

Our Ref: 3969/01
L-EC1624

10 December 2014

The Chief Executive Officer
Douglas Shire Council
PO Box 723
MOSSMAN QLD 4873

Dear Sir/Madam

**SUBMISSION OF DEVELOPMENT APPLICATION (ROL)
WROXALL INVESTMENTS PTY LTD**

Please find attached a copy of the Supporting Information Report for a Development Application for a Reconfiguration of a Lot on land described as Lot 2 on SP259953 and located Oasis Drive, Wonga Beach.

To assist Council with their assessment of the Application, the following information is also attached:

- SARA IDAS Form 1 – Application Details (RoL), including owner's consent;
- SARA IDAS Form 7 – Reconfiguring a Lot

It is noted that the Application fees payable in association with this Application have been paid electronically via Smart eDA.

We trust the attached is sufficient for Council's purposes and please don't hesitate to contact the undersigned should you have any further queries or concerns regarding any of the attached, please do not hesitate to contact the undersigned.

Yours faithfully
FLANAGAN CONSULTING GROUP

ERIN CAMPBELL
Senior Planner

Att.

CAIRNS +61 7 4031 3199 | cairns@flanaganconsulting.com.au | 138 Spence Street PO Box 5820 CAIRNS QLD 4870

DARWIN +61 8 8943 0620 | darwin@flanaganconsulting.com.au | Suite 9, 48-50 Smith Street PO Box 1782 DARWIN NT 0800

MACKAY +61 7 4944 1200 | mackay@flanaganconsulting.com.au | 56 Gordon Street PO Box 45 MACKAY QLD 4740

TOWNSVILLE +61 7 4724 5737 | townsville@flanaganconsulting.com.au | 370 Flinders Street PO Box 891 TOWNSVILLE QLD 4810

Flanagan Consulting Group is a registered business name of South Pacificsands Pty Ltd A.C.N. 052 933 687

IDAS form 1—Application details

(Sustainable Planning Act 2009 version 4.1 effective 4 July 2014)

This form must be used for **ALL** development applications.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications, you must:

- complete this form (*IDAS form 1—Application details*)
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

This form and any other IDAS form relevant to your application must be used for development applications relating to strategic port land and Brisbane core port land under the *Transport Infrastructure Act 1994* and airport land under the *Airport Assets (Restructuring and Disposal) Act 2008*. Whenever a planning scheme is mentioned, take it to mean land use plan for the strategic port land, Brisbane core port land or airport land.

PLEASE NOTE: This form is not required to accompany requests for compliance assessment.

This form can also be completed online using MyDAS at www.dsdip.qld.gov.au/MyDAS

Mandatory requirements

Applicant details (Note: the applicant is the person responsible for making the application and need not be the owner of the land. The applicant is responsible for ensuring the information provided on all IDAS application forms is correct. Any development permit or preliminary approval that may be issued as a consequence of this application will be issued to the applicant.)

Name/s (individual or company name in full)

Wroxall Investments Pty Ltd

For companies, contact name

Cl- Flanagan Consulting Group

Postal address

PO Box 5820

Suburb CAIRNS

State QLD

Postcode

4870

Country Australia

Contact phone number

(07) 4031 3199

Mobile number (non-mandatory requirement)

Fax number (non-mandatory requirement)

Email address (non-mandatory requirement)

erin

@flanaganconsulting.com.au

Applicant's reference number (non-mandatory requirement)

1. What is the nature of the development proposed and what type of approval is being sought?

Table A—Aspect 1 of the application (If there are additional aspects to the application please list in Table B—Aspect 2.)

a) What is the nature of the development? (Please only tick one box.)

- ☐ Material change of use ☒ Reconfiguring a lot ☐ Building work ☐ Operational work

b) What is the approval type? (Please only tick one box.)

- ☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☒ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

17 lot residential subdivision, including new road and drainage reserve

d) What is the level of assessment? (Please only tick one box.)

- ☐ Impact assessment ☒ Code assessment

Table B—Aspect 2 of the application (If there are additional aspects to the application please list in Table C—Additional aspects of the application.)

a) What is the nature of development? (Please only tick one box.)

- ☐ Material change of use ☐ Reconfiguring a lot ☐ Building work ☐ Operational work

b) What is the approval type? (Please only tick one box.)

- ☐ Preliminary approval under s241 of SPA ☐ Preliminary approval under s241 and s242 of SPA ☐ Development permit

c) Provide a brief description of the proposal, including use definition and number of buildings or structures where applicable (e.g. six unit apartment building defined as a *multi-unit dwelling*, 30 lot residential subdivision etc.)

d) What is the level of assessment?

- ☐ Impact assessment ☐ Code assessment

Table C—Additional aspects of the application (If there are additional aspects to the application please list in a separate table on an extra page and attach to this form.)

- ☐ Refer attached schedule ☒ Not required

5. Are there any current approvals (e.g. a preliminary approval) associated with this application? (Non-mandatory requirement)

☐ No ☒ Yes—provide details below

List of approval reference/s	Date approved (dd/mm/yy)	Date approval lapses (dd/mm/yy)
Planning & Environment Court – Court Order	25 March 2011	25 March 2015

6. Is owner's consent required for this application? (Refer to notes at the end of this form for more information.)

☐ No
☒ Yes—complete either Table F, Table G or Table H as applicable

Table F

Name of owner/s of the land	Wroxall Investments Pty Ltd
I/We, the above-mentioned owner/s of the land, consent to the making of this application.	
Signature of owner/s of the land	<i>[Signature]</i> Director. (WJ Freeman) <i>[Signature]</i> (R.J. Forrester)
Date	1 December 2014.

Table G

Name of owner/s of the land	
<input type="checkbox"/> The owner's written consent is attached or will be provided separately to the assessment manager.	

Table H

Name of owner/s of the land	
<input type="checkbox"/> By making this application, I, the applicant, declare that the owner has given written consent to the making of the application.	

7. Identify if any of the following apply to the premises (Tick applicable box/es.)

- ☐ Adjacent to a water body, watercourse or aquifer (e.g. creek, river, lake, canal)—complete Table I
- ☐ On strategic port land under the *Transport Infrastructure Act 1994*—complete Table J
- ☐ In a tidal water area—complete Table K
- ☐ On Brisbane core port land under the *Transport Infrastructure Act 1994* (No table requires completion.)
- ☐ On airport land under the *Airport Assets (Restructuring and Disposal) Act 2008* (no table requires completion)
- ☐ Listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* (no table requires completion)

Table I

Name of water body, watercourse or aquifer

Table J	
Lot on plan description for strategic port land	Port authority for the lot

Table K	
Name of local government for the tidal area (if applicable)	Port authority for the tidal area (if applicable)

8. Are there any existing easements on the premises? (e.g. for vehicular access, electricity, overland flow, water etc)

☒ No ☐ Yes—ensure the type, location and dimension of each easement is included in the plans submitted

9. Does the proposal include new building work or operational work on the premises? (Including any services)

☐ No ☒ Yes—ensure the nature, location and dimension of proposed works are included in plans submitted

10. Is the payment of a portable long service leave levy applicable to this application? (Refer to notes at the end of this form for more information.)

☒ No—go to question 12 ☐ Yes

11. Has the portable long service leave levy been paid? (Refer to notes at the end of this form for more information.)

☐ No

☐ Yes—complete Table L and submit with this application the yellow local government/private certifier's copy of the receipted QLeave form

Table L		
Amount paid	Date paid (dd/mm/yy)	QLeave project number (6 digit number starting with A, B, E, L or P)

12. Has the local government agreed to apply a superseded planning scheme to this application under section 96 of the Sustainable Planning Act 2009?

☒ No

☐ Yes—please provide details below

Name of local government	Date of written notice given by local government (dd/mm/yy)	Reference number of written notice given by local government (if applicable)

2. Location of the premises (Complete Table D and/or Table E as applicable. Identify each lot in a separate row.)

Table D—Street address and lot on plan for the premises or street address and lot on plan for the land adjoining or adjacent to the premises (Note: this table is to be used for applications involving taking or interfering with water). (Attach a separate schedule if there is insufficient space in this table.)

- ☒ Street address **and** lot on plan (All lots must be listed.)
- ☐ Street address **and** lot on plan for the land adjoining or adjacent to the premises (Appropriate for development in water but adjoining or adjacent to land, e.g. jetty, pontoon. All lots must be listed.)

Street address					Lot on plan description		Local government area (e.g. Logan, Cairns)
Lot	Unit no.	Street no.	Street name and official suburb/ locality name	Post-code	Lot no.	Plan type and plan no.	
i)			Oasis Drive, Wonga Beach	4873	2	SP259953	Douglas Shire
ii)							
iii)							

Planning scheme details (If the premises involves multiple zones, clearly identify the relevant zone/s for each lot in a separate row in the below table. Non-mandatory)

Lot	Applicable zone / precinct	Applicable local plan / precinct	Applicable overlay/s
i)	Tourist & Residential Planning Area		Acid Sulfate Soils
ii)			Natural Hazards (Bushfire - Low Risk Hazard)
iii)			

Table E—Premises coordinates (Appropriate for development in remote areas, over part of a lot or in water not adjoining or adjacent to land e.g. channel dredging in Moreton Bay.) (Attach a separate schedule if there is insufficient space in this table.)

Coordinates (Note: place each set of coordinates in a separate row)				Zone reference	Datum	Local government area (if applicable)
Easting	Northing	Latitude	Longitude			
					<input type="checkbox"/> GDA94 <input type="checkbox"/> WGS84 <input type="checkbox"/> other	

3. Total area of the premises on which the development is proposed (indicate square metres)

49,880m² (4.988 hectares)

4. Current use/s of the premises (e.g. vacant land, house, apartment building, cane farm etc.)

Vacant land

- 13. List below all of the forms and supporting information that accompany this application** (Include all IDAS forms, checklists, mandatory supporting information etc. that will be submitted as part of this application. Note: this question does not apply for applications made online using MyDAS)

Description of attachment or title of attachment	Method of lodgement to assessment manager
Development Application and Supporting Information Reports	Mail

14. Applicant's declaration

- ☒ By making this application, I declare that all information in this application is true and correct (Note: it is unlawful to provide false or misleading information)

Notes for completing this form

- Section 261 of the *Sustainable Planning Act 2009* prescribes when an application is a properly-made application. Note, the assessment manager has discretion to accept an application as properly made despite any non-compliance with the requirement to provide mandatory supporting information under section 260(1)(c) of the *Sustainable Planning Act 2009*

Applicant details

- Where the applicant is not a natural person, ensure the applicant entity is a real legal entity.

Question 1

- Schedule 3 of the *Sustainable Planning Regulation 2009* identifies assessable development and the type of assessment. Where schedule 3 identifies assessable development as "various aspects of development" the applicant must identify each aspect of the development on Tables A, B and C respectively and as required.

Question 6

- Section 263 of the *Sustainable Planning Act 2009* sets out when the consent of the owner of the land is required for an application. Section 260(1)(e) of the *Sustainable Planning Act 2009* provides that if the owner's consent is required under section 263, then an application must contain, or be accompanied by, the written consent of the owner, or include a declaration by the applicant that the owner has given written consent to the making of the application. If a development application relates to a state resource, the application is not required to be supported by evidence of an allocation or entitlement to a state resource. However, where the state is the owner of the subject land, the written consent of the state, as landowner, may be required. Allocation or entitlement to the state resource is a separate process and will need to be obtained before development commences.

Question 7

- If the premises is listed on either the Contaminated Land Register (CLR) or the Environmental Management Register (EMR) under the *Environmental Protection Act 1994* it may be necessary to seek compliance assessment. Schedule 18 of the *Sustainable Planning Regulation 2009* identifies where compliance assessment is required.

Question 11

- The *Building and Construction Industry (Portable Long Service Leave) Act 1991* prescribes when the portable long service leave levy is payable.
- The portable long service leave levy amount and other prescribed percentages and rates for calculating the levy are prescribed in the *Building and Construction Industry (Portable Long Service Leave) Regulation 2002*.

Question 12

- The portable long service leave levy need not be paid when the application is made, but the *Building and Construction Industry (Portable Long Service Leave) Act 1991* requires the levy to be paid before a development permit is issued.
- Building and construction industry notification and payment forms are available from any Queensland post office or agency, on request from QLeave, or can be completed on the QLeave website at www.qleave.qld.gov.au. For further information contact QLeave on 1800 803 481 or visit www.qleave.qld.gov.au.

Privacy—The information collected in this form will be used by the Department of State Development, Infrastructure and Planning (DSDIP), assessment manager, referral agency and/or building certifier in accordance with the processing and assessment of your application. Your personal details should not be disclosed for a purpose outside of the IDAS process or the provisions about public access to planning and development information in the *Sustainable Planning Act 2009*, except where required by legislation (including the *Right to Information Act 2009*) or as required by Parliament. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002*.

OFFICE USE ONLY

Date received

Reference numbers

NOTIFICATION OF ENGAGEMENT OF A PRIVATE CERTIFIER

To

Council. I have been engaged as the private certifier for the building work referred to in this application

Date of engagement	Name	BSA Certification license number	Building classification/s
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

QLEAVE NOTIFICATION AND PAYMENT (For completion by assessment manager or private certifier if applicable.)

Description of the work	QLeave project number	Amount paid (\$)	Date paid	Date receipted form sighted by assessment manager	Name of officer who sighted the form
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

The *Sustainable Planning Act 2009* is administered by the Department of State Development, Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

IDAS form 7—Reconfiguring a lot

(Sustainable Planning Act 2009 version 3.1 effective 1 October 2014)

This form must be used for development applications or requests for compliance assessment for reconfiguring a lot.

You **MUST** complete **ALL** questions that are stated to be a mandatory requirement unless otherwise identified on this form.

For all development applications, you must:

- complete *IDAS form 1—Application details*
- complete any other forms relevant to your application
- provide any mandatory supporting information identified on the forms as being required to accompany your application.

For requests for compliance assessment, you must:

- complete IDAS form 32—Compliance assessment
- Provide any mandatory supporting information identified on the forms as being required to accompany your request

Attach extra pages if there is insufficient space on this form.

All terms used on this form have the meaning given in the *Sustainable Planning Act 2009* (SPA) or the Sustainable Planning Regulation 2009.

This form can also be completed online using MyDAS at www.dsdip.qld.gov.au/MyDAS

Mandatory requirements

1. What is the total number of existing lots making up the premises? **One (1)**

2. What is the nature of the lot reconfiguration? (Tick all applicable boxes.)

- ☒ subdivision—complete questions 3–6 and 11
- ☐ boundary realignment—complete questions 8, 9 and 11
- ☐ creating an easement giving access to a lot from a constructed road—complete questions 10 and 11
- ☐ dividing land into parts by agreement—please provide details below and complete questions 7 and 11

3. Within the subdivision, what is the number of additional lots being created and their intended final use?

Intended final use of new lots	Residential	Commercial	Industrial	Other—specify
Number of additional lots created	17	---	---	---

4. What type of approval is being sought for the subdivision?

- ☒ Development permit
- ☐ Preliminary approval
- ☐ Compliance permit

5. Are there any current approvals associated with this subdivision application or request?
(E.g. material change of use.)

☐ No ☒ Yes—provide details below

List of approval reference/s	Date approved (dd/mm/yy)	Date approval lapses (dd/mm/yy)
Planning & Environment Court – Court Order	25 March 2011	25 March 2015

6. Does the proposal involve multiple stages?

☒ No—complete Table A ☐ Yes—complete Table B

Table A

- a) What is the total length of any new road to be constructed? (metres)
- b) What is the total area of land to be contributed for community purposes? (square metres)
- c) Does the proposal involve the construction of a canal or artificial waterway?
☒ No ☐ Yes
- d) Does the proposal involve operational work for the building of a retaining wall?
☒ No ☐ Yes

14.5 metres

0

Table B—complete a new Table B for every stage if the application involves more than one stage

- a) What is the proposed estate name? (if known and if applicable)
- b) What stage in the development does this table refer to?
- c) If a development permit is being sought for this stage, will the development permit result in additional residential lots?
☐ No ☐ Yes—specify the total number
- d) What is the total area of land for this stage? (square metres)
- e) What is the total length of any new road to be constructed at this stage? (metres)
- f) What is the total area of land to be contributed for community purposes at this stage? (square metres)
- g) Does the proposal involve the construction of a canal or artificial waterway?
☐ No ☐ Yes
- h) Does the proposal involve operational work for the building of a retaining wall?
☐ No ☐ Yes

7. Lease/agreement details—how many parts are being created and what is their intended final use?

Intended final use of new parts	Residential	Commercial	Industrial	Other—specify
Number of additional parts created				

8. What are the current and proposed dimensions following the boundary realignment for each lot forming the premises?

Current lot			Proposed lot		
Lot plan description	Area (square metres)	Length of road frontage	Lot number	Area (square metres)	Length of road frontage

9. What is the reason for the boundary realignment?

--

10. What are the dimensions and nature of the proposed easement? (If there are more than two easements proposed please list in a separate table on an extra page and attach to this form.)

Width (m)	Length (m)	Purpose of the easement (e.g. pedestrian access)?	What land is benefitted by the easement?

Mandatory supporting information

11. Confirm that the following mandatory supporting information accompanies this application or request

Mandatory supporting information	Confirmation of lodgement	Method of lodgement
All applications and requests for reconfiguring a lot		
<p>Site plans drawn to an appropriate scale (1:100, 1:200 or 1:500 are the recommended scales) which show the following:</p> <ul style="list-style-type: none"> the location and site area of the land to which the application or request relates (relevant land) the north point the boundaries of the relevant land any road frontages of the relevant land, including the name of the road the contours and natural ground levels of the relevant land the location of any existing buildings or structures on the relevant land the allotment layout showing existing lots, any proposed lots (including the dimensions of those lots), existing or proposed road reserves, building envelopes and existing or proposed open space (note: numbering is required for all lots) any drainage features over the relevant land, including any watercourse, creek, dam, waterhole or spring and any land subject to a flood with an annual exceedance probability of 1% any existing or proposed easements on the relevant land and their function all existing and proposed roads and access points on the relevant land any existing or proposed car parking areas on the relevant land the location of any proposed retaining walls on the relevant land and their height the location of any stormwater detention on the relevant land the location and dimension of any land dedicated for community 	<input checked="" type="checkbox"/> Confirmed	

purposes <ul style="list-style-type: none"> the final intended use of any new lots. 		
For a development application – A statement about how the proposed development addresses the local government's planning scheme and any other planning documents relevant to the application. For a request for compliance assessment – A statement about how the proposed development addresses the matters or things against which the request must be assessed.	<input checked="" type="checkbox"/> Confirmed	
A statement addressing the relevant part(s) of the State Development Assessment Provisions (SDAP).	<input type="checkbox"/> Confirmed <input checked="" type="checkbox"/> Not applicable	

Notes for completing this form

- For supporting information requirements for requests for compliance assessment, please refer to the relevant matters for which compliance assessment will be carried out against. To avoid an action notice, it is recommended that you provide as much of the mandatory information listed in this form as possible.

Privacy—Please refer to your assessment manager, referral agency and/or building certifier for further details on the use of information recorded in this form.

OFFICE USE ONLY

Date received

Reference numbers

The *Sustainable Planning Act 2009* is administered by the Department of State Development, Infrastructure and Planning. This form and all other required application materials should be sent to your assessment manager and any referral agency.

Department of State Development, Infrastructure and Planning
 PO Box 15009 City East Qld 4002
 tel 13 QGOV (13 74 68)
info@dsdip.qld.gov.au

www.dsdip.qld.gov.au

Department of State Development, Infrastructure and Planning
 PO Box 15009 City East Qld 4002
 tel 13 QGOV (13 74 68)
info@dsdip.qld.gov.au

www.dsdip.qld.gov.au

SUPPORTING INFORMATION REPORT

Development Application: Reconfiguration of a Lot
(1 Lot into 17, New Road & Drainage Reserve)

WROXALL INVESTMENTS PTY LTD



TABLE OF CONTENTS

<i>DEVELOPMENT PARTICULARS.....</i>	<i>1</i>
<i>DEFINITIONS</i>	<i>1</i>
<i>1.0 INTRODUCTION</i>	<i>2</i>
<i>2.0 THE SITE</i>	<i>3</i>
<i>3.0 EXISTING APPROVALS</i>	<i>5</i>
<i>4.0 THE PROPOSAL.....</i>	<i>6</i>
<i>5.0 THE SUSTAINABLE PLANNING ACT 2009</i>	<i>14</i>
<i>6.0 PLANNING SCHEME PROVISIONS</i>	<i>15</i>
<i>7.0 POTENTIAL IMPACTS AND MITIGATION MEASURES</i>	<i>22</i>
<i>8.0 RECOMMENDATIONS AND CONCLUSIONS.....</i>	<i>23</i>

APPENDIX A	DEHP's EMR & CLR Search
APPENDIX B	Lot 2 on SP259953 Title Search
APPENDIX C	Flanagan Consulting Group Sketches
APPENDIX D	Gilbert + Sutherland - On-site sewerage disposal assessment
APPENDIX E	DHI Water & Environmental and Water - Flood impact assessment

DEVELOPMENT PARTICULARS

Application Details	Development Application for Reconfiguration of a Lot (1 lot into 17 lots, new road and drainage reserve)
Applicant	Wroxall Investments Pty Ltd
Land Owner	Wroxall Investments Pty Ltd
Applicant Contact	Flanagan Consulting Group Erin Campbell Senior Planner erin@flanaganconsulting.com.au Ph: (07) 4724 5737
Site Description	Lot 2 on SP259953
Street Address	Oasis Drive, Wonga Beach
Total Site Area	4.988 hectares
Easements	Not Applicable
Assessment Manager	Douglas Shire Council
Planning Scheme	Douglas Shire Council Planning Scheme 2006
Planning Area	Tourist & Residential Planning Area

DEFINITIONS

'Applicant'	Wroxall Investments Pty Ltd
'BLE'	Building Location Envelope
'CLR'	Contaminated Land Register
'Council'	Douglas Shire Council
'DEHP'	Department of Environment and Heritage Protection
'DEO'	Desired Environmental Outcome
'EMR'	Environmental Management Register
'IDAS'	Integrated Development Assessment System in accordance with Chapter 6 of the <i>Sustainable Planning Act 2009</i>
'Planning Scheme'	Douglas Shire Planning Scheme 2008
'RoL'	Reconfiguration of a Lot
'SARA'	State Assessment and Referral Agency
'SPA'	<i>Sustainable Planning Act 2009</i>
'SPR'	<i>Sustainable Planning Regulation 2009</i>

1.0 INTRODUCTION

This Report has been prepared as Supporting Information for a Reconfiguration of a Lot (1 lot into 17 lots, new road and drainage reserve) by Wroxall Investments Pty Ltd on land located at Oasis Drive, Wonga Beach (described as Lot 2 on SP259953).

This Report sets out in detail the following:

- The Site
- Previous Approvals
- The Proposal
- Engineering Services
- SPA provisions
- Planning Scheme provisions
- Potential Impacts and Mitigation Measures
- Recommendations and Conclusions

2.0 THE SITE

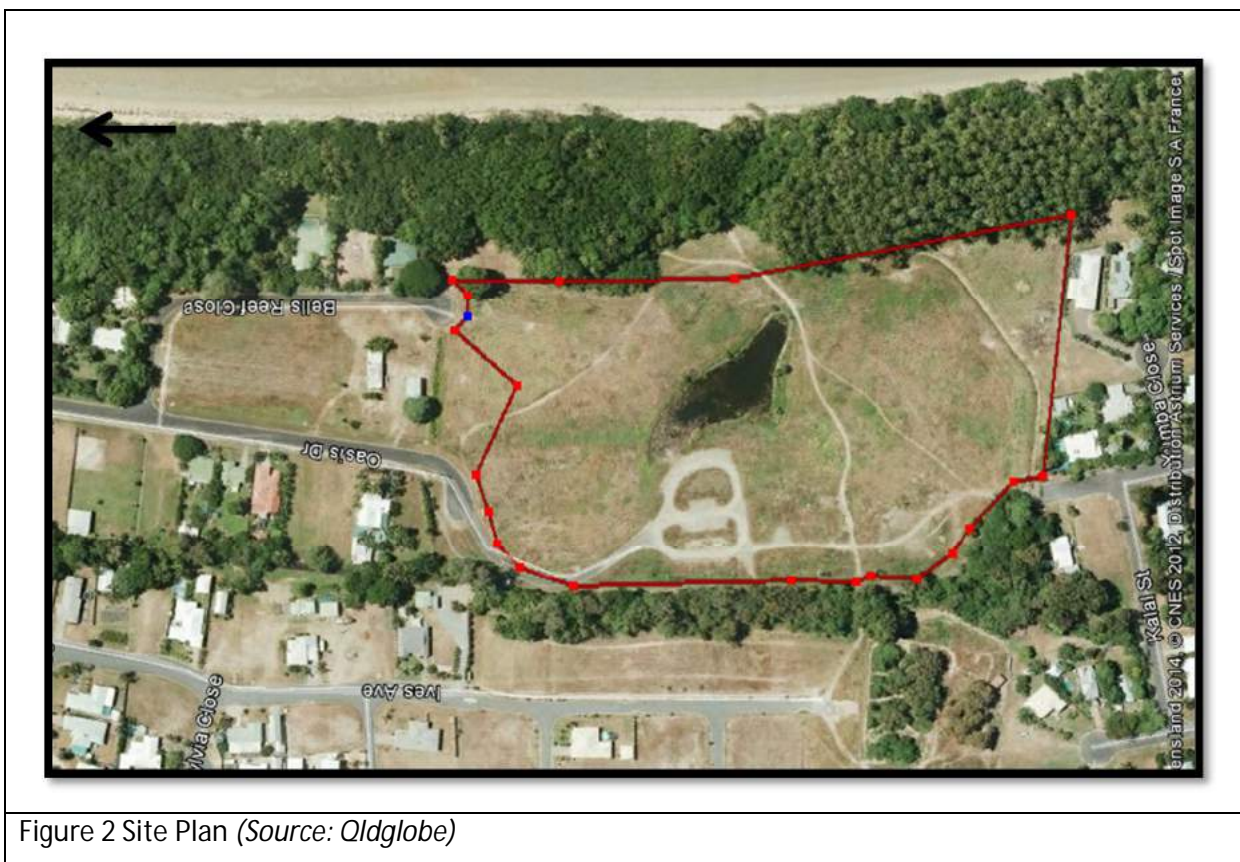
2.1 Site Description

The land the subject of this Development Application is described as Lot 2 on SP259953 and is located at Oasis Drive, Wonga Beach. The location of the site is shown on Figure 1 – Locality Plan.



Figure 1 – Locality Plan (Source: Google Maps)

Figure 2 shows an aerial view of the site with the cadastral boundaries highlighted



The site is identified as being located in the Tourist and Residential Planning Area of the Coastal Suburbs, Villages and Township Locality of the Planning Scheme and is currently vacant.

Lot 2 on SP259953 has an area of 4.988 hectares, frontage to Oasis Drive. Bells Reef Close and Marlin Drive form cul-de-sacs at the common boundary with the site.

Lot 2 on SP259953 is not listed on DEHP's CLR or EMR (please refer to Appendix A). Easements do not encumber the land. Uses surrounding the land include established residential housing allotments. The site is accessed by fully constructed sealed roads with kerb and channel. Essential urban services including power, water, and telecommunications are available. There is no reticulated sewerage network servicing the site.

The Applicant owns Lot 2 on SP259953 in Fee Simple. A copy of the relevant title search is attached at Appendix B.

3.0 EXISTING APPROVALS

A previous RoL Application on the subject land was the subject of a Planning and Environment Court Appeal between Wroxall Investments Pty Ltd and Cairns Regional Council.

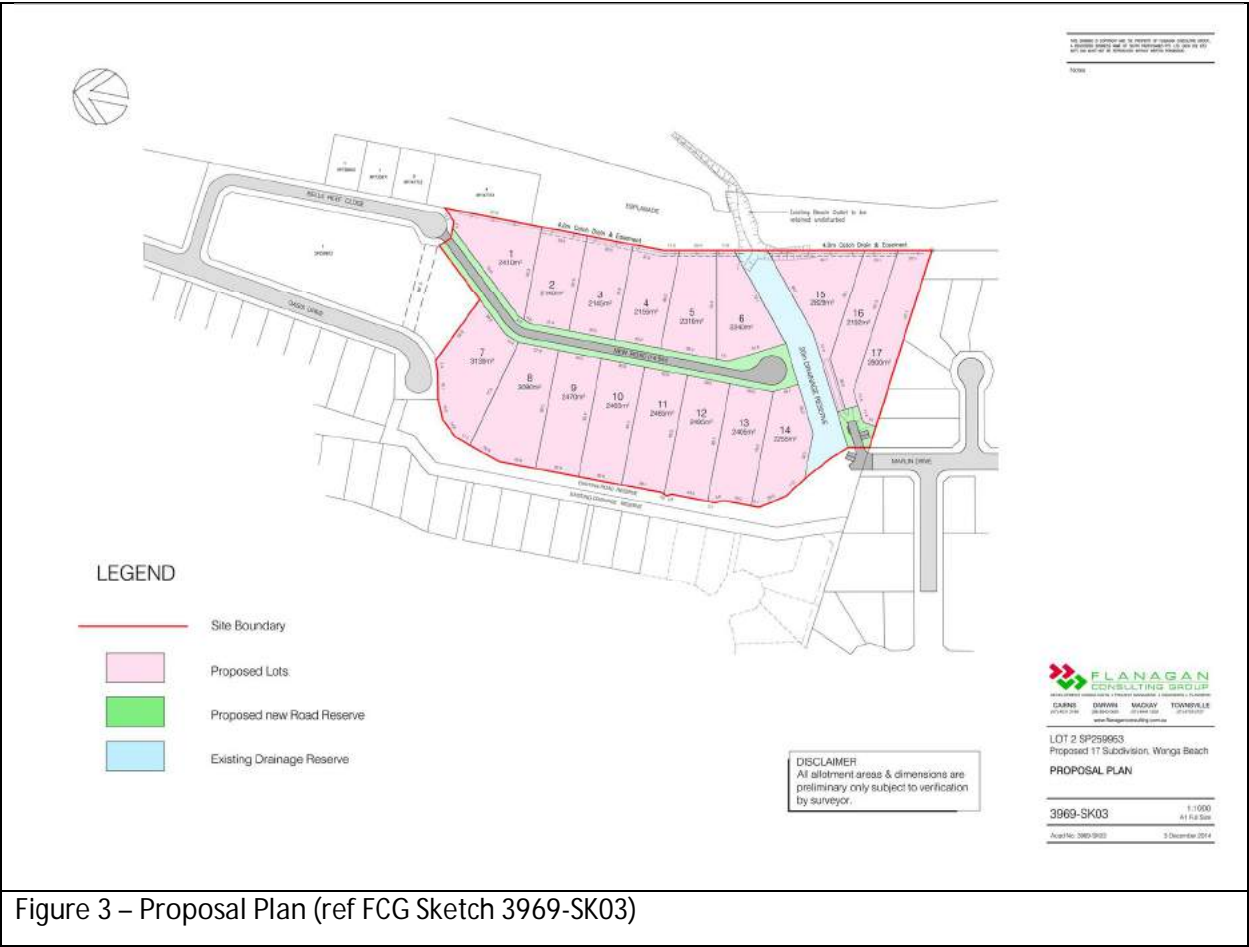
The previous Reconfiguration of a Lot proposed 2 lots into 53 lots. The Final Order issued by the Planning and Environment Court on 25 March 2011, ordered that the Development Application be Approved subject to Conditions.

The current RoL proposed by the Applicant is significantly different than the previous proposal, and includes a substantial reduction in the number of lots proposed. In this regard, it is considered that the previous RoL application and subsequent Approval represent a difference use of the land and are not relevant to the current proposal, and accordingly should not influence the assessment of this Application.

4.0 THE PROPOSAL

4.1 Proposal Plan

The Applicant proposes to develop the land to provide a total of seventeen (17) residential lots, new road and drainage reserve. A Concept Plan showing the layout of proposed allotments on the site is shown in Figure 3 (Flanagan Consulting Group Drawing No. 3969-SK03, attached at Appendix C.



The proposed lots vary in size from 2,140m² to 3,130m². A schedule of the lot sizes is detailed in the following Table 1.

Table 1 – Schedule of Lot Sizes

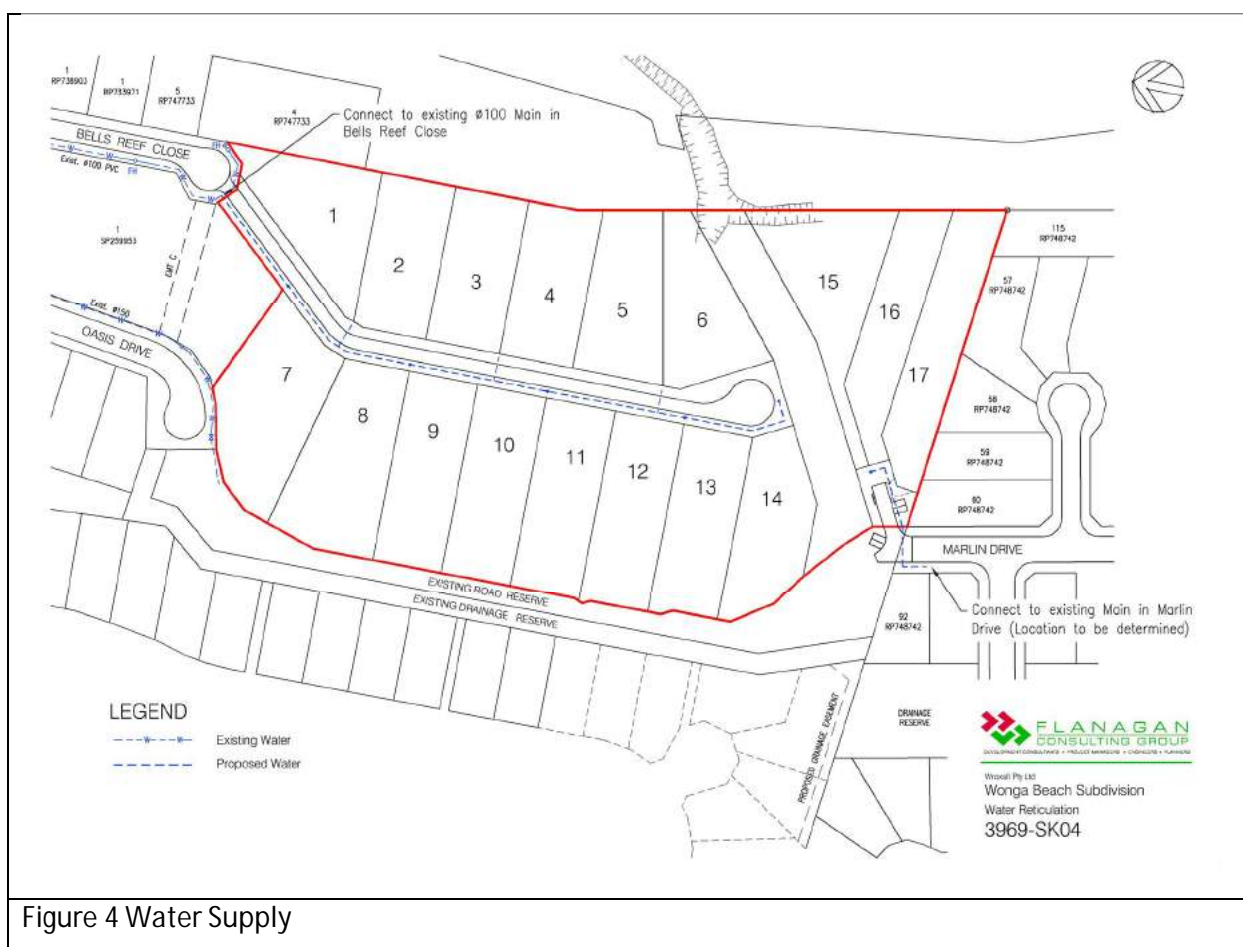
LOT SCHEDULE	
LOT SIZE	NO. OF LOTS
2,140 – 2,199m ²	4
2,200 – 2,299m ²	2
2,300 – 2,399m ²	1
2,400 – 2,499m ²	6
2,500 – 2,599m ²	--
2,600 – 2,699m ²	1
2,700 – 2,799m ²	--
2,800 – 2,899m ²	1
2,900 – 3,130m ²	2

Access to the reconfigured lots will be provided via an extension of Bells Reef Close to form a new road to provide access to Lots 1 to 14. Access to the proposed Lots 15-17 will be provided via an extension of Marlin Drive.

4.2 Water Supply

It is proposed that the existing 100 dia. Water Main in Bells Reef Close be extended along the western side of the new road and service connection provided under the road to service the lots 1-6. Lots 15-17 are proposed to be serviced by an extension of the water main in Marlin Drive.

The proposed water network Plan is shown in, Figure 4 (Flanagan Consulting Group Drawing No. 3969-SK04) attached at Appendix C.



4.3 On-site Waste Disposal

In the absence of a Council Sewerage System for Wonga Beach an on-site sewage disposal is proposed for each of the lots. An investigation into the feasibility of the on-site sewage disposal was undertaken by Gilbert & Sutherland in April 2010 (Copy of report attached in Appendix D).

This report concludes that there are only limited impediments with regards to on-site sewage disposal for lots with a minimum lots size of 800m². All lots will have a minimum lot size of 2000m² with a minimum building and treated effluent disposal area of 1000m².

4.4 Stormwater Drainage

The site currently sits along a frontal sand dune and has a drainage channel along the western boundary of the site. Flows from this channel and from an approx. 13ha catchment located to the south of the site are currently conveyed through the site in an open unlined drain to an existing natural beach outlet to the ocean. This open channel through the site is not covered by a drainage reserve or easement.

A Flood impact assessment was undertaken by DHI Water & Environmental in November 2013 (Copy of report attached in Appendix E), this assessment was based on reconstructing the existing drainage channel through the site with a trapezoidal channel with a 3.0m wide base to discharge at the eastern boundary aligned with the natural ocean outfall channel.

The Flood Impact assessment concludes the following:

- Construction of the development including a trapezoidal channel with a 3.0m wide base would have negligible impact on the 1 year, 10 year and 100 year peak flood levels.
- Based on a Peak water level of 2.60m in the western boundary drainage channel the recommended minimum Pad level is RL 2.90 (300mm freeboard, Approx 1.0m above HAT).
- The beach berm level of RL 0.90 will need to be maintained.

The proposed pad locations and direction of fall on the lots and an indicative stormwater network Layout is shown in, Figure 5 Flanagan Consulting Group Drawing No. 3969-SK05 attached at Appendix C.

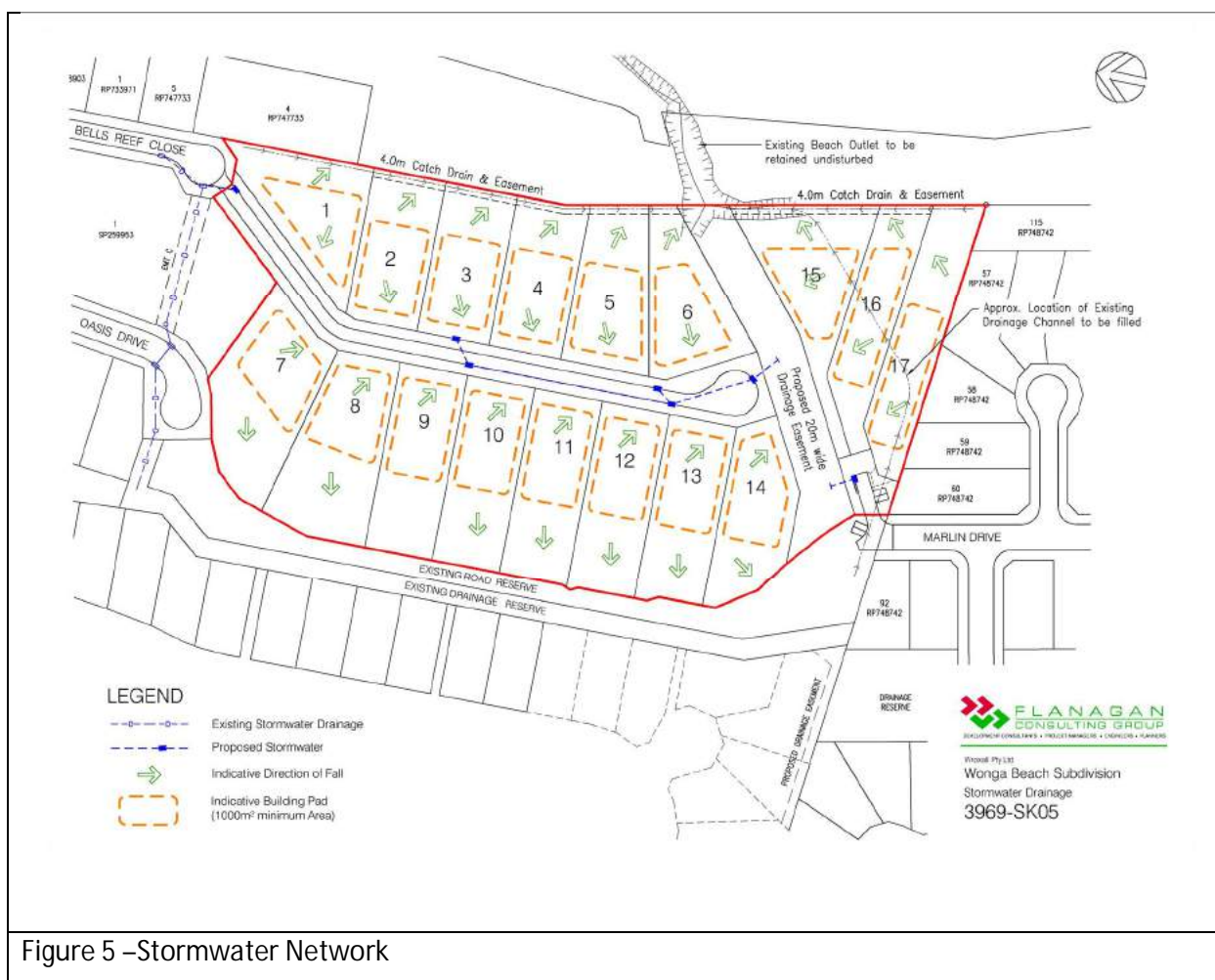


Figure 5 –Stormwater Network

Each lot will have a 1000m² building and treated effluent disposal area constructed to RL 2.90, and areas within the lot outside the building pad shall be shaped to ensure that it is free draining without ponding. A catch drain is proposed to be constructed to rear of lots 1-6 & 15-17 to incept runoff onto the esplanade and direct flows to the beach outlet.

The overall drainage regime of the site will remain relatively unchanged and no modifications to the existing drainage network are considered necessary. It will however be necessary to remove the culvert under the pathway at the end of Marlin Drive and reconstruct them further north, this is required to enable the proposed Marlin Drive turning head to be constructed.

Details of the proposed Trapezoidal Drainage channel to be constructed through the site, and aligning with the existing natural beach outlet to the ocean is shown in, Figure 6 Flanagan Consulting Group Drawing No. 3969-SK06 attached at Appendix C.

The channel is proposed to be constructed with a flexible, permeable hard base and batter stabilisation using a cellular confinement system.

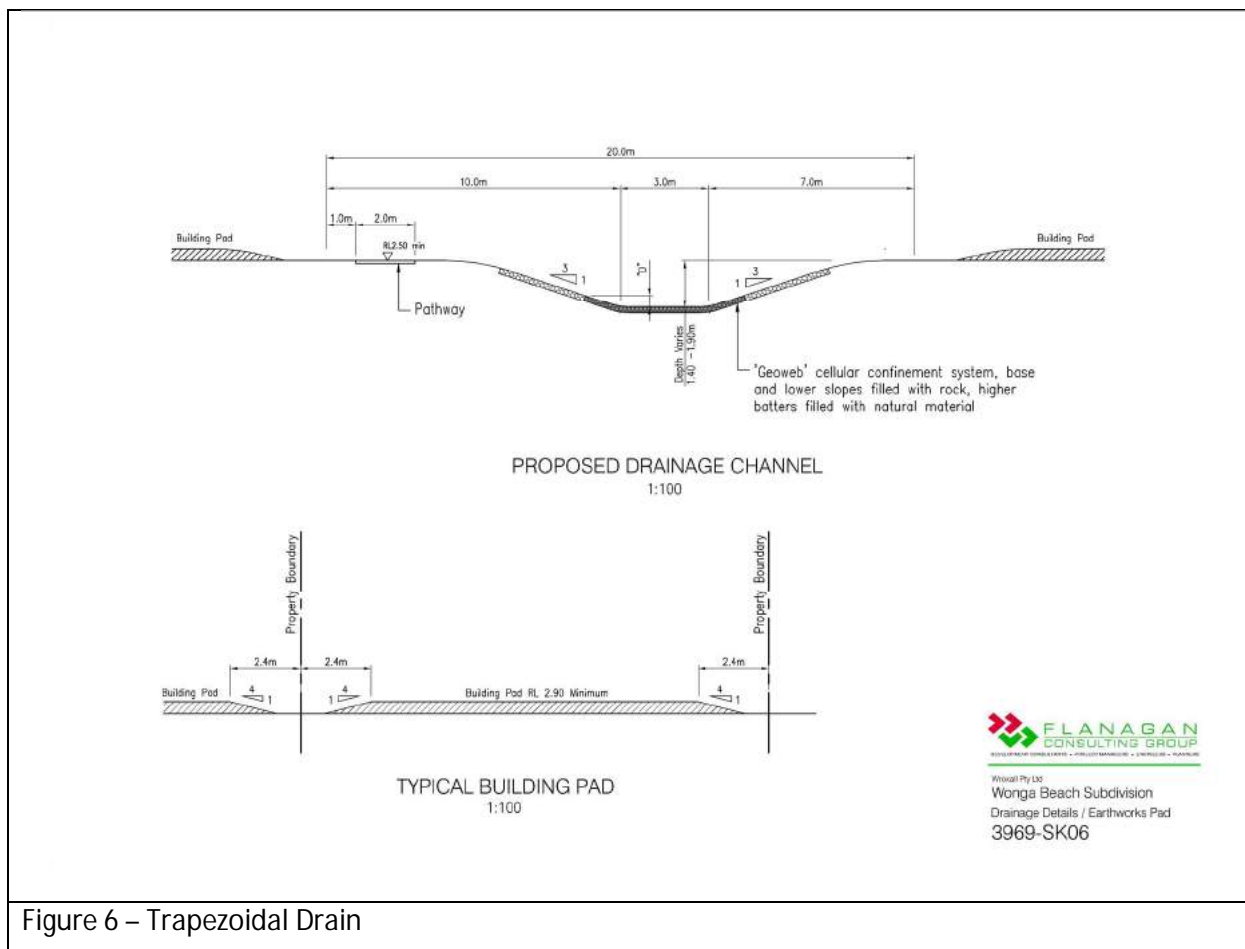


Figure 6 – Trapezoidal Drain

4.5 Traffic Impacts

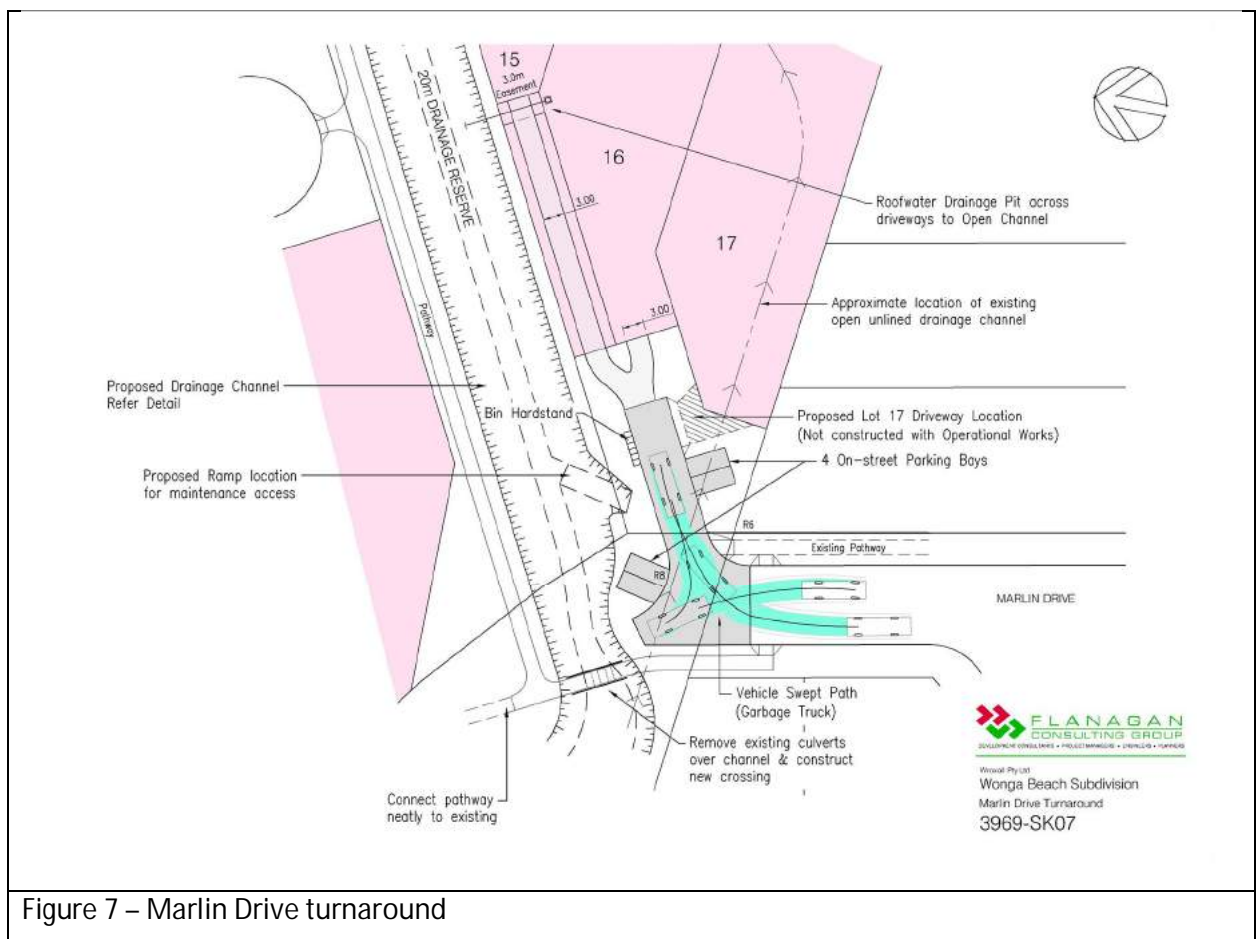
The proposed new roads will consist of a turnaround to the end of Marlin Drive and a new road connected to the end of Bells Reef Close and will be designed as an Access Place in accordance with the requirements of the FNQROC Development Manual.

The proposed turnaround at the end of Marlin Drive is to be designed and accordance with the FNQROC Development Manual and will include the following:

- Provision for a garbage truck to do a 3 point turn,

- Access Driveways to Lots 15 & 16.
- Bin bays for all three lots located on the left side of the road,
- Four (4) indented parking bays,
- Provision for a maintenance access to the drainage channel,
- Provision for overland flow from Marlin Drive into the proposed trapezoidal channel.

The proposed Marlin Drive turnaround Layout is shown in, Figure 7 Flanagan Consulting Group Drawing No. 3969-SK07 attached at Appendix C.



It is proposed to provide a pathway along the northern side of the proposed drainage channel to link the cul-de-sac of the esplanade and the existing pathway along the western boundary of the site that connects Oasis Drive to Marlin Drive.

4.6 Power & Telecommunications

Electricity and Telecommunication Services are to be provided to all lot in accordance with the relevant service provider requirements.

5.0 *THE SUSTAINABLE PLANNING ACT 2009*

The SPA provides the framework for the preparation of Planning Schemes and the assessment of development applications. The SPR specifies the triggers for Development Applications that must be referred to various State agencies in accordance with the regulations.

5.1 *Development Application*

The proposal requires the issue of a Development Permit for a Reconfiguration of a Lot (1 lot into 17 lots, new road and drainage reserve).

The Application is Code Assessable in accordance with the provisions of the Planning Scheme and is required to be assessed against the applicable Codes in the Planning Scheme pursuant to section 313(2)(e) of the SPA.

5.2 *Assessment Manager*

In accordance with Schedule 6, Table 1, Item 1 of the SPR, Douglas Shire Council is the Assessment Manager for the Development Application.

5.3 *State Assessment and Referral (SARA)*

No referral agencies have been identified for the Development Application.

6.0 PLANNING SCHEME PROVISIONS

6.1 Douglas Shire Planning Scheme

The Planning Scheme for Douglas Shire divides the local government area into six (6) localities that cover the entire Planning Scheme area. The Planning Scheme also divides the Shire into eleven (11) Planning Areas.

The subject land is located within the Tourist and Residential Planning Area of the Coastal Suburbs, Villages and Township Locality of the Planning Scheme. The proposed Reconfiguration of a Lot is required to be assessed against the following provisions and Codes of the Planning Scheme:

- Desired Environmental Outcomes;
- Coastal Suburbs, Villages and Township Locality;
- Tourist and Residential Planning Area Code; and
- Reconfiguring a Lot Code.

The Overlays affecting the subject land include:

- Acid Sulfate Soils
 - Below 20m AHD
- Natural Hazards
 - Bushfire Risk Analysis (Low Risk Hazard)

6.2 Desired Environmental Outcomes

Chapter 2 of the Planning Scheme sets out the DEOs expected to be achieved by the Scheme. Each DEO is supported by primary measures which are designed to help achieve the respective DEO. It is acknowledged that interrelationships of the DEOs is such that each will only be achieved to the extent possible having regard to the competing interests of the DEO. DEOs relevant to this development proposal are assessed in Table 2.

Table 2: Desired Environmental Outcomes

DESIRED ENVIRONMENTAL OUTCOME
Ecological Processes and Natural Systems
The development is not located within or adjacent to areas of environmental value and ecological significance. As such, the proposal will not have any impact on ecological processes and natural systems.
Economic Development
<p>The proposed development does not impact on the strong rural and tourism sectors of the Shire. The proposed development offers an opportunity to provide quality residential dwellings on large allotments in proximity to existing services at Wonga Beach. It is expected that the additional residents to the area will provide further economic benefits by utilising exiting services in the locality.</p> <p>Further the proposed reconfiguration is able to be connected to existing urban services without additional economic impacts to the Shire.</p>
Cultural, Economic, Physical & Social Well-being of the Community
<p>The development site is not located within or adjacent to a place of cultural and heritage significance. Accordingly, culturally important areas will not be impacted by the development proposal.</p> <p>The development proposes a range of lot sizes which will allow for a range of single detached dwellings to be constructed within each allotment. It is anticipated that the development will promote and encourage a high standard of dwellings types.</p> <p>The development of an additional 17 lots at Wonga Beach will not detract from the township's sense of community nor community pride. The proposed development is located adjacent to existing residential development, and has been designed to integrate with surrounding residential development.</p>

6.3 Coastal Suburbs, Villages and Townships Locality Code

To comply with the purpose of the Coastal Suburbs, Villages and Townships Locality Code, development is required to comply with the Performance Criteria for this Code. The proposal's compliance with the relevant provisions of the Coastal Suburbs, Villages and Townships Locality Code is detailed in the following Table 3.

Table 3: Coastal Suburbs, Villages and Township Locality Code

Performance Criteria	Development Compliance
General Requirements	
P1 Buildings and structures complement the height of surrounding development and buildings are limited to two storeys.	Building heights on each allotment will be limited to two (2) storeys. Council will have further opportunity at the Building Application stage to review and comment on the dwelling design proposed for each allotment.
P2 Development is connected to all urban services or to sustainable on site infrastructure services.	The proposed reconfiguration is able to be connected to existing urban services.
P3 Landscaping of development sites complements the existing character of the Coastal Suburbs, Villages and Townships Locality.	Street landscaping and all other landscaping associated with the proposed reconfiguration will be designed in accordance with the Planning Scheme Policy No 7.
P4 Development sites are provided with efficient and safe vehicle access and manoeuvring areas on site and to the site, to an acceptable standard for the locality.	The proposed new road has been designed in accordance with the provisions detailed in Planning Scheme Policy No 6 – FNQROC Development Manual. Driveways will also be designed in accordance with this Policy.
P5 Local centres are provided in the Coastal Suburbs to service the needs of the local communities.	The development does not propose a Local Centre.
P6 Any expansion of residential development in the shire outside Mossman and Port Douglas only occurs in areas designated for future residential development.	It is acknowledged that the proposed reconfiguration is not occurring in a designated area. However, the subject land is located in the Tourist & Residential Planning Area of the Locality, and is considered an appropriate development in the context of the surrounds.
P7 The existing large residential allotments at Wonga Beach on the Rural Settlement Planning Area are retained to maintain diversity and the existing character of the locality.	The proposed development is not located in the Rural Settlement Planning Area.

P8 The residential amenity of permanent residents of Wangetti is protected.	The proposed development is not located at Wangetti.
---	--

The proposed development is considered to comply with the Performance Criteria of the Coastal Suburbs, Villages and Township Code having regard to the Acceptable Solutions.

6.4 Tourist and Residential Planning Area Code

To comply with the purpose of the Tourist and Residential Area Planning Code, the development is required to comply with the Performance Criteria of this Code. The proposal's compliance with the relevant provisions of the Tourist and Residential Planning Area Code is detailed in the following Table 4.

Table 4: Tourist and Residential Area Planning Code

Performance Criteria	Development Compliance
Consistent & Inconsistent Uses	
P1 The establishment of uses is consistent with the outcomes sought for the Tourist and Residential Planning Area.	The proposed Reconfiguration of a Lot is not considered an inconsistent use in the Tourist and Residential Planning Area.
Fencing	
P4 Perimeter fencing to the frontage of a site is not visually obtrusive and does not detract from the residential character of the area.	Fencing details have not been contemplated as part of this RoL Application. It is considered that fencing details will be finalised at the Building Application stage by the respective owner of each allotment.
Recreation and Ancillary Facilities	
P7 Tourist developments include recreational and ancillary services and facilities for the enjoyment and convenience of guests.	The proposal does not involve a tourist development.

It is noted that Performance Criteria P2, P3, P5 and P6 apply to development other than a house. The proposed RoL anticipates a single dwelling house on each allotment; therefore it is considered that these Performance Criteria are not relevant to the proposal.

Accordingly, the proposed development is considered to comply with the Performance Criteria of the Tourist and Residential Planning Area Code having regard to the Acceptable Solutions.

6.5 Acid Sulfate Soils Code

The proposed Reconfiguration of a Lot is required to be assessed against the Acid Sulfate Soils Code. The purpose of the Code as it relates to the development is to ensure development which occurs in a site containing or potentially containing acid sulfate soils is undertaken so that potential risk associated with disturbing acid sulfate soils is minimised. The site is identified as being contained below the 20 metre AHD contour of the Douglas Shire Planning Scheme 2006. No soil testing has been conducted at this stage, however the extent of excavation as part of the reconfiguration will be relatively minor. Full details of the extent of excavation and filling as well as the results of soil testing together with an ASS/PASS Management Plan (if required) will be provided as supporting information to an application for a Development Permit for Operational works

6.6 Natural Hazards Code

The proposed Reconfiguration of a Lot is required to be assessed against the Natural Hazard Code for Bushfire Risk Analysis (Low Risk Hazard). The purpose of the Code is to ensure that development does not occur in areas prone to natural hazards of bushfire. Proposed lots 7-14 are identified as being located within the Bushfire Risk Analysis (Low Risk Hazard). Given the low risk severity of the bushfire hazard, and proximity of existing surrounding urban development, it is considered that there is minimal risk from bushfire as a result of the development.

6.7 Reconfiguring a Lot Code

To comply with the purpose of the Reconfiguring a Lot Code, the development is required to comply with the Performance Criteria of this Code. The proposal's compliance with the relevant provisions of the Reconfiguring a Lot Code is detailed in the following Table 5.

Table 5: Reconfiguring a Lot Code

Performance Criteria	Development Compliance
Area and Dimensions of Lots	
P1 Lots are of sufficient area and dimensions to meet the requirements of the users and accommodate the form of development likely to be constructed in the respective Planning Areas, together with the open space, landscaping, access and car parking associated with the particular form of development.	<p>The proposed allotments are of sufficient area and dimensions to accommodate the development of a single dwelling house on each allotment. Sketch 3969-SK03 attached at Appendix C provides further details about the BLE's on each allotment.</p> <p>Each proposed allotment is greater than the minimum 1,000m² in area.</p>

Performance Criteria		Development Compliance	
Infrastructure for Local Communities			
P7 Provision is made for open space that: <ul style="list-style-type: none">meets the recreational needs of residents and visitors to the Shire;provide a diverse range of settings;creates effective linkages with other areas of open space and natural areas; andcontributes to the visual and scenic amenity of the Shire.		Pedestrian paths are being developed to provide access to the surrounding road network and the nearby Esplanade.	
P8 Informal parks and sporting parks are provided and sited to meet the needs of local residents in the Shire.		It is considered that the development does not necessitate the need for, nor the provision of sporting parks. The proposed open space network proposed is considered sufficient for the purposes of providing an informal park.	
Road Network			
P9 The road network: <ul style="list-style-type: none">is integrated and consistent with the existing and proposed local road network;is legible and retains existing features, views, topography and vegetation;is convenient and safe for local residents;facilitates walking and cycling within the neighbourhood; andis compatible with the intended role of the State-controlled road and does not prejudice traffic safety or efficiency.		The proposed road has been designed to integrate with the existing surrounding local road network. The proposed is cognisant of the topography of the land and has been designed in accordance with Planning Scheme Policy No 6 – FNQROC Development Manual. Pedestrian paths are being provided to provide connect the adjoining local roads and the nearby Esplanade. The development is not located in the vicinity of a State-controlled road.	
P10 The road network for industrial/commercial reconfigurations ensures convenient movement and access for vehicles, particularly heavy vehicles, without effecting the amenity of residential neighbourhoods.		The development is not proposing an industrial / commercial reconfiguration.	
Pedestrian and Bicycle Network			
P11 Networks of pedestrian and bicycle paths are provided in safe and convenient locations.		As detailed previously, pedestrian paths are being provided within the open space network. The pedestrian paths are considered safe and appropriately located.	

Specific Outcome		Development Compliance	
Stormwater Drainage			
P12 Stormwater runoff is contained and managed so that it does not adversely affect: <ul style="list-style-type: none">natural watercourse;surface and underground water quality; orthe built environment either upstream or downstream of the site.		The proposed development will not adversely affect the existing drainage regime of the site or the adjoining properties.	
Water Supply			
P13 An adequate, safe and reliable water supply of potable water is provided.		The proposed development is able to be connected to a reticulated water supply.	
Treatment and Supply of Effluent			
P14 Provision is made for the treatment and disposal of effluent to ensure that there are no adverse impacts on water quality and no adverse ecological impacts as a result of the system or as a result of increasing the cumulative effect of systems in the locality.		The development proposes on-site effluent disposal.	
Energy Efficiency			
P22 The road and lot layout facilitates the siting and design of buildings to conserve non-renewable energy sources and assists in orientation and design appropriate for the local tropical conditions.		The road layout has been designed such that each dwelling can be orientated in a general north south direction.	
P23 The road and lot layout minimises fossil fuel by: <ul style="list-style-type: none">reducing the need for and length of local vehicle trips;maximising public transport effectiveness;encouraging walking and cycling; andprovision of appropriate street landscaping.			

7.0 POTENTIAL IMPACTS AND MITIGATION MEASURES

The proposed Reconfiguration of a Lot at Oasis Drive, Wonga Beach is considered an appropriate development in the context of the locale. The proposed development is located in the Tourist and Residential Planning Area of the Coastal Suburbs, Villages and Township Locality, and is considered to be consistent with and complies with the intent of the Tourist and Residential Planning Area and the Coastal Suburbs, Villages and Township Locality.

The proposed allotments are all greater than the minimum lot size on 1,000m² required in the Tourist and Residential Planning Area. The development is able to be connected to a potable water supply, power and telecommunications. The subject allotments are of sufficient size to accommodate onsite waste water disposal.

The proposed new road has been designed in accordance with the provisions of the FNQROC and is considered an appropriate design for the intended traffic generated by the proposed reconfiguration. Access to Lots 1 to 14 will be provided from the proposed new road from Bells Reef Close, while access to the proposed lots 15-17 will be provided via an extension of Marlin Drive.

The assessment of the proposed development against the provisions of the Planning Scheme indicates the development is able to comply with all aspects of the Planning Scheme. Accordingly, it is considered that the proposed Reconfiguration of a Lot does not cause any additional impacts to the surrounding locality that would necessitate the need for mitigation measures.

8.0 RECOMMENDATIONS AND CONCLUSIONS

Having regard to the facts and circumstances outlined in this Report, it is recommended that Douglas Shire Council approve the Development Application for a Reconfiguration of a Lot on land located at Oasis Drive, Wonga Beach.

It is considered that Council can justifiably approve the Development Application subject to reasonable and relevant Conditions, on the following grounds:

- The proposed allotments are of sufficient area to accommodate a single residential dwelling including onsite waste water disposal;
- All other urban services can be provided to the proposed development; and
- The proposed development is not considered inconsistent with the provisions of the Douglas Shire Planning Scheme 2006.

In accordance with the above, the Development Application is commended to Council for its favourable consideration.

APPENDIX A

DEHP's EMR & CLR Search



Department of Environment and Heritage Protection (EHP)
ABN 46 640 294 485
400 George St Brisbane, Queensland 4000
GPO Box 2454 Brisbane QLD 4001 AUSTRALIA
www.ehp.qld.gov.au

SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50071356 EMR Site Id: 10 December 2014
This response relates to a search request received for the site:
Lot: 2 Plan: SP259953

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

If you have any queries in relation to this search please phone 13QGOV (13 74 68)

Registrar
Administering Authority

APPENDIX B

Lot 2 on SP259953 Title Search

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19868066

Search Date: 25/11/2014 16:00

Title Reference: 50919565

Date Created: 22/07/2013

Previous Title: 21397215

50284671

REGISTERED OWNER

Dealing No: 715209063 18/07/2013

WROXALL INVESTMENTS PTY LTD A.C.N. 010 172 728

ESTATE AND LAND

Estate in Fee Simple

LOT 2 SURVEY PLAN 259953

County of SOLANDER

Parish of WHYANBEE

Local Government: DOUGLAS

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 20211168 (POR 46)
2. MORTGAGE No 711137143 31/10/2007 at 10:18
AUSTRALIA AND NEW ZEALAND BANKING GROUP LIMITED A.C.N. 005
357 522

ADMINISTRATIVE ADVICES - NIL

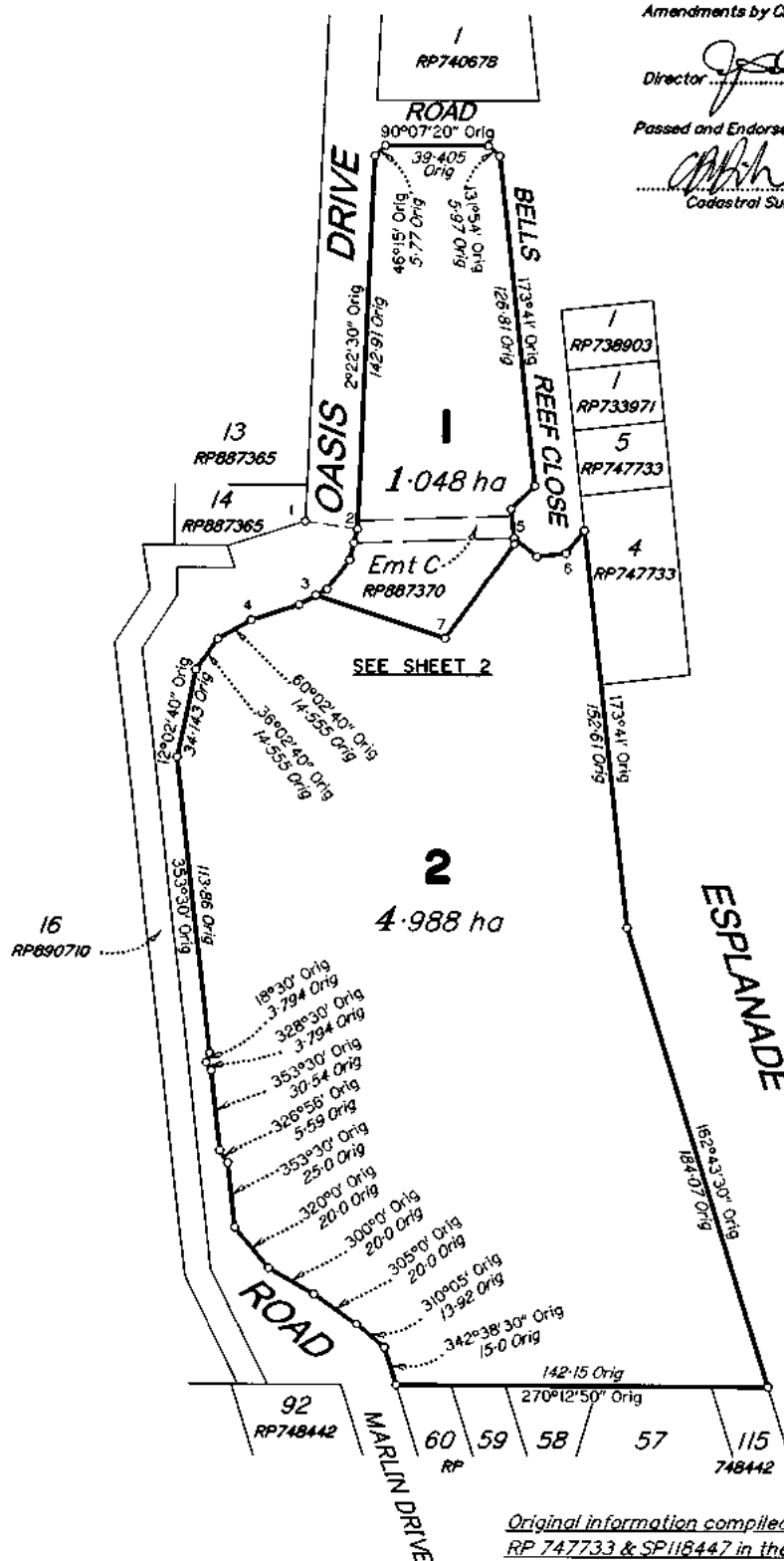
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (DEPT OF NATURAL RESOURCES AND MINES) [2014]
Requested By: D APPLICATIONS CITEC CONFIRM



Amendments by Charles O'Neill Pty Ltd (ACN 010 329 174)

Director Date 15/7/13

Passed and Endorsed:

Cadastral Surveyor

15/7/13

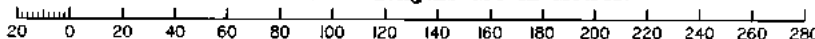
SEE SHEET 2

2
4.988 ha

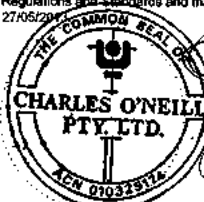
ESPLANADE

Original information compiled from
RP 747733 & SP118447 in the
Department of Natural Resources and Mines.

Scale 1:2000 - Lengths are in Metres.



CHARLES O'NEILL PTY. LTD. (ACN 010 329 174) hereby certify that the land comprised in this plan was surveyed by the corporation, by Kevin Eric Thorne, Registered Surveying Associate, for whose work the corporation accepts responsibility, under the supervision of Grant Harold Phillips, Cadastral Surveyor, and that the plan is accurate, that the said survey was performed in accordance with the Survey and Mapping Infrastructure Act 2003 and Surveyors Act 2003 and associated Regulations and Standards and that the said survey was completed on 27/05/2003.



Charles Edward O'Neill,

Julie Anne O'Neill,
Director.

Date 05/6/2013

Plan of Lots 1 & 2

Cancelling Lot 2 on RP747733 & Lot 17 on SP118447

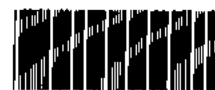
LOCAL
GOVERNMENT: *Cairns Regional Council* LOCALITY: *Wonga*

Meridion: *RP747733*

F/N's	No
1	1
2	1
3	1
4	1
5	1
6	1
7	1
8	1
9	1
10	1
11	1
12	1
13	1
14	1
15	1
16	1
17	1
18	1
19	1
20	1
21	1
22	1
23	1
24	1
25	1
26	1
27	1
28	1
29	1
30	1
31	1
32	1
33	1
34	1
35	1
36	1
37	1
38	1
39	1
40	1
41	1
42	1
43	1
44	1
45	1
46	1
47	1
48	1
49	1
50	1
51	1
52	1
53	1
54	1
55	1
56	1
57	1
58	1
59	1
60	1
61	1
62	1
63	1
64	1
65	1
66	1
67	1
68	1
69	1
70	1
71	1
72	1
73	1
74	1
75	1
76	1
77	1
78	1
79	1
80	1
81	1
82	1
83	1
84	1
85	1
86	1
87	1
88	1
89	1
90	1
91	1
92	1
93	1
94	1
95	1
96	1
97	1
98	1
99	1
100	1

Scale: **1:2000**

Format: STANDARD



SP259953

Plan Status:

715209063

\$477.80

18/07/2013 10:52

NR 400 NT

Legal/Secretary
PO Box 9975 Brisbane Queensland 4000

WARNING : Folded or Mutilated Plans will not be accepted.
Plans may be rolled.
Information may not be placed in the outer margins.

Registered

s. Lodged by

(Include address, phone number, reference, and Lodger Code)

1. Certificate of Registered Owners or Lessees.

1/We WROXALL INVESTMENTS PTY. LTD.
ACN 010 172 728

(Names in full)

*as Registered Owners of this land agree to this plan and dedicate the Public Use
Land as shown hereon in accordance with Section 50 of the Land Title Act 1994.

*as Lessees of this land agree to this plan.

Signature of *Registered Owners *Lessees

RODNEY THOMAS FORRESTER (Director)

WILLIAM JOHN FREEMAN (DIRECTOR)

6. Existing

Title Reference	Description	New Lots	Road	Secondary Interests
21397215	Lot 2 on RP747733	1 & 2		
50284671	Lot 17 on SP118447	2		

ENCUMBRANCE EASEMENT ALLOCATIONS

Easement	Lots to be Encumbered
701345809 (Emt C on RP887370)	1

MORTGAGE ALLOCATIONS

Mortgage	Lots Fully Encumbered	Lots Partially Encumbered
711137143	1 & 2	

* Rule out whichever is inapplicable

2. Local Government Approval.

* CAIRNS REGIONAL COUNCIL
hereby approves this plan in accordance with the:

%

SUSTAINABLE PLANNING ACT 2009

DATE OF APPLICATION : 15 MAY 2013

Dated this FIRST day of JULY 2013

DELEGATED OFFICER
GRAHAM BOYD, MANAGER
DEVELOPMENT AND
REGULATORY SERVICES

* Insert the name of the Local Government. % Insert Integrated Planning Act 1997 or
Insert designation of signatory or delegation Local Government (Planning & Environment) Act 1990

3. Plans with Community Management Statement:

CMS Number:

Name:

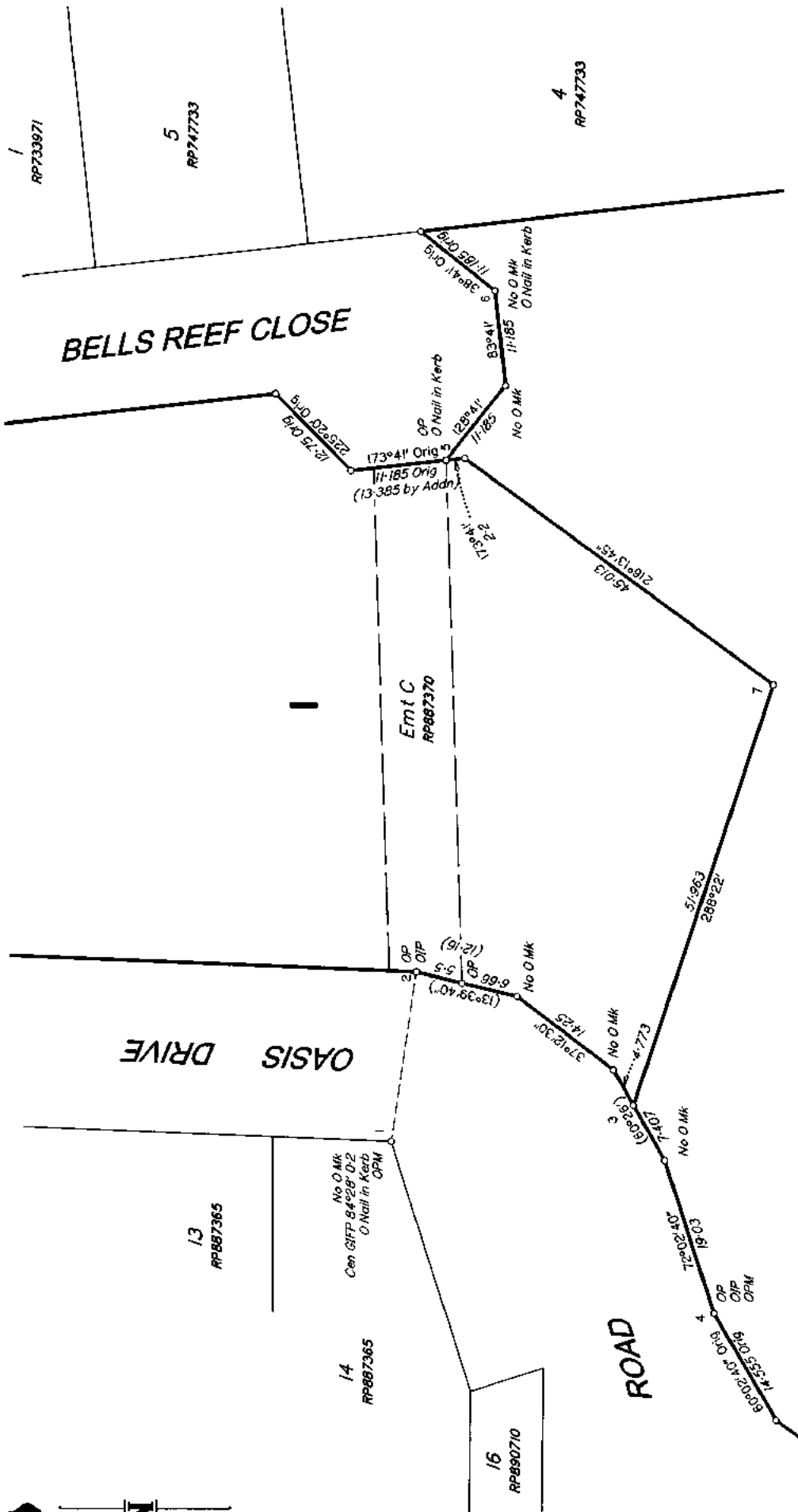
4. References:

Dept File:

Local Govt: 8/13/1733

Surveyor: 7427WEY

1,2	Por 46	12. Building Format Plans only. I certify that: * As far as it is practical to determine, no part of the building shown on this plan encroaches onto adjoining lots or road; * Part of the building shown on this plan encroaches onto adjoining * lots and road Licensed Surveyor/Director * Date *delete words not required
Lots	Orig	
7. Portion Allocation:		
8. Map Reference: 7965-21324		
9. Parish: WHYANBEE		
10. County: Solander		
11. Passed & Endorsed:		
By: CHARLES O'NEILL PTY. LTD. ACN 010 329 174 Date: 25/06/2013 Signed: [Signature] Designation: Cadastral Surveyor		13. Lodgement Fees: Survey Deposit \$ Lodgement \$ New Titles \$ Photocopy \$ Postage \$ TOTAL \$
		14. Insert Plan Number SP259953



2

TRAVERSES		
LINE	BEARING	DIST
1-2	98°24'50"	20-105

Peg placed at all new corners.

REFERENCE MARKS			
STN	TO	ORIGIN	BEARING DIST
1	O Nail in Kerb	RP887365	50°39' 7.97
2	OIP	RP747733	278°10'20" 2.005
3	Nail in Kerb	RP887365	288°38' 8.08
4	OIP	RP887370	346°44' 1.0
5	O Nail in Kerb	RP887370	46°46' 5.665
6	O Nail in Kerb	RP887370	328°13' 5.085
7	Pin		129°08' 1.297

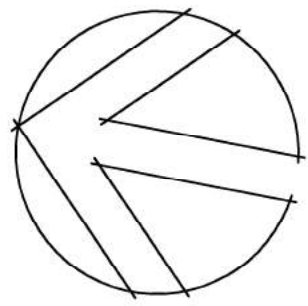
PERMANENT MARKS			
PM	ORIGIN	BEARING DIST	NO TYPE
1-OPM	RP887365	145°34' 7.2	96526 Standard
4-OPM	RP748442	172°23'35" 336-959	99373 Standard

Scale 1:500 - Lengths are in Metres.



APPENDIX C

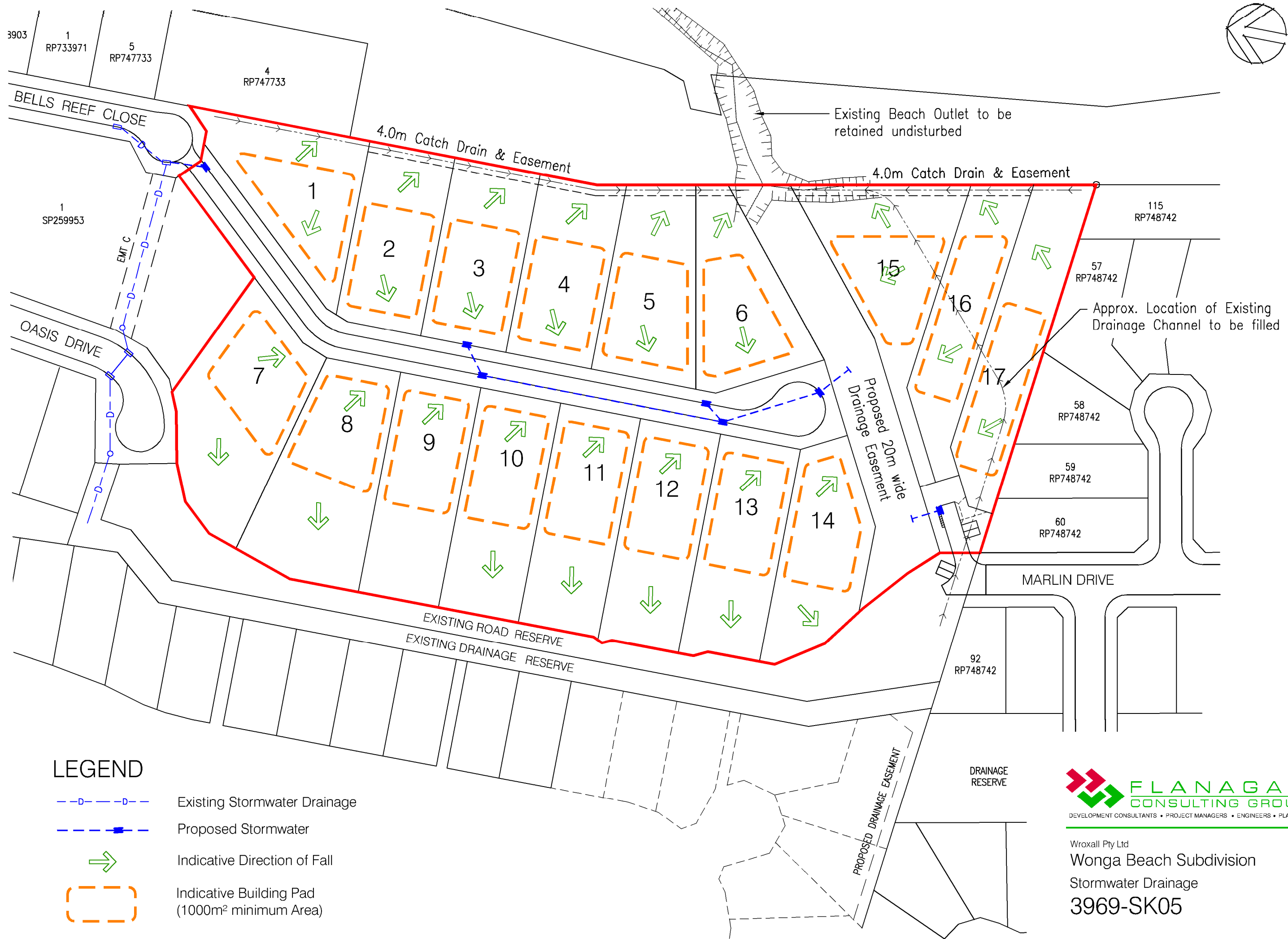
Flanagan Consulting Group Sketches



LEGEND

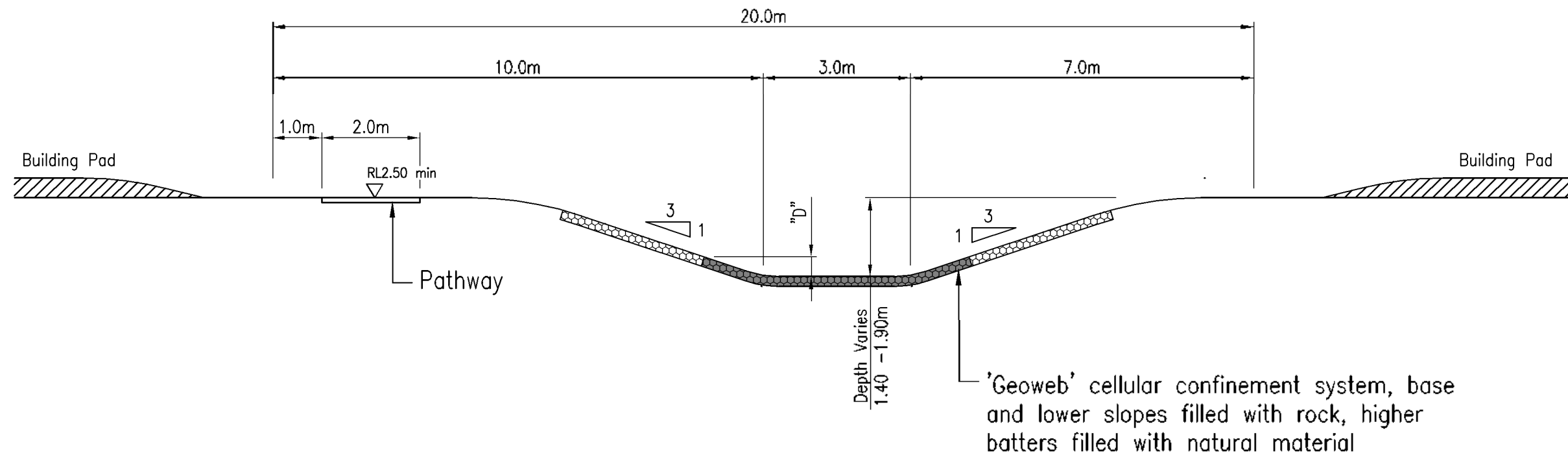
- Site Boundary
- Proposed Lots
- Proposed new Road Reserve
- Existing Drainage Reserve

DISCLAIMER
All allotment areas & dimensions are preliminary only subject to verification by surveyor.

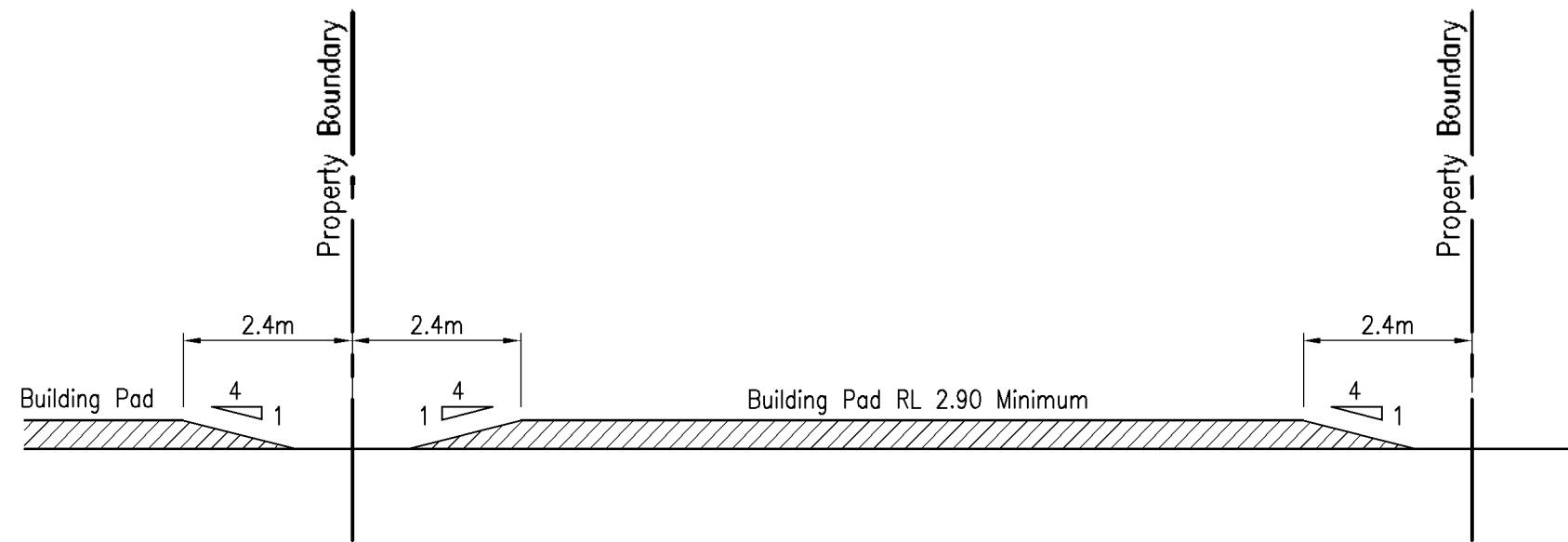


LEGEND

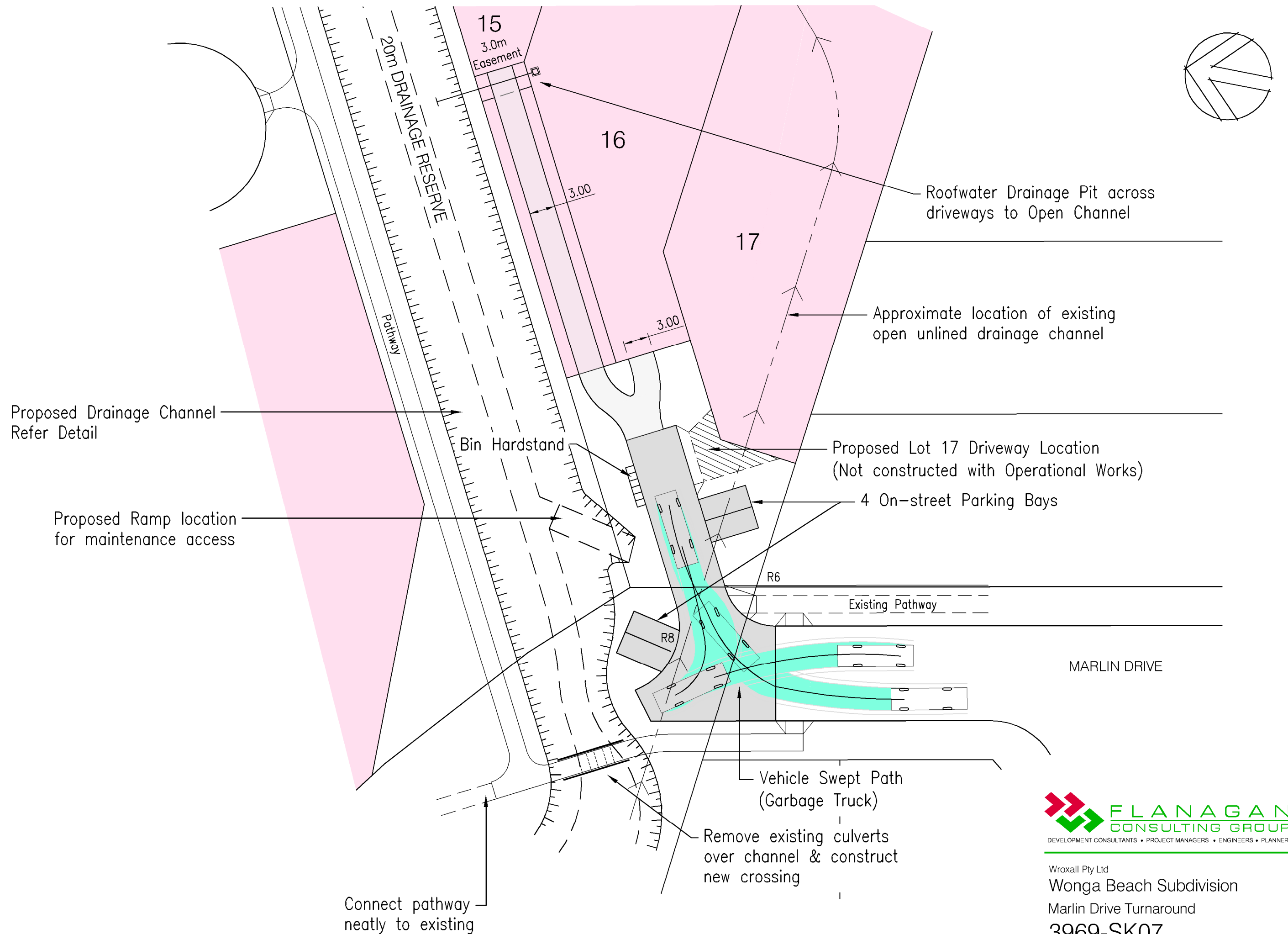
- Existing Stormwater Drainage
- Proposed Stormwater
- ➔ Indicative Direction of Fall
- Indicative Building Pad (1000m² minimum Area)



PROPOSED DRAINAGE CHANNEL
1:100



TYPICAL BUILDING PAD
1:100



APPENDIX D

Gilbert + Sutherland - On-site sewerage disposal assessment

April 21, 2010

IPA LAW
Level 2,
4-6 Innovation Parkway
Birtinya
Q 4575

Attention: Andrew Davis

Dear Andrew,

RE: PRELIMINARY SITE ASSESSMENT, SITE AT OASIS DRIVE, WONGA BEACH

Further to your request, please find as follows our preliminary assessment of the Wonga Beach site for the purposes of determining the suitability of an 800m² minimum lot size for on-site effluent disposal. This incorporates a preliminary site assessment and desktop review of the information provided to date.

Desktop Review

From a review of the Golder Associates assessment, the site soils consist of predominantly 0.5 - 0.75m brown silty SAND overlying yellow brown to pale grey SAND to 3 - 3.5m overlying dark grey CLAYEY SILTS to SANDY CLAYEY SILTS.

Exceptions to this were soils encountered in the vicinity of boreholes BH05 and BH11 of the 12 boreholes drilled in total. BH05 had 0.75m of SILTY SAND FILL from near surface (0.00m) overlying approx. 0.5m of SILTY CLAY FILL overlying the natural sand horizon. BH11 had 1m of SILTY CLAY FILL from near surface (0.25m) overlying the sand.

The watertable was generally encountered from 1-1.35m NSL (BHs 01, 02, 04, 08, 10, 11, 12) but was encountered at shallow depth in boreholes 03 and 07 (0.55m and 0.3m NSL respectively). No groundwater was encountered to the maximum depth of 5.5m in boreholes 05, 06 and 09.

These soils are similar to those encountered at 'The Ives'. However, groundwater was encountered at greater depth at 'The Ives' (1.8 to 2.1m NSL). This may be a reflection of both the increased site elevation and the date of observation given the much drier rainfall average for October (39.7mm) compared to January (397mm) (source BOM Cairns Airport).

Preliminary Site Assessment

A preliminary site assessment was undertaken on 12.04.10 by Gilbert & Sutherland staff. This incorporated a general inspection of the soil surface conditions and any impediments to on-site effluent disposal and an inspection of the recent drainage works by Council.

The hotel shown on the attached 2003 Google Earth image and Drawing 7427WEY-04 has been removed, however the asphalt roads still exist (although are degraded). The existing pond shown on the image and drawing in the central section of the site exists

and is approximately 0.3-0.5m below NSL (near surface level) (See attached Plates 2, 3 and 7). On initial inspection the pond appears to be a groundwater window - this will be confirmed with an additional inspection later this week or early next week.

There are three existing stormwater drains on the site:

- The northern drain which flows east-west
- The western drain which flows north-south; and
- The southern drain which flows east-west

The northern drain had a standing water level measured at 0.57m below the headwall at the eastern end of the drain (see Plate 15) and a depth of 0.07m; and 0.94m below the headwall at the western end of the drain (Plate 1) and a depth of 0.18m.

The western drain runs adjacent to a paved bike path which forms the western boundary of the site. The standing water level (taken adjacent the proposed loop road near lots 45-49 on Drawing M2186-07) was approximately 0.6m below NSL (Plate 11) with a depth of 0.19m.

Works have recently occurred in the southern drain. Standing water level was measured at 1.15m below the headwall at the western end (Plates 4, 5 and 12) with a depth of 0.10m, and approximately 1.3m below NSL at the eastern end (Plate 13) with a depth of 0.2m. Pictures were taken along the central section of the drain (Plates 8, 10 and 16) and the far western and eastern ends (Plates 5 and 9).

There was approximately 40-60m of veg between the eastern border and HAT. The site itself is highly disturbed and has been previously cleared of vegetation, and consists mainly of grasses. The southern section adjacent to the drain has recently been stripped.

An area of reasonably poor drainage was identified in the vicinity of (i.e. between) Golder Associates borehole locations BH06 and BH07 (i.e. lot 20) (Plate 14).

Drain works

As discussed above, Plates 8, 10 and 16 show the recent drainage works along the southern drain.

Preliminary conclusions

From the preliminary site assessment and review of supplied information, there appears to be only limited impediment with regard to on-site effluent disposal in relation to the proposed minimum lot size of 800m². Impediments include clay fill at shallow depth in the vicinity of Golder Associates borehole BH11 and some more poorly drained areas associated with a small drainage depression in the vicinity of Golder Associates boreholes BH06 and BH07.

This will be confirmed by another site visit either this week or early next week.

We have attached for your reference the Golder borehole logs with a handdrawn borehole locations map over the lot layout extrapolated from the Golder Report.

To aid in further detailed assessment it would be very helpful if we could get the contour Drawing 7427WEY-04 by Charles O'Neil in ACAD to confirm these standing

water level measurements in mAHD – particularly at the headwalls (the levels are very hard to read on the photocopied version). An ACAD version of the existing stormwater layout with Z levels would also be very helpful.

We trust this is acceptable. Please contact us if you have any queries regarding this preliminary assessment.

Yours faithfully,
Gilbert & Sutherland Pty Ltd

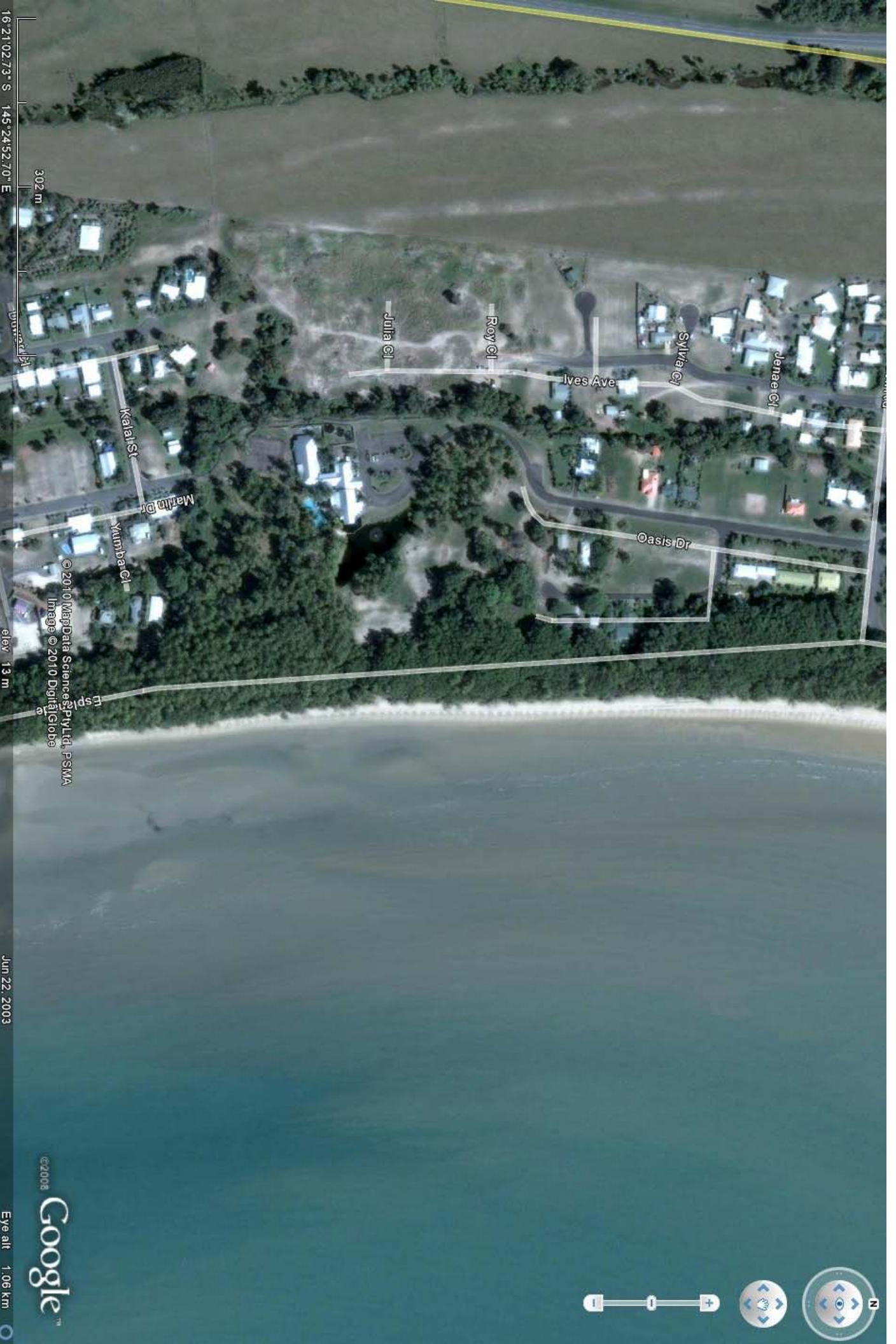


Greg Holland
Principal Environmental Scientist



Megan Hancock
Environmental Scientist

ATTACHMENT 1 – Google Earth Map 2003 and survey map Drawing 7427WEY-04 by Charles O'Neill Pty Ltd Consulting Surveyors



16°21'02.73" S 145°24'52.70" E

302 m

Kalai St

Yumba Ct

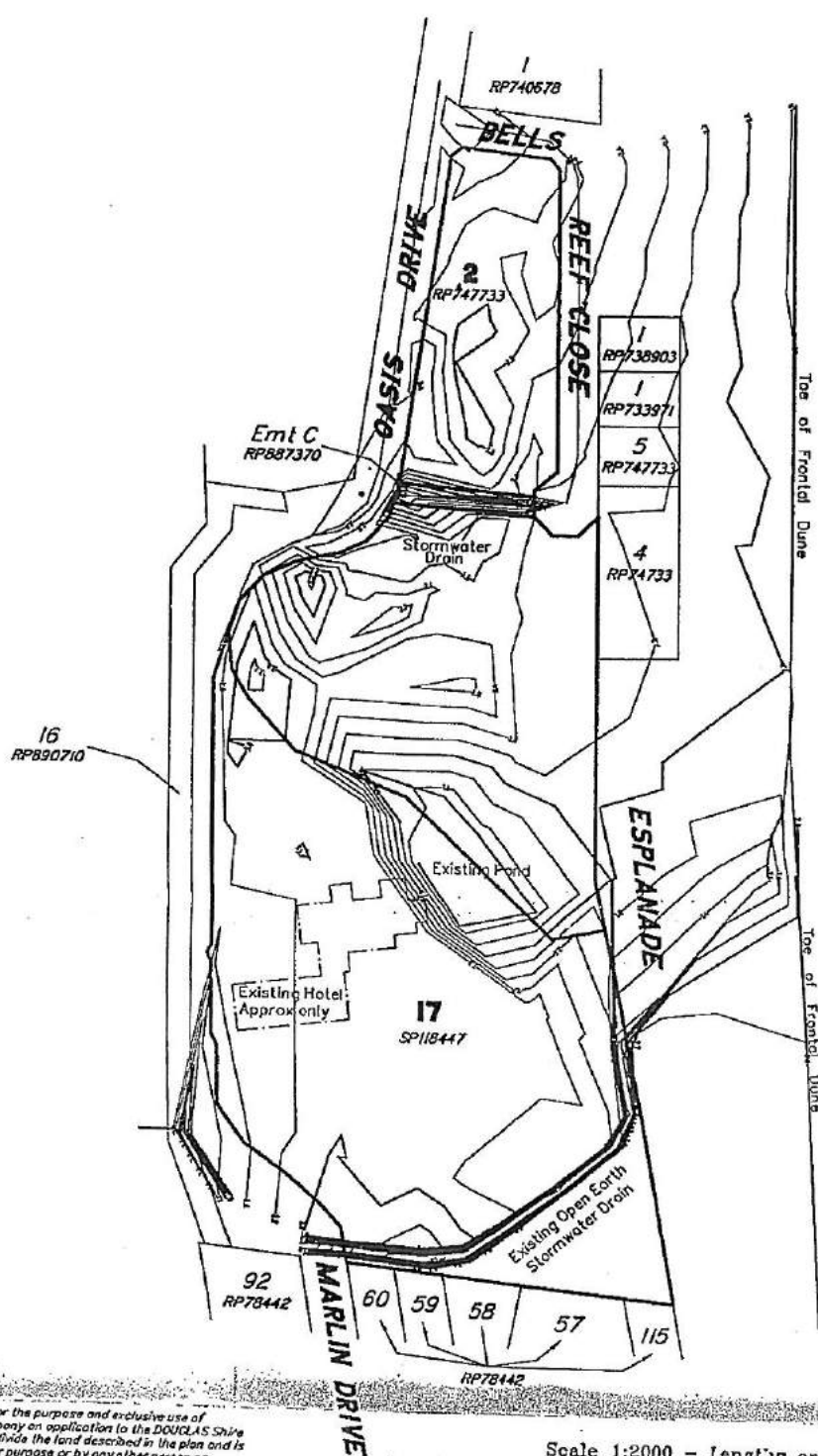
© 2010 MapData Science Pty Ltd, PSMA
Image © 2010 DigitalGlobe

elev 13 m

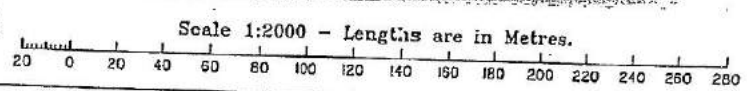
Jun 22, 2003

©2008 Google
Eye alt 1.06 km





DISCLAIMER:
 (i) This plan was prepared for the purpose and exclusive use of WROXALL Pty Ltd to accompany an application to the DOUGLAS Shire Council for approval to subdivide the land described in the plan and is not to be used for any other purpose or by any other person or corporation. Charles O'Neill Pty Ltd, accepts no responsibility for any loss or damage suffered however arising to any person or corporation who may use or rely on this plan in contravention of the terms of this clause or clauses (ii) to (iv) hereof.
 (ii) The contours shown on this plan are derived from preliminary field work, or other sources and are suitable only for the purposes of this application. The accuracy of the contours has not been verified and no reliance should be placed upon such contours for any purpose other than for the purpose of this application.
 (iii) The dimensions, area, size and location of improvements, flood information (if shown) and number of lots shown on this plan are approximate only and may vary.
 (iv) Unless stated otherwise, no investigations have been carried out by Charles O'Neill Pty Ltd into whether or not any of the land has been filled, and it is recommended that such investigation be undertaken by a suitably qualified person.
 (v) Scale shown is correct for the original plan and any copies of this plan should be verified by checking against the bar scale.
 (vi) This plan may not be photocopied unless this note is included.



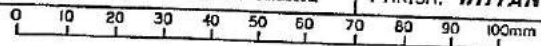
Charles O'Neill Pty. Ltd.
Consulting Surveyors

Pentagon Office 20-25 Grafton Street
 P.O. Box 5246 CAIRNS 4870
 Phone (07) 4051 6722 Fax (07) 4031 1448
 Email: manager@oneillsurveyors.com.au
 ACN 010 329 174

**Contour Plan of Lot 2 on
 RP747733 Easement C on
 RP887370 and Lot 17 on
 SP118447**

PARISH: **WHYANBEEL** COUNTY: **SOLANDER**

Scale: 1:2000 - A3	
Drawn: AD	Checked: SRS
Cad Ref: 74270T-04	Orig. Issue: 09/07
PASSED & ENDORSED: By: J. Sessions Date:	
Signed: _____ Cadastral Surveyor	
Plan No. 7427WEY-04	



ATTACHMENT 2 – Golder Associates Borehole logs and locations overlay



REPORT OF BOREHOLE: BH01

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.8 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT		Groundwater Encountered @ 1.0m	0.0	2.80	BH01/1				Silty SAND		
			0.25	2.55	DS 0.00-0.25m				Fine to coarse grained, brown, trace fine roots		
			0.50	2.30	BH01/2				Dark brown		
			0.75	2.05	DS 0.25-0.50m						
			1.00	1.80	BH01/3				SAND		
			1.25	1.55	DS 0.50-0.75m				Fine to medium grained, pale yellow brown, no roots		
			1.50	1.30	BH01/4				Fine grained		
			1.75	1.05	DS 0.75-1.00m						
			2.00	0.80	BH01/5						
			2.25	0.55	DS 1.00-1.25m				Fine to coarse grained		
			2.50	0.30	BH01/6						
			2.75	0.05	DS 1.25-1.50m						
			3.00	-0.20	BH01/7						
			3.25	-0.45	DS 1.50-1.75m						
			3.50	-0.70	BH01/8						
			3.75	-0.95	DS 1.75-2.00m						
			4.00	-1.20	BH01/9						
			4.25	-1.45	DS 2.00-2.25m						
			4.50	-1.70	BH01/10						
			4.75	-1.95	DS 2.25-2.50m						
			5.00	-2.20	BH01/11						
			5.25	-2.45	DS 2.50-2.75m						
			5.50	-2.70	BH01/12						
END OF BOREHOLE @ 5.50 m											

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2

GAP GNS PASS REV: GIB FULL PAGE: WONGA BEACH 07/07/2008 12:45:57 PM



REPORT OF BOREHOLE: BH02

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.8 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling		Field Material Description			
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol
SOIL / ROCK MATERIAL DESCRIPTION						MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	Groundwater Encountered @ 1.35m		0.0	2.80	BH02/1 DS 0.00-0.25m			
					BH02/2 DS 0.25-0.50m			
			0.5	2.30	BH02/3 DS 0.50-0.75m			
				0.75	BH02/4 DS 0.75-1.00m			
				2.05	BH02/5 DS 1.00-1.25m			
			1.0	1.80	BH02/6 DS 1.25-1.50m			
				1.30	BH02/7 DS 1.50-1.75m			
				1.75	BH02/8 DS 1.75-2.00m			
				1.05	BH02/9 DS 2.00-2.25m			
			2.0		BH02/10 DS 2.25-2.50m			
					BH02/11 DS 2.50-2.75m			
					BH02/12 DS 2.75-3.00m			
			3.0		BH02/13 DS 3.00-3.25m			
					BH02/14 DS 3.25-3.50m			
					BH02/15 DS 3.50-3.75m			
				3.75	BH02/16 DS 3.75-4.00m			
				-0.95	BH02/17 DS 4.00-4.15m			
			4.0		BH02/18 DS 4.15-4.50m			
				4.15	BH02/19 DS 4.50-4.75m			
				-1.35	BH02/20 DS 4.75-5.00m			
			4.5		BH02/21 DS 5.00-5.25m			
				4.50	BH02/22 DS 5.25-5.50m			
				-1.70				
			5.0					
				5.50				
				-2.70				
			5.5		END OF BOREHOLE @ 5.50 m			
			6.0					
			6.5					
			7.0					
			7.5					
			8.0					

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2



REPORT OF BOREHOLE: BH03

CLIENT: Wroxall Investments
PROJECT: ASS investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.4 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 10/2/08

Drilling				Sampling		Field Material Description								
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
PT		Groundwater Encountered @ 0.55m	0.0	2.40	BH03/1				Silty SAND	M				
			0.25	DS 0.00-0.25m	Fine to medium grained, brown, through to pale yellow brown, trace fine roots									
			2.15	BH03/2	DS 0.25-0.50m				Pale brown					
			0.5	0.50	BH03/3				SAND	W				
			1.90	DS 0.50-0.75m	Fine to medium grained, pale yellow brown									
			1.0	BH03/4	DS 0.75-1.00m									
			1.25	BH03/5	DS 1.00-1.25m									
			1.15	BH03/6	DS 1.25-1.50m				Fine to coarse grained					
			1.75	BH03/7	DS 1.50-1.75m									
			0.65	BH03/8	DS 1.75-2.00m				Pale grey					
			2.0	BH03/9	DS 2.00-2.25m									
			2.25	BH03/10	DS 2.25-2.50m				Medium to coarse grained					
			2.5	2.50	BH03/11				DS 2.50-3.00m					Fine to coarse grained
			3.0		BH03/12				DS 3.00-3.50m					
			3.5	3.50	BH03/13				DS 3.50-4.50m					With some silt
			4.0											
			4.5	4.50	BH03/14				DS 4.50-5.00m					Silty Clayey SAND
5.0	5.00	BH03/15	DS 5.00-5.50m	Sandy Clayey SILT										
5.5	5.50			END OF BOREHOLE @ 5.50 m										
	6.0													
	6.5													
	7.0													
	7.5													
	8.0													

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN, F01a
RL2



REPORT OF BOREHOLE: BH04

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.2 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EzlProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
PT			0.0	2.20	BH04/1 DS 0.00-0.25m			Silly SAND Fine to medium grained, brown, trace fine roots	M			
			0.5	0.50	BH04/2 DS 0.25-0.50m							
			1.0	1.00	BH04/3 DS 0.50-0.75m			SAND Fine to coarse grained, pale yellow brown				
			1.5	1.50	BH04/4 DS 0.75-1.00m			Fine to medium grained				
			2.0	2.00	BH04/5 DS 1.00-1.25m			With some imbedded dark brown fine to medium grained silty sand				
			2.5	2.50	BH04/6 DS 1.25-1.50m			Fine to coarse grained, no imbedded silty sand				
			3.0	3.00	BH04/7 DS 1.50-1.75m			Pale yellow brown and pale grey				
			3.5	3.50	BH04/8 DS 1.75-2.00m			Pale grey, trace roots				
			4.0	4.00	BH04/9 DS 2.00-2.25m			No roots				
			4.5	4.50	BH04/10 DS 2.25-2.50m							
			5.0	5.00	BH04/11 DS 2.50-3.00m							
			5.5	5.50	BH04/12 DS 3.00-3.50m							
			6.0	6.00	BH04/13 DS 3.50-3.75m			Clayey SILT Dark grey, trace medium to coarse grained sand				
			6.5	6.50	BH04/14 DS 3.75-4.00m			Clayey SILT Grey, trace fine shell				
			7.0	7.00	BH04/15 DS 4.00-4.25m							
			7.5	7.50	BH04/16 DS 4.25-4.50m							
			8.0	8.00	BH04/17 DS 4.50-5.00m							
			8.5	8.50	BH04/18 DS 5.00-5.50m							
			9.0	9.00	END OF BOREHOLE @ 5.50 m							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN, F01a
RL2



REPORT OF BOREHOLE: BH05

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.9 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	Groundwater Not Encountered		0.0	2.90	BH05/1 DS 0.00-0.25m				FILL:- Silty SAND Fine to coarse grained, dark brown through to brown, trace fine roots	M	
			0.5	0.50	BH05/2 DS 0.25-0.50m				Fine to medium grained, pale brown, with some fine to medium gravel, with some clay		
			1.0	1.00	BH05/3 DS 0.50-0.75m				FILL:- Silty CLAY Pale brown and pale red brown, trace fine to medium grained gravel, trace fine to medium grained sand		
			1.5	1.50	BH05/4 DS 0.75-1.00m				Trace fine to coarse grained gravel		
			2.0	2.00	BH05/5 DS 1.00-1.25m				Silty SAND Fine to coarse grained, pale yellow brown		
			2.5	2.50	BH05/6 DS 1.25-1.50m				SAND Fine grained, pale yellow brown		
			3.0	3.00	BH05/7 DS 1.50-1.75m				Fine to medium grained sand		
			3.5	3.50	BH05/8 DS 1.75-2.00m				Fine to coarse grained sand		
			4.0	4.00	BH05/9 DS 2.00-2.25m				Pale yellow brown and pale grey		
			4.5	4.50	BH05/10 DS 2.25-2.50m				Pale grey		
			5.0	5.00	BH05/11 DS 2.50-2.75m				Medium to coarse grained		
			5.5	5.50	BH05/12 DS 2.75-3.00m				Fine to coarse grained		
			6.0	6.00	BH05/13 DS 3.00-3.25m				Clayey SILT Dark grey, trace medium to coarse grained sand, trace fine to medium shells		
			6.5	6.50	BH05/14 DS 3.25-3.50m						
			7.0	7.00	BH05/15 DS 3.50-3.75m						
			7.5	7.50	BH05/16 DS 3.75-4.00m						
			8.0	8.00	BH05/17 DS 4.00-4.25m						
			8.5	8.50	BH05/18 DS 4.25-4.50m						
			9.0	9.00	BH05/19 DS 4.50-4.75m						
			9.5	9.50	BH05/20 DS 4.75-5.00m						
			10.0	10.00	BH05/21 DS 5.00-5.25m						
			10.5	10.50	BH05/22 DS 5.25-5.50m						
			11.0	11.00	END OF BOREHOLE @ 5.50 m						

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2

GAP DNS PASS REMOVED FULL PAGE 11/01/2008 12:46:36 PM



REPORT OF BOREHOLE: BH06

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.5 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EzIProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
PT	Groundwater Not Encountered		0.0	2.60	BH06/1			Silty SAND	W		
			0.25	DS 0.00-0.25m	BH06/2			Fine to coarse grained, brown, trace fine roots			
			0.50	DS 0.25-0.50m	BH06/3			Becoming pale yellow brown			
			0.75	DS 0.50-0.75m	BH06/4			SAND			
			1.00	DS 0.75-1.00m	BH06/5			Fine to medium grained, pale yellow brown			
			1.25	DS 1.00-1.25m	BH06/6			Fine grained			
			1.50	DS 1.25-1.50m	BH06/7			Fine to coarse grained			
			1.75	DS 1.50-1.75m	BH06/8			Trace roots			
			2.00	DS 1.75-2.00m	BH06/9						
			2.25	DS 2.00-2.25m	BH06/10						
			2.50	DS 2.25-2.50m	BH06/11			Medium to coarse grained, pale grey, trace fine shell			
			2.75	DS 2.50-2.75m	BH06/12			Fine to coarse grained			
			3.00	DS 2.75-3.00m	BH06/13						
			3.25	DS 3.00-3.25m	BH06/14			Sandy Clayey SILT			
			3.50	DS 3.25-3.50m	BH06/15			Dark grey, trace fine shells			
			3.75	DS 3.50-3.75m	BH06/16						
			4.00	DS 3.75-4.00m	BH06/17						
			4.25	DS 4.00-4.25m	BH06/18			No shells			
			4.50	DS 4.25-4.50m	BH06/19			Trace fine shells			
			4.75	DS 4.50-4.75m	BH06/20						
			5.00	DS 4.75-5.00m	BH06/21						
			5.25	DS 5.00-5.25m	BH06/22						
			5.50	DS 5.25-5.50m				END OF BOREHOLE @ 5.50 m			
6.0											
6.5											
7.0											
7.5											
8.0											

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2



REPORT OF BOREHOLE: BH07

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.3 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EzProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 11/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling			Field Material Description		
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION
PT		Groundwater Encountered @ 0.3m	0.0	2.30	BH07/1 DS 0.00-0.25m			Silty SAND Fine to medium grained, brown, trace fine roots
			0.5	0.75	BH07/2 DS 0.25-0.50m			
			1.0	1.65	BH07/3 DS 0.50-0.75m			
			1.5	1.50	BH07/4 DS 0.75-1.00m			SAND Fine to medium grained, pale yellow brown
			2.0	0.80	BH07/5 DS 1.00-1.25m			
			2.5	1.75	BH07/6 DS 1.25-1.50m			With some dark brown fine to medium grained silty sand
			3.0	0.55	BH07/7 DS 1.50-1.75m			No silty sand
			3.5	2.25	BH07/8 DS 1.75-2.00m			
			4.0	0.05	BH07/9 DS 2.00-2.25m			Pale grey, medium to coarse grained
			4.5	3.25	BH07/10 DS 2.25-2.50m			
			5.0	-0.95	BH07/11 DS 2.50-2.75m			
			5.5	3.50	BH07/12 DS 2.75-3.00m			Sandy Clayey SILT Fine to coarse grained, pale grey, trace fine shell
			6.0	-1.20	BH07/13 DS 3.00-3.25m			Dark grey
			6.5		BH07/14 DS 3.25-3.50m			
			7.0		BH07/15 DS 3.50-3.75m			
			7.5		BH07/16 DS 3.75-4.00m			
			8.0		BH07/17 DS 4.00-4.25m			
			8.5		BH07/18 DS 4.25-4.50m			
			9.0		BH07/19 DS 4.50-4.75m			
			9.5		BH07/20 DS 4.75-5.00m			
			10.0		BH07/21 DS 5.00-5.25m			
			10.5		BH07/22 DS 5.25-5.50m			
			5.5	-3.20	END OF BOREHOLE @ 5.50 m			

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2

GAP CNS PASS REV0102 FULL PAGE WONGA BEACH GINT FN F01a GAP 1.80T 21/02/2008 12:46:51 PM



REPORT OF BOREHOLE: BH08

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EzlProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 12/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling			Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
PT		Groundwater Encountered @ 1.2m	0.0	2.00	BH08/1			Silty SAND			
			0.25	DS 0.00-0.25m	Fine to coarse grained, brown, trace fine to medium roots						
			0.5	1.75	BH08/2			DS 0.25-0.50m			SAND
			0.75	BH08/3	DS 0.50-0.75m			Fine to medium grained, pale yellow brown, trace medium roots			
			1.0	1.25	BH08/4			DS 0.75-1.00m			Fine grained
			1.25	BH08/5	DS 1.00-1.25m						
			1.5	BH08/6	DS 1.25-1.50m						
			1.75	BH08/7	DS 1.50-1.75m						
			2.0	0.25	BH08/8			DS 1.75-2.00m			Fine to medium grained
			2.25	BH08/9	DS 2.00-2.25m			Pale yellow brown and pale grey, trace roots			
			2.5	0.25	BH08/10			DS 2.25-2.50m			Fine to coarse grained, pale grey
			2.75	BH08/11	DS 2.50-2.75m			No roots			
			3.0	BH08/12	DS 2.75-3.00m						
			3.25	BH08/13	DS 3.00-3.25m						
			3.5	1.25	BH08/14			DS 3.25-3.50m			Medium to coarse grained
			3.75	BH08/15	DS 3.50-3.75m			Sandy Clayey SILT			
			4.0	1.75	BH08/16			DS 3.75-4.00m			Pale grey, trace fine shell
			4.25	BH08/17	DS 4.00-4.25m			Dark grey			
			4.5	BH08/18	DS 4.25-4.50m						
			4.75	BH08/19	DS 4.50-5.00m						
5.0	BH08/20	DS 5.00-5.50m									
5.5	5.50			END OF BOREHOLE @ 5.50 m							
6.0	3.50										
6.5											
7.0											
7.5											


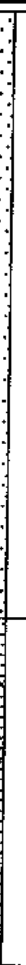

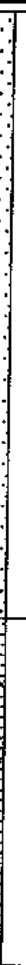


REPORT OF BOREHOLE: BH09

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.9 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 12/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling		Field Material Description								
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT			0.0	2.90	BH09/1				SAND	M			
			0.25	DS 0.00-0.25m	Fine to medium grained, pale yellow brown and pale brown, trace fine to medium roots, trace of silt								
			0.50	DS 0.25-0.50m	With some dark brown fine to medium grained silty sand								
			0.75	BH09/3	No silty sand, no roots								
			1.00	DS 0.50-0.75m									
			1.25	BH09/4	Pale yellow brown								
			1.50	DS 0.75-1.00m									
			1.75	BH09/5									
			2.00	DS 1.00-1.25m									
			2.25	BH09/6									
			2.50	DS 1.25-1.50m									
			2.75	BH09/7	Fine grained								
			3.00	DS 1.50-1.75m									
			3.25	BH09/8	Fine to medium grained								
			3.50	DS 1.75-2.00m									
			3.75	BH09/9	Pale yellow brown and pale grey								
			4.00	DS 2.00-2.25m									
			4.25	BH09/10	Fine to coarse grained, trace roots								
4.50	DS 2.25-2.50m												
4.75	BH09/11	No roots	W										
5.00	DS 2.50-3.00m												
5.25													
5.50	BH09/12												
5.75	DS 3.00-3.50m												
			6.00	3.50	BH09/13				Sandy Clayey SILT				
			6.25	DS 3.50-3.75m	Dark grey, fine to medium grained sand, trace fine shells								
			6.50	BH09/14									
			6.75	DS 3.75-4.00m									
			7.00	BH09/15									
			7.25	DS 4.00-4.25m									
			7.50	BH09/16									
			7.75	DS 4.25-4.50m									
			8.00	BH09/17									
			8.25	DS 4.50-5.50m									
			5.50	-2.60	END OF BOREHOLE @ 5.50 m								
			6.0										
			6.5										
			7.0										
			7.5										
			8.0										

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP g/INT FN. F01a
RL2



REPORT OF BOREHOLE: BH10

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 2.9 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: PAW DATE: 12/1/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling			Field Material Description		
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol
SOIL / ROCK MATERIAL DESCRIPTION						MOISTURE	CONSISTENCY	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT		Groundwater Encountered @ 1.3m	0.0	2.90	BH10/1			
			0.25	2.65	DS 0.00-0.25m			
			0.50	2.40	BH10/2			
			0.75	2.15	DS 0.25-0.50m			
			1.00	1.90	BH10/3			
			1.25	1.65	DS 0.50-0.75m			
			1.50	1.40	BH10/4			
			1.75	1.15	DS 0.75-1.00m			
			2.00	0.90	BH10/5			
			2.25	0.65	DS 1.00-1.25m			
			2.50	0.40	BH10/6			
			2.75	0.15	DS 1.25-1.50m			
			3.00	-0.10	BH10/7			
			3.25	-0.35	DS 1.50-1.75m			
			3.50	-0.60	BH10/8			
			3.75	-0.85	DS 1.75-2.00m			
			4.00	-1.10	BH10/9			
			4.25	-1.35	DS 2.00-2.25m			
			4.50	-1.60	BH10/10			
			4.75	-1.85	DS 2.25-2.50m			
			5.00	-2.10	BH10/11			
			5.25	-2.35	DS 2.50-2.75m			
			5.50	-2.60	BH10/12			
			5.75	-2.85	DS 2.75-3.00m			
			6.00	-3.10	BH10/13			
			6.25	-3.35	DS 3.00-3.25m			
			6.50	-3.60	BH10/14			
			6.75	-3.85	DS 3.25-3.50m			
			7.00	-4.10	BH10/15			
			7.25	-4.35	DS 3.50-4.00m			
			7.50	-4.60	BH10/16			
			7.75	-4.85	DS 4.00-4.50m			
			8.00	-5.10	BH10/17			
			8.25	-5.35	DS 4.50-5.00m			
			8.50	-5.60	BH10/18			
			8.75	-5.85	DS 5.00-5.50m			
			9.00	-6.10	END OF BOREHOLE @ 5.50 m			

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2



REPORT OF BOREHOLE: BH11

CLIENT: Wroxall Investments
PROJECT: ASS Investigation
LOCATION: Wonga Beach
JOB NO: 077673054

POSITION: Refer to Site Plan
SURFACE RL: 3 m DATUM: AHD
INCLINATION: -90°
HOLE DIA: mm HOLE DEPTH: 5.50 m

SHEET: 1 OF 1
DRILL RIG: EziProbe
DRILLER: GAP - AAB
LOGGED: RG DATE: 1/2/08
CHECKED: PKS DATE: 19/2/08

Drilling			Sampling		Field Material Description			
METHOD	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT	Groundwater Encountered @ 1.25m	0.0	0.10	BH11/1		USC	TOPSOIL:- SAND	
		0.25	0.25	DS 0.10-0.25m			Medium grained, dark grey brown, some clay	
		2.75	2.75	BH11/2			FILL:- Clayey SAND	
				DS 0.25-0.50m			Fine to medium grained, brown, some gravel	
				BH11/3			FILL:- Silty CLAY	
				DS 0.50-0.75m		M	Brown and red brown, some sand and gravel	
				BH11/4				
				DS 0.75-1.00m				
				BH11/5				
				DS 1.00-1.25m				
		1.25	1.25	BH11/6			SAND	
		1.75	1.75	DS 1.25-1.50m			Fine to medium grained, grey brown	
				BH11/7				
				DS 1.50-1.75m				
				BH11/8				
				DS 1.75-2.00m				
		2.00	2.00	BH11/9		M	SAND	
		1.00	1.00	DS 2.00-2.25m			Fine to medium grained, grey, some coarse sand and fine grained gravel	
				BH11/10				
				DS 2.25-2.50m				
		2.50	2.50	BH11/11			Fine to medium grained	
		0.50	0.50	DS 2.50-2.75m				
				BH11/12				
				DS 2.75-3.00m				
		3.00	3.00	BH11/13			Medium to coarse grained	
		0.00	0.00	DS 3.00-3.25m				
				BH11/14				
				DS 3.25-3.50m				
				BH11/15				
				DS 3.50-3.75m				
				BH11/16				
				DS 3.75-4.00m				
		4.00	4.00	BH11/17		M	Sandy Clayey SILT	
		-1.00	-1.00	DS 4.00-4.25m			Dark grey, fine grained sand, trace fine shells	
				BH11/18				
				DS 4.25-4.50m				
				BH11/19				
				DS 4.50-4.75m				
				BH11/20				
				DS 4.75-5.00m				
		5.0	5.0	BH11/21				
				DS 5.00-5.25m				
				BH11/22				
				DS 5.25-5.50m				
		5.50	5.50				END OF BOREHOLE @ 5.50 m	
		-2.50	-2.50					

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL2

GAP CNE PASS REV06.GLB FULL PAGE JENUN200707673054 - OASIS DRIVE, WONGA BEACH 08/10/2007 12:47:14 PM

ATTACHMENT 3 – Plates



Plate 1. At northern drain culvert at Oasis drive



Plate 4. Southern drain looking from culvert at end of Marlin Drive looking east



Plate 2. Western bank of pond looking east



Plate 5. Southern drain looking west towards culvert at end of Marlin Drive



Plate 3. From Plate 2 looking north



Plate 6. From Culvert at end of Marlin Drive looking west



Plate 7. From southern bank of pond looking north



Plate 10. Mid-southern drain looking northeast



Plate 8. Central southern drain looking east at recent drain works



Plate 11. Standing water level in western drain



Plate 9. From southern drain at eastern boundary looking east



Plate 12. Standing water level southern drain at western boundary



Plate 13. Standing water level southern drain at eastern boundary



Plate 16. Southern drain near eastern boundary looking south west at recent drain works



Plate 14. From Golder Associates BH06 looking SW towards area of poor drainage



Plate 15. Standing water level east drain western end

APPENDIX E

DHI Water & Environmental and Water - Flood impact assessment



TATE Professional Engineers Pty Ltd

39-45 First Avenue
PO Box 1092
Mooloolaba QLD 4557
Australia

Att: Steve Harrison

**DHI Water & Environment
Pty Ltd**

Level 5, 67 Astor Terrace

QLD-4000 Spring Hill
Australia

61 7 3236 9161 Telephone
61 7 3236 9461 Telefax

tvk@dhigroup.com

Ref:
43801457

Init:
TVK

Date:
28 November 2013

Concerning – Flood impact assessment of the amended Oasis Drive Development at Wonga Beach

Dear Steve,

As described in our proposal of 18th November 2013, we have carried out flood impact modelling for the proposed Oasis Drive Development at Wonga Beach. The attached letter report documents the study results, and outlines the methodology applied and key modelling assumptions.

The work amends a previous study carried out by DHI in 2009 for the site. An amendment to the 2009 development plan was submitted to Cairns Council in 2013. The amended plan envisages reconstruction of the existing "Pub Drain" channel, instead of box culverts running through the middle of the development site, as was originally proposed. Council requested that the impact of the revised layout on flood levels be investigated for the subject site and its surroundings.

In addition to testing the impact of the revised layout, this study also seeks to optimise the design dimensions and effectiveness of the drain. The objectives of this are to minimise the channel footprint on the site, and to minimise upstream peak flood water levels potentially affecting minimum development plot ground levels.

The analysis found that a 3 metre trapezoidal Pub Drain channel base width is necessary to minimise peak flood levels. While a narrower channel would be sufficient to offset the development impact on the surrounding floodplain in the 100 year ARI event, the design peak water levels in Wonga Drain (west of the development) would require higher minimum plot ground levels.

To avoid this increase, the 3 metre base channel was retained for an entire reconstructed length of the Pub Drain from Wonga Drain down to the sea outlet. Furthermore, the proposed cycle way along the western boundary of the site has been configured in the model to act as a high level floodway to further alleviate peak flood levels. Full details of these considerations are included in the following report.

Please contact me if you have any queries or comments,

Best regards
DHI

Terry van Kalken
Technical Director

Wonga Beach Oasis Drive Development – Flood modelling assessment

Prepared by DHI Water and Environment, November 2013

Project objectives

This study outlines hydraulic modelling carried out for a proposed development at Oasis Drive, Wonga Beach. It utilises an existing MIKE11 model of Wonga Beach, developed for the Wonga Beach Area Drainage Study for Douglas Shire Council in 2001. The 2001 model was subsequently adapted for an earlier development assessment study at the same Oasis Drive site in 2009. The current study updates the 2009 work to reflect recent changes in the development plan.

This study report aims to provide the following information:

- **Development flood impact assessment:** comparison of peak catchment flood levels for the existing and post-development cases, to assess the impact of the development on local flooding
- **Design level modelling:** simulation of the development under a catchment generated flood in combination with storm tide event; and also under a more severe storm surge event, as an input to development floor level selection.

Note that the 2009 study included a range of information regarding sedimentation, and culvert and beach outfall maintenance. This information is not reproduced in the current report, and the 2009 report should be referred to if this is of interest.

Background

The proposed Oasis Drive development site extends from the northern end of Marlin Drive northwards to the intersection of Oasis Drive and Bells Reef Close (see Figure 1). The development site is currently undeveloped open grassland, approximately 5ha in area. The site is bounded on the western side by a drainage easement which runs parallel to the coast, for much of the length of Wonga Beach (called the Wonga Drain in this report).

The 2009 development study focussed on a proposed culvert discharging from Wonga Drain directly eastwards through the middle of the development. The current development proposal does not include this flow route. Instead it involves reconstruction of the entire length of the Pub Drain channel, which runs across the southern edge of the site.



Figure 1 Oasis Drive Development site (Screen captured from Google Earth)

Input data

The current project relies on archived project models from previous work, along with new information provided by TATE Professional Engineers. The information used for the study includes:

- The existing situation model applied in the 2009 Oasis Drive study
- A reconfiguration plan for the development prepared by JFP Consultants for Wroxall Investments (unknown date and plan number)
- Information and assumptions in the 2001 and 2009 studies, which are documented here in relevant parts of this report.

Summary of catchment and sea boundary conditions

The modelling relies on a range of catchment inflow and sea level boundary conditions. These are outlined here, along with an explanation of the combinations of these utilised in the modelling. In setting a minimum lot level for a development site in the coastal plain, the risks associated with flooding and storm surge are generally assessed separately; being the maximum of:

- a site specific flood level of a particular ARI (usually 100 year ARI) that includes a realistic ocean tailwater condition where the site is subject to the effects of tide (rows 1, 2 and 3 in Table 1); and
- a site specific statistical storm tide level with allowances for sea level rise and wave setup (storm surge level; row 4 in Table 1).

Table 1 Modelling boundary condition case summary

Objective	Case	Catchment storm condition	Sea level condition	Comments
Development impact assessment (on drain and floodplain water levels)	Existing baseline situation	1, 10 and 100 year ARI	Low Isles tidal record	Storm discharge and tidal level peak coincide
	Development situation	1, 10 and 100 year ARI	Low Isles tidal record	Storm discharge and tidal level peak coincide
Design level assessment	Development situation, catchment flood with sea event	100 year ARI + 30% flow increase due to climate change	2.10 mAHD (Highest Astronomical Tide + 300mm climate change)	Storm discharge and tidal level peak coincide
	Development situation, sea event	None	2.70 mAHD (100 yr storm surge + 300mm climate + wave, wind setup)	Not modelled as no catchment storm – level for comparison

Drain catchment hydrology

The 2001 DHI Wonga Beach Drainage study included development of storm hydrology for the entire Wonga Beach drainage system. The storm hydrographs produced in the 2001 study are incorporated in the hydraulic model as point inflows, located throughout the model according to the locations of subcatchment inflows. For this study, 1, 10, and 100 year Average Recurrence Interval (ARI) design catchment storms have been incorporated into the model for assessment. The critical storm duration identified in the 2001 study was 2 hours, and this is the duration applied for all catchment floods in the current study.

Scientific opinion suggests climate change impacts on rainfall intensity in tropical areas will lead to increases in short period rainfall intensities of as much as 10-50%. For the current study, a provision for increased future storm intensity of 30% in flow rate has been adopted.

For the development modelling, the following hydrological boundaries have been applied:

- **Development impact assessment:** The current study applies design 1, 10 and 100 year ARI hydrographs from the 2001 Wonga Beach Drainage Study
- **Design level assessment:** The current study applies design 1, 10 and 100 year ARI hydrographs from the 2001 Wonga Beach Drainage Study increased by provision of 30% for climate change

Sea boundaries

The closest mainland tidal station to Wonga Beach is the standard port called Port Douglas. The Highest Astronomical Tide (HAT) at Port Douglas is RL 1.78 m AHD. The tides are semi-diurnal with a large diurnal inequality in both height and phasing. A spring-neap cycle recurs about every 15 days. The spring and neap ranges are 1.76 m and 0.48 m respectively. Table 2 summarises the tidal plane characteristics from Port Douglas applied to this study.

Table 2 Tidal Plane at Port Douglas (Height above AHD; source: Qld Tide Tables MSQ 2014)

Location	MHWS	MHWN	MLWN	MLWS	AHD	MSL	HAT
Port Douglas	0.88	0.24	-0.24	-0.88	0.0	0.01	1.78

This development impact assessment utilises the Low Isles tidal record as in the 2009 study. This is a tidal level record in the vicinity of Wonga Beach under non-storm surge condition and shown in Figure 2.

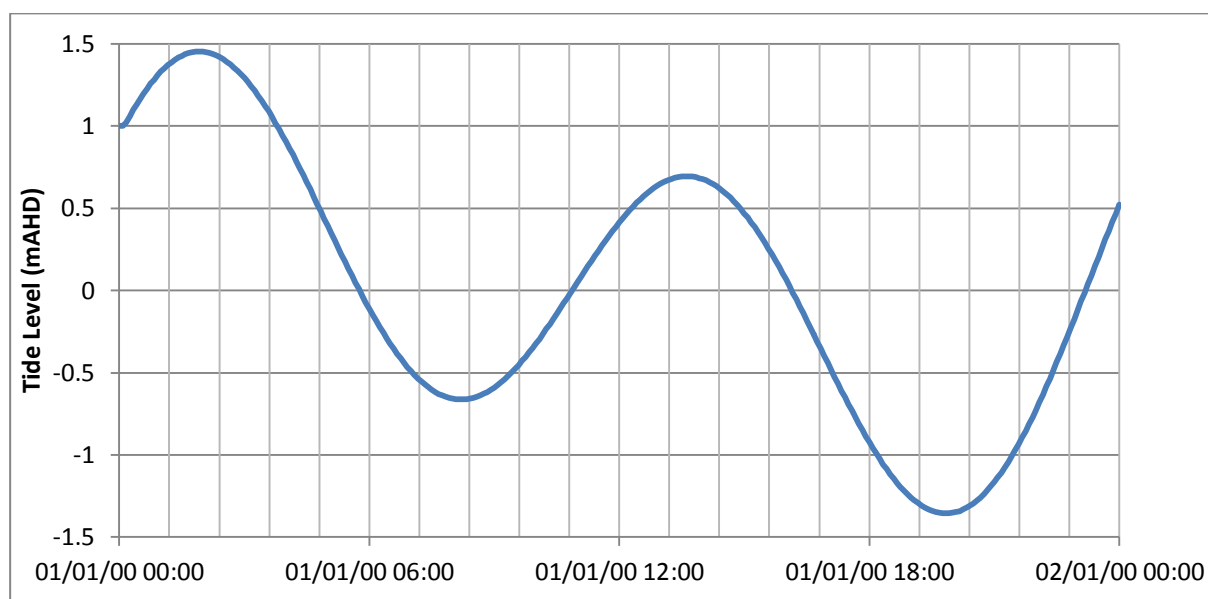


Figure 2 Low Isles tidal level (the record 01/01/2000 00:00– 02/01/2010 00:00 is used as a model boundary)

The design level assessment utilises published data for the analysis of storm tide levels from the Ocean Hazards Assessment (OHA, 2004) at Newell Beach, which is less than 10 km south of the study site. Figure 3 shows return periods for extreme water levels at Newell Beach resulting from tropical cyclone induced storm tides. The synthetic data set has been enhanced to account for the potential impact of climate change up to the year 2050. This has been done by including a sea level rise of 300 mm, increasing the frequency of storms by 10%, increasing the intensity of storms by 10% and shifting the tracks 1.3° south.

It should be noted that there is some considerable debate as to how tropical cyclone patterns will be impacted by climate change. Furthermore, these values do not include any allowances for wave set-up or run-up. However a study by Harper (1998) for Oak Beach recommended an allowance of 0.5 metres.

On the basis of the above information, a reasonable estimate for the 1:100 year water level is RL 2.7 m AHD. This is made up of 2.2 mAHD from the climate enhanced storm tide and an additional 0.5 m to account for wave set-up and run-up. In recommending a storm tide level that has statistical relevance to planning horizons (100 years), it should be noted that severe tropical cyclones (Category 3 and above) in combination with high tides can produce higher levels that pose a significant threat to human life and infrastructure.

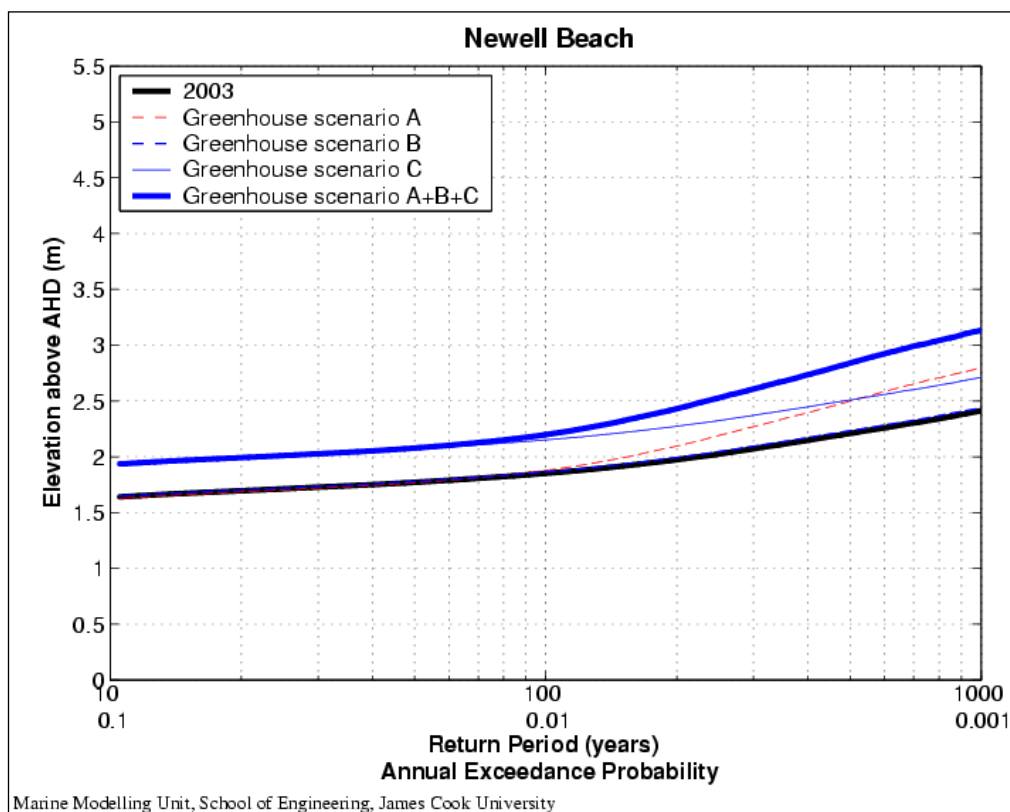


Figure 3 Extreme water level return periods for Newell Beach (OHA, 2004)

A development study for another part of Wonga Beach to the north of the site was recently completed (BMT-WBM, 2013). This study uses similar sea level boundary conditions in its modelling based site assessment. Table 3 compares the sea boundary conditions applied to different aspects of the modelling in the two studies. The table confirms that adopted storm surge design levels are similar (2.70 mAHD in the DHI 2009 and current study, and 2.73 mAHD in the BMT-WBM 2013 study).

Table 3 Comparison of sea boundary conditions in DHI (2009) and BMT-WBM (2013)

	DHI (2009)	WBM (2013)
Sea event		
1:100 year storm tide (including climate change provision)	2.20 mAHD	2.23 mAHD
Storm surge level	2.70 mAHD	2.73 mAHD
Combined catchment flood event and sea event		
Assumed sea outlet boundary	2.10 mAHD	2.23 mAHD
(Highest Astronomical Tide + 300mm climate change)	(Highest Astronomical Tide + 300mm climate change)	(1:100 year storm tide including climate change)
Floor level outcomes at eastern side of development		

	DHI (2009)	WBM (2013)
Floor levels	2.8 m	2.7 to 2.8 m
Floor level minimum determined by	1:100 storm surge level	Q100 flood combined with 1:100 storm tide level

Joint catchment and sea generated flood events

As the catchment has such a short time of concentration (2 hours) large event catchment rainfalls will not be independent of storm surges. Consequently when modelling a catchment rainfall generated flood an elevated sea level boundary must be assumed.

For a given catchment design storm, an appropriate coincident sea level storm surge level would ideally be selected by a comprehensive joint probability assessment. There is no data that would support such an assessment at Wonga Beach, so a choice of suitable design sea level has to be made based on engineering judgement. This choice has to carefully consider the likely correlation between extreme rainfall and sea levels. If the Annual Exceedance Probability (AEP) of the chosen storm sea level is too small (i.e. too unlikely), then the joint probability of the combined flood/surge event becomes very rare and too conservative (e.g. a 100 year ARI flood combined with a 1% AEP storm surge level yields a 10,000 year ARI event if the two events are independent).

For the development modelling, the following approaches have been applied:

- **Development impact assessment:** The current study applies the Low Isle tidal record time series, with the design catchment flood peak occurring around the time of a 1.45 mAHd peak tidal level.
- **Design level assessment:** The current study has chosen to apply Highest Astronomical Tide (HAT) at Port Douglas and an additional increment for climate change generated sea level rise. Applying HAT is generally seen as conservative (as the chances of a flood coinciding with the highest tide of the year are quite small), and applying a sea level rise component also ensures that freeboard above the design flood level is not diminished over time (300mm over the next 50 years is generally considered an appropriate allowance).

Existing situation (baseline) modelling

The existing situation model layout is shown in Figure 4. The key features in the model relevant to this study are:

- **The Pub Drain** through the southern part of the site; this is a roughly trapezoidal earth channel with depth of 1.5 to 2 metres, a base width of 2-3 metres at its base, and 7-10 metres wide at its banks; the drain is approximately 300 metres long, with the upstream 50 metres near Wonga Drain upstream of Kalal Street heavily vegetated; the lower 300 metres runs through grass and open coastal strip
- **The Wonga Drain** which runs along the western side of the site, which is 1-2 metres deep, approximately 2 metres at its base and 6-10 metres wide at its banks; this is heavily vegetated for its entire length
- **The Pub Drain culvert** located at the end of Kalal Street which consists of two 1.2 metre diameter pipes; this is located at the western side of the development site
- **Pub Drain beach discharge:** Pub Drain discharges across the beach into the sea; the beach forms a “berm” across the end of the drain, which is assumed to scour away gradually once upstream drain water levels overtop the berm to a depth of 0.1 metres; the berm level is assumed to be 1.3 metres AHD (as described in the 2001 report)

- **Sea boundary condition:** The Pub Drain channel discharges through the berm and across the beach into the sea; a range of tidal and storm surge levels are assumed at this point in the model

The existing baseline MIKE 11 model from the 2009 study was updated to the latest version of the MIKE11 software (2012 Service Pack 2). The updated model was run with the selected design storms and sea boundaries described in Table 1. Table 4 shows the resulting peak water levels at selected locations around the development site. Results are shown for the locations identified in Figure 4.

Table 4 Peak water levels for catchment design floods under existing situation (Baseline)

Location	Description	MIKE 11 Branch	MIKE 11 Chainage (m)	100 year ARI (mAHD)	10 year ARI (mAHD)	1 year ARI (mAHD)
F	Kalal St	Wonga_sth_Chan	150	2.53	2.37	2.11
H	Marlin Drive -Barker Close	Marlin-drive	810	2.77	2.68	2.57
A	Channel upstream of Wonga Beach road, east	Wonga_nth_chan (Wonga Drain)	560	2.53	2.37	2.10
B	Pub-channel - Wonga Drain	Pub-Chan	170	2.52	2.27	2.08
D	Pub-channel - Upstream of culvert under Marlin Drive	Pub-Chan	240	2.40	2.19	2.02
E	Pub-channel - south edge of the site	Pub-Chan	340	2.08	1.94	1.82
Peak Ocean Level (Boundary)				1.45		

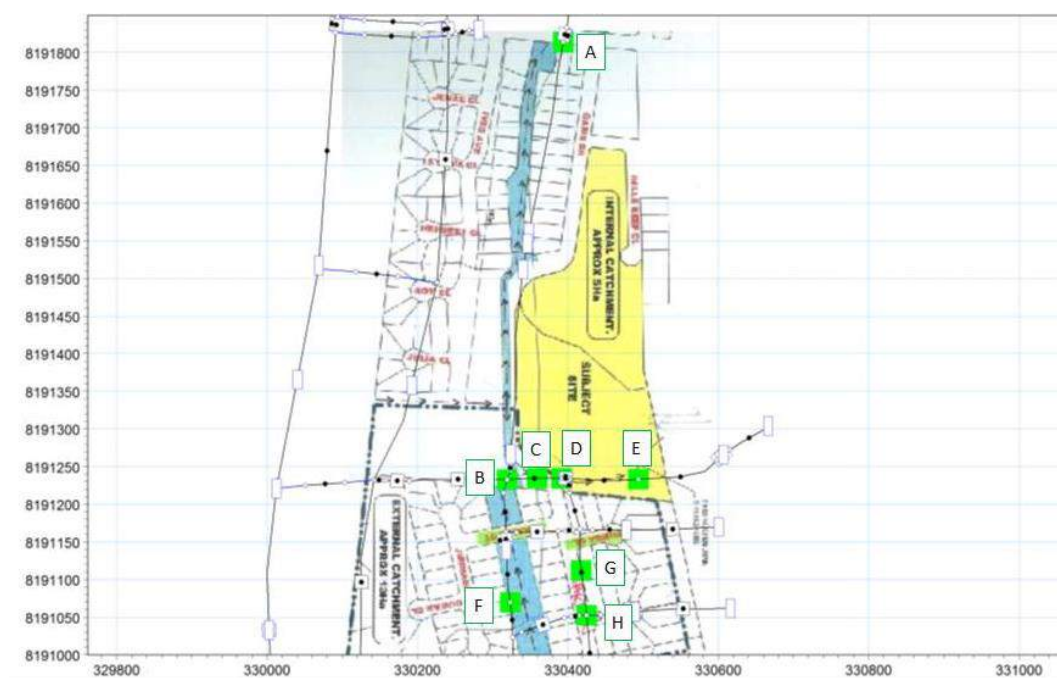


Figure 4 Output Locations

Development impact assessment modelling

The existing baseline model was adapted to represent the proposed development situation, where the Pub Drain channel is reconstructed. The changes made to produce the development model included:

- reconstruction of the Pub Drain channel from Wonga Drain down to the sea outlet:
 - the reconstructed channel maintains the existing bed level profile, but has a rock-lined trapezoidal section with bed width of 3.0 metres and side slopes of 3:1 H:V;
 - this is modelled by replacement of cross-sections Pub-chan 170, Pub-chan 240, Pub-chan 250, Pub-chan 340 and Pub-chan 450 with trapezoidal sections;
 - existing channel bed levels and gradients between cross-sections are maintained; and
 - reconstructed channel sections have Mannings roughness factors reduced from 0.080 to 0.040.
 - the land at the development site is filled to 2.9m and this is represented in the cross-sections at Pub-chan 170, Pub-chan, 240, Pub-chan 340
- construction of a cycle path along the eastern bank of Wonga Drain that will act as a flood relief channel:
 - the average ground level of the cycle path along the Wonga Drain will be 2.5 m AHD;
 - the cycle way and shoulders will be approximately 12 metres wide
 - this drops to 2.4 m AHD as the cycleway approaches Pub Drain at the Marlin Drive culvert crossing.

The channel design concept is based on a preliminary design sketch of the channel provided by TATE Professional Engineers.

As part of the study, various channel widths were evaluated to see if a narrower channel and smaller drainage area footprint could be achieved. Trials were made with channel base widths of 0 and 1.0 metres instead of the initial design width of 3.0 metres. These trials found that narrower channels did have sufficient capacity to offset the impacts of the development on the surrounding floodplain in the *development impact assessment* 100 year ARI event. However narrower channels produced peak Wonga Drain flood levels in the *design level assessment* 100 year ARI flood, that may have required raised minimum plot levels in the development (see the following section). For this reason, the design 3.0 metre channel base width is the selected modelled drain configuration in this study.

The typical cross-sections at Pub Drain and at Wonga Drain are shown in Figure 5 and Figure 6 respectively.

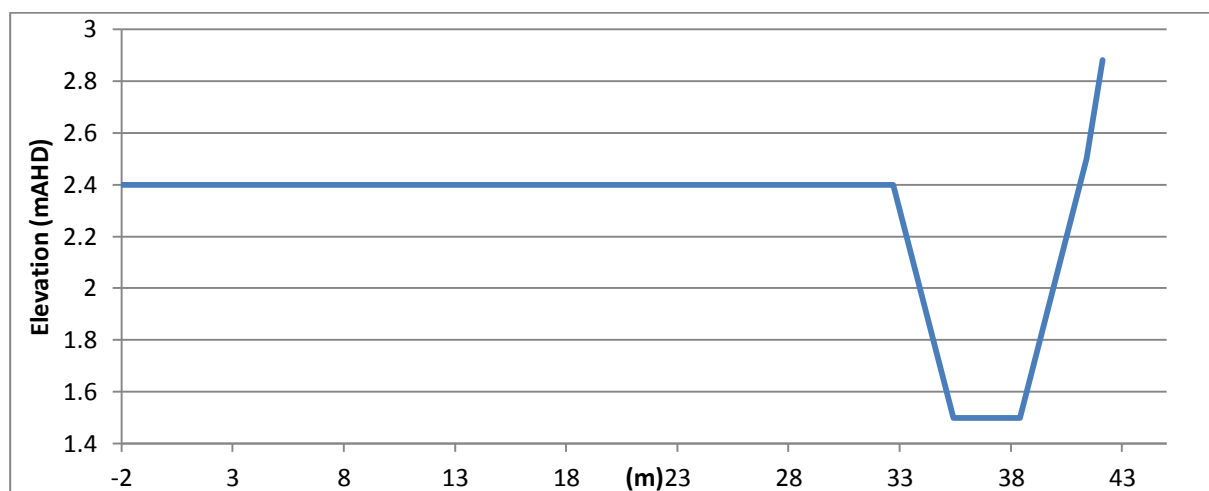


Figure 5 Cross-section at Pub-chan Chainage 240m

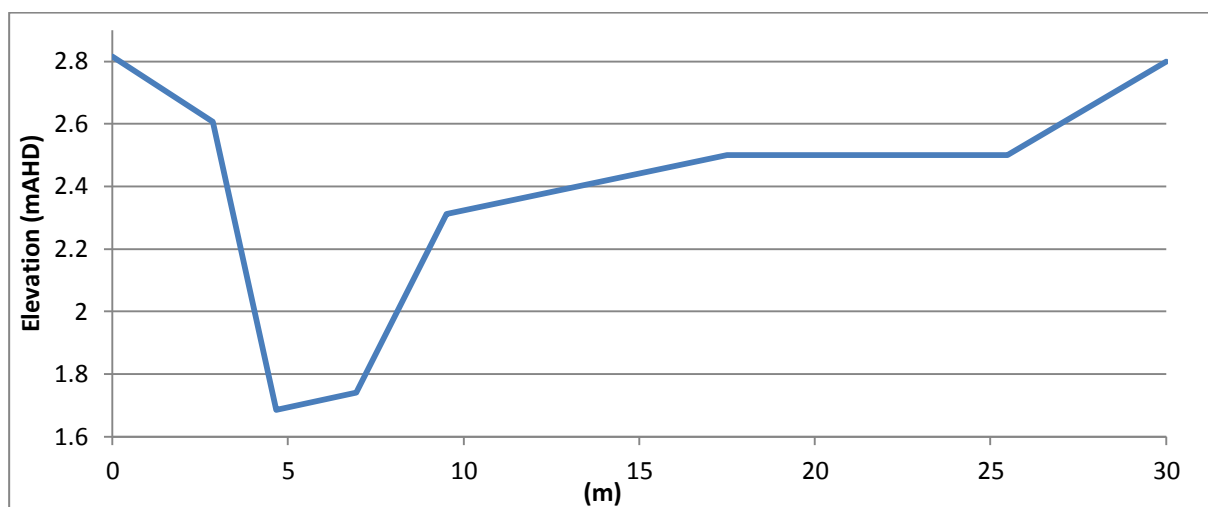


Figure 6 Cross-section at Wonga_nth_chan Chainage 200m (Wonga Drain)

Flood level results comparison

The development model was run for the events identified in

Table 1, and results are summarised in Table 5.

Table 5 Peak water levels for catchment design floods under development situation, difference from Baseline is in parenthesis

Location	Description	MIKE 11 Branch	MIKE 11 Chainage (m)	100 year ARI (mAHD)	10 year ARI (mAHD)	1 year ARI (mAHD)
F	Kalal St	Wonga_sth_Chan	150	2.53 (0.00)	2.37 (0.00)	2.11 (0.00)
H	Marlin Drive -Barker Close	Marlin-drive	810	2.77 (0.00)	2.68 (0.00)	2.57 (0.00)
A	Channel upstream of Wonga Beach road, east	Wonga_nth_chan (Wonga Drain)	560	2.42 (-0.11)	2.26 (-0.11)	2.04 (-0.06)
B	Pub-channel - Wonga Drain	Pub-Chan	170	2.40 (-0.12)	2.19 (-0.08)	2.01 (-0.07)
D	Pub-channel - Upstream of culvert under Marlin Drive	Pub-Chan	240	2.36 (-0.04)	2.15 (-0.03)	1.98 (-0.04)
E	Pub-channel - south edge of the site	Pub-Chan	340	2.00 (-0.09)	1.88 (-0.06)	1.78 (-0.05)
Peak Ocean Level (Boundary)				1.45		

The results confirm that with the proposed channel configuration, the development does not increase peak water level in the floodplain surrounding the site in the three modelled events. It also confirms that for a provisional development floor level of 2.9 m AHD, development buildings are flood free in this particular event scenario (no climate change impact on flows and sea level; Low Isles tidal record sea boundary).

Flow velocity summary

In order to assess the potential for sediment blockage of the reconstructed Pub Drain, peak average channel velocities were taken from the development case model. These are summarised in Table 6.

Table 6 Peak flow velocities for catchment design floods (no climate change impact on flows and sea level; Low Isles tidal record sea boundary)

Location	Description	MIKE 11 Branch	MIKE 11 Chainage (m)	100 year ARI (m/s)	10 year ARI (m/s)	1 year ARI (m/s)
C	Pub-channel – near Wonga Drain	Pub-Chan	205	0.41	0.34	0.26
D	Pub-channel - Upstream of culvert under Marlin Drive	Pub-Chan	240	0.41	0.35	0.27
E	Pub-channel - south edge of the site	Pub-Chan	340	0.90	0.73	0.58

Design level assessment

This assessment examines more severe catchment flow and sea level conditions than the development impact assessment. The development impact assessment looked at the relative impact of the development on the floodplain. The design level assessment examines whether nominated floor levels are sufficient to meet planning requirements.

Two events are considered in the design level assessment: the catchment design flood, and the 100 year storm surge.

Catchment flood design level assessment

The boundary conditions for the catchment flood design level assessment are described in Table 1.

. The assessment is based on:

- HAT sea levels and a 300mm future sea level rise provision; the assumed sea level boundary rises from 1.5 mAHD at the commencement of the simulation to reach a peak level of 2.1 mAHD coinciding with the approximate peak catchment discharge in the drainage system; (this is a more extreme sea condition than the development impact assessment);
- a 100 year ARI catchment flood increased by 30% representing climate change driven increased rainfall intensity
- an initial condition assuming that prior to the event, the drainage system has already been filled by high sea levels and antecedent rainfalls, to a depth of 1.5 mAHD.

Table 7 presents the results at selected locations around the development site for the design level assessment. The model confirms that flood flows are contained within the drainage channels around the site. At the southern end of the site, the peak water level in Pub Drain is 2.54 mAHd at the northern end of Marlin Street. These decrease to 2.27 mAHd near the eastern edge of the development site.

Table 7 Peak water levels under design conditions

Location	Description	MIKE 11 Branch	MIKE 11 Chainage (m)	100 year ARI (mAHd)
F	Kalal St	Wonga_sth_Chan	150	2.65
H	Marlin Drive -Barker Close	Marlin-drive	810	2.85
A	Channel upstream of Wonga Beach road, east	Wonga_nth_chan (Wonga Drain)	560	2.60
B	Pub-channel - Wonga Drain	Pub-Chan	170	2.59
D	Pub-channel - Upstream of culvert under Marlin Drive	Pub-Chan	240	2.54
E	Pub-channel - south edge of the site	Pub-Chan	340	2.27
Peak Ocean Level (Boundary)				2.10

In the Wonga Drain along the western side of the site, the peak water level reaches 2.60mAHd. Based on existing ground levels from the channel cross-sections, this water level is contained within the drain channel and flood relief channel. This confirms that the proposed minimum allotment level of 2.90mAHd is sufficient.

Storm surge assessment

The assumed 100 year storm surge level as described in Table 1 (including 300mm climate change sea level rise provision) at the site is 2.70 mAHd. This level is also important in consideration of acceptable minimum lot levels for the project.

Conclusions

- The modelling predicts the development, culvert and channel arrangement outlined above produces negligible impacts on 1 year, 10 year and 100 year ARI peak flood levels in the surrounding network of drainage channels.
- For the catchment flood design level assessment, the modelled peak flood level in the Wonga Drain channel along the western boundary of the site is 2.60 mAHd.
- Based on the assessed peak catchment flood design level, a provisional minimum lot level of RL 2.90 m AHd (freeboard of 300mm; approximately 1.0m above HAT) is considered consistent with planning requirements.
- The design of the channel to the ocean has not been reviewed, only it's capacity to convey flows. In a dynamic beach environment, this channel will be subject to cyclic erosion and sedimentation

that may undermine the rock spalls and geofabric scour protection. The outlet channel should be maintained and monitored in a similar manner to other established outlets in the area.

- The beach berm level at the location of the storm water outlet should be maintained at around RL 0.9 mAHD. If this level is maintained it is reasonable to assume that the open channel system will not suffer siltation effects worse than that of the surrounding drainage channels.

References

BMT-WBM (2013) Wonga Beach Integrated Stormwater Management Plan. Report prepared for the McCloy Group. April 2013.

BPA (1984) Mulgrave Shire Northern Beaches. Report prepared for Mulgrave Shire Council by the Beach Protection Authority. 1984.

DHI (2001) Wonga Beach Area Drainage Study. Report prepared for Port Douglas Shire Council by DHI. 2001.

DHI (2009) MIKE11 Modelling at Wonga Beach – Oasis Drive Development. Letter report prepared for TATE Professional Engineers. 2009.

MSQ (2013) Queensland Tide Tables. Maritime Safety Queensland, 2014.

OHA (2004) Ocean Hazards Assessment – Stage 3. Queensland Climate Change and Community Vulnerability to Tropical Cyclones. Surge plus tide statistics for selected open coast locations along the Queensland east coast. Prepared by the Marine Modelling unit at James Cook University. July 2004.

WBM (2002) Cairns Shoreline Erosion Management Plan, Technical report prepared for Cairns City Council by WBM Oceanics, 2006.