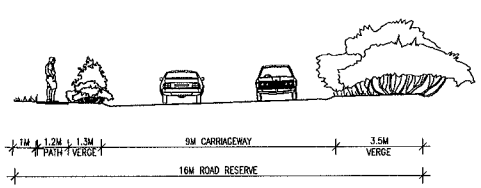
Lennox Head



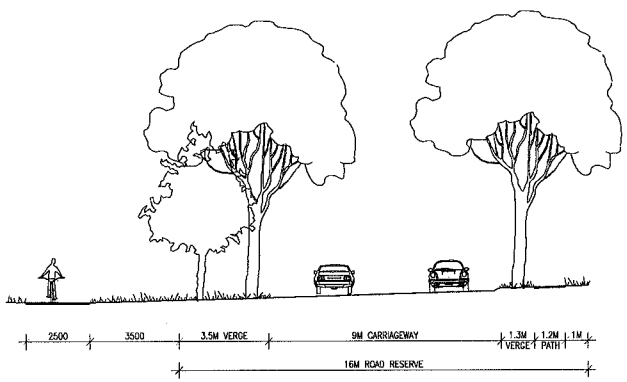
AA LANDSCAPE SECTION
1:500



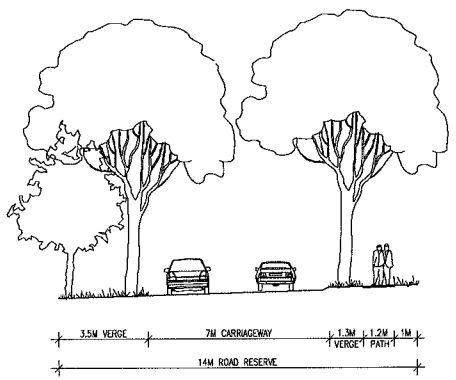
BB LANDSCAPE SECTION
1:500



CC TYPICAL STEET LANDSCAPE TREATMENT - CROWN ROAD RESERVE
1:100



DD TYPICAL STREET LANDSCAPE TREATMENT - ROAD NO. 2
1:100



EE TYPICAL STREET LANDSCAPE TREATMENT - ROAD NO. 3
1:100

HASSELL

PSL 3394 / PA04 Landscape Sections

Scale As Shown

August 2006

COASTAL GROVE DEVELOPMENTS

Lennox Head

3. ROAD NETWORK AND TRAFFIC CONDITIONS

3.1 ROAD NETWORK

The road network serving the area comprises:

* *Byron Bay Road – The Coast Road:* a State Road (SR 545) connecting between Byron Bay and Ballina which is classified as an Urban Arterial Road

* *North Creek Road – Ballina Street:* a collector road route

* *Blue Seas Parade and Survey Street:* a local access route.

3.2 ROAD GEOMETRY

The road geometry circumstances in the area are as follows:

North Creek Road:

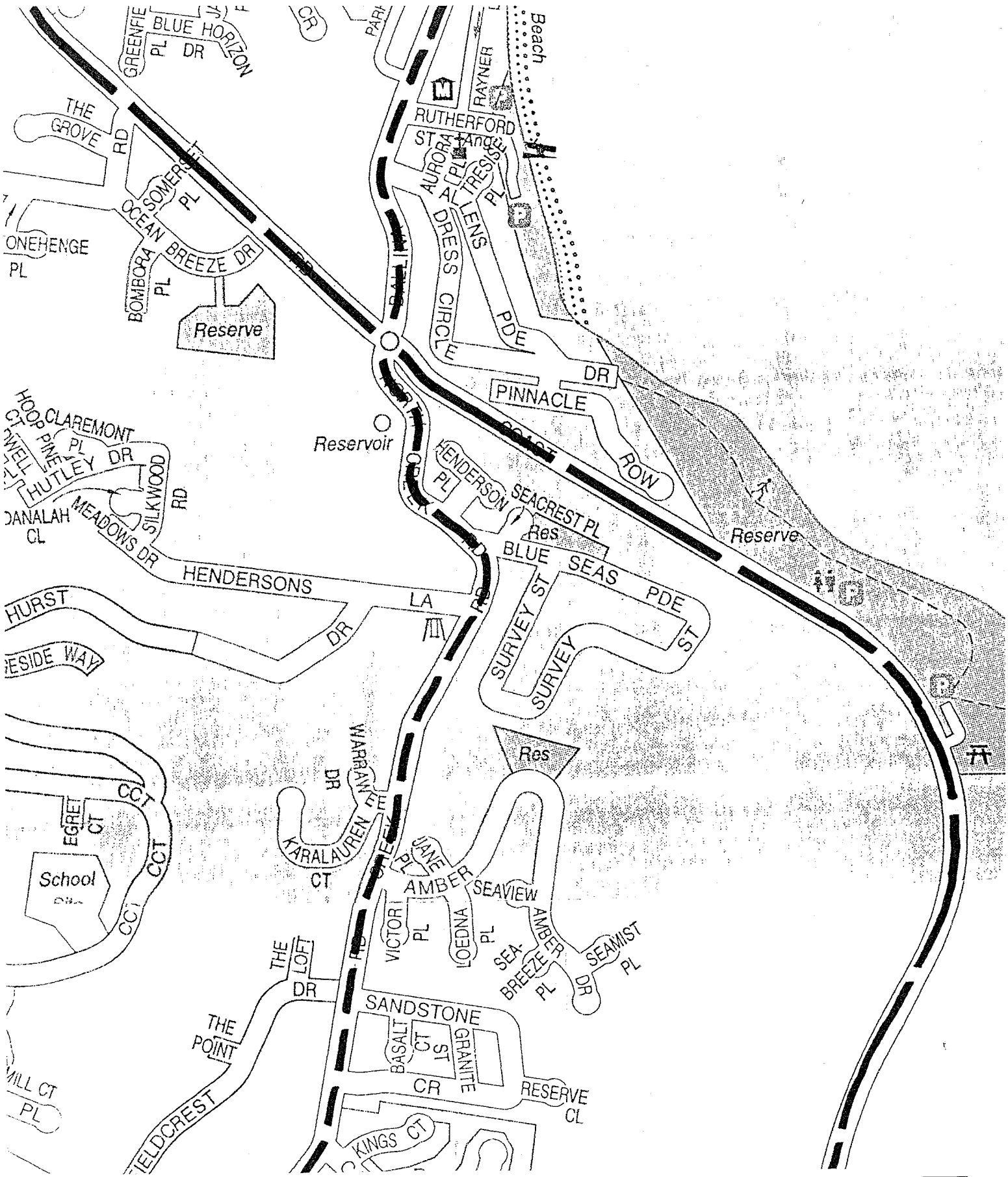
* Henderson Place to The Coast Road – 8.0 metres wide pavement, no kerbs
* Henderson Place southerly – 13.0 metres wide, kerb and guttered.

Blue Seas Parade:

* 9.0 metres wide, roll kerb and guttered.

Survey Street:

* 9.0 metres wide, roll kerb and guttered (split level with central island/wall in south-east section).



LEGEND

URBAN ARTERIAL

COLLECTOR

N

ROAD NETWORK AND TRAFFIC CONTROLS

FIG 3

3.3 TRAFFIC CONTROLS

The relatively few traffic controls applied to the road system in the area comprise:

* the roundabout at The Coast Road and North Creek Road intersection
* the 60 kmph speed restriction on North Creek Road
* the 50 kmph speed restriction on Blue Seas Parade and Survey Street
* the BUS STOPS on North Creek Road
* the central 'barrier' lines along North Creek Road and the western end of Blue Seas Parade.

3.4 TRAFFIC CONDITIONS

An indication of the traffic conditions in the area is provided by data published by the RTA and Council as well as surveys undertaken as part of this study. The RTA data published by the RTA is expressed in terms of Annual Average Daily Traffic (AADT) and is summarised in the following:

Location	**AADT**	
	1998	**2001**
The Coast Road (SR 545)		
South of Tintenbar Road	6,891	9,366

Ballina Shire Council has undertaken 'tube count' surveys in the area and this 2003 data is reproduced in the following:

	Av Daily Traffic
North Creek Road, north of Blue Seas Parade	3045
Blue Seas Parade, east of Survey Street	412
Survey Street, south of Blue Seas Parade	374

The results of recent (2006) surveys undertaken during the morning and afternoon peak periods at the North Creek Road and Blue Seas Parade intersection are shown on Figure 4 and summarised in the following:

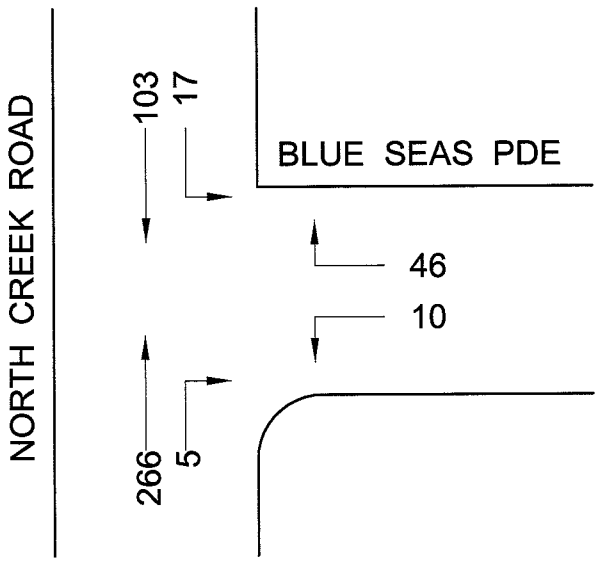
		AM	**PM**
North Creek Road	Northbound	266	164
	Right-turn	5	6
	Southbound	103	287
	Left-turn	17	39
Blue Seas Parade	Right-turn	46	23
	Left-turn	10	5

The operational performance of this intersection under the existing peak traffic demands has been analysed using the SIDRA program. The results of that assessment (Appendix A) indicating a satisfactory level of service are provided in the following while the criteria for interpreting SIDRA output are reproduced overleaf:

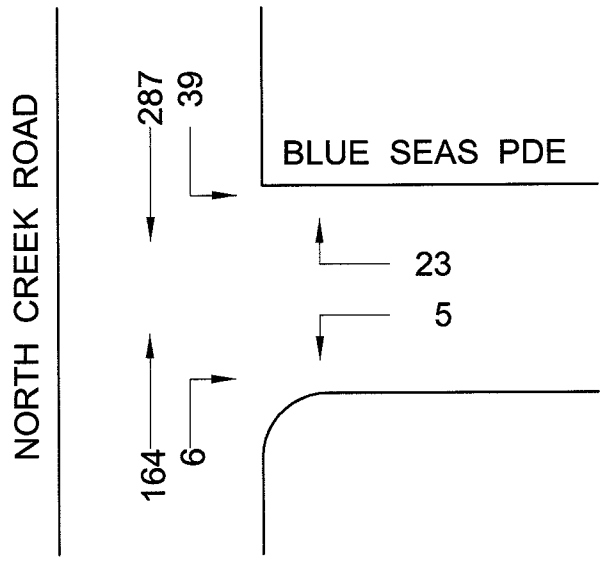
	AM	**PM**
Level of Service	A	A
Degree of Saturation	0.108	0.177
Av Vehicle Delay	2.1	1.7

3.5 TRANSPORT SERVICES

There is a regular bus service along North Creek Road operated by Blanches Bus Service and Kirkland Bus Co and a limited number of 'school special' services circulate through Blue Seas Parade and Survey Street.

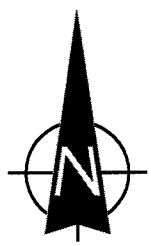


MORNING PEAK



AFTERNOON PEAK

LEGEND



PEAK TRAFFIC VOLUMES

FIG 4

Criteria for Interpreting Results of SIDRA Analysis

1. *Level of Service (LOS)*

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good	Good
'B'	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
'C'	Satisfactory	Satisfactory but accident study required
'D'	Operating near capacity	Near capacity and Accident Study required
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
'F'	Unsatisfactory and requires additional capacity	Unsatisfactory and requires other control mode

2. *Average Vehicle Delay (AVD)*

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (ie inner city conditions) and on some roads (ie minor side street intersecting with a major arterial route).

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

3. *Degree of Saturation (DS)*

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**[1] both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

[1] *the values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs*

4. PROPOSED SUBDIVISION ROAD SYSTEM

4.1 ROAD SYSTEM

The proposed subdivision road system reflects the objectives of permeability and ESD housing outcomes avoiding the characteristics of a standard 'grid' pattern. The proposed roadway pattern is relatively regular with slight curvilinear alignment, although the regularity is arranged in order to assist in restraining vehicle speeds and avoid cross intersections.

The proposed road configuration will be as follows:

* Roads 1 and 2: 9.0 metre wide carriageway with 3.5 metre wide verges (16 metre reserve)
* Road 3: 7.0 metre wide carriageway with 3.5 metre wide verges (14 metre reserve)

4.2 ACCESS CONNECTIONS

The access connections to the existing road system will comprise:

* a 'T' junction connection with Blue Seas Parade
* a 'T' junction connection with Survey Street.

In the future the new eastern roadway running along the Crown Land Reserve may be extended southerly in conjunction with development of the adjoining lands. The proposed access connections represents suitable, appropriate and easily understood intersection arrangements.

5. TRAFFIC IMPLICATIONS

5.1 TRAFFIC GENERATION

The RTA Development Guidelines provide generic criteria in relation to the assessed traffic generation of single residential dwellings as follows:

Single Dwellings

'Outer Sydney area, new dwellings, large lots, poor public transport'

- 0.85 vtph (peak hour)

A more relevant assessment can be undertaken adopting the traffic generation characteristics of the existing adjoining subdivision development accessed via Blue Seas Parade. This 'contained' precinct has a total of 90 occupied dwellings and the results of the surveys undertaken at the North Creek Road/Blue Seas Parade intersection revealed the following 'internal' traffic generation outcome.

AM Peak
78 vtph (less buses and the existing site use)
72 vtph = 0.80 vtp dwelling
26% IN, 74% OUT

PM Peak
73 vtph (less buses and the existing site use)
70 vtph = 0.78 vtp dwelling
62% IN, 38% OUT

The assessed traffic generation outcome for the development of 49 dwellings in the proposed subdivision (adopting that recorded in the above survey) is as follows:

AM		PM	
IN	**OUT**	**IN**	**OUT**
10	30	24	15

5.2 TRAFFIC IMPACT

The projected directional distribution of traffic is 85% to/from north and 15% to/from south as derived from the existing intersection traffic survey. Thus the future traffic circumstances at the North Creek Road/Blue Seas Parade intersection will be:

		AM	PM
North Creek Road	Northbound	266	164
	Right-turn	7	10
	Southbound	103	287
	Left-turn	25	63
Blue Seas Parade	Right-turn	68	34
	Left-turn	17	8

The projected operational performance of this intersection has been modelled using SIDRA and the results of that assessment (Appendix A) are provided in the following indicating that satisfactory performance will prevail under these post development circumstances:

	AM	PM
Level of Service	A	A
Degree of Saturation	0.166	0.190
Av Vehicle Delay	2.9	2.3

The projected two-way peak movements on the local access roads are as follows:

	AM	PM
Blue Seas Parade east of Survey Street	75	70
Survey Street south of Blue Seas Parade	39	38
Blue Seas Parade west of Survey Street	118	114

5.3 TRAFFIC NOISE

The control and regulation of traffic noise is subject to:

* EPA Criteria (The Environmental Criteria for Road Traffic Noise, May 1999)
* RTA Criteria (Environmental Noise Management Manual)
* The Noise Control Act
* The Motor Traffic Regulations
* The Australian Design Rules for Motor Vehicle Noise.

At the local level the detailed features of the road system relative to noise generation include:

* causation of starting, stopping and heavy acceleration of vehicles

* state of road surface causing uneven traffic flow with consequent noise from braking, acceleration and vibration from vehicles.

The noise emitted by individual motor vehicles is largely regulated and controlled by the Motor Traffic and Vehicle Design Regulations.

Road traffic noise (as distinct to the noise of individual vehicles) is generally measured or predicted in terms of $L_{A10,\ 18\ hrs}$. This is the arithmetic mean of 18 separate one hourly volumes of L_{A10} covering the period 6.00am to midnight on a normal day.

The environmental goals for road traffic noise are set by the EPA as follows:

* Arterial Road Traffic Noise:
  Max $L_{a10,\ 18\ hr}$ – 63 dB(A) measured 1 metre from a residential façade

* Non-Arterial Road Traffic Noise:
  Max $L_{A10,\ 18\ hr}$ – 58dB(A) measured 1 metre from a residential façade

* Intermittent or low traffic flow noise:
  The nature of some activities results in traffic being concentrated and consequently a noise nuisance only at certain times of day with low traffic flow at other times of the day with low traffic flow at other times. An $L_{A\ eq}$ value is the preferred description in these circumstances. For residential situations:

  $L_{A\ eq}$ – 55dB(A) should apply for new developments
  $L_{A\ eq}$ – 60dB(A) should apply for existing development

Traffic noise can be predicted using the UK Department of Environment method known as the 'Calculation of Road Traffic Noise or CORTN method'. This method has been found to correlate well with people's reactions to traffic noise and takes into consideration factors including:

* traffic volumes
* traffic speed
* % of heavy vehicles
* road gradient
* road surface characteristics
* distance from road to residence and nature of intervening ground
* non-uniformity of road
* partial screening
* multiple services and reflection effects.

Assessment having regard to the CORTN method indicates that the noise created by the traffic generated by development on the proposed subdivision will (quite expectedly) be less than $L_{A\ eq}T$ of 55dB(A) for residences both in the new subdivision and on the immediate local access roads of Blue Seas Parade and Survey Street. Consequently, noise mitigation measures will not be required.

It is noted that AMCORD makes the following appraisal:

'Traffic noise can be a matter of major community concern. Where traffic volumes in residential areas do not exceed 3,000 vpd and the verge widths and setbacks proposed in the model code are observed traffic noise should not be a problem'.

The projected daily traffic volumes in Blue Seas Parade and Survey Street will be some < 1,000 vpd and therefore substantially below the 3,000 vpd where AMCORD suggests that more detailed assessment should be undertaken.

5.4 TRAFFIC RELATED ENVIRONMENTAL IMPLICATIONS

Environmental Capacity

The RTA Guide to Traffic Generating Developments specifies the following 'Environmental Capacity Performance Standards' for residential streets:

	Max Speed	**Max Peak Hour Volume**
Access Way (cul-de-sac)	25 kmph	100 (environmental goal)
Local Street	40 kmph	200 (environmental goal) 300 (max)
Collector Street	50 kmph	300 (environmental goal) 500 (max)

Blue Seas Parade and Survey Street are local access streets and the relativity of the traffic volume outcome with the new subdivision development as a proportion of the environmental goal (200 vph) is as follows:

	AM	**PM**
Blue Seas Parade east of Survey Street	37.5%	35%
Survey Street south of Blue Seas Parade	19.5%	19%
Blue Seas Parade west of Survey Street	59%	57%

It is apparent that the outcome with the increased volumes consequential to the proposed subdivision will be well below the established environmental capacity level.

Road Geometry

The Development Design Specification adopted by Northern Rivers Local Government identifies the following design criteria in relation to the proposed subdivision roads:

Road Type	Max Speed	Carriageway Width	Kerbing	Min Verge
Access Street	40 kmph	6 metres	Mountable	14 metres
Local Street	40 kmph	7 – 9 metres	Mountable	15 – 17 metres

The proposed subdivision roads will accord with the requirements of the Development Design Specifications.

Traffic Management

The principal issues of traffic management are:

* Intersection Design/Control

  There will be three intersections created and these will all be simple 'T' junctions where the 'right-of-way' will be clearly understood in accordance with the statutory regulations. There will be no need for traffic sign or any other controls.

  A potential future intersection (with extension on the Crown Road Reserve) would also be a simple 'T' junction.

* Vehicle Speed

  A statutory 50 kmph speed limit will apply, however speeds will be contained by:

  - the bends and intersections
  - the 'slow way' narrowings located centrally on the two straight sections. This treatment will accord with the AS 1742.13 design (see Appendix B).

Vehicle speeds will essentially be constrained to 40 kmph (or below) by these measures.

* Provision of Footways

  A sealed footway will be provided along one side of the road 'circuit' in accordance with the code.

* Provision for Buses

  It is not expected that a bus service will be introduced along the road system (although the School Special services operating along Blue Seas Parade and Survey Street could be extended). The road geometry however, has been designed to suitably provide for service vehicles and potential future bus movements.

6. SERVICING, PEDESTRIANS AND CYCLISTS

6.1 SERVICING

The permeability of the subdivision road system will facilitate the movements of service vehicles and particularly garbage removal.

The road widths and intersection arrangements will accommodate the movements of 'large rigid trucks' and the cul-de-sac 'bulb' on Road № 4 accords with Council's design requirements.

6.2 PEDESTRIANS

Suitable and appropriate provision is made for pedestrians in the design with:

* verges on both sides of the roads
* footpath along one side of the road circuit
* 'slow ways' and bends to contain vehicle speeds at the principal crossing points
* suitable sight distances
* walkway system with linkages
* suitable street lighting.

6.3 CYCLISTS

There is no existing bicycle facility which would connect to the subdivision. The proposal will make suitable and appropriate provision for cyclists with:

* the shared cycle/pedestrian pathway (2.5 metres wide)
* slow ways and bends to constrain vehicle speeds
* suitable sight distances
* suitable street lighting.

7. CONSULTATION

Consultation in relation to the 'traffic' aspects of the proposed subdivision have been undertaken with Ballina Shire Council and the Roads and Traffic Authority. A copy of this report has been forwarded to the relevant persons (see Appendix C). The report was sent to the RTA on 8th August 2006 and followed up with numerous phone calls. Advice was provided by Michael Baldwin, of the RTA's Ballina office, on 18th September 2006 that he would be dealing with the matter, however he could not advise when he would be able to respond (despite the fact that 6 weeks had elapsed since the report was submitted).

During earlier discussions Mr Baldwin had indicated that he was familiar with the site and because there were no 'State Road' issues it was unlikely that the RTA would have any concerns with the proposal.

8. CONCLUSION

The proposed 'Coastal Grove' subdivision at Lennox Head will permit the development of additional high quality housing in a desirable location while retaining appropriate open space areas. The proposed 45 lot subdivision (49 dwelling units) will have an access road system which accords with Council's Development Design Specification and suitably encourages/facilitates walking and cycling.

Development on the subdivision would comprise up to 49 dwellings and the 'traffic outcome' will be satisfactory in relation to:

* road/intersection capacity implications
* traffic related environmental implications
* traffic management and safety implications.

It is considered that the Director General's requirements have been satisfied in relation to:

* the provision of an appropriate Traffic Report
* addressing the Northern Rivers Local Government Development Design Manual
* consultation.

APPENDIX A

SIDRA RESULTS

Movement Summary

Existing AM Peak

North Creek Road / Blue Seas Parade

Give-way

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
South Approach										
2	T	280	0.0	0.074	0.4	LOS A	4	0.13	0.01	58.0
2	R	5	0.0	0.074	0.4	LOS A	4	0.13	0.01	58.0
Approach		**285**	**0.0**	**0.074**	**0.4**	**LOS A**	**4**	**0.13**	**0.01**	**58.0**
East Approach										
4	L	11	0.0	0.108	12.2	LOS A	4	0.44	0.60	44.9
5	R	48	0.0	0.108	12.3	LOS A	4	0.44	0.78	44.8
Approach		**59**	**0.0**	**0.108**	**12.3**	**LOS A**	**4**	**0.44**	**0.74**	**44.8**
North Approach										
7	L	18	0.0	0.065	8.2	LOS A	0	0.00	0.67	49.0
8	T	108	0.0	0.065	0.0	LOS A	0	0.00	0.00	60.0
Approach		**126**	**0.0**	**0.065**	**1.2**	**LOS A**		**0.00**	**0.10**	**58.1**
All Vehicles		**470**	**0.0**	**0.108**	**2.1**	**Not Applicable**	**4**	**0.14**	**0.13**	**56.0**

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Movement Summary

Existing PM Peak

North Creek Road / Blue Seas Parade

Give-way

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
South Approach										
2	T	173	0.0	0.047	1.0	LOS A	3	0.22	0.02	56.7
2	R	6	0.0	0.047	1.0	LOS A	3	0.22	0.02	56.7
Approach		**179**	**0.0**	**0.047**	**1.0**	**LOS A**	**3**	**0.22**	**0.02**	**56.7**
East Approach										
4	L	5	0.0	0.064	13.7	LOS A	2	0.55	0.71	43.6
5	R	24	0.0	0.064	13.8	LOS A	2	0.55	0.81	43.5
Approach		**29**	**0.0**	**0.064**	**13.7**	**LOS A**	**2**	**0.55**	**0.79**	**43.5**
North Approach										
7	L	41	0.0	0.177	8.2	LOS A	0	0.00	0.67	49.0
8	T	302	0.0	0.177	0.0	LOS A	0	0.00	0.00	60.0
Approach		**343**	**0.0**	**0.177**	**1.0**	**LOS A**		**0.00**	**0.08**	**58.4**
All Vehicles		**551**	**0.0**	**0.177**	**1.7**	**Not Applicable**	**3**	**0.10**	**0.10**	**56.9**

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Movement Summary

Post Development AM Peak

North Creek Road / Blue Seas Parade

Give-way

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
South Approach										
2	T	280	0.0	0.075	0.5	LOS A	4	0.14	0.02	57.9
2	R	7	0.0	0.075	0.5	LOS A	4	0.14	0.02	57.9
Approach		**287**	**0.0**	**0.075**	**0.5**	**LOS A**	**4**	**0.14**	**0.02**	**57.9**
East Approach										
4	L	18	0.0	0.165	12.4	LOS A	6	0.46	0.61	44.7
5	R	72	0.0	0.166	12.5	LOS A	6	0.46	0.80	44.6
Approach		**90**	**0.0**	**0.165**	**12.5**	**LOS A**	**6**	**0.46**	**0.76**	**44.6**
North Approach										
7	L	26	0.0	0.069	8.2	LOS A	0	0.00	0.67	49.0
8	T	108	0.0	0.069	0.0	LOS A	0	0.00	0.00	60.0
Approach		**134**	**0.0**	**0.069**	**1.6**	**LOS A**		**0.00**	**0.13**	**57.5**
All Vehicles		**511**	**0.0**	**0.166**	**2.9**	**Not Applicable**	**6**	**0.16**	**0.18**	**54.9**

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Movement Summary

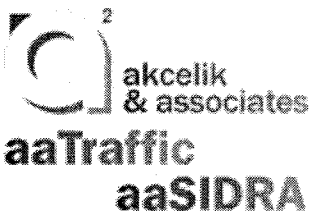
Post Development PM Peak

North Creek Road / Blue Seas Parade

Give-way

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (m)	Prop. Queued	Eff. Stop Rate	Aver Speed (km/h)
South Approach										
2	T	173	0.0	0.050	1.3	LOS A	3	0.22	0.04	56.6
2	R	11	0.0	0.050	1.3	LOS A	3	0.22	0.04	56.6
Approach		**184**	**0.0**	**0.050**	**1.3**	**LOS A**	**3**	**0.22**	**0.04**	**56.6**
East Approach										
4	L	8	0.0	0.099	14.1	LOS A	3	0.56	0.73	43.2
5	R	36	0.0	0.099	14.2	LOS A	3	0.56	0.84	43.1
Approach		**44**	**0.0**	**0.099**	**14.2**	**LOS A**	**3**	**0.56**	**0.82**	**43.1**
North Approach										
7	L	66	0.0	0.190	8.2	LOS A	0	0.00	0.67	49.0
8	T	302	0.0	0.190	0.0	LOS A	0	0.00	0.00	60.0
Approach		**368**	**0.0**	**0.190**	**1.5**	**LOS A**		**0.00**	**0.12**	**57.7**
All Vehicles		**596**	**0.0**	**0.190**	**2.3**	**Not Applicable**	**3**	**0.11**	**0.15**	**55.9**



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APPENDIX B

EXTRACT FROM AUSTRALIAN STANDARDS

Australian Standard®

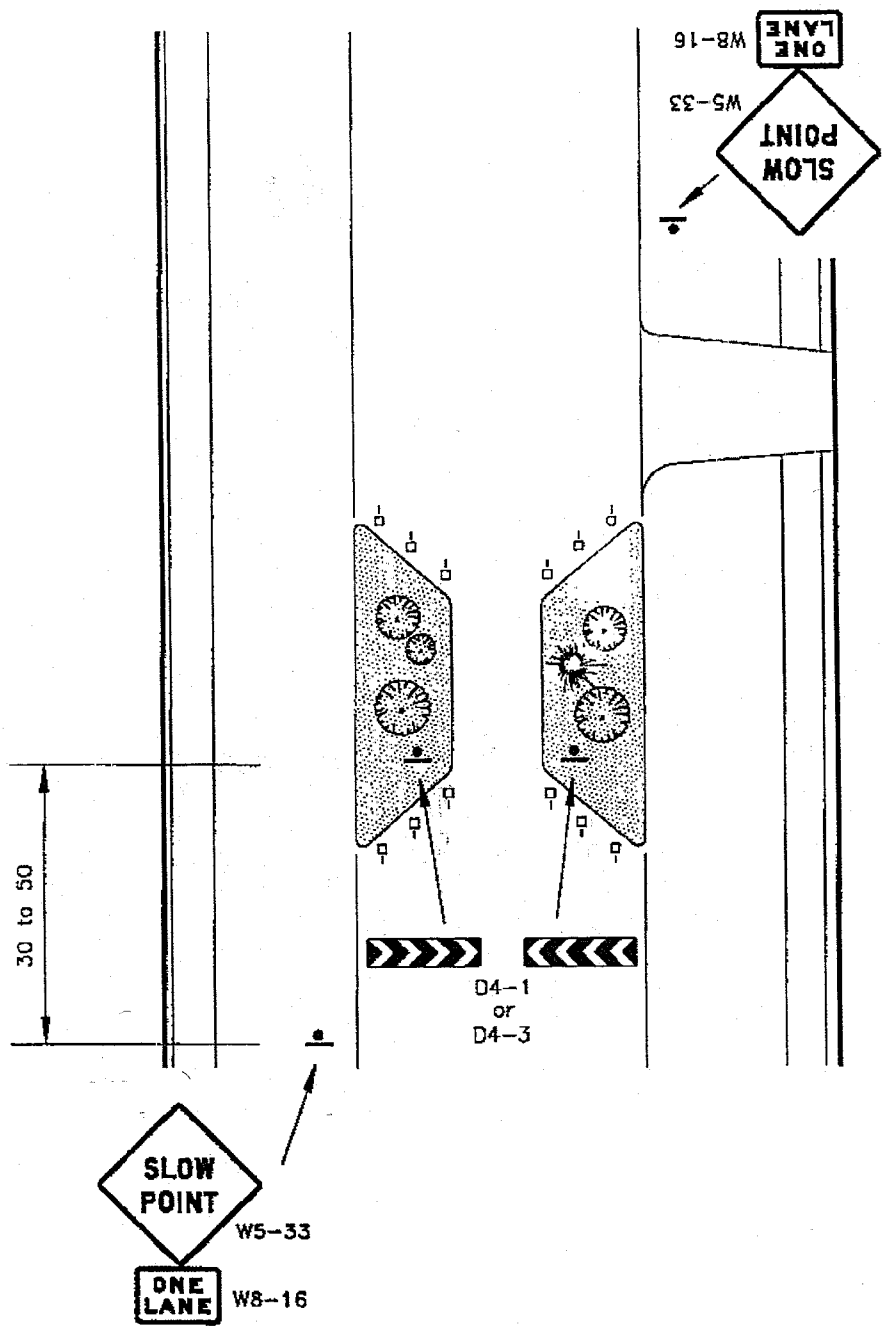
Manual of uniform traffic control devices

Part 13: Local area traffic management

First published as AS 1742.13—1991.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

ISBN 0 7262 7098 9



DIMENSIONS IN METRES

NOTES:

1 Sign assemblies W5-33/W8-16 and D4-1 or D4-3 are not generally required when the treatment is part of an area-side scheme.

2 To achieve satisfactory speed reduction, it may be necessary to incorporate a road hump in this device. If so, and if signs are required, the signing arrangement shall be in accordance with Figure 3.2.

FIGURE 3.6 SINGLE-LANE SLOW POINT

APPENDIX C

CONSULTATION ACTION

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

A division of Monvale Pty Ltd ACN 060 653 125
ABN 44 060 653 125

8 August 2006
Ref 05167

Ms Jackie Hanson
Ballina Shire Council
PO Box 450
BALLINA 2478

(Email: council@ballina.nsw.gov.au)

Dear Jackie

Proposed Residential Subdivision
at Lennox Head

Please find attached a Traffic Report which addresses the subject proposed development. The report responds to the 'Director General's Requirements' which include a requirement to consult with the RTA and Ballina Shire Council.

It would be appreciated if you could consider the report and provide your comments (the Department of Planning requires a formal response in order to confirm that liaison has occurred).

Yours faithfully

Ross Nettle
Director
Transport and Traffic Planning Associates

TRANSPORT AND TRAFFIC PLANNING ASSOCIATES

A division of Monvale Pty Ltd ACN 060 653 125
ABN 44 060 653 125

8 August 2006
Ref 05167

Mr Greg Sciffer
Roads and Traffic Authority
GRAFTON

(Email: land_use_northern@rta.nsw.gov.au)

Dear Greg

Proposed Residential Subdivision at Lennox Head

Please find attached a Traffic Report which addresses the subject proposed development. The report responds to the 'Director General's Requirements' which include a requirement to consult with the RTA and Ballina Shire Council.

It would be appreciated if you could consider the report and provide your comments (the Department of Planning requires a formal response in order to confirm that liaison has occurred).

Yours faithfully

Ross Nettle
Director
Transport and Traffic Planning Associates