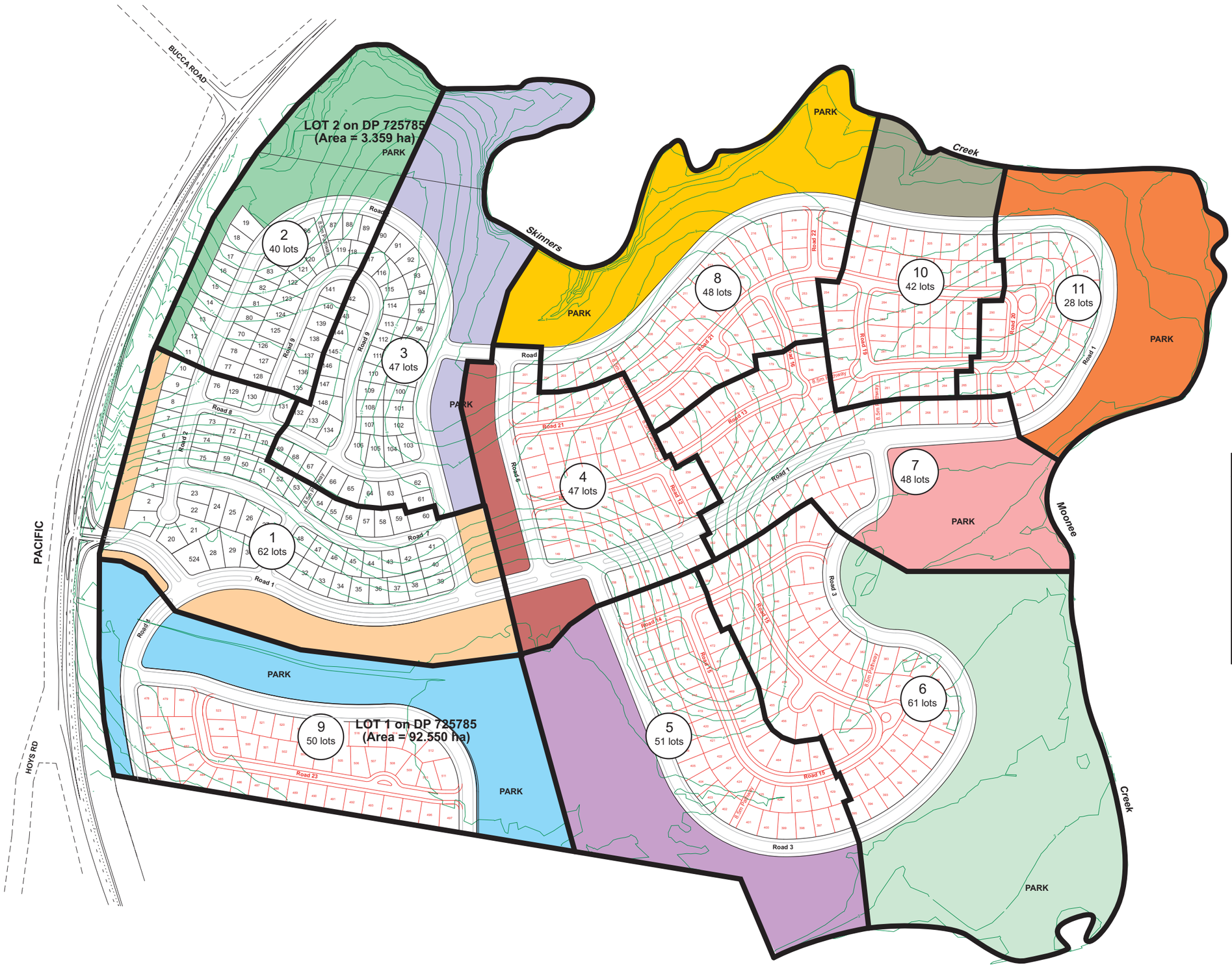
ANNEXURES

ANNEX A

Open Space Dedication Staging Plan



CONSTRUCTION

Stage	No of Lots
1	62
2	40
3	47
4	47
5	51
6	61
7	48
8	48
9	50
10	42
11	28
TOTAL	**524**

Legend

- Construction Stage

Open Space Areas to be Dedicated

- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Stage 5
- Stage 6
- Stage 7
- Stage 8
- Stage 9
- Stage 10
- Stage 11

Source: AUSPACIFIC Engineers Pty Ltd 04-1600 November 2006

ERM

0 100m

Approximate Only

Annex A

Staging of Open Space Dedication to Council

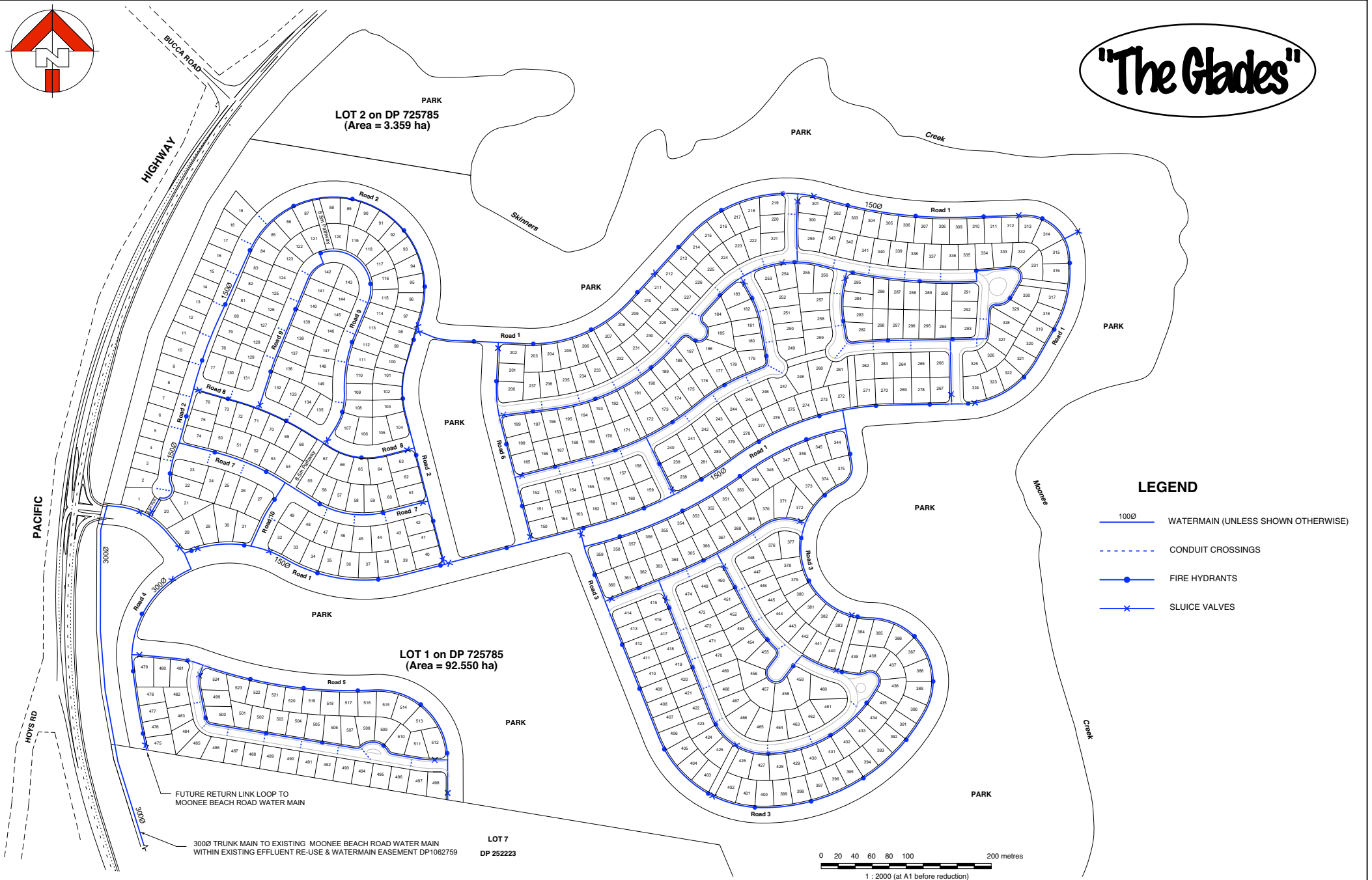
The Glades Estate, Coffs Harbour- Preferred Project Report

ANNEX B

Water and Sewerage Reticulation Concept Plans and Correspondence

ANNEX B1

Water Strategy



amdt no.	date	amendment
C	APRIL 08	ENTRY AMENDED & WATER NOTES ADDED

WATER RETICULATION CONCEPT PLAN

AUSPACIFIC ENGINEERS
ENGINEERS

AUSPACIFIC ENGINEERS PTY LTD
development consultants, civil, structural and hydraulic engineers

3 / 20 Nerang Street
NERANG QLD 4211

T 07 5596 5377
F 07 5596 3443

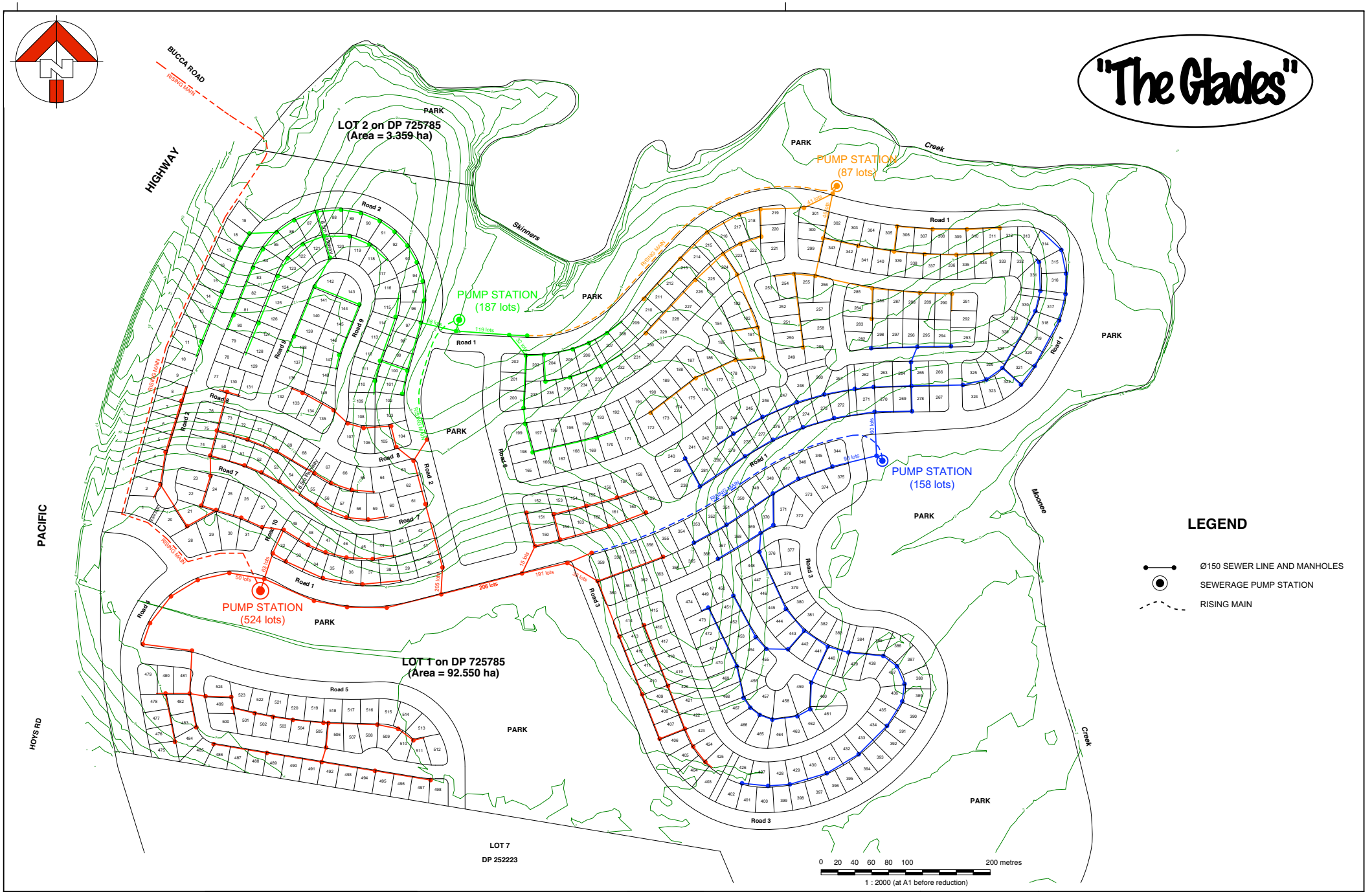
E auspacifik@austarnet.com.au

scales	AS SHOWN
design	RKH
drawn	JM
date	NOV 2006
signed	
client	THE ROTHWELL BOYS PTY LTD
project	PROPOSED RESIDENTIAL SUBDIVISION MOONEE BEACH COFFS HARBOUR
dwg no.	P9
amendment	A

04-1600

ANNEX B 2

Sewer Strategy



A	APRIL 08	LAYOUT AMENDED
amdt no.	date	amendment

DISCLAIMER: This is a preliminary concept plan prepared by Auspacific Engineers Pty Ltd ("the consultant")
The concept plan has been prepared by the Consultant for the benefit of the entity to which it is address ("the Client") and is in response to certain instructions and requests given by the Client. The concept plan therefore may only be relied upon by the Client for the purpose for which it has been prepared and for no other purpose.
The concept plan does not represent the Consultant's professional advice, but is merely an overview of potential development outcome and as stated is "preliminary" in nature.
No third party is entitled to rely upon the information contained in the preliminary report and any definitive advice as to budgets, yields, etc., should be sought directly from the consultant.

CONVENTIONAL SEWERAGE RETICULATION CONCEPT PLAN

AUSPACIFIC ENGINEERS

AUSPACIFIC ENGINEERS PTY LTD
development consultants, civil, structural and hydraulic engineers
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NERANG QLD 4211
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E auspacifik@austarnet.com.au

scales	AS SHOWN		
design	RKH	drawn	JM
date	NOV 2006	signed	

client: THE ROTHWELL BOYS PTY LTD

project: PROPOSED RESIDENTIAL SUBDIVISION MOONEE BEACH COFFS HARBOUR

dwg no.	amendment
P7	A

04-1600

ANNEX B 3

Advice from Coffs Harbour City Council

Steve Oconnor

From: Matt Cooper [matt@resdesman.com.au]
Sent: Thursday, 17 July 2008 12:46 PM
To: Steve Oconnor
Cc: dholt@winten.com.au; bill sarkis; Rod Holmes; Carolyn Maginnity
Subject: FW: Water Servicing Option - The Glades Estate, Moonee Beach

Steve,

Re water servicing issue raised by Mark Hannon in our most recent meeting with CHCC.

Please find below Council's comments.

Regards,

Matt Cooper

From: Greg Powter [mailto:greg.powter@chcc.nsw.gov.au]
Sent: Thursday, 17 July 2008 12:36 PM
To: Matt Cooper
Cc: Simon Thorn; Glenn O'Grady
Subject: RE: Water Servicing Option - The Glades Estate, Moonee Beach

Matt,
i confirm that Council would give in principle agreement to use of the easement on the eastern side of the hwy.
this would be subject to design and could not compromise councils future use of the easement for trunk mains to service our reservoirs to the north.
in this respect, the main would be a temporary service main with the permanent main still being required in the collector road reservation as per our strategy.
thus the temporary water main would need to be fully funded by the developer on top of contributions for the permanent main.
additionally, the easement is in councils favour only so the legal implications of how the main is constructed would need to be investigated and the arrangements sorted out.

the main on the western side of the hwy is a trunk main feeding councils reservoirs to the north only and constant reticulation supply can not be provided.
access would only be to a reservoir on your clients property. i believe this is not feasible due to the cost and the lack of elevated land to provide reticulation pressures. storage and supply requirements in this regard have been previously advised.

regards
Greg Powter
ph: 66484420
fax: 66484477
greg.powter@chcc.nsw.gov.au

From: Matt Cooper [mailto:matt@resdesman.com.au]
Sent: Tuesday, 15 July 2008 9:29 AM
To: Greg Powter
Subject: FW: Water Servicing Option - The Glades Estate, Moonee Beach

Greg,

ANNEX C

Project Plan

BUCCA ROAD

HIGHWAY

PACIFIC

HOYS RD

LOT 2 on DP 725785
(Area = 3.359 ha)

LOT 1 on DP 725785
(Area = 92.550 ha)

LOT 7
DP 252223

Skinners Creek

Moonee Creek

PARK

Road 1
Road 2
Road 3
Road 5
Road 6
Road 7
Road 8
Road 9
Road 10

1
2
3
4
5
6
7
8
9
10
11

Legend

- Project Application Area
- 524 — Lot Number
- 620sq m — Lot Area
- 20.0 — Lot Length
- Construction Stages

Stage	No of Lots
1	62
2	40
3	47
4	47
5	51
6	61
7	48
8	48
9	50
10	42
11	28
TOTAL	**524**

Source: AUSPACIFIC Engineers Pty Ltd P1 04 - 1600 Amended May 2008

ERM

0 100m
Approximate Only

Annex C **Project Plan**

The Glades Estate, Coffs Harbour- Preferred Project Report

ANNEX D

Supplementary Hydraulic Assessment

Our Ref LJ8596_2/Lt1 :JMcA/kb

Contact John McArthur

Cardno LawsonTreloar

Shaping the Future

11 March 2008

Auspacific Engineers Pty Ltd
3/20 Nerang Street
NERANG QLD 4211

Attention: Mr Rod Holmes

Dear Rod,

RE: GLADES ESTATE - MOONEE BEACH
REVISED HYDRAULIC ASSESSMENT - SEA LEVEL RISE

1.0 Introduction

Cardno Lawson Treloar (CLT) has previously undertaken an hydraulic assessment of a residential development proposal located on Lots 1 and 2 DP725785 within the Coffs Harbour Local Government Area. (Refer LJ8596_02/R2 dated April 2007)

The hydraulic modelling associated with this assessment included the following scenarios:

- 1% AEP flood event with a normal tide (0.6mAHD)
- 5% AEP flood event with a 5% AEP tide (2.3mAHD)
- 20% AEP flood event with a 1% AEP tide (2.6mAHD)

The report also indicated that these ocean water levels could rise by up to 0.25 metres by 2040 due to climate change.

The Department of Planning (DOP), in a response dated 29/1/08, has requested that a conservative approach be undertaken when addressing climate change and associated sea level rise, and in particular a 100 year timeframe be considered.

2.0 Approach

CLT has reviewed recent information provided by the Intergovernmental Panel on Climate Change (IPCC) which indicates a global sea level rise of 180 – 590mm by 2100. For the east coast of Australia an additional rise of around 100mm is anticipated.

To ensure a conservative approach, the 1% AEP flood events set up previously have been re-run in the MIKE11 model with the previous 1% AEP ocean water level plus 0.69 metres (i.e. an ocean water level of 3.29mAHD).

Results are presented below.

3.0 Hydraulic Modelling Results

A comparison of 1% AEP flood levels (i.e. previous tailwaters vs revised tailwater) adjacent to the site is presented in Table 1 below. Full results are attached. Figures 1 and 2 show the MIKE11 cross-section locations.

Cardno Lawson Treloar Pty Ltd
ABN 55 001 882 873

Ground Floor, 9 Gardner Close
Milton Qld 4064
PO Box 388
Toowong Qld 4066
Australia
Telephone: 07 3310 2455
Facsimile: 07 3369 9722
International: +61 7 3310 2455
Email: cltqld@cardno.com.au
Web: www.cardno.com.au

Cardno Offices
Brisbane
Sydney
Canberra
Melbourne
Perth
Darwin

Cairns
Townsville
Mackay
Rockhampton
Hervey Bay
Sunshine Coast
Toowoomba
Gold Coast
Gosford
Baulkham Hills
Wollongong
Busselton

Papua New Guinea
Indonesia
Vietnam
China
Kenya
United Arab Emirates
United Kingdom
United States

Table 1 – 1% AEP Flood Level Comparison
Previous TW vs TW = 3.29mAHD

Branch	Chainage	1% AEP Flood Level (mAHD)	
		Previous	TW = 3.29mAHD
Bucca	1520	2.594	3.344
Bucca	1100	3.339	3.364
Bucca	760	4.061	4.009
Bucca	720	4.341	4.239
Moonee	6420	2.940	3.426
Moonee	6050	2.764	3.393
Skinners	2900	3.081	3.456
Skinners	2200	3.197	3.487
Skinners	1460	4.025	3.740

As indicated above, the higher ocean sea level impacts on peak 1% AEP flood levels only in the southern extent of the development. However minimum fill levels have been set at RL 4.75mAHD, providing a freeboard in excess of 1.0 metre. Even at the upstream development extents, freeboard in excess of 700mm is maintained under the conservative 2100 ocean water level scenario.

4.0 Conclusions

A conservative modelling approach has been undertaken combining a 1% AEP flood event with a 1% AEP ocean water level. This 1% AEP ocean water level incorporates a 2100 sea level rise of 0.69 metres.

The modelling indicates the development is not significantly impacted by this sea level rise due to its location in relation to the coast. In addition the proposed minimum fill level of RL 4.75mAHD provides freeboard in excess of 700mm in this revised 1% AEP storm event.

Figure 3 attached shows the 1% AEP flood extents in the developed situation as requested by DOP.

Please contact the undersigned should you require any further information.

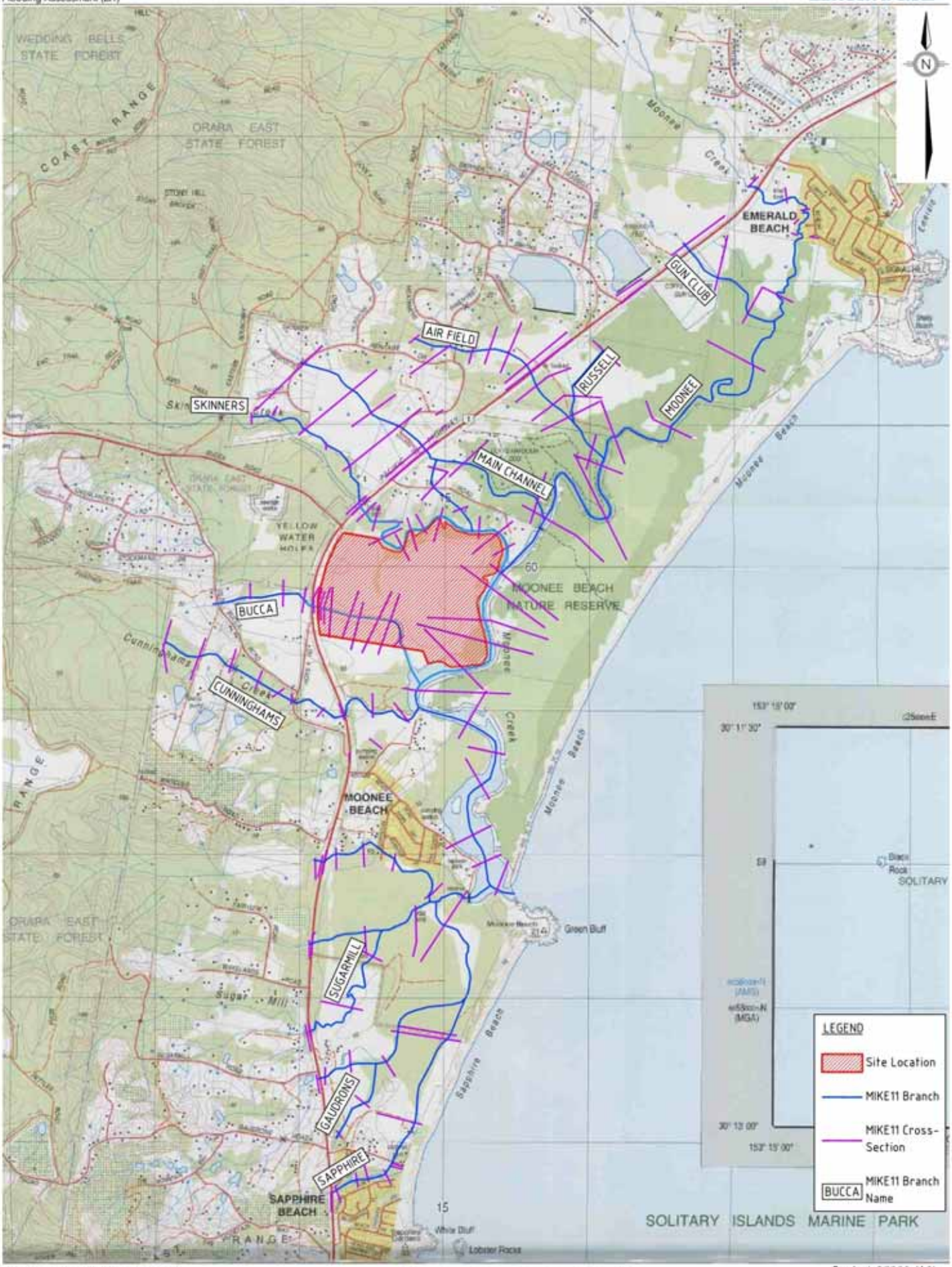
Yours sincerely

John McArthur
Principal
for **Cardno Lawson Treloar**

Enc: MIKE11 Flood Level Results
Figures 1, 2 and 3

Peak Flood Levels (mAHD)				
Branch	Chainage	1% AEP Flood (Low TW)		
		Developed Case Current Tailwater	Developed Case Proposed Tailwater	Difference (m)
MOONEE	0	10.418	10.167	-0.251
MOONEE	20	10.434	10.177	-0.257
MOONEE	70	10.055	9.983	-0.072
MOONEE	300	8.907	8.864	-0.043
MOONEE	330	8.786	8.733	-0.053
MOONEE	570	7.985	7.889	-0.096
MOONEE	680	7.756	7.666	-0.090
MOONEE	850	7.235	7.094	-0.141
MOONEE	1050	6.960	6.522	-0.438
MOONEE	1420	5.856	5.139	-0.717
MOONEE	1750	5.687	4.873	-0.814
MOONEE	2480	4.573	3.984	-0.589
MOONEE	3025	4.095	3.738	-0.357
MOONEE	3570	3.865	3.645	-0.220
MOONEE	4050	3.588	3.541	-0.047
MOONEE	4250	3.256	3.484	0.228
MOONEE	4350	3.222	3.479	0.257
MOONEE	4700	3.168	3.470	0.302
MOONEE	5550	3.104	3.459	0.355
MOONEE	5600	3.101	3.459	0.358
MOONEE	5950	3.078	3.454	0.376
MOONEE	6050	3.052	3.448	0.396
MOONEE	6180	3.048	3.448	0.400
MOONEE	6420	2.940	3.426	0.486
MOONEE	6580	2.764	3.393	0.629
MOONEE	6900	2.598	3.372	0.774
MOONEE	7200	2.174	3.339	1.165
MOONEE	7280	2.152	3.338	1.186
MOONEE	7400	2.124	3.336	1.212
MOONEE	7800	2.012	3.327	1.315
MOONEE	8150	1.776	3.315	1.539
MOONEE	8420	1.619	3.310	1.691
MOONEE	8760	1.430	3.304	1.874
MOONEE	8960	1.231	3.299	2.068
MOONEE	9200	0.992	3.294	2.302
MOONEE	9400	0.600	3.290	2.690
LINE-B	0	6.478	6.276	-0.202
LINE-B	90	6.409	6.235	-0.174
LINE-B	110	6.259	5.860	-0.399
LINE-B	170	6.258	5.849	-0.409
LINE-B	200	5.965	5.695	-0.270
LINE-B	380	5.881	5.367	-0.514
TIKI	300	5.881	5.367	-0.514
TIKI	350	5.022	4.938	-0.084
TIKI	550	4.850	4.663	-0.187
TIKI	650	4.560	4.450	-0.110
TIKI	850	3.148	3.475	0.327
TIKI	1000	3.135	3.473	0.338
SKINNERS	0	12.851	12.231	-0.620
SKINNERS	180	11.336	10.775	-0.561
SKINNERS	450	8.828	8.544	-0.284
SKINNERS	600	7.739	7.582	-0.157
SKINNERS	950	5.820	5.690	-0.130
SKINNERS	1270	4.709	4.131	-0.578
SKINNERS	1300	4.519	4.026	-0.493
SKINNERS	1360	4.443	3.974	-0.469
SKINNERS	1460	4.025	3.740	-0.285
SKINNERS	1600	3.720	3.639	-0.081
SKINNERS	1820	3.537	3.574	0.037
SKINNERS	1980	3.280	3.504	0.224
SKINNERS	2140	3.221	3.492	0.271
SKINNERS	2200	3.197	3.487	0.290
SKINNERS	2380	3.163	3.480	0.317
SKINNERS	2500	3.135	3.473	0.338
SKINNERS	2650	3.094	3.460	0.366
SKINNERS	2820	3.084	3.457	0.373
SKINNERS	2900	3.081	3.456	0.375
SKINNERS	3000	3.078	3.454	0.376
BUCCA	0	7.084	6.968	-0.116
BUCCA	300	6.812	6.752	-0.060
BUCCA	500	5.067	4.744	-0.323
BUCCA	680	5.063	4.694	-0.369
BUCCA	720	4.341	4.239	-0.102
BUCCA	760	4.061	4.009	-0.052
BUCCA	800	3.982	3.838	-0.144
BUCCA	810	3.979	3.823	-0.156
BUCCA	840	3.965	3.774	-0.191
BUCCA	866	3.806	3.736	-0.070
BUCCA	900	3.765	3.698	-0.067
BUCCA	1030	3.512	3.423	-0.089
BUCCA	1100	3.339	3.364	0.025
BUCCA	1270	3.033	3.346	0.313
BUCCA	1350	2.869	3.345	0.476
BUCCA	1520	2.594	3.344	0.750
BUCCA	1800	2.174	3.339	1.165

Cardno Lawson Treloar



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1:25,000

Scale 1:25000 (A3)

FIGURE 1

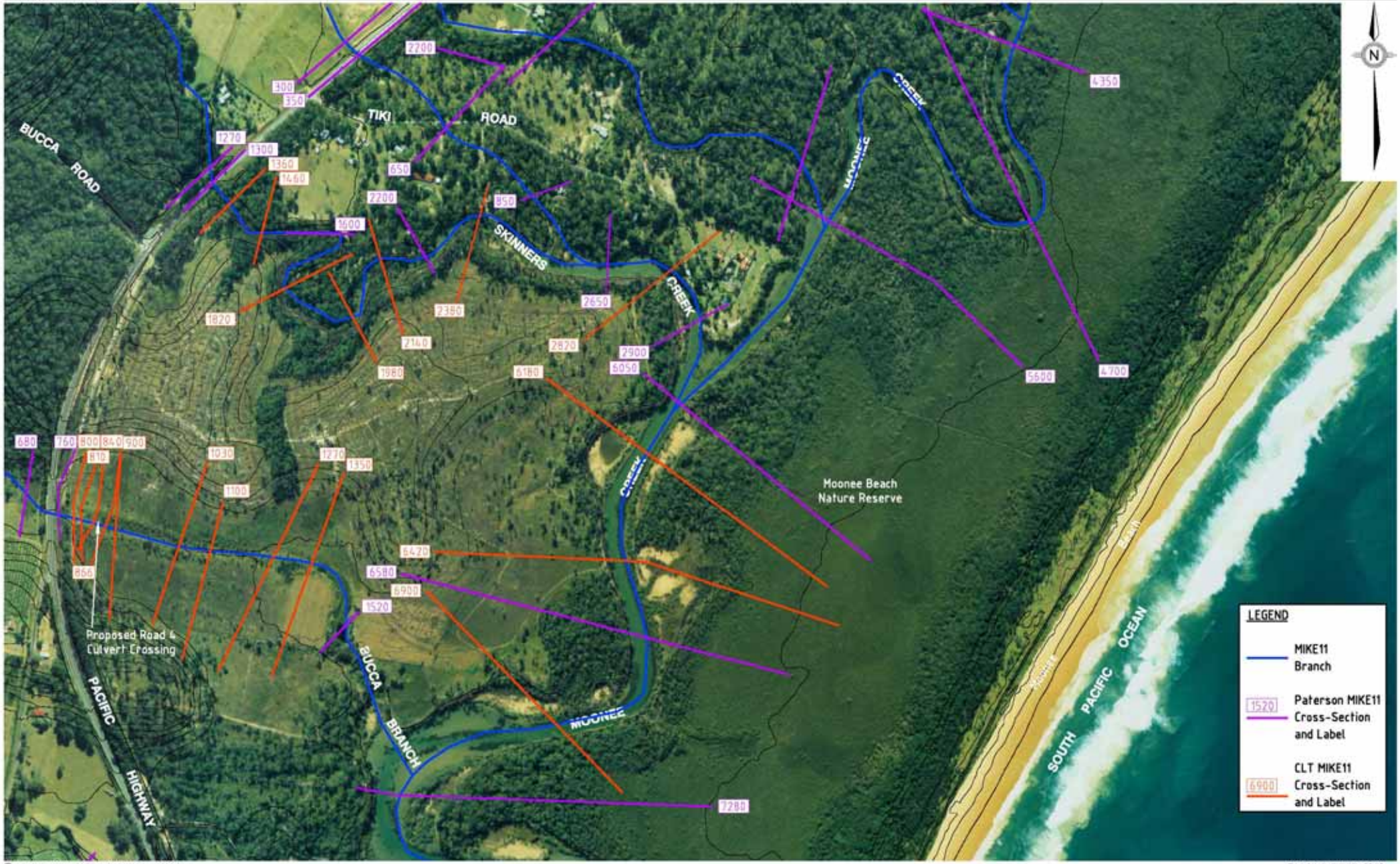
SITE LOCATION AND MIKE11 MODEL LAYOUT

Rev: 0 Date: March 2008

Project No.: LJ8596/002

Auspacific Engineers

Cardno Lawson Treloar



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Scale 1:7500 (A3)

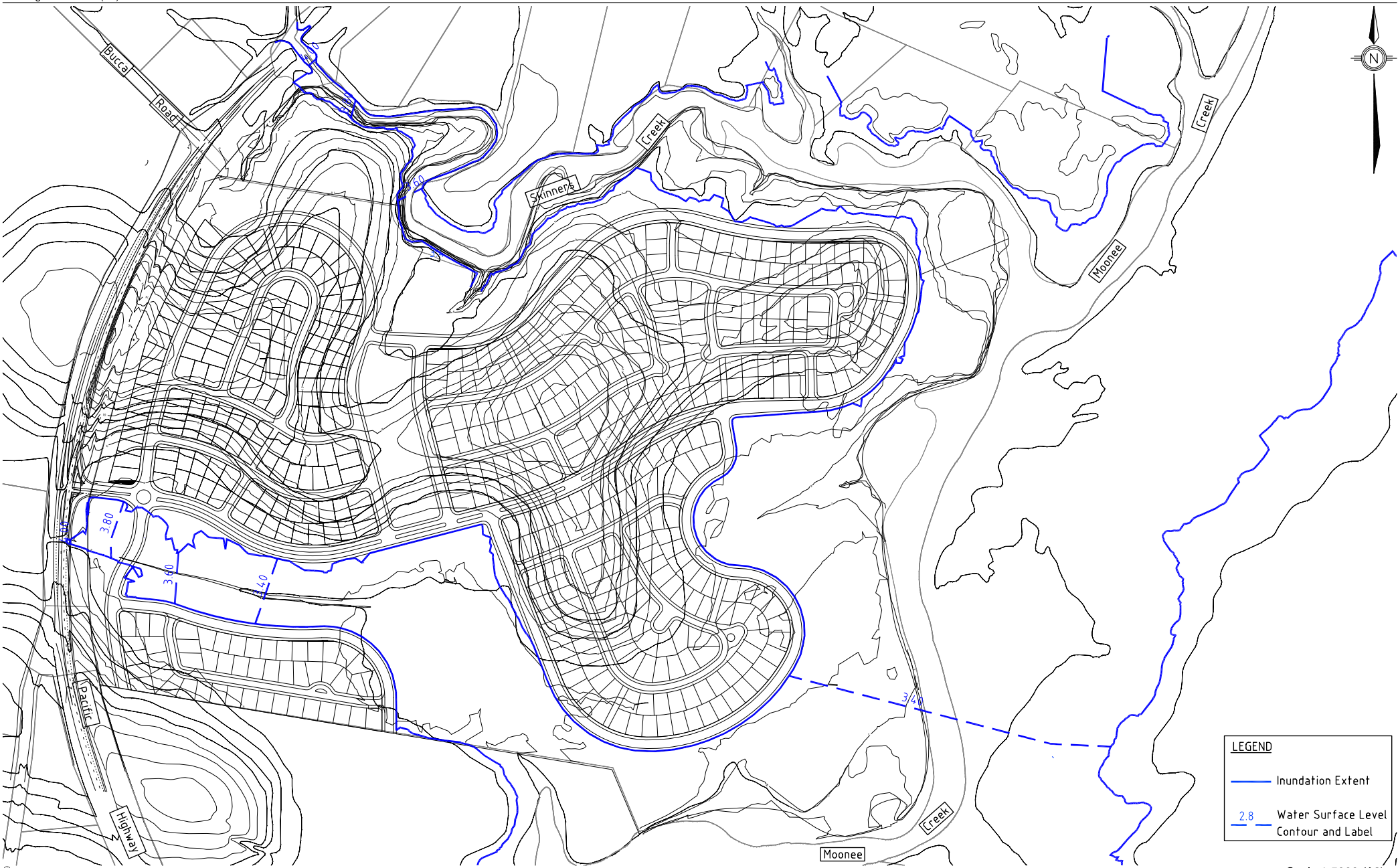
FIGURE 2

MIKE11 MODEL LAYOUT (SITE)

Rev: 0 Date: March 2008

Project No.: LJ8596/002

Auspacific Engineers



Scale 1:5000 (A3)

FIGURE 3

1% AEP FLOOD EVENT INUNDATION EXTENT (DEVELOPED)

Rev: Orig. Date: March 2008

Project No.: LJ8596

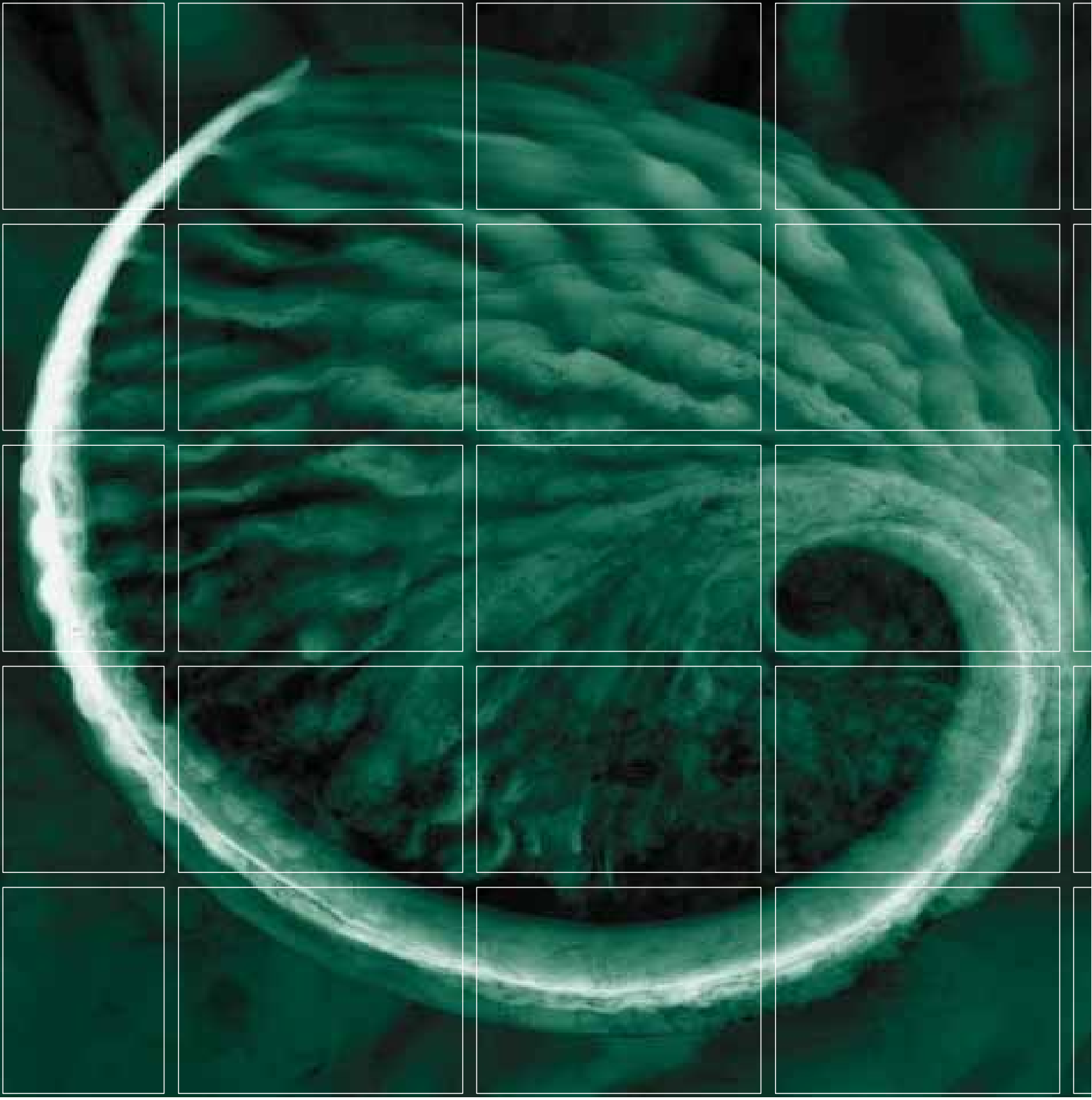
Auspacific

CAD FILE: G:\WorkLAT\J8596_2\Figures\Lt1\Figure3.dwg
XREF's: DGR SUBMIT 148 Lots

PRINT DATE: 12 March, 2008 - 8:38am

ANNEX E

Revised Construction Environmental Management Plan



The Glades Estate, Pacific Highway, Moonee

Construction Environmental Management Plan

Rothwell Boys Pty Ltd

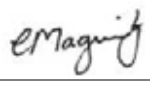
August 2008

0037659 CEMP Final

www.erm.com

Delivering sustainable solutions in a more competitive world

ERM

Approved by:	*Carolyn Maginnity*
Position:	Project Manager
Signed:	
Date:	*13 August 2008*
Approved by:	*Steve O'Connor*
Position:	Principle
Signed:	
Date:	*13 August 2008*

Environmental Resources Management Australia Pty Ltd Quality System

The Glades Estate, Pacific Highway, Moonee

Construction Environmental Management Plan

Rothwell Boys Pty Ltd

August 2008

0037659 CEMP Final

www.erm.com

CONTENTS

LIST OF FIGURES

1 INTRODUCTION

1.1 BACKGROUND

This Construction Environmental Management Plan (CEMP) has been prepared by Environmental Resources Management (Australia) Pty Ltd (ERM) on behalf of Rothwell Boys Pty Ltd for a proposed development at Moonee. The residential estate is to be known as the "Glades Estate" at Moonee Beach, north of Coffs Harbour. The Glades Estate will be constructed in stages and will ultimately comprise approximately 524 residential lots and approximately 45 hectares of open space and habitat conservation areas.

This CEMP details the proposed environmental management procedures that will be implemented during construction of the subdivision.

This plan is to be updated prior to the commencement of construction to include detailed management procedures to be implemented during all construction activities. Appropriate roles and responsibilities relating to environmental management during construction will also be updated.

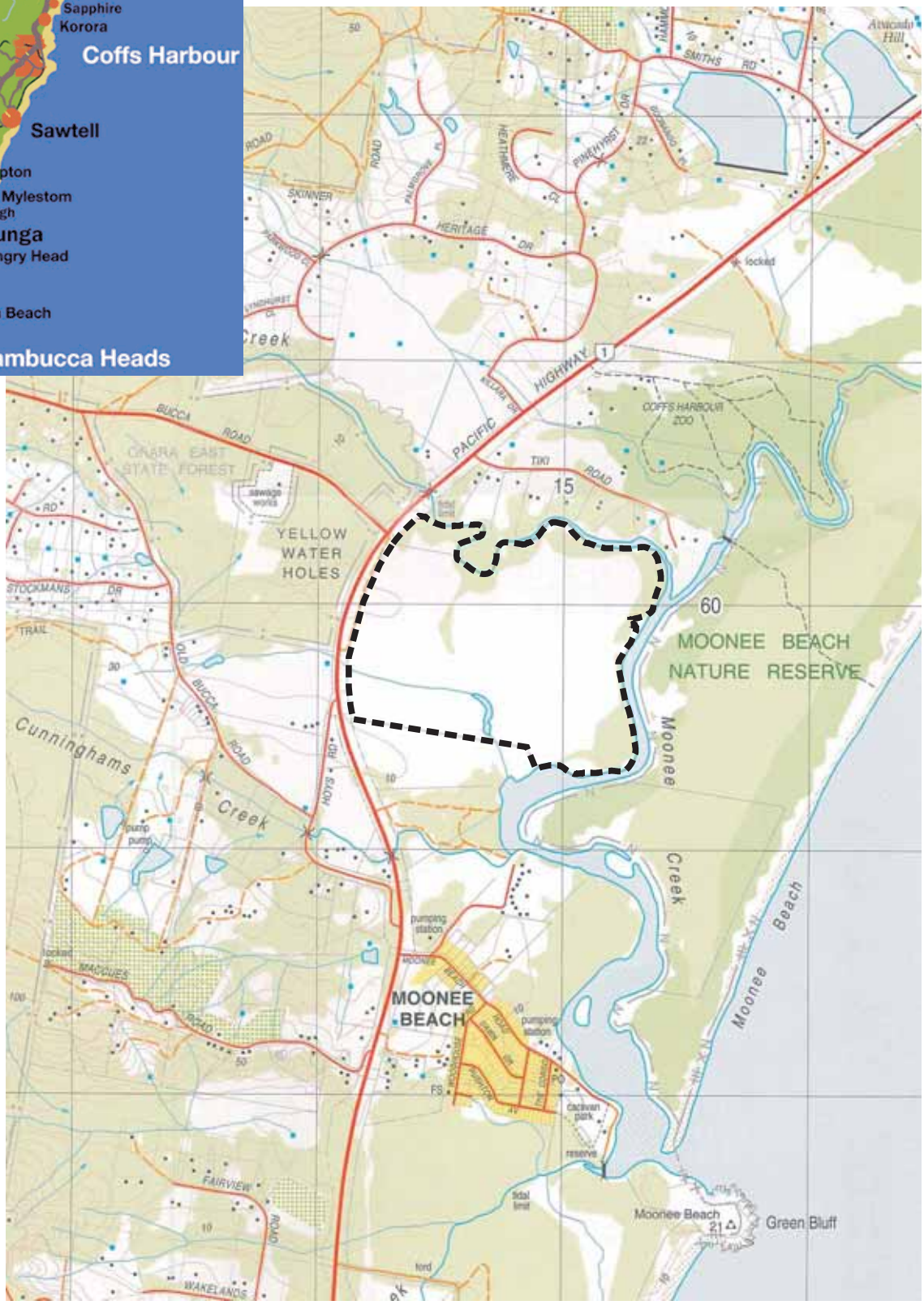
1.2 SITE DESCRIPTION

The site is located approximately 13 kilometres north of Coffs Harbour and approximately 8 kilometres south of Woolgoolga on the Mid North Coast. The site is on the eastern side of the Pacific Highway (the highway runs north south generally parallel to the coastline) and is approximately 1 kilometre north of the existing Moonee Village urban area. A locality plan is provided as *Figure 1.1*.

The site comprises Lots 1 and 2 in DP 725785 and has an area of approximately 96 hectares. The site has a western frontage of approximately 920 metres to the Pacific Highway. On the northern and eastern boundaries are Skinners Creek and Moonee Creek respectively. To the east of the site across Moonee Creek is the Moonee Beach Nature Reserve which contains estuarine and dunal environments adjacent to the beach. To the south of the site is vacant land that is zoned for urban use. An aerial photograph of the site and surrounds is shown in *Figure 1.2*.

1.3 PROJECT DESCRIPTION

The project involves the creation of a Torrens Title residential subdivision of approximately 524 residential lots, as illustrated by the Project Plan at *Figure 1.3*. The identification of the area proposed to be developed for residential purposes has resulted from a detailed analysis of the constraints



Legend

Site Boundary

Source: 1:25,000 Topographic Series

Jobs/2006/0037659/CEMP- Fg1.1 Locality Plan.cdr 24 08 2007 SP Environmental Resources Management Australia Pty Ltd

ERM

0 500m

Approximate Only

Figure 1.1 **Locality Plan**

The Glades Estate, Coffs Harbour

Source:AUSPACIFIC Engineers Pty Ltd 06-1811 July 2006

ERM

0 100m
Approximate Only

Figure 1.2 **Aerial Photograph**

The Glades Estate, Coffs Harbour

Stage	No of Lots
1	62
2	40
3	47
4	47
5	51
6	61
7	48
8	48
9	50
10	42
11	28
TOTAL	**524**

Source: AUSPACIFIC Engineers Pty Ltd P1 04 - 1600 Amended May 2008

ERM

0 100m

Approximate Only

Figure 1.3 **Project Plan**

The Glades Estate, Coffs Harbour- CEMP

and opportunities of the site to determine the most appropriate development footprint.

This CEMP relates to the construction of the subdivision and associated infrastructure. It does not address construction of dwellings or other structures once the construction of the subdivision is complete.

1.4 CONSTRUCTION ACTIVITIES

Activities associated with the construction of the subdivision, and which are covered by this plan include:

- clearing of vegetation in accordance with the project approval;
- stripping and stockpiling of topsoil, including stormwater sediment controls;
- earthworks, including stormwater sediment controls;
- sewer and stormwater drainage construction;
- construction of road pavements, kerb and guttering, stormwater sediment controls and water quality controls;
- construction of telecommunications, electricity, and reticulated water; and
- revegetation of exposed soils following completion.

1.5 OPERATING HOURS

Proposed operating hours are within the following:

- Monday to Friday, 7:00 am to 6:00 pm;
- Saturday, 7:00 am to 4:00 pm; and
- no construction on Sundays or public holidays (unless previous authorization is granted).

2 CONSTRUCTION MANAGEMENT

2.1 OBJECTIVES OF THE CEMP

The objectives of the CEMP are to:

- ensure that the construction activities comply with current environmental legislation and best practice environmental management;
- comply with all relevant approval for the site; and
- minimise the risk to workers on the site and ensure public safety whilst protecting the amenity of adjoining residents and the public generally.

2.2 ENVIRONMENTAL MANAGEMENT STRUCTURE AND RESPONSIBILITIES

This plan is to be updated prior to the commencement of construction with appropriate roles and responsibilities relating to environmental management. Tasks and responsibilities are summarised in *Annex A* of this CEMP.

2.3 APPROVAL AND LICENSING REQUIREMENTS

The project requires approval from the NSW Minister for Planning under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

2.4 TRAINING AND SITE INDUCTION

All employees and subcontractors will undergo environmental awareness training as part of the site induction to ensure they understand their obligations and responsibilities under this CEMP. The site induction will include:

- familiarisation with the requirements of the CEMP and other relevant management plans (i.e. erosion and sediment control plan);
- environmental emergency response procedures; and
- familiarisation with site environmental controls.

Records of all site inductions will be kept and maintained by the site supervisor.

2.5 *EMERGENCY CONTACT AND RESPONSE*

In the event of an environmental emergency, the following person can be contacted 24 hours per day, seven days per week:

Name:	Dale Holt
Position/Responsibility:	Winten Project Manager
Contact Number:	0418 758 988
Alternative Contact Number (office hours):	(07) 5578 2788

Emergency services contact details are as follows:

Emergency Hotline:	000
Ambulance:	000
NSW Fire Service:	000
Coffs Harbour Police Station:	(02) 6652 0299
SES:	13 2500
WIRES (injured wildlife):	0500 559 559

All on-site information relating to hazardous materials, including Material Safety Data Sheets and spill containment materials will be kept at the Site Office.

3 SITE CONTROLS

3.1 PUBLIC SAFETY, AMENITY, AND SITE SECURITY

Procedures for the management of public safety, amenity and site security include:

- all vehicular access/egress associated with the construction works will be via the main site entrance (to be noted to personnel during site inductions);
- main entrance and site office will be appropriately signposted;
- signage will be placed at site boundary to provide appropriate safety warnings, and include contact details of construction company and/or site supervisor;
- no materials will be stored within the road reserve or placed where it will hinder public access across adjoining public land;
- exposed areas will be kept to a minimum to minimise visual impact as well as reduce air and water pollution; and
- safety fencing will be erected and maintained around specific areas of the work site as appropriate (to be identified in an occupational health and safety plan).

3.2 FLORA AND FAUNA

The following measures are intended to minimise the impact of construction activities on flora, fauna and threatened species:

- clearing activities will be restricted to only those areas nominated on the construction plans;
- vehicle movements within uncleared areas will be restricted;
- vegetation removed during construction is to be mulched for use on site;
- weed control will be undertaken during construction as required to ensure there is no spread of weeds on or off site;
- mature eucalypts and mature *Melaleuca sieberi* will be retained where possible within the development area, particularly within parks and landscaping areas., including the two hollow bearing trees within the development area. These trees are to be clearly identified and flagged prior to construction;

- areas of known environmental weed species occurrence should be avoided during construction activities where possible;
- landscape and landfill materials are to be sourced from a supplier where cane toads do not occur;
- fill material is to be inert material to reduce the risk of pH change within the Wallum froglet foraging habitat;
- areas of native vegetation around the Wallum froglet foraging habitat are to be retained and protected;
- mature habitat trees are to be retained where possible;
- any injured wildlife will be reported to WIRES or similar organisation immediately for rescue;
- a qualified fauna handler should be on site when clearing occurs;
- maintain a 50 metre buffer around the Osprey nest in the south east corner of the site;
- planting of suitable feed trees (*Allocasuarina littoralis, A. torulosa*) around retained areas of the site for Glossy black cockatoos utilising the site;
- landscape plantings are to include a majority of native species that will provide habitat for nectarivorous and frugivorous birds and bats;
- landscape plantings are to be situated where possible to reduce the amount of disturbance to retained areas of habitat. All landscaping works will be undertaken in accordance with the Landscape Concept Plan and Open Space Management Plan;
- compensatory koala habitat trees are to be planted in the north-west corner of the site and outside of the development envelope for any koala habitat trees removed;
- use of preferred koala trees in landscaping where suitable;
- installation of lighting and koala exclusion fencing where appropriate in roadways adjacent to koala habitat;
- retain tree species listed within the KPoM for Secondary Koala Habitat;
- installation of koala warning signs along roads within the development area, particularly in the north-west corner of the site adjacent to Skinners Creek where mature Tallowwood occur;
- a 40km/hr speed limit is to be imposed on internal access roads; and

- installation and maintenance of erosion and sediment control prior to and during construction to minimise impacts on water quality of the Wallum Frog habitat.

3.3 ABORIGINAL HERITAGE

The following measures will be taken to minimise any potential impact on Aboriginal heritage at the site:

- fencing of the following areas, with high visibility fencing, will be carried out to ensure the areas are not disturbed:
    - the area of remnant vegetation within Aboriginal Site 2 (refer to *Figure 5.2* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007);
    - the area of cultural significance and the area of potential archaeological deposits (PADs) identified in *Figure 5.3* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007); and
    - Aboriginal sites 3, 4, 6 and 7 identified in *Figure 5.2* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007).
- any activity likely to involve any level of ground disturbance (including elevated boardwalks) in the following areas will require additional archaeological assessment, including consultation with the Aboriginal community:
    - any area of remnant vegetation (identified in *Figure 5.3* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007);
    - any area outside of the proposed development footprint (as indicated by *Figure 1.3*), which has not been surveyed for this proposal; and
    - the area of cultural significance identified in *Figure 5.3* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007).
- representatives of the local Aboriginal community will be given an opportunity to participate in all additional archaeological ground surveys and to participate in the proposed mitigation/management measures. The Aboriginal community representatives will also be given the opportunity to be present during subsurface exploratory test pitting, to halt works if significant cultural material is found and to be included in the decision making for such finds;
- a locked and secure temporary storage facility will be provided on site for the temporary storage of artefacts collected from the site. A timeframe for the temporary storage of artefacts will be provided and a program developed in consultation with the local Aboriginal community for the

long term care and control of all Aboriginal Cultural material collected from the development site; and

- all contractors will be briefed on the control measures to be implemented to manage Aboriginal heritage at the site.

3.4 NOISE AND VIBRATION CONTROLS

The EPA criteria for noise from construction sites are assessed at residential properties and the following are applicable during construction of the subdivision:

- for construction periods of between four and 26 weeks, the L_{10} noise level due to the construction site should not exceed the existing L_{90} background noise level by more than 10 dB; and

- for construction periods longer than 26 weeks, the criteria for a continuously operating source should apply, which generally means that the L_{10} noise level due to construction should not exceed the existing L_{90} background noise level by more than 5 dB.

No construction activities are to be undertaken outside the operations hours detailed in *Section 1.5* to minimise the impact of noise on nearby residences.

All combustion engine plants, such as generators, compressors and welders, will be maintained and kept in good working order to ensure they produce minimal noise. Where practical, machines will be operated at low speed or power and switched off when not being used rather than be left idling for prolonged periods.

Machines found to produce excessive noise compared to industry best practice will be removed from the site or stood down until repairs or modifications can be made.

Once construction activity commences close to any residence, it is to be completed with the minimum of undue delay. In any case, all reasonable attempts will be made to complete significant noisy activities within a short period.

While the above measures will not necessarily result in meeting the construction noise criteria, they will serve to reduce impacts to levels most residents will find acceptable considering the relatively short-term nature of construction work.

3.5 *AIR AND DUST MANAGEMENT*

Management of air quality and dust impacts on the site during construction will include:

- all permanent bunds and reshaped areas will be revegetated as soon as possible after completion;
- stockpiling onsite will be minimised where possible;
- an on-site water cart will be available at all times. Exposed areas will be watered regularly, particularly during high risk times such as during hot and windy days, times of low rainfall, after receipt of complaints, or as needed;
- vehicle movements will be restricted to sealed or dedicated areas;
- truck and vehicle speeds will be below 40km/hr on unsealed roads;
- all vehicles containing loads that may generate dust travelling to or from the site will be covered to prevent dust emissions; and
- all site vehicles and machinery will be kept in good working order to minimise exhaust emissions.

3.6 *STORMWATER, GROUNDWATER AND SEDIMENT CONTROL*

A preliminary erosion and sediment control plan has been prepared for the site and is provided as *Figure 3.1.* Prior to the commencement of construction, however, a more detailed erosion and sediment control plan will be prepared, based on the requirements of the Stormwater Management Plan (Gilbert and Sutherland, 2007) and *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) (Blue Book). All management measures outlined in the Stormwater Management Plan and Erosion and Sediment Control Plan will be implemented and maintained prior to and during construction activities.

General requirements for stormwater and sediment control during construction activities include:

- the estate will be developed in stages to minimise the potential for soil erosion and water pollution and enable progressive rehabilitation as the development proceeds;
- as soon as practicable after the completion of earthworks for each stage, lots will be re-seeded to establish a fast growing cover crop which will minimise erosion and movement of sediment across and off site. On steeper slopes and the road cuttings, hydro mulching and/or placing of hoop pine mulch may be required;

Legend

- Silt Fence
- Sediment Basin
- Cut Off Swales
- Catchment Boundary
- Direction of Construction Flows
- Creek Buffers

NOTE:

ALL WORKS TO BE WHOLLY CONTAINED WITHIN THE BOUNDS OF THE ASSET PROTECTION ZONE

TO BE READ IN CONJUNCTION WITH GILBERT & SUTHERALND STORMWATER ASSESSMENT & DRAWING No's 1600-P6 FOR STORMWATER OUTLETS AND STORMWATER TREATMENT DETAILS

NOTES

SILT AND SEDIMENT CONTROL

1 EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED ON SITE IN ACCORDANCE WITH THE REQUIREMENTS OF THE COFFS HARBOUR CITY COUNCIL AND THE EPA'S "MANAGING URBAN STORMWATER".

2 THE CONTRACTOR IS TO INSPECT ALL SEDIMENT AND EROSION CONTROL DEVICES IMMEDIATELY AFTER AND IF NECESSARY DURING RAINFALL EVENTS.

3 TOPSOIL AND STOCKPILED SOIL SHALL BE STORED/BUNDED IN A MANNER TO PREVENT SOIL BEING WASHED OFFSITE. ALL SOIL PROCESSING AREAS WILL DRAIN INTO SEDIMENTATION BASINS NO NET LOSS OF SEDIMENT SHOULD OCCUR FROM THE WORK SITE. THIS WILL NECESSITATE THE USE OF APPROPRIATE EROSION AND SEDIMENT CONTROLS. THESE SHOULD BE IMPLEMENTED AT THE SITE ESTABLISHMENT PHASE AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
CARE SHOULD BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING ADDITIONAL SEDIMENT CONTROLS AROUND STOCKPILES AND/OR SILT TRAPS IN GULLIES, TABLE DRAINS AND INLET STRUCTURES AS DIRECTED.

4 THE CONTRACTOR SHALL AT ALL TIMES WITHIN ALLOTMENTS AND PARK LANDS MINIMISE THE DISTURBANCE OF THE EXISTING VEGETATION INCLUDING GRASS COVER, AND IF REQUESTED SHALL ROPE OFF OR SIMILARLY PROTECT ANY AREAS DIRECTED BY THE SUPERINTENDENT.

5 OUTSIDE THE CONSTRUCTION AREA EXISTING SURFACE STORMWATER RUNOFF IS TO BE MAINTAINED WHEREVER POSSIBLE.

6 THE CONTRACTOR IS TO ENSURE STORMWATER CONTROL IS ACHIEVED BY THE MAINTENANCE OF NEGATIVE GRADE BACK TO THE CONSTRUCTED SEDIMENTATION BASINS WHEREVER POSSIBLE.

7 STORMWATER DISCHARGE FROM THE SITE SHALL CONFORM TO THE FOLLOWING QUALITY CRITERIA - pH 6.5 to 8.5, SUSPENDED SOLIDS <50mg/l.

8 SHAKE DOWN AREA - THE CONTRACTOR SHALL PROVIDE A SHAKE DOWN AREA FOR CONSTRUCTION, SERVICE AND STAFF VEHICLES ENTERING AND LEAVING THE PUBLIC ROADS. THE CONTRACTOR SHALL LOCATE THE SHAKE DOWN AREAS TO SUITE SITE ACTIVITIES. THE SHAKE DOWN AREA SHALL COMPRISE 150mm THICK LAYER OF COURSE RIVER GRAVEL AVERAGE SIZE 75mm. OVER MI. A34 GEOFABRIC FOR AN AREA OF 15 m x 5m.

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DUST CONTROL

1 THE CONTRACTOR SHALL PROVIDE AN ON SITE WATER CART AT ALL TIMES DURING CONSTRUCTION.

2 CLEARING OF LAND AND MAJOR EARTHWORKS WILL BE RESTRICTED IN SITUATIONS OF HIGH WIND.

3 STOCKPILES ONSITE WILL BE MINIMISED WHERE POSSIBLE AND LOCATED AWAY FROM THE EFFECTS OF PREVAILING WINDS ON EXISTING DWELLINGS.

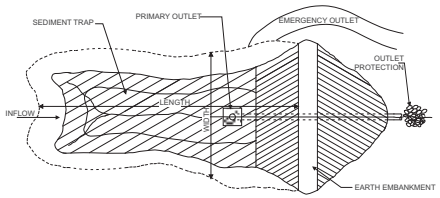
4 ALL PERMANENT BUNDS, BATTER AND DISTURBED AREAS ARE TO BE REVEGETATED AS QUICKLY AS POSSIBLE.

ON SITE EQUIPMENT

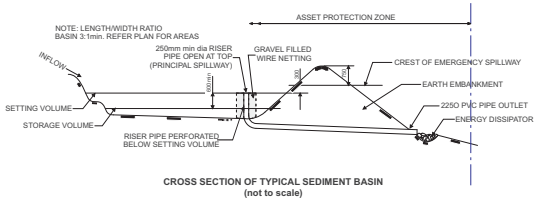
1 THE CONTRACTOR SHALL MINIMUMISE THE ON SITE MAINTENANCE OF MACHINERY WHEREVER POSSIBLE.

2 ALL STORAGE, PREPARATION AND DISPOSAL OF FUELS AND OILS IS TO TAKE PLACE UNDER THE SUPERVISION OF THE EARTHMOVING CONTRACTOR WHO WILL BE RESPONSIBLE FOR ANY SITE DECONTAMINATION.

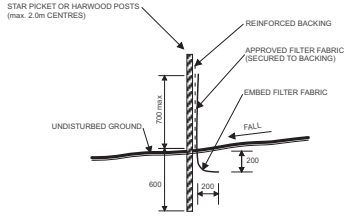
3 THE CONTRACTOR IS TO ENSURE THAT A SUITABLE PRODUCT DESIGNED TO CONTAIN AND ABSORB FUEL AND OIL SPILLS ON WATER IS AVAILABLE ONSITE.



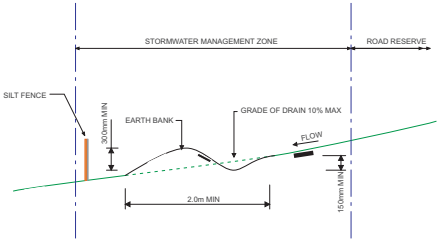
PLAN VIEW OF TYPICAL SEDIMENT BASIN
(not to scale)



CROSS SECTION OF TYPICAL SEDIMENT BASIN
(not to scale)



FILTER FABRIC SILT FENCE
(not to scale)



TEMPORARY DIVERSION CHANNEL
(not to scale)

Source:AUSPACIFIC Engineers Pty Ltd 04-1600 P10 A Nov 2006

ERM

0 100m
Approximate Only

Figure 3.1 **Preliminary Erosion and Sediment Control Plan**

The Glades Estate, Coffs Harbour - CEMP

- wherever possible, the site will remain grassed and otherwise undisturbed until construction commences;

- sediment control measures are to be installed and maintained throughout all construction areas prior to and during construction activities. Erosion and sediment control measures are to be implemented in accordance with the erosion and sediment control plan to be developed and the Blue Book prior to construction occurring;

- a detailed erosion and sediment control plan will be developed prior to commencement of construction and will address the following issues:

    - site layout, including access, soil stockpile locations and building material stockpiles;

    - proposed disturbed and undisturbed areas throughout construction;

    - erosion and sediment control measures proposed, which may include: clean water diversion, sediment fences, straw bales, sand bags, sediment traps, erosion mats and blankets, check dams, surface mulching, vegetation plantings, turf filter strips and surface roughening; and

    - proposed maintenance and monitoring program to be implemented to ensure erosion and sediment controls are appropriately implemented for the duration required;

- erosion and sediment control measures must be maintained until landscaping has been completed and becomes established;

- entry into the site during construction will be restricted to designated ingress and egress areas; and

- stockpiled soils shall be stored / bunded in a manner to prevent soil being washed offsite.

All rubbish and waste materials will be stored appropriately to ensure they do not enter nearby drains and waterways. Chemicals, oils, and fuels required on site will be stored in suitable containers, in a secure storage area.

Surface water is to be managed in accordance with the recommendations contained within ASS and Groundwater Management Plan, Moonee Glades Residential Development , Moonee Beach, New South Wales (Gilbert and Sutherland, 2008). Section 4.3 of the Management Plan sets out the water quality criteria which must be achieved before release to receiving waters in terms of pH ((6.5 – 9.0), Dissolved Oxygen (> 6.0 mg/L), Turbidity (<50NTU) and Visible Oils and Greases (non visible). Monitoring within any sedimentation/ detention basins of water quality will be undertaken with in situ monitoring equipment calibrated prior to each round of monitoring.

The Management Plan also provides for groundwater quality monitoring to be undertaken on a monthly basis at six monitoring locations. The following parameters are to be assessed;

- pH (field measured);
- EC (field measured);
- Dissolved Oxygen (field measured);
- Temperature (field measured);
- Total and dissolved nitrogen; and
- Total and dissolved phosphorus.

If the field pH is below 6.5, laboratory analysis for the following parameters should be performed;

- Calcium;
- Magnesium;
- Total and dissolved iron;
- Filtered aluminium;
- Bicarbonate;
- Carbonate;
- Chloride;
- Sulfate; and
- Colour.

3.7 ACID SULFATE AND ACIDIC SOIL MANAGEMENT

Results of previous testing (Coffey, July 2007) indicate that the soils within Stages 1 to 3 of the development are unlikely to have pyritic sulfur, but may contain organic sulfur, suggesting that the soils are unlikely to be acid sulfate soils (ASS), but are acidic soils. Acidic soils are unlikely to cause significant harm to the environment, as the production of acid is slow and is unlikely to leach from the soils in significant quantities in their natural state. Should the soils be disturbed and be washed into waterways then acidification of the water can occur. Acidic soils can have a negative effect on vegetation growth, especially vegetation that is not native to Australia. Concrete footings can also be corroded by acidic soils.

The recommendations of the Acid Sulfate Soils Assessment for Residential Subdivision (Coffey, July 2007) and supplementary report GEOTCOFH01173AC-AB (Coffey, April 2008) are to be complied with during construction activities, as follows:

- two options for dealing with acidic soils during construction may be considered:
    - implementation of the erosion and sediment control plan which would prevent acidic soils from entering waterways; or
    - treatment of the acidic soils with lime;
- acidic soils should be treated with lime to increase the soil pH to within range of PH 6 - 7. A bulk density of 1.6t/m^3 has been assumed for the residual soils. Using the Total Actual Acidity (TAA) results, the liming ratio requirements were assessed to be 7kg/m^3 of soil for acidic soils excavated;
- good quality fine agricultural lime should be used to treat the excavated soils. In calculating the liming ratios, a safety factor of 1.5 has been allowed above the theoretical requirement to take into account the rate of lime reactivity and the possibility of inhomogeneous mixing; and
- without treatment with lime the alluvial/colluvial and residual soils are considered to be naturally acidic. The recommendations indicated in AS2159-1995, with respect to concrete piles (*Table 6.1* of that document) should be adopted for foundations at the site.

Further detailed ASS investigations are to be undertaken for Stages 4 to 11 of the development, in accordance with the recommendations of the Acid Sulfate Soils Assessment for Residential Subdivision (Coffey, July 2007) and supplementary report GEOTCOFH01173AC-AB (Coffey, April 2008) and the Acid Sulfate Soil and Groundwater Management Plan, Moonee Glades Residential Development, Moonee Beach, New South Wales (Gilbert and Sutherland, August 2008). The Management Plan concluded that sufficient information is available to indicate that ASS are not a significant constraint to the proposed development. ASS are manageable and the Management Plan describes appropriate measures for management of material likely to be disturbed.

The Management Plan outlines requirements for further investigation, monitoring and management of both ASS and groundwater including;

- all soils to be excavated below current surface level in Zone 2 are to be subject of investigations involving boreholes along the alignment of proposed trenching at a maximum spacing of every 100m;

- samples to be collected (approximately 0.3kg each) from every soil horizon, or at least every 0.5m to the depth of drilling, which shall extend at least to 0.5m below the maximum depth of excavation; and

- all samples to be screened for field pH and field oxidation pH and at least one sample from every 0.5m to be laboratory analysed for Chromium Reducible Sulfur and Titratable Actual Acidity in accordance with the ASSMAC guidelines.

The Management Plan outlines soil assessment and treatment options including;

- where ASS requiring more than 40 kg/ cubic metre of lime treatment these soils are to be transported to dedicated treatment areas;

- treatment areas to be confined in a bunded area and should not be located on public land. They are to be protected from upslope surface flows and have sediment filters provided downslope;

- the material used to construct the bund should be free from ASS and prepared with surface lime at a rate of 5kg/cubic metre of material placed; and

- validation testing is to be performed by assessing oxidisable sulfur sampled at a rate of one sample per 100m of trench or 500 cubic metres of treated material.

3.8 WASTE AND MATERIALS RE-USE

The Coffs Harbour Waste Management Development Control Plan (WMDCP 2006) applies to residential premises including rural residential subdivision and residential subdivision. The objective of the WMDCP is to set standards of good practice in on-site management of wastes. While "The Glades" will be assessed under Part 3A of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), the WMDCP has been used as a guideline in the preparation of the Concept Plan Application and the Project Application to be submitted to the Department of Planning in accordance with the Director Generals Requirements (DGRs).

The consideration of waste minimisation during the design and planning phases of a project is more likely to maximise reuse opportunities and minimise the waste generated.

There are a number of practical techniques outlined in the *'Waste Wise Construction Program – Handbook Techniques for reducing construction waste'* (Department of the Environment and Heritage) that assist construction managers with site waste management. Various procedures will be expected from the successful contractor for the proposed development and will require

the nomination of an appropriate person to be responsible for waste management.

Estimated waste generated from construction can only be adequately determined once the volume of cut and fill and of materials required for the construction of roads is known. This would be normally carried out by the contractor during the tendering process or by a quantity surveyor prior to tendering.

To achieve adequate reuse and recycling of materials, it is necessary to ensure that appropriate areas for the separation and storage of waste will be provided.

Appropriate training and supervision of staff will be conducted to ensure that the objectives of the waste management plan are implemented and that contamination of the recyclable waste streams is avoided. Raising awareness of waste management will be achieved through both formal and/or informal discussion with staff and contractors, such as during site inductions, and 'tool-box talks'.

The successful construction contractor will ensure any subcontractor's waste streams are also included in the planning process and comply with the construction management plan.

Waste segregation is the practice of classifying waste and placing it into the appropriate waste container immediately after the waste is generated. In order to achieve effective recycling and reuse, appropriate waste segregation will be carried out on site.

Avoidance

Purchasing policies will ensure that excessive waste is avoided through simple product substitutions for those with less packaging (or packaging that can be recycled) and avoiding over-ordering of items with expiry periods.

Reduction

Products will be assessed prior to purchase in terms of potential to generate excess waste. Products that include minimal packaging would be favoured, without compromising on product performance. Pre-fabricated products that avoid the production off-cuts will be preferred.

Re-Use

Whenever possible, practical and cost effective to do so, re-usable waste from the construction of the first stage of the subdivision will be utilised later in the development. Items that will be considered for reuse include:

- green waste will be mulched, stockpiled, and used in landscaping;
- topsoil will be stripped, stockpiled and reused to revegetate exposed areas following construction;
- excess fill will be used onsite if possible; and
- waste timber, pallets, and other suitable items will be reused as formwork if possible.

Re-Cycling

Plastic, paper, cardboard and other recyclable products will be disposed of in a dedicated receptacle, and, stored and baled for recycling collection.

3.9 TRAFFIC MANAGEMENT

Pedestrian and cycle access is available along the Pacific Highway adjacent to the site. This will not be hindered during the construction phase, with exception of some vehicular movements into and out of the site accessway. The accessway will be signposted with warning signage to alert pedestrians, cyclists and drivers.

The following measures will be taken to minimise any disruption to local traffic during the construction works:

- all vehicular access/egress associated with the construction works will be via the Pacific Highway entrance (to be noted to personnel during site inductions);
- staggering the arrival of vehicles where possible;
- heavy vehicle movements to/from the site shall be restricted to the operating hours noted in *Section 1.5*;
- oversize vehicle movements will obtain appropriate permits from the Roads & Traffic Authority and comply with any conditions contained therein;
- all vehicles will be accommodated within on-site parking areas;
- all loading and unloading will be carried out within the boundaries of the site;
- use of advisory signage to warn pedestrians and cyclists of heavy vehicle movements;

- if any dust or foreign materials build up on the public roadway, this material will be swept off or vacuumed as soon as practicable; and

- where traffic movements associated with the construction works will cause delays in traffic flows on the surrounding road network, appropriate traffic control plans will be developed and implemented.

REFERENCES

Coffey (April 2008) **Response to Information Request from the NSW Department of Planning – The Glades Development, Moonee, Lot 1 DP725785 Pacific Highway, Moonee NSW.** Report prepared for Rothwell Boys Pty Ltd c/o Resource Design & Management Pty Ltd.

Coffey (July 2007) **Acid Sulfate Soils Assessment for Residential Subdivision, Lot 1 DP725785 Pacific Highway Moonee Beach NSW**. Report prepared for Resource Design and Management Pty Ltd.

Coffey (December 2005) **Geotechnical Assessment, Proposed Subdivision at North Moonee Beach.** Report prepared for Resource Design and Management.

Coffs Harbour City Council (2006) **Coffs Harbour Waste Management Development Control Plan.** Coffs Harbour City Council.

Department of the Environment and Heritage (2005) **WasteWise Construction Program – Handbook Techniques for reducing construction waste.** Australian Government.

ERM (October 2007) **'The Glades' Residential Development, Moonee Beach NSW Aboriginal Cultural Heritage Assessment.** Report prepared for Rothwell Boys Pty Ltd.

Gilbert and Sutherland (2007) **Revised Stormwater Assessment of the proposed residential development, the Glades Moonee Beach. Moonee Beach North, Coffs Harbour.** Report prepared Rothwell Boys Pty Ltd.

Gilbert and Sutherland (2008) **ASS and Groundwater Management Plan , Moonee Glades Residential Development, Moonee Beach. New South Wales.** Report prepared Rothwell Boys Pty Ltd.

Harrison, A (2007) **Landscape Concept Plan and Open Space Management Plan, The Glades at Moonee Beach**. Report prepared for Rothwell Boys Pty Ltd.

James Warren & Associates Pty Ltd (November, 2007) **Flora and Fauna Assessment - Lot 1 & 2 DP 725785 Pacific Highway, Moonee.** Report prepared for Rothwell Boys Pty Ltd.

Landcom (2004) **Managing Urban Stormwater: Soils and Construction**, 4th Edition.

Annex A

Construction Environmental Management Plan Checklist

Table A.1 Construction Environmental Management Plan Checklist

Environmental Management Control	Person Responsible	Timing/Frequency	Completed (Initials/date)	Reference/Notes
Construction Environmental Management Plan				
Construction Environmental Management Plan to be updated, including updated roles and responsibilities, updated checklist and development of associated management plans such as erosion and sediment control plan etc as required	Environmental manager	Before work commencing and ongoing during operations as required		CEMP Section 1.1
General Site Issues				
Conduct site induction training for all personnel to alert them to sensitive work areas, explain the requirements of this CEMP, outline each individual's responsibilities, outline emergency response procedures. Documented evidence to be kept and maintained of site inductions.	Environmental manager	Before commencing work and ongoing during operations		CEMP Section 2.4, Section 3.3
Public Safety, Amenity and Site Security				
Ensure all vehicles access site via Pacific Highway entrance only and vehicle movements within uncleared areas restricted.	Site supervisor	Ongoing during operations		CEMP Section 3.1, Section 3.2 Section 3.6
Ensure site office and Pacific Highway entrance are clearly signposted.	Site supervisor	Before commencing work		CEMP Section 3.1
Safety signage to be erected around site boundary and at site entrance.	Safety manager	Before commencing work		CEMP Section 3.1
No materials to be stored/placed within public road reserve.	Site supervisor	Ongoing during operations		CEMP Section 3.1

Environmental Management Control	Person Responsible	Timing/Frequency	Completed (Initials/date)	Reference/Notes
Areas of work to be kept to minimum required to minimise visual impact (as well as dust emissions and sediment generation).	Site supervisor	Ongoing during operations		CEMP Section 3.1
Safety fencing to be erected around work areas in accordance with the site safety plan.	Safety manager	Before commencing work and ongoing during operations		CEMP Section 3.1
A 40km/hr speed limit to be imposed on internal roads	Safety and Environment managers	During and after operations		CEMP Section 3.3
Flora and Fauna				
Ensure conservation areas and areas of Wallum froglet foraging habitat are surveyed and marked using polyweb fencing or similar before vegetation clearing commences. Maintain fencing during works to keep vehicles out of designated areas. Mature and hollow bearing trees to be retained to be clearly marked.	Environmental manager	Before commencing work and ongoing during operations		CEMP Section 3.2
Clearing activities to be restricted to areas nominated in construction plans for stage 1 works and no clearing undertaken in other areas.	Environmental manager	Ongoing during operations		CEMP Section 3.2
Vegetation removed during construction to be mulched and reused on site.	Environmental manager	Ongoing during operations		CEMP Section 3.2
Weed control to be undertaken during construction to ensure there is no spread of weeds on or off site.	Site supervisor	Ongoing during operations		CEMP Section 3.2
Mature vegetation to be retained where possible, particularly in parks and open space areas, including hollow bearing trees, habitat trees and tree species listed within the KPoM for Secondary Koala habitat.	Environmental manager	Ongoing during operations		CEMP Section 3.2

Environmental Management Control	Person Responsible	Timing/Frequency	Completed (Initials/date)	Reference/Notes
Areas of known weed occurrence to be avoided where possible during construction activities.	Site supervisor	Ongoing during operations		CEMP Section 3.2
Landscape and fill materials to be sourced from a supplier where cane toads do not occur.	Site supervisor	Ongoing during operations		CEMP Section 3.2
Fill material to be inert to reduce the risk of pH change within the Wallum froglet habitat.	Site supervisor	Ongoing during operations		CEMP Section 3.2
A qualified fauna handler to be on site when clearing occurs.	Environmental manager	Ongoing during clearing operations		CEMP Section 3.2
Any injured wildlife to be reported to a wildlife rescue organisation or similar for rescue.	Site supervisor	Ongoing during operations		CEMP Section 3.2
A 50 metre buffer to be retained around the Osprey nest in the south east corner of the site.	Environmental manager	Ongoing during operations		CEMP Section 3.2
Landscape plantings are to include suitable feed trees for the glossy black cockatoo, preferred koala trees and include a majority of native trees for habitat for nectarivorous and frugivorous birds and bats.	Environmental manager	During landscape planting		CEMP Section 3.2
Landscape plantings to be situated where possible to reduce the amount of disturbance to retained areas of habitat.	Environmental manager	During landscape planting		CEMP Section 3.2
All landscaping works to be consistent with the landscape Concept Plan and open Space Management Plan.	Environmental manager	During landscape planting		CEMP Section 3.2

Environmental Management Control	Person Responsible	Timing/Frequency	Completed (Initials/date)	Reference/Notes
Compensatory koala habitat trees to be planted in the north-west corner of the site and outside of the development envelope for any koala habitat trees removed.	Environmental manager	During landscape planting		CEMP Section 3.2
Installation of lighting, koala exclusion fencing and signage where appropriate in roadways adjacent to koala habitat and particularly in the north west corner of the site adjacent to Skinners Creek where mature Tallowwood occur.	Environmental manager	During landscape planting		CEMP Section 3.2
A 40km/hr speed limit to be imposed on internal roads.	Safety and Environment managers	During and after construction operations		CEMP Section 3.2
Aboriginal Heritage				
The area of cultural significance and the potential archaeological deposits (PAD's), Aboriginal Sites 3, 4, 6 and 7 and the area of remnant vegetation within Aboriginal Site 2 to be surveyed and fenced, using polyweb fencing or similar, before construction operations commence. Maintain fencing during works to keep vehicles out of designated areas.	Site supervisor	Daily		CEMP Section 3.3
Representatives of the local Aboriginal community to be invited to participate in any additional archaeological ground surveys, as well as proposed mitigation/management measures.	Environmental manager	Prior to commencement of works and during operations.		CEMP Section 3.3
Aboriginal community representatives to be invited to be present during subsurface exploratory test pitting, to halt works if significant cultural material is found and to participate in the decision making for such finds.	Environmental manager	Prior to commencement of works and during operations.		CEMP Section 3.3

Environmental Management Control	Person Responsible	Timing/Frequency	Completed (Initials/date)	Reference/Notes
Additional archaeological assessment, including consultation with the Aboriginal community, to be undertaken prior to any activity likely to involve any level of ground disturbance in the following areas: ▪ any area of remnant vegetation identified in *Figure 5.3* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007); ▪ any area outside of the proposed development footprint (as indicated by *Figure 1.3*), which has not been surveyed for this proposal; and ▪ the area of cultural significance identified in *Figure 5.3* of the Aboriginal Cultural Heritage Assessment (ERM, October 2007).	Environmental manager	Prior to commencement of works		CEMP Section 3.3
A locked and secure temporary storage facility to be provided on site for the temporary storage of artefacts collected from the site. A timeframe for the temporary storage of artefacts being provided and a program developed in consultation with the local Aboriginal community for the long term care and control of all Aboriginal Cultural material collected from the development site.	Environmental manager /Site supervisor	Ongoing during operations		CEMP Section 3.3

Noise and Vibration			
Check that all work is being conducted within prescribed operation hours.	Site supervisor	Daily	CEMP Section 1.5
All combustion engine plants (eg generators, compressors and welders) maintained and kept in good working order. Check they are being operated at low speed or power and switched off when not being used rather than being let to idle.	Site supervisor	Daily	CEMP Section 3.4
Machines producing excessive noise to be removed from site or stood down until repairs or modifications are made.	Site supervisor	Daily	CEMP Section 3.4
Construction activities close to any residence to be completed with the minimum of undue delay.	Site supervisor	Daily	CEMP Section 3.4
Air Quality			
Check vehicles are keeping to sealed and/or designated areas.	Site supervisor	Ongoing during operations	CEMP Section 3.4
Check machines are complying with emission standards (i.e. emissions not visible for more than 10 seconds).	Site supervisor	Ongoing during operations	CEMP Section 3.4
Enforce 40km/h speed limit on unsealed tracks/roads.	Site supervisor	Ongoing during operations	CEMP Section 3.4
Ensure a mobile water tanker equipped with a pump and sprays is used to suppress dust from unsealed roads when in use and other areas as required.	Site supervisor	Ongoing during operations	CEMP Section 3.4
To prevent dust emissions, all vehicles leaving and entering a site with loads that may generate dust to be covered at all times except during loading/unloading.	Site supervisor	Ongoing during operations	CEMP Section 3.4

Any dust or foreign material build up on the public roadway to be swept off or vacuumed as soon as possible.	Site supervisor	Ongoing during operations	CEMP Section 3.9
All permanent bunds and reshaped areas to be revegetated as soon as possible after completion.	Site supervisor	Ongoing during operations	CEMP Section 3.4
Stockpiling on site to be kept to a minimum.	Site supervisor	Site supervisor	CEMP Section 3.4
Stormwater, Groundwater and Sediment Control			
Prepare and implement an Erosion and Sediment Control Plan.	Environmental Manager	Prior to commencement of work	CEMP Section 3.6
Development of the estate to be undertaken in stages to minimise area of exposed surfaces.	Site supervisor	Before commencing work and ongoing during operations	CEMP Section 3.6
After the completion of earthworks, drainage and sewer works within each stage, lots are reseeded. On steeper slopes and road cuttings, hydro mulching and/or placing hoop pine mulch may be used.	Site supervisor	Immediately following construction of each stage	CEMP Section 3.6
Site to remain grassed and undisturbed until construction commences.	Site supervisor	Before commencing work and ongoing during operations	CEMP Section 3.6
Sediment and erosion control measures to be installed prior to construction and maintained throughout construction until landscaping has been completed and becomes established.	Site supervisor	Before commencing work and ongoing during operations	CEMP Section 3.6
Stockpiled soils to be stored/bunded in a manner to prevent soil being washed off site.	Site supervisor	Ongoing during operations	CEMP Section 3.6
Provide an area for storage of waste materials.	Site Supervisor	Prior to commencement of work	CEMP Section 3.6, 3.8

Chemicals, oils and fuels not stored on site, or alternatively, stored in suitable containers in a secure storage area away from nearby drains and waterways.	Site Supervisor	Before commencing work and ongoing during operations	CEMP Section 3.6
Ensure all hazardous materials are appropriately stored and MSDS are available on site.	Site Supervisor	Prior to commencement of work	CEMP Section 3.8
Acid Sulfate and Acidic Soil Management			
Acidic soils to be treated with lime to increase the soil PH to within range of PH 6 – 7. Liming ratio requirements have been assessed to be 7kg/m^3 of soil for acidic soils excavated.	Site supervisor	Ongoing during operations	CEMP Section 3.7
The recommendations indicated in AS2159-1995, with respect to concrete piles (Table 6.1 of that document) to be adopted for foundations at the site.	Site supervisor / Environmental manager	Ongoing during operations	CEMP Section 3.7
Acidic soil stockpiles/treatment areas to be bunded with appropriate capacity to contain a critical storm event and constructed of low permeability material (e.g. clay) to contain leachate/stormwater runoff.	Environmental manager	Prior to commencement of work	CEMP Section 3.7
Testing of acid levels in soils, collected water within bunded areas, walls/floors of excavation areas and groundwater and application of lime as required and release of materials only when pH levels are satisfactory.	Site supervisor / Environmental manager	Ongoing during operations	CEMP Section 3.7
Undertake testing of the pH of lime treated materials to assess whether pH levels are greater than 4. Testing should produce Total Potential Acidity (TPA) results of zero or indicating a small amount of excess lime.	Site supervisor	Immediately following construction of each stage	CEMP Section 3.7

Delivery dockets of agricultural lime to be kept on site.	Site supervisor	Ongoing during operations	CEMP Section 3.7
Period of dewatering to be minimised by excavating soils above the water table initially and dewatering only for the excavation of deeper soils.	Site supervisor	Ongoing during operations	CEMP Section 3.7
Soils exposed within the excavation including those above the water table shall be maintained in a wet condition by frequent irrigation to restrict oxygen entry into the soils within the excavation.	Site supervisor	Ongoing during operations	CEMP Section 3.7
If monitoring of collected water at the point of discharge indicates the pH is below acceptable discharge limits, discharge must cease immediately and further treatment carried out.	Site supervisor	Ongoing during operations	CEMP Section 3.7
Hydrated lime to be applied only in the presence of an ASS consultant. Hydrated lime to be stored in a covered and bunded area to prevent accidental release to waters.	Site supervisor	Ongoing during operations	CEMP Section 3.7
Lime to be stored in a dry location on site.	Site supervisor	Ongoing during operations	CEMP Section 3.7
Waste Management			
During clearing, vegetation to be stockpiled for mulching and use in landscaping on-site.	Environmental Manager	During operatioms	CEMP Section 3.2 and 3.8
Topsoil and excess fill to be reused on site wherever possible.	Site Supervisor	Ongoing during operation	CEMP Section 3.8
Waste materials to be reused on site wherever possible prior to recycling or disposal.	Site Supervisor	Ongoing during operation	CEMP Section 3.8

Provide an area for the segregation, storage and recycling of waste.	Site Supervisor	Prior to commencement of work	CEMP Section 3.8
Traffic Management			
Heavy vehicle movements to/from the site are to be restricted to approved operating hours.	Site supervisor	Ongoing during operations	CEMP Section 3.9
Oversize vehicle movements to obtain appropriate permits from the Roads & Traffic Authority and comply with any conditions contained therein.	Site supervisor	Ongoing during operations	CEMP Section 3.9
Ensure the main access is not used for parking, loading, marshalling or standing of any semi-trailer, heavy plant floats or wide loads.	Site supervisor	Ongoing during operations	CEMP Section 3.9
Ensure all vehicles can be accommodated within on-site parking areas.	Site supervisor	Prior to commencement and ongoing during operations	CEMP Section 3.9
All loading and unloading to be carried out within the boundaries of the site.	Site supervisor	Ongoing during operations	CEMP Section 3.9
The arrival of vehicles to be staggered where possible.	Site supervisor	Ongoing during operations	CEMP Section 3.9
Advisory signage to be erected to warn pedestrians and cyclists of heavy vehicle movements.	Site supervisor	Prior to commencement	CEMP Section 3.9
Where traffic movements associated with the construction works will cause delays in traffic flows on the surrounding road network, appropriate traffic control plans are to be developed and implemented.	Site supervisor	Ongoing during operations	CEMP Section 3.9

ANNEX F

Bulk Earthworks and Noise Attenuation Barriers Plan

ANNEX F1

Figure Showing Bulk Earthworks

BUCCA ROAD

HIGHWAY

PACIFIC

HOYS RD

LOT 2 on DP 725785
(Area = 3.359 ha)

LOT 1 on DP 725785
(Area = 92.550 ha)

LOT 7
DP 252223

ZONE 1

ZONE 2

PARK

Skinners Creek

Moonee Creek

Max Cut R.L. 9.50
(135,000 cu m)

Max Cut R.L. 8.50
(110,000 cu m)

Max. Cut R.L. 6.0
(29,000 cu m)

Min Fill R.L. 4.75
(274,000 cu m)

Road 1
Road 2
Road 3
Road 4
Road 5
Road 6
Road 7
Road 8
Road 9
Road 10

A
B
C

LEGEND

BULK FILL AREA

BULK CUT AREA

NOISE ATTENUATION AREA
(IN ASSOCIATION WITH NOISE IMPACT STATEMENT PREPARED BY H.K.CLARKE & ASS. PTY LTD.
REFER DWG No.04-1600-P3/1 FOR TYPICAL SECTIONS)

ZONE 1 & 2 BOUNDARY
(Taken from Coffey Geotechnics Report dated 1 April 2008 - Annex T)

Source: AUSPACIFIC Engineers Pty Ltd P3 04 - 1600

ERM

0 100m
Approximate Only

Annex F

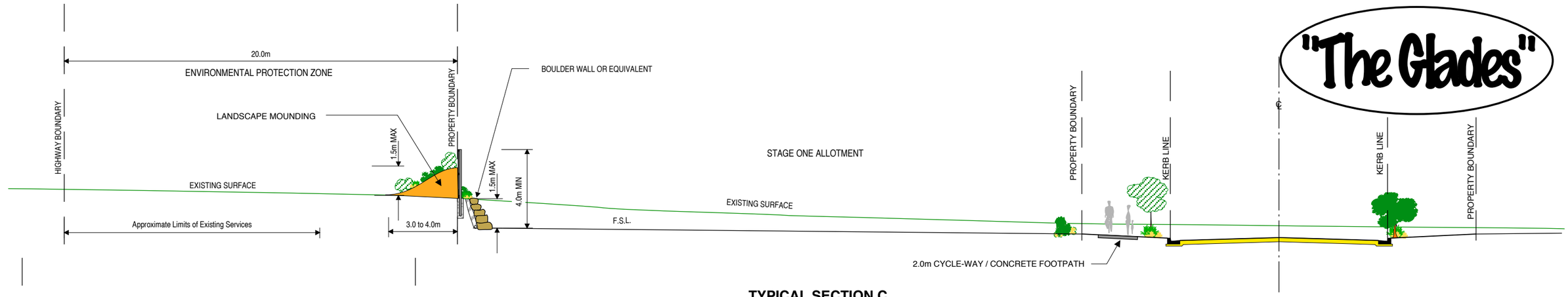
Bulk Earthworks and Boundary Between Zone 1 and 2

The Glades Estate, Coffs Harbour- Preferred Project Report

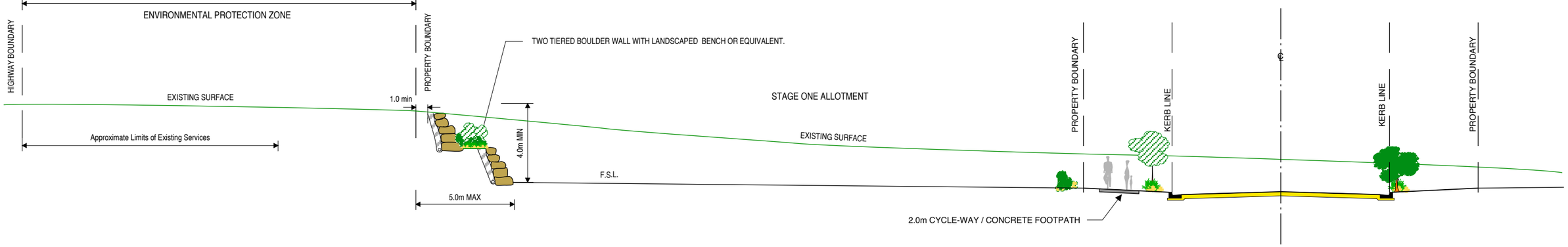
ANNEX F2

Cross Sections

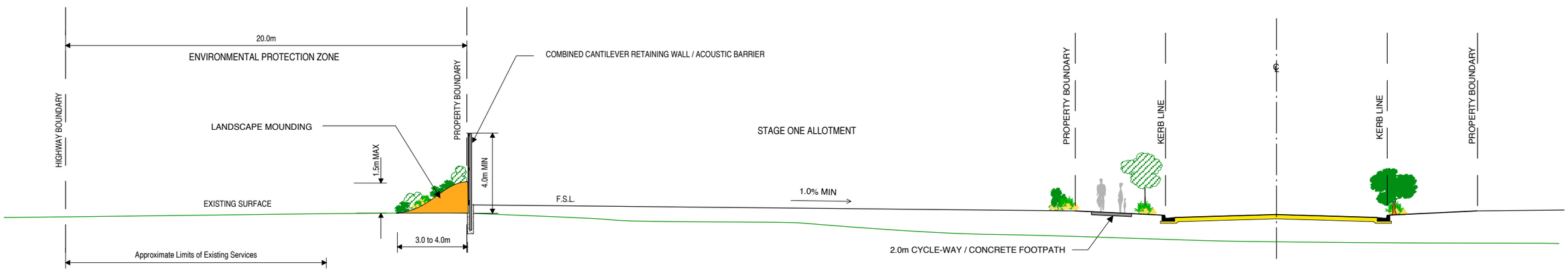
"The Glades"



TYPICAL SECTION C



TYPICAL SECTION B



TYPICAL SECTION A

0 1 2 3 4 5 10 metres

(1 : 100 @ A1)

NOTE:- TO BE READ IN CONJUNCTION WITH DRAWING NO. 04-1600-P3

amdt no.	date	amendment
A	17/4/08	EXIST SERVICES SHOWN & WALL HTS AMENDED

TYPICAL NOISE ATTENUATION BARRIER SECTIONS

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scales	AS SHOWN		
design	RKH	drawn	JM
date	April 2008	signed	

client	THE ROTHWELL BOYS PTY LTD	project no. 04-1600
project	PROPOSED RESIDENTIAL SUBDIVISION MOONEE BEACH COFFS HARBOUR	dwg no. P3/1 / amendment A