



**COASTAL GROVE
1 SURVEY STREET
LENNOX HEAD**

PREFERRED PROJECT REPORT

Submitted to: Department of Planning

Date: June 2007

Job Number: 06/21

MG PLANNING PTY LTD

Suite 11
340 Darling Street
Balmain 2041
P (02) 9555 7128
F (02) 9555 6579
mail@mgplanning.com.au

© 2007 MG Planning Pty Ltd

Reproduction of this document or any part thereof is not permitted without prior written permission.

INTRODUCTION

This Preferred Project Report has been prepared by the applicant following the exhibition of the Environmental Assessment and supporting documentation for the proposed residential subdivision of land at 1 Survey Street, Lennox Head.

The Project was exhibited in October/ November 2006. During that time the Department of Planning received submissions from Ballina Council, the Department of Environment and Conservation (DECC) and other government agencies as well as a number of submissions from the general public.

Based on the comments received a number of modifications have been made to the proposal specifically to further minimise impacts on the environment. These modifications have been made in consultation with the Department of Planning, DECC and Ballina Council. As a result, the subdivision layout has now been amended and the number of lots proposed reduced from 45 to 39. The draft Statement of Commitments has also been amended to reflect the additional work undertaken to address concerns.

The purpose of this report is to detail the changes that have been made and to consider any potential impacts arising from these changes.

This Preferred Project Report should be read in conjunction with the Environmental Assessment dated September 2006 and its accompanying specialist plans and reports, as well as more recent work and plans submitted to the Department of Planning.

PREFERRED PROJECT

Overview

The proposal has been amended as follows:

1. reducing the number of allotments from 45 to 39;
2. providing a 50m buffer between the proposed subdivision and the Coastal Fontainea (*Fontainea oraria*) in the adjoining Amber Drive Reserve. The buffer has been provided by deleting Lot 1 as shown on the exhibited plan;
3. providing for the protection of the Hairy Jointgrass threatened species by redesigning the subdivision layout in the vicinity of Lots 27 to 38, reducing the number of lots in this area from 11 to 5;
4. conserving the additional area of Hairy Jointgrass for inclusion in the open space corridor;
5. removing the existing threats to the conservation of the Hairy Jointgrass and providing for its long term protection through the preparation and implementation of an Environmental Management Plan;
6. increasing the period from two to five years during which the applicants will undertake open space (including Hairy Jointgrass and bushland) maintenance and weed control prior to dedication to Council;
7. increasing the proposed open space corridor to be dedicated to Council which includes the area of additional conserved Hairy Jointgrass and buffer to Coastal Fontainea.
8. redesigning the road layout to ensure protection of the Hairy Jointgrass;
9. modifying the proposed stormwater management plan to reflect the subdivision layout changes and to minimise adverse impacts on the Hairy Jointgrass habitat;
10. providing an additional pedestrian/cycleway link from the end of Road 1 to connect with the proposed open space pedestrian pathway;
11. relocating one of the proposed dual occupancy lots to Lot 25 to minimise visual impact at the southern end of Road 1;

Plans showing the proposed changes have been prepared by Hassell and Patterson Britton and are included at Attachment 1. The plans are as follows:

- amended Subdivision Plan PSL 3394/PA02 prepared by Hassell and dated 20 June 2007;
- amended Landscape Plan PSL 3394/PA03 prepared by Hassell and dated 20 June 2007;
- amended Stormwater Concept Plan prepared by Patterson Britton and dated 21 June 2007.

The draft Statement of Commitments has now been amended to reflect the above changes and is provided at Attachment 2.

A discussion of the key considerations and specific changes is detailed below.

Hairy Jointgrass

Following exhibition and in response to comments from Ballina Council, the Department of Planning and DECC, a further report on the extent of the threatened Hairy Jointgrass (*Arthraxon hispidus*) was undertaken by Ecological Australia on behalf of the applicants. A copy of the final report is enclosed at Attachment 3.

In light of the findings of this report and subsequent discussions with both the DECC and Ballina Council, it was agreed to protect additional areas of Hairy Jointgrass located within the subdivision footprint. Accordingly, the subdivision has been modified by:

- protecting all areas of high density Hairy Jointgrass in the vicinity of lots 27 to 33 (as exhibited) by incorporating them into the open space system;
- reconfiguring the lot layout in response to the conservation of the Hairy Jointgrass habitat and reducing the number of lots in this area from 11 to 5;
- removing part of Road No 2 in the vicinity of exhibited lots 27-23 and providing access to the bulk of the lots by means of two culs-de-sac;
- reducing the length of Road No 3 to protect the western extent of high density Hairy Jointgrass; and
- provision of a 3 metre buffer around the Hairy Jointgrass areas to the residential lots consistent with advice from DECC.

As a result of these changes, and that made previously to provide for a greater buffer for the Coastal Fontainea, the number of lots has been reduced from 45 as originally proposed to 39.

The draft Statement of Commitments has now been amended to reflect the recommendations of the Ecological Australia Report and other matters. The revised draft Statement of Commitments is provided at Attachment 2.

The draft Statement of Commitments includes an undertaking regarding the preparation of an Environmental Management Plan to provide for the management of the Hairy Jointgrass areas and associated riparian corridor/open space. The Environmental Management Plan will be prepared in consultation with Council and DECC and will be a 5 year plan addressing the establishment of the reserve, maintenance works and monitoring. In particular, the plan will address:

- Promotion of Hairy Jointgrass
- Exclusion of cattle
- Mowing in the winter months with removal of mulch.
- Hand weeding of particularly aggressive weeds
- Management of access into the area
- Locate rainforest species to complement the current and future population of Hairy Jointgrass
- Provide a concise set of ongoing management requirements/ conditions for the site to promote a self maintaining system

It is considered that the additional area of Hairy Jointgrass and buffer to the Coastal Fontainea should be incorporated into the open space system not only because there is a logical spatial connection between these areas and

the open space but also to ensure integrated management and long term protection. It should be noted that these areas will be fully rehabilitated, embellished and a management regime established over a five year period prior to dedication. This will mean that their ongoing management will have limited impact on Council resources.

Stormwater

In view of the changes to the subdivision layout, a revised stormwater concept plan has been prepared by Patterson Britton. The key changes are:

- relocation of the proposed drainage line from the existing drainage pipe draining to the western boundary of the site to avoid the Hairy Jointgrass;
- the addition of a rain garden and gross pollutant trap to treat and detain runoff from Lots 26 to 30 and a short section of Road 1 as well as the removal of the surface runoff collection drain from Lots 26 to 30.

Patterson Britton have advised that the revised stormwater strategy will ensure that the hydrology of the Hairy Jointgrass area will remain without significant change. Their advice also indicates that the spring groundwater will remain unchanged which is the main source of wetness for the species.

Bushfire

The bushfire consultant, Barry Eadie Consulting Pty Ltd, has provided updated advice in relation to the revised layout (Attachment 4). No major concerns are raised from a bushfire perspective subject to the following:

- the separation of those lots that directly adjoin the area of Hairy Joint Grass by a non-combustible fence, the height of which will need to be a minimum of twice the height of the Hairy Joint Grass.
- the provision of pedestrian access linking the two culs-de-sac. This pedestrian access is for firefighters and obviates the need for fire truck access during a bushfire. The revised Landscape Plan has made provision for pedestrian access between the two culs-de-sac.

The draft Statement of Commitments has been amended to reflect these requirements.

CONSIDERATION OF ALTERNATIVES

In preparing the revised scheme a number of alternatives to the subdivision layout were considered, particularly to maintain a loop road for vehicular connectivity. These alternatives included a reduced loop road in the vicinity of lots 24/39 (as exhibited) as well as continuing a road generally along the alignment of the exhibited layout but with a narrower carriageway.

However, because of the topography of the site and the need to protect the high density areas of Hairy Jointgrass it was concluded that the only feasible option is for the two culs-de-sac as shown. Retaining the road in its exhibited alignment would result in the fragmentation of the Hairy Jointgrass and potentially the loss of some high density areas. Providing an east-west road link further to the north was not feasible from an engineering viewpoint.

In response to comments regarding the revised layout incorporating the culs-de-sac, Transport and Traffic Planning Associates have advised that the design is consistent with the Northern Rivers – Local Government Road Design (Urban and Rural) Manual 2003 adopted by Ballina Council as well as the RTA's Guide to Traffic Generating Development 2002. A copy of their advice is provided at Appendix 5.

The proposed road layout is also consistent with other recent residential subdivisions approved at Lennox Head, notably Lennox Meadows and Pacific Pines Estates. Given the particular nature of the site and the small number of lots being serviced by the culs-de-sac, it is considered that the road layout is the optimal solution in this instance.

CONCLUSION

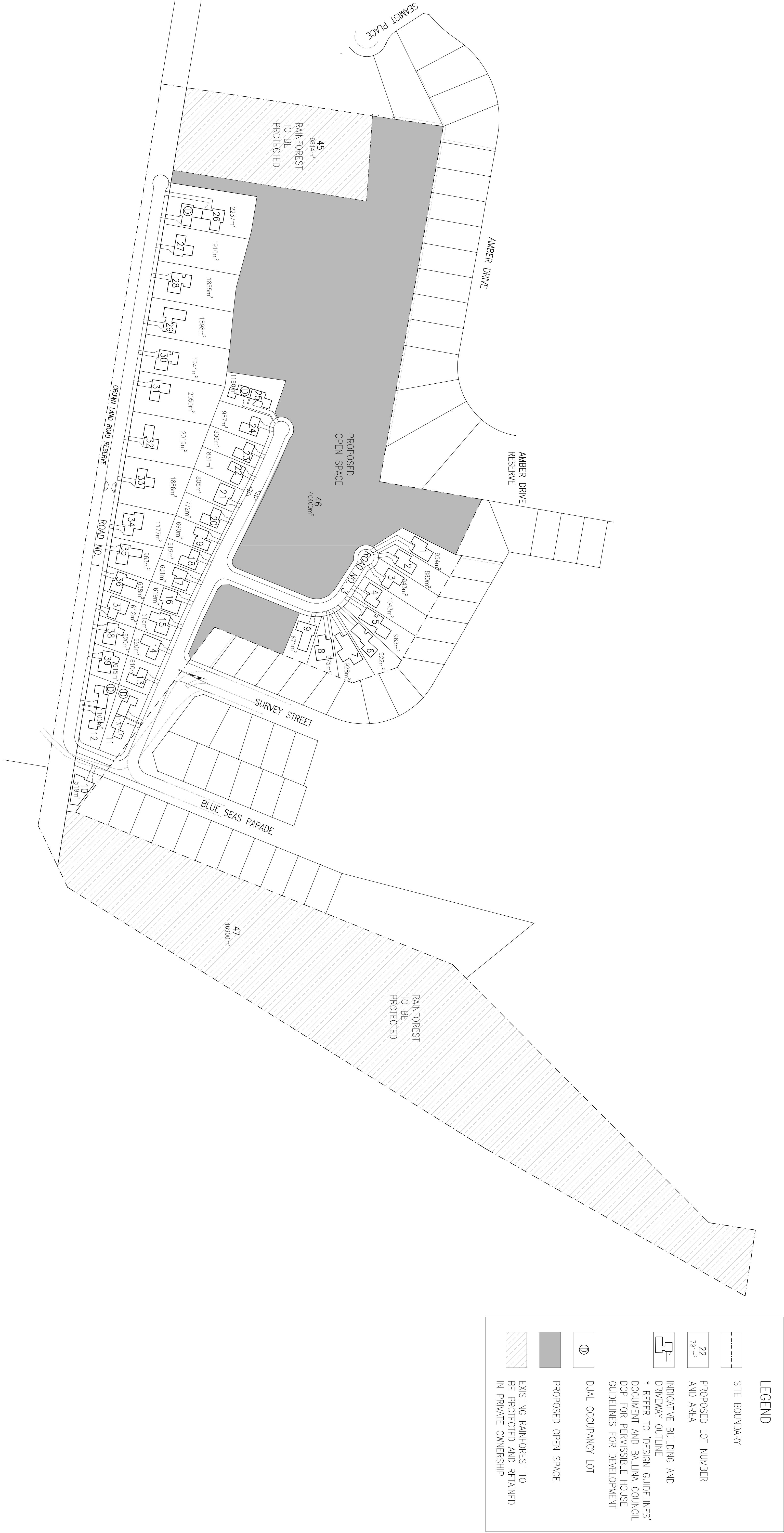
Changes have now been made to the subdivision layout to protect areas of Hairy Jointgrass and littoral rainforest for long term conservation. The conservation of these areas has required a reduction in the number of lots from the original 45 provided for in the Project Application to the current 39, as shown on the subdivision layout at Attachment 1.

We believe that the owners have gone to some lengths to develop a scheme that satisfies a range of competing needs and demands. This final subdivision design has taken account of all concerns that have arisen during the protracted development assessment process. It should also be remembered that this site is zoned for residential/urban purposes under Ballina LEP, is located within the Town Centre Boundary and Existing Urban Footprint of the Far North Coast Regional Strategy, and has been identified by Council for future residential development in the Lennox Head Strategic and Structure Plans.

It is our strong belief that this proposal more than adequately provides for the protection of the threatened species as well as ensuring a sustainable and attractive residential community for both existing and future residents.

ATTACHMENT 1

Revised Plans



LEGEND

SITE BOUNDARY

PROPOSED LOT NUMBER AND AREA

22791m²

INDICATIVE BUILDING AND DRIVEWAY OUTLINE

* REFER TO 'DESIGN GUIDELINES' DOCUMENT AND BALINA COUNCIL DCP FOR PERMISSIBLE HOUSE GUIDELINES FOR DEVELOPMENT

DUAL OCCUPANCY LOT

PROPOSED OPEN SPACE

EXISTING RAINFOREST TO BE PROTECTED AND RETAINED IN PRIVATE OWNERSHIP

0 30M 60M 120M
1:1500 @ A1

PSL 3394 / PA02 Subdivision Plan

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

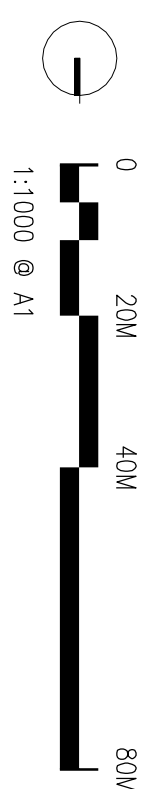
20 June 2007 - Project Application (Revision E)

COASTAL GROVE DEVELOPMENTS

SAKE DEVELOPMENT

Lennox Head

COASTAL GROVE



PSL 3394 / PA03 Landscape Plan (Rev C)

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

20 June 2007 - Project Application (Revision E)

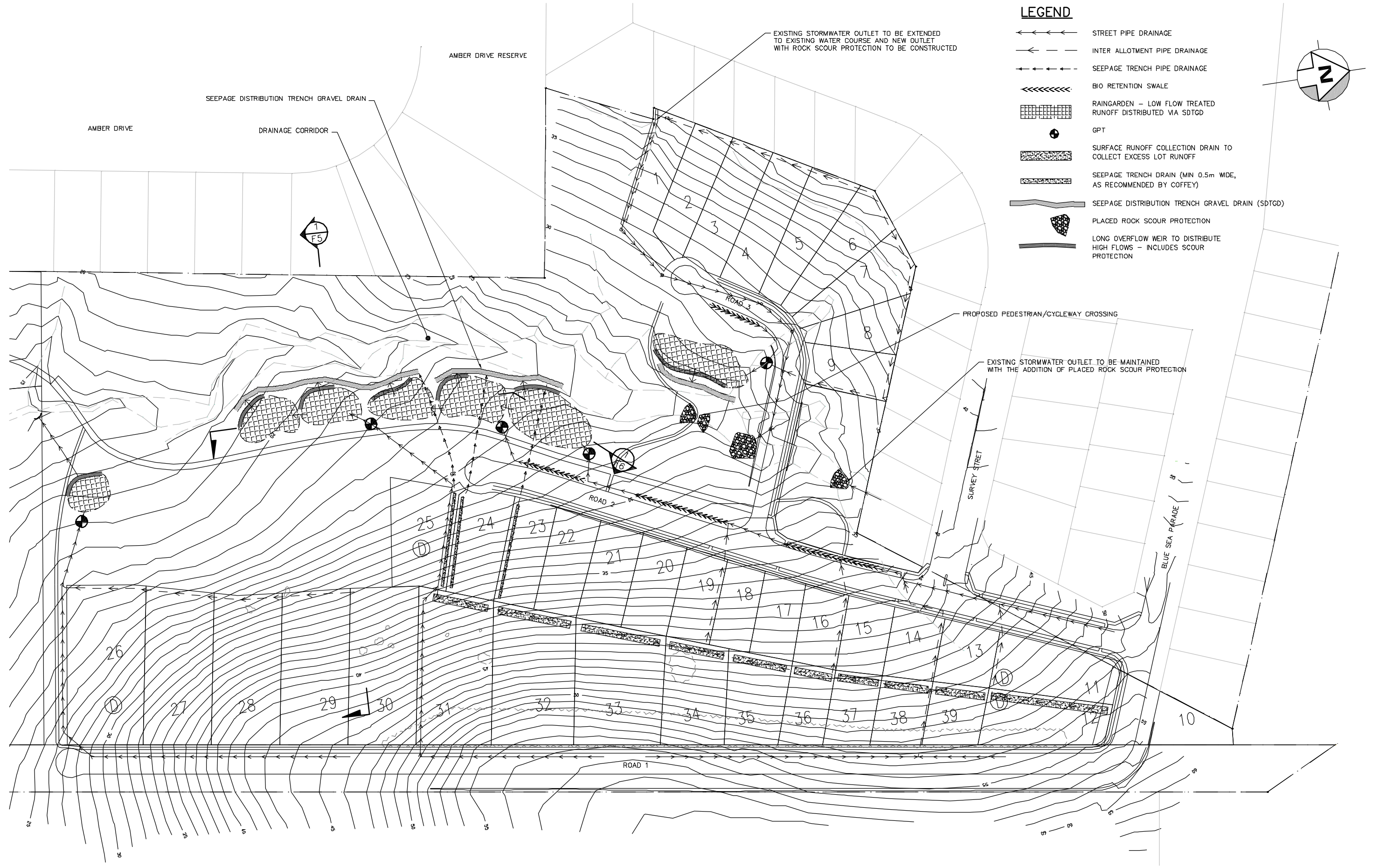
LEGEND

- 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 VERGE FOOTPATH (1.2M)
- PROPOSED PEDESTRIAN FOOTPATH (FINAL DESIGN/LOCATION TO BE DETERMINED IN CONSULTATION WITH COUNCIL TO ENSURE NO ADVERSE IMPACT ON HARRY JOINT GRASS)
- PROPOSED RAINGARDEN
- PLAYGROUND AREA
- LOT BOUNDARY AND NUMBER
- INDICATES POTENTIAL DUPLEX DEVELOPMENT LOT
- AREA OF HARRY JOINT GRASS TO BE PROTECTED (Extent Interpolated from 'Final Amended' Diagram in Ecological Assessment prepared by Eco Logical Australia)
- 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 (SEE NOTE 2)
- PROPOSED PLANTED BIO-RETENTION SWALES
- PROPOSED GRASS AREA

Note 1.
Location of Fontainea orotia is approximate based on information provided by Council that 'A Council Survey confirmed the coastal Fontainea is growing approximately 7.5m from the boundary of the Council Reserve and Lot 2'.

Note 2.
Riparian edge planting to be undertaken in accordance with a management plan and to protect the extent of the endangered Harry Joint Grass.

FIGURE 2



ATTACHMENT 2

Revised Statement of Commitments

DRAFT STATEMENT OF COMMITMENTS

In accordance with the Director-General's EA requirements, the following amended draft statement of commitment identifies the proposed mitigation measures, environmental management of residual impacts and monitoring for the proposed development. This draft Statement of Commitments responds to the amended design post exhibition and identifies those measures that will need to be implemented during the pre-construction and construction phases as well as once the development is complete in order to minimise impacts on the environment. Other mitigation measures including measures to minimise any impacts on the threatened species on site have been incorporated into the revised design.

Where a plan or report referred to in the following Statement of Commitments has not yet been amended to reflect the revised subdivision design it should be taken that this will be undertaken prior to the issue of a construction certificate. In these circumstances the principles outlined in that plan / report should be taken to generally apply to the revised scheme.

The applicant undertakes to carry out the development in accordance with the commitments given below

GENERAL

- A. The proponent will undertake the development in accordance with the Environmental Assessment report prepared by MG Planning Pty Ltd dated September 2006 and as amended by the Preferred Project Report dated June 2007 including:
 - Subdivision Plan PA02 (dated 20 June 2007), Landscape Plan PA03 (dated 20 June 2007), Landscape Sections PA04 dated 19 September 2006, prepared by Hassell, provided under separate cover;
 - The Civil Drawings prepared by Patterson Britton and Partners in the Coastal Grove Infrastructure Strategy (September 2006) and as amended by the Revised Conceptual Stormwater Management Strategy dated 21 June 2007.
 - This Statement of Commitments.

STATUTORY REQUIREMENTS

- B. In relation to any obligations under other Acts, the proponent will ensure that all licences, permits and approvals are obtained and kept current, as required throughout the construction and post construction phases of the development.

OPEN SPACE

- C. The ecological buffer area and open space on the site is to be dedicated to Council as a conservation reserve following rehabilitation, enhancement and management according to the Environmental Management Plan and embellishments in accordance with the Landscape Plan PA03 dated 20 June 2007 and Landscape Sections PA04 prepared by Hassell. The embellishment and dedication of the area is to

be undertaken five years after the release of the construction certificate at the conclusion of the maintenance and monitoring program.

- D. The open space is to be embellished in accordance with the Landscape Plan PA03 dated 20 June 2007 and Landscape Sections PA04 prepared by Hassell and provided under separate cover.
- E. In general, the pedestrian and cycleway crossing of the drainage corridor within the open space area will be designed in accordance the Department of Natural Resources Guidelines for the Design and Construction of Paths and Cycleways Along Watercourses and Riparian Areas. This work will be done prior to the issue of the subdivision certificate.
- F. The proposed pathway through the open space corridor will be designed to ensure that there will be no adverse impact on the Hairy Jointgrass distribution. The Environmental Management Plan for the Hairy Jointgrass will provide details of the design and construction of the pathway.
- G. The proponent will work with Council on the detailed design of the children's playground, including the provision of a shade structure and the provision of appropriate play equipment.
- H. Where possible, landscaping in the open space and road reserves will be from locally sourced plant species.

ROADS

- I. The proposed roads will be constructed and dedicated to Council for the full frontage of all proposed lots. Roads will be designed in accordance with the drawings prepared by Patterson Britton and Partners in the Coastal Grove Infrastructure Strategy (September 2006) as amended by the revised design illustrated on Landscape Plan PA03 dated 20 June 2007.
- J. In terms of Road 1 design, the proponent will at the construction certificate stage explore with Council the potential to lower the pavement levels to remove the need for any suspended driveway structures.

FLORA AND FAUNA

- K. The threatened grass species, Hairy Jointgrass (*Arthraxon hispidus*) is to be retained and protected within an 'ecological buffer', as mapped in Figure 6 of the "Review of Hairy Jointgrass (*Arthraxon hispidus*) at Survey Street, Lennox Head" prepared by Ecological Australia (June 2007).
- L. An Environmental Management Plan will be prepared in consultation with Council and DECC for the management of the ecological buffer and associated open space. The 5 year plan will address the establishment of the reserve, maintenance and monitoring. In particular, the plan will address:

- Promotion of Hairy Jointgrass
 - Exclusion of cattle
 - Mowing in the winter months with removal of mulch.
 - Hand weeding of particularly aggressive weeds
 - Management of access into the area
 - Locate rainforest species to complement the current and future population of Hairy Jointgrass
 - Provide a concise set of ongoing management requirements/conditions for the site to promote a self maintaining system
- M. Within the ecological buffer the hydrology of the Hairy Jointgrass will remain without significant change and there will be no reshaping of the creek banks. Ongoing management of the ecological buffer will be defined within the environmental management plan, and will include:
- Any landscape plantings will be compatible with appropriate habitat to protect and enhance the Hairy Jointgrass
 - Any paths are to avoid traversing the known Hairy Jointgrass population and may include elevated pedestrian cycleways or boardwalks that may enable viewing and interpretation of the Hairy Jointgrass
 - No reshaping of creek or its banks in the vicinity of the Hairy Joint Grass
 - Any passive recreation or access is to be restricted to designated paths to minimise impact
- N. The Environmental Management Plan will be prepared prior to the release of the construction certificate.
- O. The Environmental Management Plan will include a five-year program of bushland maintenance and weed control using trained personnel. This program will involve weed control along the creek lines, the littoral rainforest remnants to the south and where revegetation has been completed. The program of bushland maintenance/weed control will commence from the date of issue of the Construction Certificate.
- P. Monitoring and ongoing survey work of the Hairy Jointgrass population will be undertaken for a period of five years at yearly intervals in the late summer months. An annual report will be provided to Council regarding the monitoring program. Additional survey work will commence prior to the issue of the construction certificate and monitoring will commence from the date of issue of the Construction Certificate.
- Q. In accordance with the Landscape Plan PA03 dated 20 June 2007, a vegetation buffer will be provided between the Coastal Fontainea known from Amber Reserve and the closest proposed house on Lot 1.
- R. Additional littoral rainforest species will be planted adjacent to the existing rainforest species in the riparian corridor, and weed control will be undertaken for a period of five years by experienced bushland regenerators to further protect this rainforest remnants.
- S. All new planting will be undertaken prior to the issue of the subdivision certificate.

- T. The construction management plan will be reviewed to incorporate measures for the protection of the Hairy Jointgrass,

VISUAL IMPACT AND HOUSING

- U. The proponent will work with Ballina Council in finalising the draft Development Control Plan for the subdivision to ensure that appropriate controls are put in place to guide the design and construction of future housing. Matters to address include:

- Vertical building lines for Lots 34-39 and 11-12.
- Enhanced sustainability measures including shading and screen devices, and landscaping to the western facades to reduce any potential for glare.
- Terminology for duplex lots.
- Appropriate measures to protect against mosquitoes, as recommended in the Mosquito Impact Assessment Supplementary Report dated May 2007.

- V. Duplex developments will be confined to lots 25, 26, 11 and 12.

FIRE MANAGEMENT

- W. An Asset Protection Zone will be provided to the south of the site, south of the proposed roadway within the open space area. Landscaping in the Asset Protection Zone will be in accordance with the *Planning for Bushfire Protection* (Rural Fire Service, 2001) or as otherwise specified by the NSW Rural Fire Service.

- X. An asset protection zone will be provided to Lot 10 in accordance with Planning for Bushfire Protection 2001. A bushfire management plan will be developed for the remaining vegetation and approved prior to the issue of a Construction Certificate for subdivision works.

- Y. Other bushfire protection measures in response to the amended subdivision design will be undertaken in accordance with the letter prepared by Barry Eadie Consulting Pty Ltd dated 24 May 2007. These include:

- The provision of non combustible fencing to lots adjoining the area of Hairy Joint Grass at a minimum height of twice the height of the Hairy Joint Grass;
- The provision of pedestrian access through the area of Hairy Joint Grass connecting Road No1 and Road No 2. This design and location of the pedestrian access is to be undertaken as part of the Environmental Management Plan.

CULTURAL HERITAGE

- Z. If any artefacts or sites relating to Aboriginal heritage are uncovered during site works, all work will cease and the NSW Department of Environment and Conservation will be contacted to advise on what action must occur prior to recommencing works.
- AA. All site contractors will be briefed prior to the commencement of future works about the statutory responsibilities and obligations concerning Aboriginal cultural heritage according to the National Parks and Wildlife Act 1974.

SERVICES

- BB. Water reticulation will be provided to each lot in accordance with the recommendations of the *Infrastructure Strategy* prepared by Patterson Britton and Partners (September 2006) and prior to the issue of the construction certificate..
- CC. Recycled water reticulation will be installed within the development in preparation for future provision of a recycled water trunk main to the area.
- DD. Satisfactory arrangements will be made with Telstra Australia prior to the release of the construction certificate, for the provision of standard communications services into and throughout the development. This service will be reticulated throughout the development in shared trenching accommodating pits and 100 mm conduits.
- EE. Satisfactory arrangements will be made with Country Energy prior to the release of the construction certificate, for the supply of electricity to each lot.
- FF. Upgrade to the sewer and reticulation to each of the lots will be undertaken in accordance with the Coastal Grove Infrastructure Strategy prepared by Patterson Britton and Partners (September 2006).
- GG. Prior to construction of dwellings on Lots 10 – 12 and 29 – 38, a hydraulic design of internal service lines and plumbing will be undertaken by a suitably qualified person.
- HH. Prior to construction of dwellings on Lots 10 – 12 and 29 – 38, 25mm water service and 20mm water meter will be provided in lieu of the standard 20mm water meter usually provided for residential lots.
- II. In terms of the sewer reticulation layout, further details of the diversion flows from SP3106 to SP3108 and the upgrading of SP3107 and the possible upgrading of the rising main from the pump station will be submitted prior to issue of the construction certificate.
- JJ. Detailed sewer and water reticulation plans will need to be submitted with an application for Construction Certificate and development contributions paid in accordance with Councils Development Servicing Plan.

WATER CYCLE MANAGEMENT

KK. Water quality control measures will be designed and installed in accordance with the recommendations of the Coastal Grove Water Cycle Management Report prepared by Patterson Britton and Partners (September 2006) except as modified by the Revised Conceptual Stormwater Management Strategy dated 21 June 2006. The water cycle management strategy will be undertaken prior to the release of the subdivision certificate. Specific measures to be undertaken include, but are not limited to, the following:

- construction of raingardens/bioretention basins
- installation of five gross pollutant traps, as shown in the Revised Conceptual Stormwater Management Strategy of the Water Cycle Management Report
- provision of bioretention/vegetated swales alongside roadways in accordance with the Water Cycle Management Report and the Revised Conceptual Stormwater Management Strategy dated 21 June 2007.
- installation of infiltration trenches along the rear of lots located on the eastern side of the site as shown in the Revised Conceptual Stormwater Management Strategy
- review of potential scour of the swale to Road 2 to be addressed at detailed design phase with appropriate inclusion of rock scour protection where velocities are excessive, prior to the issue of the Construction Certificate.

LL. All construction works will be undertaken in accordance with the Erosion and Sediment Control Plan prepared by Patterson Britton and Partners dated September 2006 and provided within the Construction, Environmental and Waste Management Plan at Appendix 9 and the following matters:

- No burning of cleared vegetation or other waste will occur on site during the construction phase. All waste will be removed to a licensed waste management facility.
- A secure, covered and bunded area will be provided on site for the storage of chemicals including flocculant.
- To manage noise during construction, mufflers on all equipment will be used and details of the builder / civil contractor will be erected on site during construction works.
- Further details regarding sedimentation retention ponds, sediment and erosion controls for the steeper areas and the weir / spillway will be submitted to Council prior to the issue of the construction certificate.

MM. Monitoring of runoff water quality will be undertaken during construction and for two years after construction of the subdivision to verify that the veracity of the proposed controls. A quarterly report will be provided to Council detailing the results of the monitoring during construction. If monitoring results exceed the relevant criteria on two consecutive occasions, the monitoring period will be extended to five years.

GEOTECHNICAL

NN. All civil works required for the subdivision will be carried out in accordance with the recommendations of the Slope Stability Assessment prepared by Coffey (August 2006) and methodology for earthworks for remediation of on site excavation dated 20 February 2007.

CONTAMINATION

OO. The proponent will remediate the site in accordance with the recommendations contained within the Environmental Site Assessment (Coffey, September 2006). Excavated contaminated material will be removed off site to landfill or placed under a road or other such element of the development to ensure the inaccessibility of the contaminated soil.

SECTION 94

PP. The proponent will pay Section 94 developer contributions in accordance with Council's Section 94 plans, subject to negotiation with Council regarding material public benefit associated with the provision and embellishment of additional open space.

QQ. The development will be serviced by sewer through upgrade of the SP3107 pumping station and rising main to the Lennox STW. These upgrades are in accordance with Council's DSP to upgrade infrastructure for the surrounding area and as such the proponent will seek credits for the provision of the upgrade.

CONSTRUCTION

RR. The subdivision will be constructed in accordance with the Construction Environmental and Waste Management Plan prepared by Patterson Britton and Partners (September 2006).

ATTACHMENT 3

Ecological Report

Review of Hairy Jointgrass (*Arthraxon hispidus*) at Survey St, Lennox Head

FINAL - AMENDED

(Project No. 161-001)

Report prepared for:
David and Ruth Dosser

June 2007

Document Tracking

Item	Detail	Signature
Project Name	Review of Hairy Joint Grass distribution at Survey St Lennox Head	
Project Number	161-001	
Prepared by	RM	JL
Prepared by	PG	
Approved by	AM	MC
Status	FINAL – AMENDED	
Version Number	3	
File location	G:\Current_Projects\Private Clients\Sake Development\Survey St Lennox Head Eco Review\Reports\Hairy Jointgrass Review_DRAFTv6.doc	
Last saved on	22 June 2007	

Acknowledgements

This document has been prepared by Eco Logical Australia Pty Ltd with support from SAKE Developments, MG Planning and the client.

Disclaimer

This document may only be used for the purpose for which it was commissioned and in accordance with the contract between Eco Logical Australia Pty Ltd and David and Ruth Dosser. The scope of services was defined in consultation with the client, by time and budgetary constraints imposed by the client, and the availability of reports and other data. Changes to available information, legislation and schedules are made on an ongoing basis and readers should obtain up to date information.

Eco Logical Australia Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for site specific assessment or legal advice in relation to any matter. Unauthorised use of this report in any form is prohibited.

Contents

1. INTRODUCTION AND BACKGROUND	1
2. HAIRY JOINTGRASS ECOLOGY AND RESEARCH.....	2
2.1 HABITAT	2
2.2 DISTRIBUTION	2
2.2.1 <i>World</i>	2
2.2.2 <i>Regional</i>	2
2.2.3 <i>Local</i>	3
2.3 RESERVATION STATUS	6
2.4 SIGNIFICANCE ASSESSMENT	6
2.5 HAIRY JOINTGRASS RESEARCH.....	6
3. IMPACTS OF PROPOSAL.....	8
4. CONSERVATION STRATEGY	11
4.1 OBJECTIVES	11
4.2 CONTEXT	11
4.3 EXTENT	11
4.4 CONDITION AND LONG TERM VIABILITY	12
4.5 SECURITY	12
4.6 STATEMENT OF COMMITMENTS.....	12
5. CONCLUSION	14
6. REFERENCES / INFORMATION SOURCES.....	15
APPENDIX 1 - ASSESSMENT UNDER THE ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT 1999.....	16

1. Introduction and Background

This report provides a review of conservation status of the threatened Hairy Jointgrass (*Arthraxon hispidus*) and an assessment of impacts to this species likely to arise from a proposed development at 1 Survey St., Lennox Head.

The development is designated as a 'Major Project' under 'Part 3A' of the EP&A Act, (Major Project No. 06_0002). The 'Project Application' and 'Environmental Assessment' were lodged with the Department of Planning on 21 September 2006 and exhibited publicly in October/November 2006.

This review was commissioned to address comments from the Department of Planning (DoP), Ballina Shire Council and the Department of Environment and Conservation (DEC), regarding the impact of the proposed development on the Hairy Jointgrass population and the adequacy of the proposed conservation strategy.

Issues identified with respect to the potential impact on the Hairy Jointgrass on the site include:

- removal of plants within the development footprint;
- alteration of the hydrology on, and downstream of, the site; and
- management of threats to the long term viability of the local population of the species

In particular, this review provides:

- a discussion of the conservation status of the Hairy Jointgrass, as well as the local and regional distribution of the species;
- a discussion on the habitat requirements of the local population
- responses to the requirements of the 'Part 3A' threatened species guidelines, specifically the 'improve or maintain' principle; and
- recommendations for a management strategy for the species.

This review has been prepared in accordance with the *Draft Guidelines for Threatened Species Assessment* (DEC/DPI 2005) required for 'Major Projects' assessed under 'Part 3A' of the EP&A Act. The assessment process under 'Part 3A' and these guidelines do not require the preparation of a '7-part test' or a 'Species Impact Statement'.

2. Hairy Jointgrass Ecology and Research

2.1 Habitat

Hairy Jointgrass is a moisture and shade loving grass, found in or on the edges of rainforest and in wet Eucalypt forest, often near creeks and swamps. It also often occurs in open grassy areas that have high moisture levels.

The plant has been considered to be a perennial species which tends to die down in winter. However, from local observations and personal communications (Doug Binns NSW Forests & Andy Benwell, Ecos Environmental), the species appears to be an annual in most locations.

2.2 Distribution

2.2.1 World

The species is found in Australia, Japan, Asia and central Eurasia. It also occurs as a weed in USA

2.2.2 Regional

The indicative national distribution from the Federal Department of Environment and Water Resources database shows a concentration of occurrences in south east Queensland, far north east NSW and the NSW Northern Tablelands as shown in figure 1 below. It is also known from inland Queensland on mound springs (A. Benwell pers. comm.).

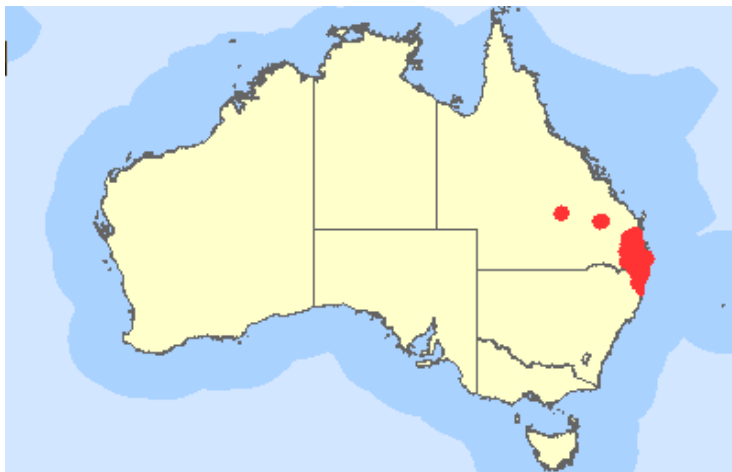


Figure 1: Hairy Jointgrass distribution from Department of Environment and Water Resources (2006).

Records in the Atlas of NSW Wildlife database suggest about 10 – 15 populations exist in NSW, based on records from the Royal Botanic Gardens, NSW State Forests and the Department of Environment and Conservation. There are also a number of additional populations known in north east NSW between the Port Macquarie and Queensland-NSW border. This may bring the total number of populations to between 20 and 50. Figure 2 shows the approximate distribution of populations recorded across north east NSW.

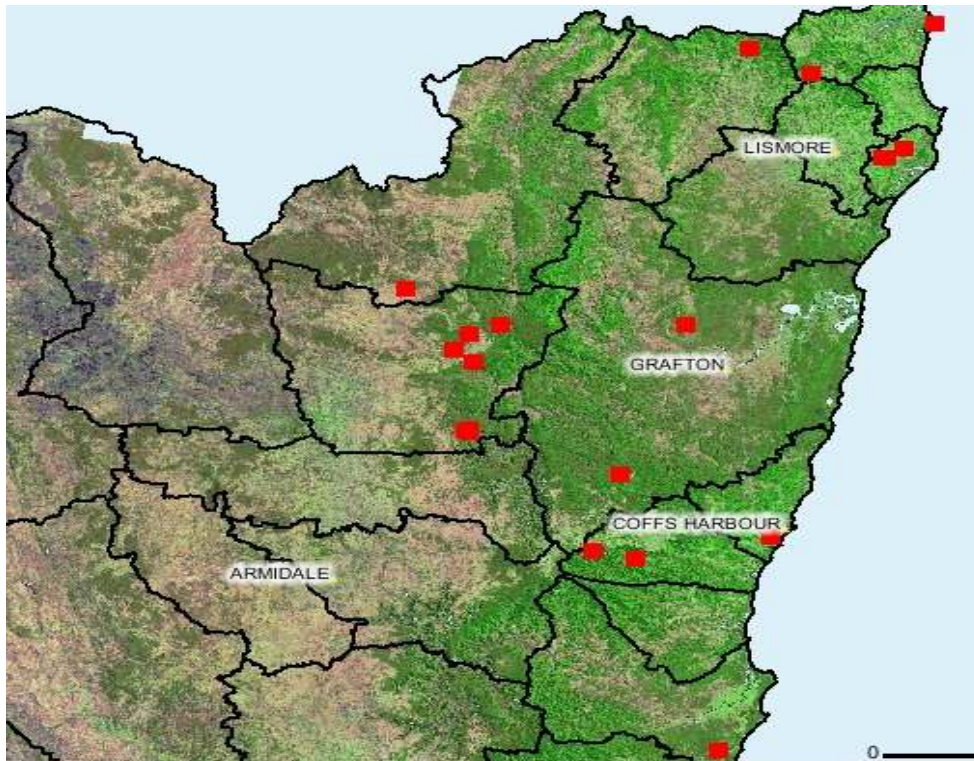


Figure 2: Hairy Jointgrass populations recorded in north east NSW (NSW State Government 2006)

2.2.3 Local

Hairy Jointgrass is located in varying densities on the subject site, predominantly along the riparian strip and in areas of elevated soil moisture where it is not out-competed by exotic grasses or other weeds (Figure 4).

The subject site would have formerly supported littoral rainforest. It is assumed that once the site was cleared for agriculture it allowed the Hairy Jointgrass to spread. It may have been present originally along the creek line on the site or brought to the site during the agricultural use of the site.

Over August-September 2006, the initial surveys mapped the distribution as an area covering 3m x 4m of the site. Subsequent survey work by Ballina Shire Council, Peter Parker and Eco Logical Australia over the summer months of 2006/2007 has confirmed that the distribution of the species has expanded on the subject site. This apparent expansion in distribution is likely to be due to the recent surveys being in summer/autumn when the species is more vigorous and observable.

A number of plants have been recorded along drainage lines on the adjoining property to the east and south as shown in Figure 3 (Peter Parker Environmental Consultants 2006 & Earth Process Ecological Services).

The species is considered likely to occur elsewhere in similar habitat in the Lennox Head area.

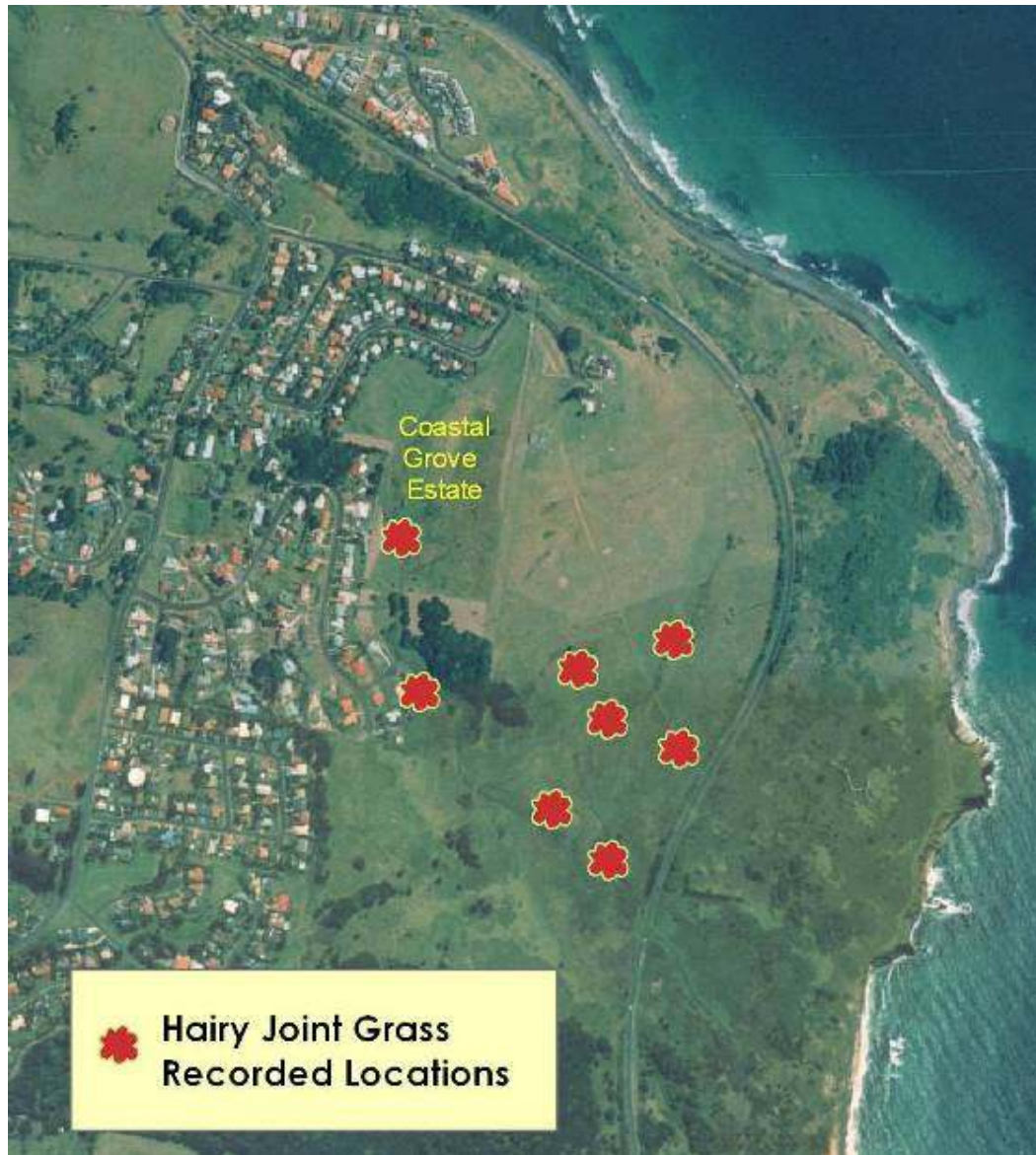


Figure 3: Hairy Jointgrass recorded in the local vicinity

A targeted survey for the species was carried out by Eco Logical Australia on 22 March 2007 with the aim of validating the mapped distribution and density of the species. Figure 4 shows the updated distribution and density on the proposed development site, as well as the adjoining property to the south.

'High density' areas on Figure 4 indicate where dense, continuous patches of Hairy Jointgrass were found. Broader 'Distribution' areas are those where individual plants or smaller patches of Hairy Jointgrass were found.



The site validation substantially agreed with the distribution and densities mapped by Peter Parker and Ballina Shire Council as at 6 March 2007. Small variations were made to the mapping, including the extent of higher density areas:

1. In the north west
2. At the south east
3. Immediately east of the drainage channel

The original mapping did not survey the property to the south.

2.3 Reservation Status

There are no known populations of Hairy Jointgrass within conservation reserves in NSW. However, a population is recorded from Cooloola National Park in south east Queensland.

This limited reservation status of the species may be due to a combination of the nature of its habitat, preferring moist open areas and edges of rainforest or moist forest (in most known cases associated with disturbed areas that are not reserved), as well as the limited research and knowledge of the species, as there has been minimal work completed in regards to regional targeted survey for the species.

2.4 Significance Assessment

Hairy Jointgrass is listed as a vulnerable species under both the NSW *Threatened Species Conservation Act* (1995) (TSC ACT), and the Commonwealth *Environment Protection and Biodiversity Conservation Act* (1999) (EPBC Act). This means that the species is likely to become endangered if threats, such as clearing, over-grazing and competition from introduced grasses, continue.

The Hairy Jointgrass was listed as 'vulnerable' at the onset of the TSC Act. It was taken from the national listing of Rare or Threatened Australian Plants (ROTAP). The species appears to have always been sparsely distributed in north eastern NSW and south eastern Queensland. At the time of listing, the species was known from very few populations in NSW.

At present there has been no recovery plan prepared for the species, and detailed information on its distribution and significance is scarce (Di Brown, DEC – pers. com. March 2007).

The population of the species on the site is locally significant. Therefore, threats to its long term survival, such as clearing, grazing and competition from weed species are required to be minimized and managed to ensure survival of this local population.

2.5 Hairy Jointgrass Research

Research on effective management for Hairy Jointgrass has been carried out by Ecos Environmental (2004) at Koala Beach Estate in the Tweed Shire. The major findings include:

- Slashing and raking away of mulch stimulated germination of Hairy Jointgrass seedlings from the soil seedbank (as well as some exotics locally present).
- Hairy Jointgrass seed fails to germinate through thick mulch (>3cm).
- Hairy Jointgrass can compete with the much greater number of exotic grass and herb seedlings in regrowth after slashing and mulch removal.
- Translocation of Hairy Jointgrass seedlings from dense seedling groups to other parts of the reserve proved effective in increasing the spatial extent and size of the population
- Attempted selective removal of exotics (Setaria – not present at Survey St site) using herbicide (where Setaria was mixed with native grasses and sedges), caused just as much damage to native species, given the herbicide used and method of application.
- The population of annual Hairy Jointgrass plants was successfully maintained by slash-mulch removal and increased by population enhancement

This research, as well as personal communication with local ecologists, suggests that the Hairy Jointgrass is an annual grass. Therefore, areas where it occurs should be slashed/mowed in the winter months.

3. Impacts of Proposal

The Department of Planning, Ballina Shire Council and the Department of Environment and Conservation, have raised issues regarding the impact of the proposed development on the Hairy Jointgrass population identified at the site.

Direct Impacts

A targeted survey for the species was carried out by Eco Logical Australia on 22 March 2007 to confirm the occurrence and distribution of the species on site (see section 2.2.3 and Figure 4). The distribution relates to areas that have elevated soil moisture and are not out competed by exotic grasses or other weeds.

By overlaying the mapped Hairy Jointgrass distribution with the proposed residential subdivision it can be seen that approximately 0.3 ha out of 1.8 ha of the main habitat area on the site will be lost on proposed lots 23, 24 and 25 (Figure 5). The distribution of the species over this area is made up of some individual plants and very small patches. There are also some isolated patches and individual plants that will be affected over lots 27, 31 and 32. The proposed design will avoid direct impact to areas where the Hairy Jointgrass has been recorded as having a "high density".

The stormwater infrastructure has been located to avoid the known areas of Hairy Jointgrass.

In order to mitigate the impacts of the removal of some Hairy Jointgrass habitat, a conservation strategy (section 4) has been prepared with key outcomes to be provided as statement of commitments. The strategy seeks to achieve the long term security of a viable Hairy Jointgrass population on site.

Indirect Impacts

Stormwater and hydrology impacts have been clarified and addressed in a response by Patterson Britton (May 07). The proposed stormwater management measures have been further revised to minimise the impact of the proposal on the updated Hairy Jointgrass distribution. The revisions have included:

- relocation of the proposed drainage line from the existing drainage pipe draining to the western boundary of the site to avoid the Hairy Jointgrass,
- relocation of the proposed rain gardens and seepage distribution trench gravel drain further to the east to avoid the Hairy Jointgrass,
- relocation of the northern most rain garden further north to avoid the Hairy Jointgrass, and
- addition of a rain garden and gross pollutant trap to treat and detain runoff from lots 26 to 30.

These revisions will assist to maximise the retention area of the Hairy Jointgrass, as well as to maintain the same hydrological conditions over the extent of the grass (letter from Mark Tooker, Patterson Britton 25/5/07). The draft Statement of Commitments has been amended to reflect these revisions.

The relocation of the drainage line from the western boundary will not affect the hydrology for the grass in this area. Runoff from this outlet has eroded a deep channel through the site. The flow rate and steepness in this channel would mean that storm flows would not contribute significantly to shallow subsoil through-flows which the grass relies upon. The relocation of the drainage line will allow rehabilitation of the eroded channel area and provide more area for colonisation by the grass without the disturbance of the construction of the proposed drainage line. Any seepage of spring water in this area can continue after the proposed development.

A construction management plan will need to be prepared to manage the on-site impacts to the species.

Requirements under the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999

An assessment of whether the development proposal and associated management commitments is likely to have a significant impact on matters considered to be of national environmental significance (NES matters) has been undertaken as the Hairy Jointgrass is listed as 'vulnerable' under the EPBC Act. The assessment has been undertaken in accordance with the "Significance of Impact Criteria" set out by the Administrative Guidelines of the EPBC Act (Appendix 1).

The assessment has concluded that the proposed development, along with the associated package of conservation strategy and management commitments is not likely to significantly impact the vulnerable Hairy Jointgrass. Under this assessment, a referral to the Commonwealth for the proposal is not required.



4. Conservation Strategy

4.1 Objectives

The primary aim for the conservation strategy is to 'improve or maintain' biodiversity values for the site, through:

1. maintenance of existing habitat of the Hairy Jointgrass where possible;
2. establishment of a management plan to restore and enhance habitat extent and condition; and
3. demonstration of the long term security of the conserved population of Hairy Jointgrass and other biodiversity values on the site.

4.2 Context

The conservation strategy is guided by the principles identified in the draft Guidelines prepared by DEC and DPI for Threatened Species Assessment (2005) under Part 3A of the EP&A Act, as well as the required development principles contained in the Lennox Head Structure Plan and Lennox Head Community Aspirations Strategic Plan.

These principles can be summarised as:

- 'improve or maintain' biodiversity values;
- protect and enhance high biodiversity values and habitat for threatened species;
- prevent species extinction; and
- protect the long term viability of local populations of a species.

To achieve the conservation plan objectives in line with these guiding principles, specific consideration has been given to:

- the current and future **extent** of the Hairy Jointgrass;
- management and enhancement of the **condition** and providing for the **long term viability** of the population; and
- **security** of protection for the species.

An overall strategy is proposed (see below) which is based on these principles and considerations.

4.3 Extent

- The current area of Hairy Jointgrass habitat covers approximately 1.8ha of the site (figure 4)
- Approximately 83% of the current Hairy Jointgrass distribution over the site will be retained for long term conservation and enhancement through management. Areas of Hairy Jointgrass identified to be of a "high density" distribution will be retained. The majority of the Hairy Jointgrass distribution occurring on the site is to be reserved as an ecological buffer to support the species (figure 6)

- The total area of habitat identified for on going enhancement and conservation of the Hairy Jointgrass as part of the development proposal is approximately 1.5ha.

4.4 Condition and Long Term Viability

- An environmental management plan of specific actions will be developed to addresses the requirements of the Hairy Jointgrass.
- Management practices will include establishment of the reserve and a five year maintenance program to enhance the Hairy Jointgrass habitat. This will include the management of threats and competition, such as weed encroachment and grazing.
- The management plan will include criteria and targets to be met for enhancement of the Hairy Jointgrass habitat. These criteria and targets will be developed in consultation with DECC and Council.
- The proponent will be responsible for preparing the management plan and ensuring its implementation over the five year maintenance period.
- Stormwater and natural seepage will be managed on the site to promote long term viability of habitat for the Hairy Jointgrass in the conservation area. The Stormwater Concept Plan for the development has been revised by Patterson Britton to ensure this is achieved.
- In order to enhance the overall biodiversity values on the site, the management plan will include the restoration and management of associated littoral rainforest located to the south of the site.

4.5 Security

- Following successful completion of the management and maintenance program over five years, the area containing the ecological buffer can be dedicated to Ballina Shire Council to be maintained as a conservation reserve to enable the long term protection of biodiversity values. It is anticipated that by this time, the management regime will be well-established and will involve minimal Council resources (mowing and removal of mulch minimum once yearly).

4.6 Statement of Commitments

In order to facilitate the effective management and long term conservation of the local population of Hairy Jointgrass, the Flora and Fauna section of the Statement of Commitments has been updated to incorporate the objectives and management recommendations of this conservation strategy.



5. Conclusion

The proposed development, combined with the identified management strategy, should enhance the security of a long term viable population of the Hairy Jointgrass.

There will be minimal loss of Hairy Jointgrass habitat as a result of the proposed development. The proposed strategy will result in the reservation, protection and management of 1.5ha of its habitat. Active management will seek to maintain and enhance the population of the species.

In addition, the proposed strategy seeks to protect the threatened Coastal Fontainea, restore bushland areas and manage littoral rainforest to the south of the site.

6. References / Information Sources

Australian Department of Environment and Water Resources (2006) SPRAT database. [online]. Available:

http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=9338

Briggs JD & Leigh LH (1988) Rare of Threatened Australian Plants. CSIRO Publishing.

DEC & DPI (2005) Draft Guidelines for Threatened Species Assessment. July.

Earth Process Ecological Services () EIS: In relation to proposed work in a SEPP26 Littoral Rainforest and associated 100m buffer area at Lennox Head, Northern NSW; Lot 2 DP 587685, Lot 4 DP 592045 and Lot 2 DP 778022, Ballina LGA.

Ecos Environmental (2004) Population Management Plan for the Threatened Grass *Arthraxon hispidus* at Koala Beach Estate, Tweed Shire. Prepared for the Australian Koala Foundation, on behalf of the Ray Group Pty Ltd. March.

NSW DEC (2006) Atlas of NSW Wildlife database.

NSW State Government (2006) Bionet. [online]. Available:

http://www.bionet.nsw.gov.au/BioNet.cfm?is_nav6up

Peter Parker Environmental Consultants (2006) Coastal Grove Residential Development, Flora and Fauna Report. Prepared for the NSW Department of Planning on behalf of DM & RD Dossier. September.

Personal communication with the following experts regarding the known distribution and ecology of Hairy Jointgrass:

- Andy Benwell (Ecos Environmental)
- Di Brown (DEC Threatened Species Officer)
- Doug Binns (NSW Forests Senior Ecologist)
- Paul Sherringham (DEC botanist)
- Robert Kooyman (Earth Process Ecological Services)

APPENDIX 1 - Assessment Under the Environment Protection & Biodiversity Conservation Act 1999

Approval from the Commonwealth Environment Minister is required under the EPBC Act if the *action* (in this case the proposed development at 1 Survey St., Lennox Head) will, or is likely to, have a significant impact on matters considered to be of national environmental significance (NES matters).

The EPBC Act Administrative Guidelines on Significance set out 'Significant Impact Criteria' that are to be used to assist in determining whether a proposed action is likely to have a significant impact on matters of national environmental significance. The Hairy Jointgrass is listed as vulnerable under the EPBC Act.

The 'Significant Impact Criteria' provided for species listed as vulnerable under the EPBC Act are addressed for the Hairy Jointgrass individually below.

a. lead to a long-term decrease in the size of an important population of a species, or

b. reduce the area of occupancy of an important population

The proposal aims to primarily maintain the area of distribution of the local population of the Hairy Jointgrass through management and reservation, as well as provide an opportunity for the enhancement of the local population.

c. fragment an existing important population into two or more populations

The proposal aims to consolidate, secure and enhance the local distribution of the Hairy Jointgrass.

d. adversely affect habitat critical to the survival of a species

The proposal will establish a management area and environmental management plan aimed at maintaining and enhancing existing habitat for the Hairy Jointgrass to ensure survival of the local population of the species.

e. disrupt the breeding cycle of an important population,

The proposal will implement active management over the identified management area, such as mowing slashing in winter and removal of mulch, to promote the breeding cycle of the Hairy Jointgrass.

f. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The aims of the environmental management plan to be developed as part of the proposal is to improve or maintain the habitat for the Hairy Jointgrass on the site, resulting in an enhancement in the longer term viability and security for the species.

g. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

An environmental management plan will include active management, including removal and management of competitive invasive species (weeds) to promote and enhance the habitat for the Hairy Jointgrass.

h. interferes substantially with the recovery of the species

The proposal will not interfere with the recovery of the species, but will prepare and implement an environmental management plan specifically to promote and enhance the habitat and distribution of the local population of the Hairy Jointgrass.

Conclusion

On review and response to the 'Significant Impact Criteria', it is considered that the proposed development at 1 Survey St., Lennox Head is not likely to significantly impact the vulnerable Hairy Jointgrass. Therefore, under this assessment referral to the Commonwealth for the proposal is not required.

ATTACHMENT 4

Updated Bushfire Advice

24 May 2007

Sake Development
Attn: Sarah Kelly
Suite 11, 340 Darling Road
Balmain NSW 2041

Re: Lennox Head

Dear Sarah

I have reviewed the updated plan for Lennox Head relative to bushfire matters. I understand that the updated layout is as a consequence of an area of Hairy Joint Grass, a threatened plant species, being found towards the southern portion of the site. The updated layout has impacted upon lots 28-33 by deletion/modifying the lots and deleting the road.

In relation to the implications that the updated layout has on any Asset Protection Zone requirements. The only change from the original plan and Bushfire Assessment Report is that those lots that directly adjoin the area of Hairy Joint Grass should be separated from the grass area by a non-combustible fence, the height of which should be a minimum of twice the height of the Hairy Joint Grass to a maximum of 1.8 metres.

With the deletion of the road there is now no loop road to provide alternate access and egress for some residents and in particular fire fighters in the event of a bushfire. It is not recommended that vehicular access pass through areas of threatened species, however access for fire fighters is required.

Access for fire fighters is required for fire control lines and for Asset Protection Zone maintenance. Planning for Bushfire Protection 2006 states:

A fire trail is not a substitute for a perimeter road and any proposals will need to demonstrate clear benefits over the use of a perimeter road. Fire trails are expensive to maintain and can only be effective in the context of a strategic advantage and access for hazard reduction operations.

For the subject layout the section of road that has been deleted is that portion of road that would have passed directly through the area of threatened grass.

The road that serves the centre of the development is not impacted on by a bushfire hazard and residents could easily egress the area away from any bushfire hazard to the South. This egress is also into an existing residential area and way from any bushfire risk.

The road that is along the eastern boundary of the site terminates in a cul-de-sac where it adjoins the threatened grass area. Due to the nature of the vegetation in this area it is not considered appropriate for there to be vehicular access through this area. From a fire fighting aspect access for firefighters is important, this access should include a reasonable distance from roads and hydrants.

With the provision of hydrants in the roadways that service the site in particular in the cul-de-sac areas, pedestrian access should be provided from each cul-de-sac linking both cul-de-sacs. The inclusion of the footpath may be appropriate for inclusion in the access provisions.

Due to the nature of the vegetation and in particular the area of threatened species the specific layout of any access for firefighters cannot be determined until such time as the landscape plan has been agreed with Council.

To resolve the provision of access a recommended Condition of Consent could be that, pedestrian access be provided to the southern vegetated portion of the site such access to be determined in consultation with Council as part of the landscape plan for the overall site.

An additional condition of Consent should be that those lots that directly adjoin the area of Hairy Joint Grass to be separated from the Hairy Joint Grass area by non-combustible fence of twice the height of the Hairy Joint Grass to a maximum of 1.8 metres in height.

If you have any questions or further information do not hesitate to contact me.

Yours truly,

Barry Eadie

ATTACHMENT 5

Traffic and Access Advice



12 June 2007
Ref 05167

Ms Sarah Kelly
SAKE Development Pty Ltd
Suite 11, 340 Darling Street
BALMAIN 2041

(E-mail: sarah_kelly@optusnet.com.au)

Dear Sarah

Proposed Lennox Head Subdivision

I refer to your advice that the Department has raised some concerns in relation to the revised subdivision arrangement due to the adoption of cul-de-sacs to overcome the other issues which have arisen.

The considerations in relation to subdivision road patterns are dealt with in the following appropriate documents:

- * Northern Rivers – Local Government Road Design (Urban and Rural) 2003
- * Guide to Traffic Generating Development RTA 2002
- * AMCORD

Connectivity is addressed in these documents, however:

- * the emphasis is on pedestrian connectivity (rather than motor vehicle), and unnecessary distance travelled and access to schools etc
- * connectivity relates to a much broader context than the subject circumstance.

It is quite clear from my reading of these documents (extracts attached) that there is no intent to 'outlaw' cul-de-sacs. What the connectivity issue refers to are widespread 'mazes' with constrained access connections. This is clearly not the case in point

Transportation, Traffic and Design Consultants

Transport and Traffic Planning Associates

where there will be good pedestrian/cyclist connectivity and the cul-de-sacs are only quite short.

There are in fact distinct advantages in the provision for some cul-de-sacs as this ensures that vehicle speeds are constrained without the need for the dreaded LATM devices.

My view is that, yes there is a case for connectivity considerations, however this is largely related to collector road connections in large estates. I don't believe that connectivity relates to the very small subject subdivisions which do not involve access to schools, shops, playing area and the like.

Yours faithfully

A handwritten signature in black ink, appearing to be 'RN' with a stylized flourish at the end.

Ross Nettle
Director
Transport and Traffic Planning Associates

2. The scope and sequence of drawing sheets shall comply with the example provided in Annexure DQS-B of the Specification for QUALITY ASSURANCE REQUIREMENTS FOR DESIGN.

Compliance

(d) Certification

1. Drawings shall bear the signature of the design consultant and shall where required by the Council be certified as complying with the appropriate design specifications (D1 to D12). The certificate shall be in the format detailed in Annexure DQS-A of the Specification for QUALITY ASSURANCE REQUIREMENTS FOR DESIGN.

Design Consultant

(e) Certification

1. All design drawings shall reflect the road chainages used by Council on designs for existing roads.

Council Road Chainages

URBAN DESIGN CRITERIA

D1.07 ROAD HIERARCHY

1. A hierarchical road network is essential to maximise road safety, residential amenity and legibility. Each class of road in the network serves a distinct set of functions and is designed accordingly. The design should convey to motorists the predominant function of the road. A typical hierarchy is shown on Figure D1.1.

Functionality

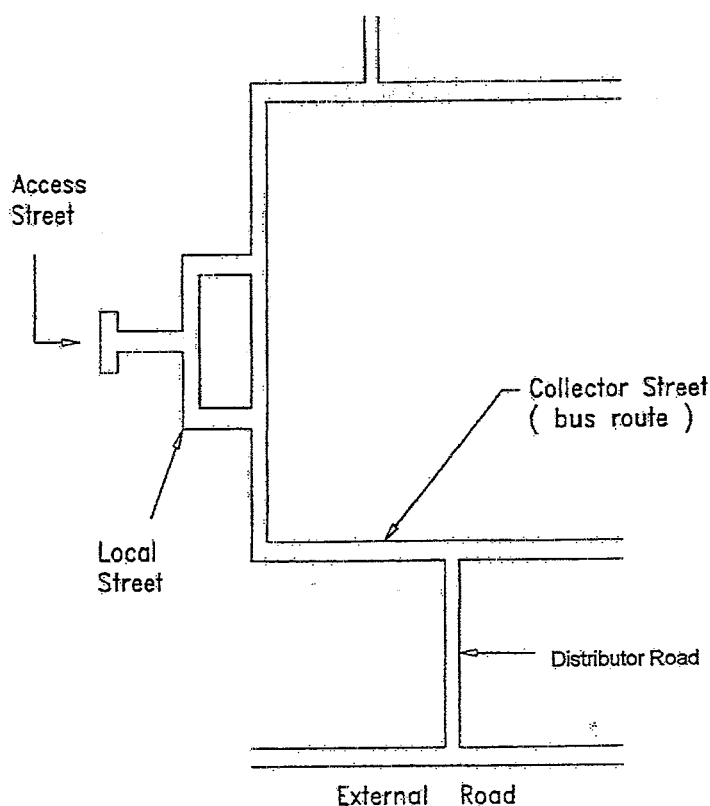


Figure D1.1 - Typical Road Hierarchy

2. Four distinct levels of roads are:

- Access Street
- Local Street
- Collector Street
- Distributor Road.

3. The lowest order road (access street) having as its primary function, residential space - amenity features which facilitate pedestrian and cycle movements, and where vehicular traffic is subservient in terms of speed and volume, to those elements of space, amenity, pedestrians and cyclists. The features of a typical access street are shown in Figure D1.2.

Access Street

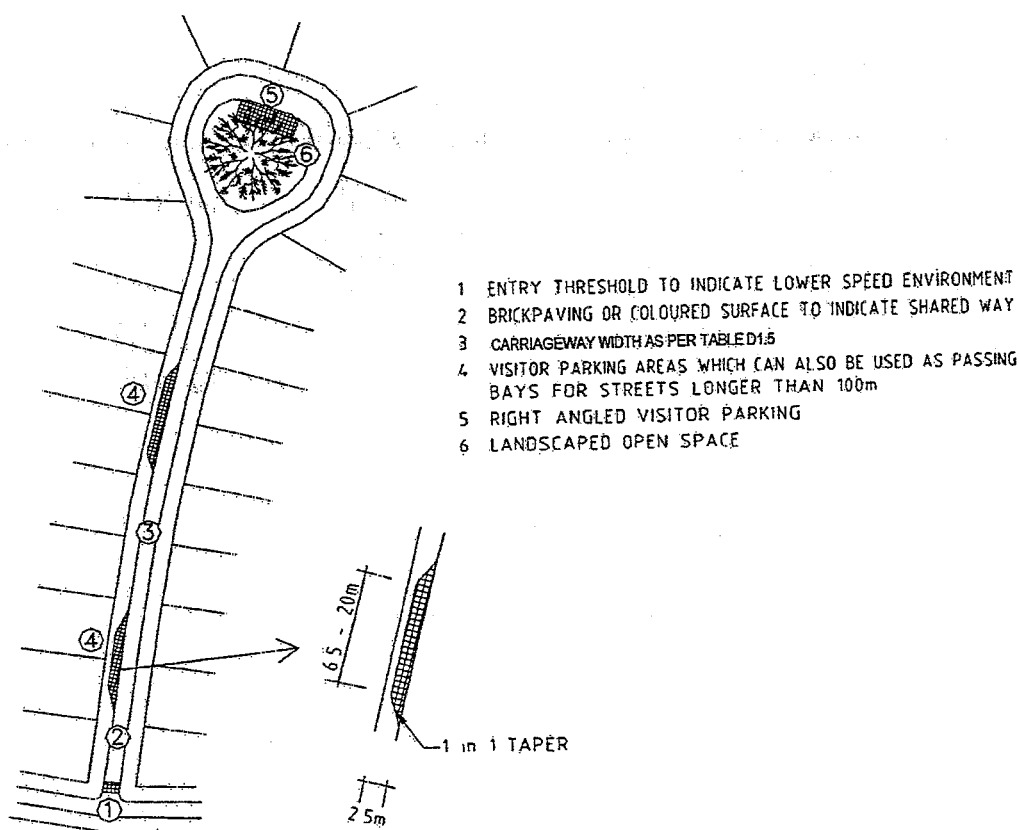
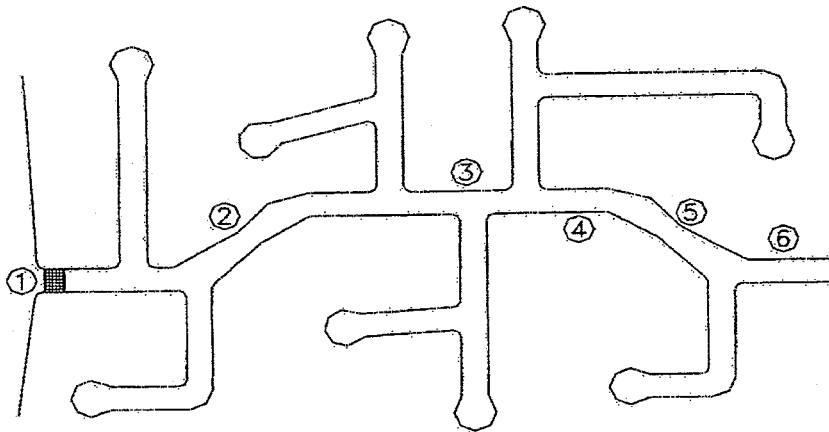


Figure D1.2 - Access Street

4. The next level road (local street) as a local residential street should provide a balance between the status of that street in terms of its access and residential amenity functions. Resident safety and amenity are dominant but to a lesser degree than access streets. A typical local street is illustrated in Figure D1.3.

Local Street



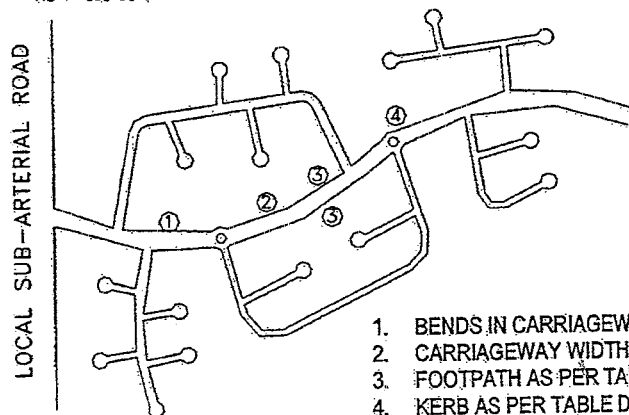
- 1 ENTRY THRESHOLD SIGNIFIES ENTRY TO LOWER SPEED ENVIRONMENT
- 2 BENDS IN CARRIAGEWAY CONTROL SPEED
- 3 SHORT SECTIONS OF STRAIGHT CARRIAGEWAY CONTROL SPEED
- 4 CARRIAGEWAY WIDTH AS PER TABLE D1.5
- 5 FOOTPATH ON ONE SIDE AS PER TABLE D1.5
- 6 KERB AS PER TABLE D1.5

Figure D1.3 - Local Street

5. The second highest order road (collector street) has a residential function but also carries higher volumes of traffic collected from lower order streets. A reasonable level of residential amenity and safety is maintained by restricting traffic volumes and speeds, however, amenity and resident safety do not have the same priority as access or local streets. A typical collector street is shown in Figure D1.4.

Collector Street

- * MAXIMUM VOLUME 3000 VPD
- * MAXIMUM SPEED 50 km/h
- * CARRIAGEWAY SHARED BY VEHICLES AND CYCLISTS
- * AS A CUL-DE-SAC ARRANGEMENT SERVES APPROXIMATELY 16 Ha



1. BENDS IN CARRIAGEWAY CONTROL SPEED
2. CARRIAGEWAY WIDTH AS TABLE D1.5
3. FOOTPATH AS PER TABLE D1.5
4. KERB AS PER TABLE D1.5

Figure D1.4 - Collector Street

6. The highest order road (Distributor road) within a residential development should have as its main function the convenient and safe distribution of traffic generated by the development. Direct access should not be provided for single dwelling allotments but access can be provided to multi-unit developments and non-residential land uses. The Distributor should serve only the development and should not attract through traffic. Figure D1.5 shows the layout of a Distributor road.

**Distributor
Road**

APPROPRIATE NETWORK DESIGN AND NUMBER OF ACCESS POINTS CAN LIMIT DISTRIBUTOR TO SHORT LENGTHS

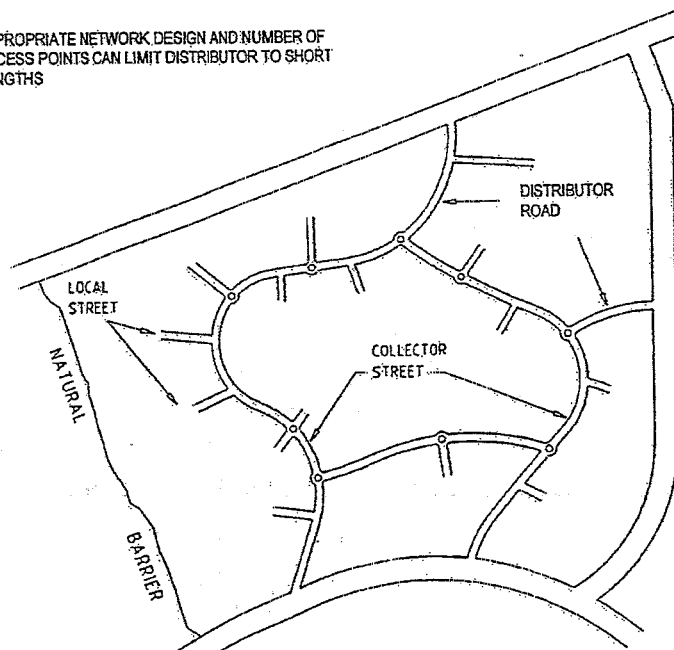


Figure D1.5 - Distributor Road

D1.08 ROAD NETWORK

1. The design features of each type of road convey to the driver its primary functions and encourage appropriate driver behaviour (refer Figure D1.2 to D1.5).
2. Traffic volumes and speeds on any road should be compatible with the residential functions of that road.
3. The maximum length of an access street should ensure its status as a residential place is retained, where the traffic, in terms of speed and volume will enable the integration of pedestrian, bicycle and vehicular movements. This length will also ensure that residential convenience is not unduly impaired as a result of speed restraints.
4. The length of Distributor within a development should be minimised.
5. The time required for drivers to travel on all streets within the development should be minimised.
6. Where access streets form part of a pedestrian or bicycle network, access links should provide suitable connectivity with adjoining access streets or open space systems so as to ensure such pedestrian and bicycle network are functionally efficient.
7. The road network should ensure that no road links with another road which is more than two levels higher or lower in the hierarchy. In exceptional circumstances roads

Compatibility

Access Street

Distributor

Travel Time

**Pedestrian or
Bicycle
Network**

Road Links

These themes tend to use connectivity as the main attribute. They have also included the layout of streets, in particular proposals for orthogonal grid road networks (NTD). More recently the TOD has been more firmly defined as having good access to public transport foci, whereas the TND is more concerned with mixed land uses and the consequent benefits. This is highlighted by proposals for urban villages and the belief that intense urban consolidation can reduce travel demand while increasing the rate of participation in social activities.

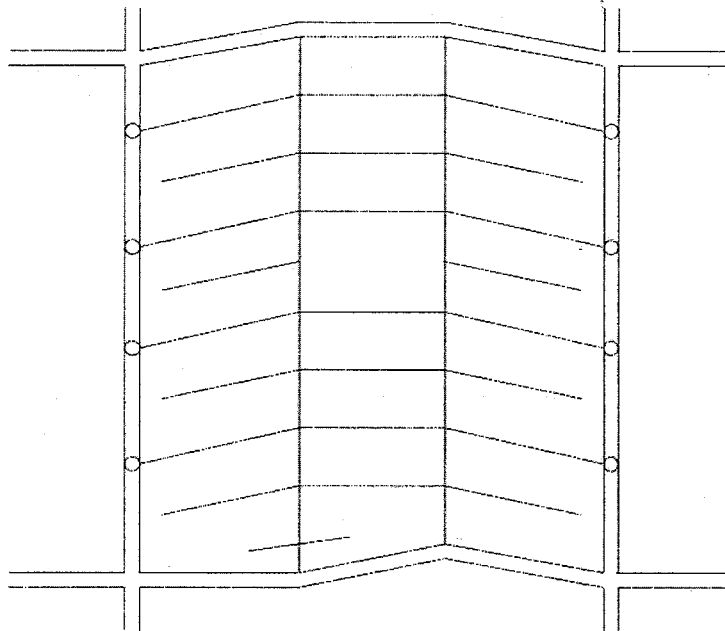


Figure 7.3 Road connectivity.

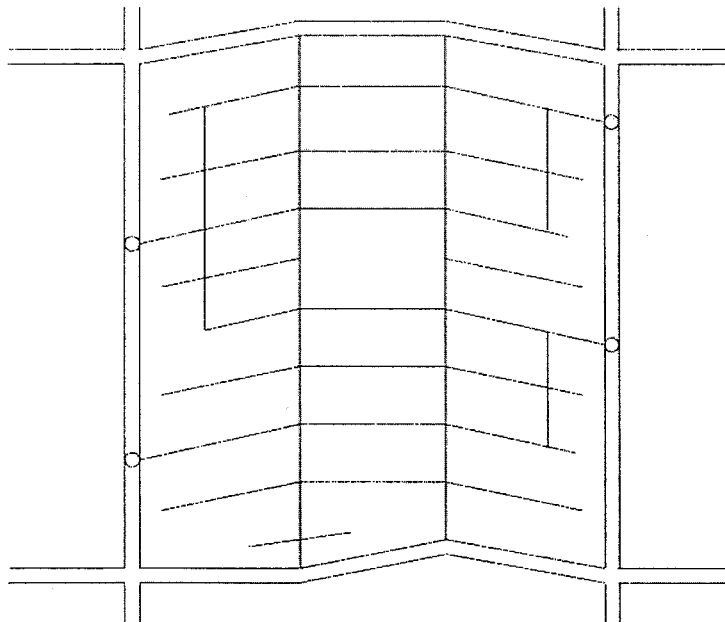


Figure 7.4 Alternative design with fewer connecting roads.

Figure 3 Neighbourhood-related control elements

- B1 Lot Size and Orientation;
- B6 Transport Networks;
- B9 Pedestrian/Cyclist Facilities;
- B10 Utilities Provision & Location;
- B11 Public Open Space;
- B12 Drainage Network.

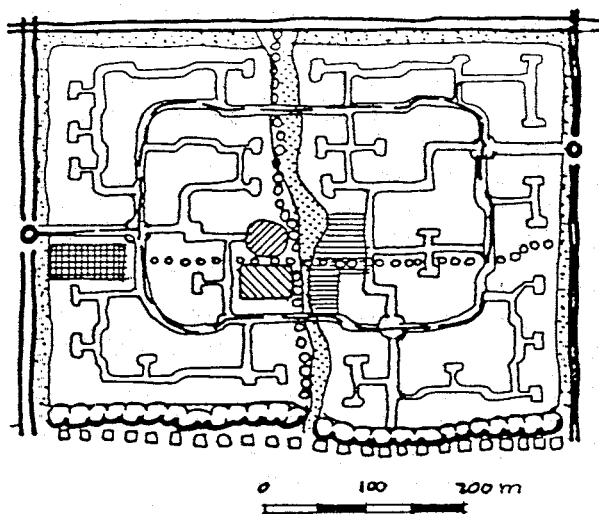
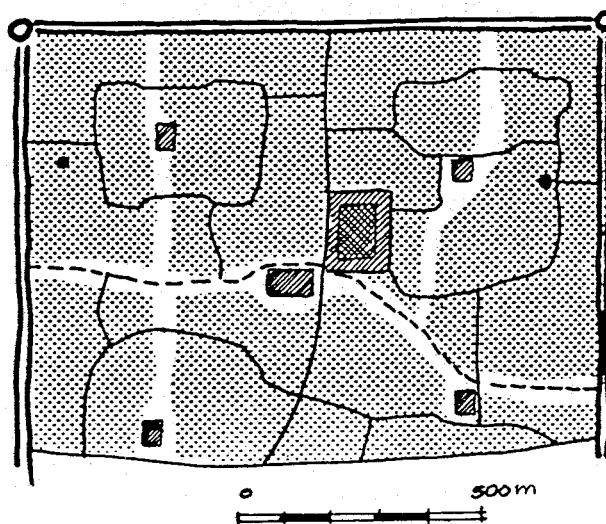


Figure 4 District-related control elements

- B6 Transport Networks;
- B9 Pedestrian/Cyclist Facilities;
- B10 Utilities Provision & Location;
- B11 Public Open Space;
- B12 Drainage Network.



In the case of a single site, only a limited number of control elements apply. The primary concern of single allotment development is the adequacy of the site for the development proposed, and its relationship with adjoining developments. For subdivision and development of larger areas, other control elements are required.

It should be noted that the figures 1, 2, 3 and 4 do not necessarily represent the kind of details required for the submission of a plan, but simply typical aspects which are relevant at the area level.

A7. PLANNING CONTEXT

Town planning schemes or the like prescribe the use to which land can be put and the conditions under which such use is permitted. A residential development code, based on the Model Code, would be the means used to assess a residential development proposal, and would become an extension of the planning scheme.